



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A1			
Sh.	1	of	5
		A0	A1
		A2	

Service HYDROCARBONS WITH OR WITHOUT HYDROGEN
FUEL GAS
NATURAL GAS

Codes

Size	Pipe		Fitting Thk	Nipples	
	Thk	Sch		Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	3.91	40	3.91	40	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	XS			
42	12.7	XS			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	42	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5	CL300 RF	125 µin.Ra
3	26	42	ASME-B16.47 series.A	CL300 RF	125 µin.Ra
5	1/2	24	ASME-B16.5	CL600 RF	125 µin.Ra
6	4	24	ASME-B16.5	CL900 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra
11	26	42	ASME-B16.47 series.A	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp.	Size up to
	42
°C	Pressure in bar
2	19.65
38	19.64
93	17.93
137	16.29
149	15.85
204	13.81
260	11.72
275	11.16
295	10.42
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Ball valves use is limited to 180 °C

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.



JOB 316800					
Piping Class A1A1					
Sh.	3	of	5	Rev.	
				A0	A1

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	42	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	42	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	26	28	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	18	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
6	4	12	WN FLANGE - ASME-B16.5	CL900 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	26	42	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	42	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	1/2	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
	26	42	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
3	1 1/2	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
DRIP RING						
	3	3	DRIP-RING - TB DRI 5011	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	42	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1/2	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	



JOB 316800								
Piping Class A1A1								
Sh.	4	of	5					
				Rev.				
				A0	A1	A2		

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt.	from	to			
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT					
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized
SPIRAL WOUND					
	1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
1	26	36	GA-E-60113	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
4	2	18	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	26	32	GA-E-60331	Carbon Steel - Check-Flanged or BW-Dual plate-Wlidd seat - API594 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
8	1/2	6	GA-E-60401	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats	
8	8	16	GA-E-60415	Carbon Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats	
8	18	24	GA-E-60411	Carbon Steel - Ball-Split body-FB-Trunnion ball - API6D - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats	
8	26	42	GA-E-60412	Carbon Steel - Ball-Split body-FB-Trunnion ball - API6D - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats	
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	



JOB 316800					
Piping Class A1A1					
Sh.	5	of	5		
				Rev.	
	A0	A1	A2		

pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2
1	14	24	GA-E-60604	Carbon Steel - T Strainer-BW - <MFR Std - Metallic> - CL150 - BW Body Mat. ASTM A234 WPB - SMLS Trim Mat. 316 - CLOTH - MESH 3
1	26	36	GA-E-60607	Carbon Steel - T Strainer-BW - <MFR Std - Metallic> - CL150 - RF - 125 µin.Ra Body Mat. ASTM A234 WPBW - WLDD Trim Mat. 316 - CLOTH - MESH 3



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A1(Z)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service CAUSTIC SOLUTION
Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	3.91	40		3.91	40
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
315	9.67
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																						
Run size																						
1/2	A																					
3/4	A	A																				
1	A	A	A																			
1 1/2	A	A	A	A																		
2	S	S	S	S	T																	
3	S	S	S	S	T	T																
4	S	S	S	S	T	T	T															
6	S	S	S	S	W	T	T	T														
8	S	S	S	S	W	T	T	T														
10	S	S	S	S	W	W	W	T	T	T												
12	S	S	S	S	W	W	W	T	T	T	T											
14	S	S	S	S	W	W	W	W	T	T	T	T										
16	S	S	S	S	W	W	W	W	T	T	T	T	T									
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T								
20	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T							
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T						
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24						
Legenda																						
A	TEE - SW ENDS - ASME-B16.11																					
S	SOCKOLET - SW END - MSS-SP97																					
T	TEE - ASME-B16.9																					
W	WELDOLET - MSS-SP97																					



JOB 316800				
Piping Class A1A1(Z)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 24	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
	2 24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
3	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
3	2 24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	1 1/2 6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER				
	2 24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET				
	2 10	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT				
	3 1 1 1/2	LWN FLANGE - TB FLG 5040	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800				
Piping Class A1A1(Z)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60146	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
1	2	24	GA-E-60107	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
4	1/2	1 1/2	GA-E-60239	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
4	2	8	GA-E-60207	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
6	1/2	1 1/2	GA-E-60346	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
6	2	24	GA-E-60307	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
8	1	6	GA-E-60401	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats
8	8	16	GA-E-60402	Carbon Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size from	to	Doc.	Type
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A1A3					
Sh.	1	of	4		
				Rev.	

Service	HYDROCARBON NATURAL GAS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	XS		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	XS			
38	12.7	XS			
40	12.7	XS			
46	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	46	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5	CL300 RF	125 µin.Ra
5	1/2	24	ASME-B16.5	CL600 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra
11	26	36	ASME-B16.47 series.A	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	Size to	Internal	External
1/2	46	3.2	0

Welding			
Size from	Size to	Weld. spec.	
1/2	46	NIOEC-SP-90-02	
		Weld. class	10%

Design Limits			
Temp.	Size up to		
	24	46	
°C	Pressure in bar		
2	19.65	17.52	
38	19.64	17.52	
93	17.93	17.09	
149	15.85	15.85	
204	13.81	13.81	
209	13.62	13.62	
231	12.8	12.8	
260	11.72	11.72	
272	11.27	11.27	
316	9.63	9.63	
343	8.62	8.62	
371	7.58	7.58	
398	6.58	6.58	
400	6.51	6.51	
Max. hydr. P.	29.4	26.2	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.



JOB 316800							
Piping Class A1A3							
Sh.	3	of	4	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	46	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	46	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	4	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	26	36	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	46	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
	26	36	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
3	1 1/2	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	46	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	46	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
2	46		CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1/2	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	46	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800					
Piping Class A1A3					
Sh.	4	of	4		
				Rev.	
	A0	A1	A2		

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt.	from	to			
SPIRAL WOUND					
1/2	46	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS					
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	24	GA-E-60103	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
1	26	36	GA-E-60114	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	10	GA-E-60203	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	24	GA-E-60303	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A3(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A3(Z)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service CAUSTIC SOLUTION
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160	4.78	160	
3/4	5.56	160	5.56	160	
1	6.35	160	6.35	160	
1 1/2	5.08	80	7.14	160	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	30			
24	9.53	STD			
36	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
	26	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	36	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	36	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	T	T	T	T	
36	S	S	S	S	W	W	W	W	W	P	P	P	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	24	36
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
P	PIPE-TO-PIPE													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800							
Piping Class A1A3(Z)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	36	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	36	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	36	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A1A3(Z)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
Size	Doc.	Type		
pos. from to				
1	1/2	1 1/2	GA-E-60146	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
1	2	14	GA-E-60107	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
4	1/2	1 1/2	GA-E-60239	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
4	2	8	GA-E-60207	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
6	1/2	1 1/2	GA-E-60346	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
6	2	14	GA-E-60307	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
11	1/2	3/4	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF

STRAINERS				
Size	Doc.	Type		
pos. from to				
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A6			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH OR WITHOUT HYDROGEN
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
3/4	7.82	XXS	7.82	XXS	
1	9.09	XXS	9.09	XXS	
1 1/2	10.15	XXS	10.15	XXS	
2	8.74	160			
3	11.13	160			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	12.7	XS			
20	12.7	XS			
24	12.7	XS			
32	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
3/4	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	32	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	3/4	24	ASME-B16.5	CL300 RF	125 µin.Ra
11	26	32	ASME-B16.47 series.A	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
3/4	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				Welding	
from	Size to	Internal	External	from	Size to
3/4	1 1/2	6	0	3/4	32
2	32	6.4	0		

Weld. spec. NIOEC-SP-90-02
Weld. class 10%

Design Limits			
Temp.	Size up to		
	24	32	
°C	Pressure in bar		
2	19.64	16.07	
38	19.64	16.07	
93	17.93	15.67	
149	15.85	15.19	
204	13.81	13.81	
260	11.72	11.72	
290	10.6	10.6	
Max. hydr. P.	29.4	24.1	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Run size		Branch Connections 90 Degrees																		
3/4	A																			
1	A	A																		
1 1/2	A	A	A																	
2	S	S	S	T																
3	S	S	S	T	T															
4	S	S	S	T	T	T														
6	S	S	S	W	T	T	T													
8	S	S	S	W	W	T	T	T												
10	S	S	S	W	W	T	T	T	T											
12	S	S	S	W	W	W	T	T	T	T										
14	S	S	S	W	W	W	T	T	T	T	T									
16	S	S	S	W	W	W	W	T	T	T	T	T								
18	S	S	S	W	W	W	W	W	T	T	T	T	T							
20	S	S	S	W	W	W	W	W	T	T	T	T	T	T						
24	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T					
32																				
Branch size	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	32				
Legenda																				
A	TEE - SW ENDS - ASME-B16.11																			
S	SOCKOLET - SW END - MSS-SP97																			
T	TEE - ASME-B16.9																			
W	WELDOLET - MSS-SP97																			



JOB 316800				
Piping Class A1A6				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
opt.	Size	Item	Rating/Facing	Material	
	from	to			
PIPE					
	3/4	24	PIPE		ASTM A106 GR.B - SMLS
	26	32	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW
CONNECTION FLANGE					
	3/4	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
3	3/4	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
11	26	32	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	3/4	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	1 1/2	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70
	26	32	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	3/4	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
	26	32	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD
REDUCER					
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
	26	32	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD
CAP					
	3/4	1 1/2	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized
	3/4	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	3/4	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	3/4	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized
MALE PLUG					
	3/4	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	3/4	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES					
	3/4	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	3/4	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE					
	3/4	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET					
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET					
	3/4	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized
SOCKOLET					
	3/4	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized
FLANGED INSERT					
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized



JOB 316800								
Piping Class A1A6								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
3/4	32	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	3/4	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	3/4	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
4	2	8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	3/4	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
11	3/4	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A6(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1A6(X)			
Sh.	1	of	1
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A1B1			
Sh. 1 of 1		Rev.	
A0	A1		

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1A1
Ricalcolato spessori
Trim 13CR come in A6B1

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A1B1(Z)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1A1
Ricalcolato spessori
Trim 13CR come in A6B1

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A1B3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1A3
Trim 13CR come A6B1
Ricalcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material

VALVES			
Size	Doc.	Type	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1B3(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1B3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Grade

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C1(Z)			
Sh. 1 of 3	Rev.		
	A0		

Service STRIPPED WATER
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	3.91	40		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	14 ASME-B16.5		CL300 RF	125 µin.Ra
5	1/2	16 ASME-B16.5		CL600 RF	125 µin.Ra
11	12	16 ASME-B16.5		CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	20
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
230	12.84
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size																		
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	W	T	T	T	T						
16	S	S	S	S	W	W	W	W	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20			
Legenda																		
A	TEE - SW ENDS - ASME-B16.11																	
S	SOCKOLET - SW END - MSS-SP97																	
T	TEE - ASME-B16.9																	
W	WELDOLET - MSS-SP97																	



JOB 316800			
Piping Class A1C1(Z)			
Sh.	2	of	3
A0			

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	20	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	2	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800			
Piping Class A1C1(Z)			
Sh. 3 of 3	Rev.		
	A0		

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60106 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
1	2	20	GA-E-60107 Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
4	1/2	1 1/2	GA-E-60206 Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
4	2	8	GA-E-60207 Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
6	1/2	1 1/2	GA-E-60306 Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
6	2	20	GA-E-60307 Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
11	1/2	1 1/2	GA-E-60198 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 316



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C3			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service **HYDROCARBONS WITH H2S WATER**
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	14	ASME-B16.5 CL300 RF 125 µin.Ra		
5	1/2	16	ASME-B16.5 CL600 RF 125 µin.Ra		
11	12	24	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits		
Temp. °C	Size up to	Pressure in bar
	24	
2		19.65
38		19.64
93		17.93
149		15.85
204		13.81
230		12.84
Max. hydr. P.	29.4	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	T	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	T	T	T	T	T
16	S	S	S	S	W	W	W	T	T	T	T	T
18	S	S	S	S	W	W	W	W	T	T	T	T
20	S	S	S	S	W	W	W	W	T	T	T	T
24	S	S	S	S	W	W	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A1C3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	20	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	2	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800			
Piping Class A1C3			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60104 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Monel
1	2	16	GA-E-60105 Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Monel
4	1/2	1 1/2	GA-E-60204 Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Monel
4	2	8	GA-E-60205 Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Monel
6	1/2	1 1/2	GA-E-60304 Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Monel
6	2	14	GA-E-60305 Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Monel
11	1/2	1 1/2	GA-E-60145 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. Monel



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C3(N)			
Sh.	1	of	4
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
34	9.53	STD			
36	12.7	XS			
38	12.7	XS			
40	12.7	XS			
52	15.88				
56	15.88				
84	17.48				
88	19.05				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	60	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	ASME-B16.5		CL300 RF	125 µin.Ra
11	12	ASME-B16.5		CL150 RF	125 µin.Ra
11	26	40 ASME-B16.47 series.A		CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	88	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	88	NIOEC-SP-90-02
Weld. class 10%		
PWHT YES => 2"		

Design Limits			
Temp.	Size up to		
	24	88	
°C	Pressure in bar		
2	19.65	18.23	
38	19.64	18.23	
93	17.93	17.78	
149	15.85	15.85	
204	13.81	13.81	
230	12.84	12.84	
260	11.72	11.72	
280	10.97	10.97	
315	9.65	9.65	
343	8.61	8.61	
350	8.36	8.36	
Max. hydr. P.	29.4	27.3	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.



JOB 316800					
Piping Class A1C3(N)					
Sh.	3	of	4	Rev.	
				A0	A1

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
from	to					
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
	26	88	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	26	60	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	20	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	40	40	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
	40	40	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
3	1 1/2	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	48	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60020	
	50	88	LONG RADIUS ELBOW - TB RAC 5060		ASTM A234 WPBW - WLDD GA-E-60020	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	48	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60020	
	50	88	REDUCER, LARGE BORE - TB RAC 5062/63		ASTM A234 WPBW - WLDD GA-E-60020	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	40	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1/2	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	40	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60020	
	52	88	TEE - TB RAC 5061		ASTM A234 WPBW - WLDD GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	



JOB 316800				
Piping Class A1C3(N)				
Sh.	4	of	4	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	60	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
1	26	32	GA-E-60589	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60609	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C3(X)			
Sh. 1 of 5	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	8.38	30			
14	9.53	30			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	XS			
38	12.7	XS			
40	12.7	XS			
42	12.7	XS			
44	12.7	XS			
46	12.7	XS			
48	12.7	XS			
54	15.88				
60	15.88				
64	15.88				
66	15.88				
76	17.48				
84	17.48				
90	19.05				
92	19.05				
94	19.05				
96	19.05				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	60	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
62	96	<MFR Std - Metallic>		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5	CL300 RF	125 µin.Ra
6	3	24	ASME-B16.5	CL900 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra
11	26	60	ASME-B16.47 series.A	CL150 RF	125 µin.Ra
11	62	96	<MFR Std - Metallic>	CL150 RF	125 µin.Ra
31	12	24	ASME-B16.5	CL300 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	96	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	96	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits			
Temp.	Size up to	24	96
°C	Pressure in bar		
2		19.65	17.52
38		19.64	17.52
93		17.93	17.09
149		15.85	15.85
204		13.81	13.81
230		12.84	12.84
260		11.72	11.72
280		10.97	10.97
315		9.67	9.67
343		8.62	8.62
350		8.36	8.36
Max. hydr. P.		29.4	26.2

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Ball valves use is limited to 180 °C

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.



JOB 316800					
Piping Class A1C3(X)					
Sh. 2 of 5	Rev.				
	A0	A1	A2		

Branch Connections 90 Degrees

Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	38	40	42	44	46	48	54	60	64	66	76	
1/2	A																																
3/4	A	A																															
1	A	A	A																														
1 1/2	A	A	A	A																													
2	S	S	S	S	T																												
3	S	S	S	S	S	T	T																										
4	S	S	S	S	S	T	T	T																									
6	S	S	S	S	S	W	T	T	T																								
8	S	S	S	S	S	W	W	T	T	T																							
10	S	S	S	S	S	W	W	W	T	T	T																						
12	S	S	S	S	S	W	W	W	T	T	T	T																					
14	S	S	S	S	S	W	W	W	T	T	T	T	T																				
16	S	S	S	S	S	W	W	W	T	T	T	T	T	T																			
18	S	S	S	S	S	W	W	W	T	T	T	T	T	T	T																		
20	S	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T																	
24	S	S	S	S	S	W	W	W	T	T	T	T	T	T	T	T	T																
26	S	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	T	T														
28	S	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	P	T	T	T												
30	S	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	P	P	T	T	T											
32	S	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	T	T											
36	S	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P											
38																																	
40	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T	
42																																	
44																																	
46																																	
48																																	
54																																	
60																																	
64	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	
66	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	
76	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	
84	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
90	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
92	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
94																																	
96	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	

Legenda

A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
R	TEE - TB RAC 5061
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class A1C3(X)			
Sh. 3 of 5	Rev.		
	A0	A1	A2

Branch Connections 90 Degrees

Run size

1/2					
3/4					
1					
1 1/2					
2					
3					
4					
6					
8					
10					
12					
14					
16					
18					
20					
24					
26					
28					
30					
32					
36					
38					
40					
42					
44					
46					
48					
54					
60					
64					
66					
76					
84 R					
90 R R					
92 R R R					
94					
96 R R R R					
Branch size	84	90	92	94	96

Component/Material descriptions

opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
	26	96	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW GA-E-60021
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	26	60	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
6	3	3	WN FLANGE - ASME-B16.5	CL900 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
11	26	96	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
31	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE					
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	26	36	BLIND FLANGE - ASME-B16.47 series.B	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND					
	1/2	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021
	26	96	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021
3	8	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
	26	48	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021
	50	96	LONG RADIUS ELBOW - TB RAC 5060		ASTM A234 WPBW - WLDD GA-E-60021
REDUCER					
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
	26	48	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021
	50	88	REDUCER, LARGE BORE - TB RAC 5062/63		ASTM A234 WPBW - WLDD GA-E-60021



JOB 316800							
Piping Class A1C3(X)							
Sh.	4	of	5	Rev.			
				A0	A1	A2	

Branch Connections 90 Degrees

Run size
Branch size

		Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material		
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	38	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	40	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
	64	96	TEE - TB RAC 5061		ASTM A234 WPBW - WLDD GA-E-60021	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND						
	1/2	60	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800							
Piping Class A1C3(X)							
Sh.	5	of	5	Rev.			
				A0	A1	A2	

VALVES					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
1	26	36	GA-E-60589	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
2	66	96	GA-E-60506	Carbon Steel - Special Butterfly-Flanged-Triple Off Set-Int.seat-Fire safe - <MFR Std> - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. Metal seat - 316 - 316 disc	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
8	30	32	GA-E-60413	Carbon Steel - Ball-Split body-FB-Trunnion ball - API6D - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. Soft seat-316L trim - PTFE seats	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	4	6	GA-E-60609	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A1C3(Z)					
Sh. 1 of 3		Rev.			
		A0	A1		

Service	STRIPPED WATER
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL150 RF	125	µin.Ra
3	1/2	14 ASME-B16.5	CL300 RF	125	µin.Ra
5	1/2	16 ASME-B16.5	CL600 RF	125	µin.Ra
11	12	16 ASME-B16.5	CL150 RF	125	µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
		Weld. class 10%
		PWHT YES

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
230	12.84
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	T	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class A1C3(Z)					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
	Size	Item		Rating/Facing	Material	
opt.	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	20	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	2	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A1C3(Z)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60106	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
1	2	20	GA-E-60107	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
4	1/2	1 1/2	GA-E-60206	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
4	2	8	GA-E-60207	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
6	1/2	1 1/2	GA-E-60306	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
6	2	20	GA-E-60307	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
11	1/2	1 1/2	GA-E-60198	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 316	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A1C4					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1C3ma spessori come B1A4.
Variato c.a. da 3.2 a 4.5 e ricalcolato spessori
Rating 6000

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		

VALVES			
Size	Doc.	Type	
pos. from	to		



JOB 316800			
Piping Class A1C4(X)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C6			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1C3
Spessori come A1A6
Variato c.a. da 3.2 a 6.4 (6.0 per inferiori)
Ricalcolato spessori
Rating 6000

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1C6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	SOUR WATER (Wet H2S Service)
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	10.15	XXS		10.15	XXS
2	8.74	160			
3	11.13	160			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	14	ASME-B16.5 CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2	1 1/2		6	0
2	14		6.4	0

Welding		
from	Size	to
1/2	14	
Weld. spec. NIOEC-SP-90-02		
Weld. class 10%		
PWHT YES => 2"		

Design Limits	
Temp.	Size up to
°C	14
	Pressure in bar
2	19.64
38	19.64
93	17.93
149	15.85
204	13.81
230	12.84
Max. hydr. P.	29.4

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size												
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	W	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda												
A	TEE - SW ENDS - ASME-B16.11											
S	SOCKOLET - SW END - MSS-SP97											
T	TEE - ASME-B16.9											
W	WELDOLET - MSS-SP97											



JOB 316800	
Piping Class A1C6(N)	
Sh. 2 of 3	Rev.
	A0 A1 A2

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 14	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	2 14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 14	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4 3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2 14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
3	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800				
Piping Class A1C6(N)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	14	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	14	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A1C6(X)					
Sh.	1	of	3	Rev.	
				A0	A1

Service HYDROCARBONS WITH H2SWATER
SOUR WATER
ACID FLARE
(Severe Wet H2S Service)

Codes

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	XXS	
3/4	7.82	XXS	7.82	XXS	
1	9.09	XXS	9.09	XXS	
1 1/2	10.15	XXS	10.15	XXS	
2	8.74	160			
3	11.13	160			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	12.7	XS			
20	12.7	XS			
24	12.7	XS			
26	12.7	XS			
28	12.7	XS			
30	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
	26	30 ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	14 ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				Welding	
Size from	to	Internal	External	Size from	to
1/2	1 1/2	6	0	1/2	30
2	30	6.4	0	Weld. spec. NIOEC-SP-90-02	
				Weld. class 10%	
				PWHT YES => > 2"	

Design Limits			
Temp. °C	Size up to	24	30
		Pressure in bar	
2		19.64	17.15
38		19.64	17.15
93		17.93	16.72
149		15.85	15.85
204		13.81	13.81
230		12.84	12.84
260		11.72	11.72
315		9.67	9.67
343		8.62	8.62
350		8.36	8.36
Max. hydr. P.	29.4	25.7	

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	T			
26	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	T	T		
28	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	T	T	T	
30	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	P	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A1C6(X)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
	26	30	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW GA-E-60021	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	26	30	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	24	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
3	8	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	30	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	30	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	30	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	30	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A1C6(X)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60609	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A1D1			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1A1
Ricalcolato spessori
Valvole HOLD

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1D3			
Sh. 1 of 1	Rev.		
	A0	A1	

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1A3
Ricalcolati spessori
Valvole HOLD

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



JOB 316800			
Piping Class A1E1			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1E3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	LEAN AMINE
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160	4.78	160	
3/4	5.56	160	5.56	160	
1	6.35	160	6.35	160	
1 1/2	5.08	80	7.14	160	
2	5.54	80	8.74	160	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5		CL300 RF 125 µin.Ra
5	1/2	24	ASME-B16.5		CL600 RF 125 µin.Ra
11	12	24	ASME-B16.5		CL150 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
24	24
2	19.64
38	19.64
93	17.93
149	15.85
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A1E3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	6	6	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
3	2	24	BEND - WITH R=3 DN - TB RAC 5023		ASTM A234 WPB - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800								
Piping Class A1E3								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1E3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5 CL300 RF 125 µin.Ra		
11	12	24	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	24	3.2	0

Welding		
from	Size to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits		
Temp.	Size up to	
°C	24	Pressure in bar
2		19.64
38		19.64
93		17.93
149		15.85
Max. hydr. P.	29.4	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	T	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	

Legend	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800							
Piping Class A1E3(N)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	3	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A1E3(N)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	6	8	GA-E-60609	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A1E3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees

Run size
Branch size
Legenda

Component/Material descriptions

Size	Item	Rating/Facing	Material
------	------	---------------	----------

opt. from to

VALVES

Size	Doc.	Type
------	------	------

pos. from to



JOB 316800			
Piping Class A1E6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1E3
Spessori come A1A6
Variato c.a. da 3.2 a 6.4 (6.0 per inferiori)
Ricalcolato spessori
Rating 6000

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1E6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	10.15	XXS		10.15	XXS
2	8.74	160			
3	11.13	160			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	12.7	XS			
20	12.7	XS			
24	12.7	XS			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	ASME-B16.5	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	1 1/2	6	0	
2	24	6.4	0	

Welding			
Size from	to	Weld. spec.	
1/2	24	NIOEC-SP-90-02	
Weld. class		10%	
PWHT		YES	

Design Limits		
Temp.	Size up to	
°C	24	Pressure in bar
2	19.64	
38	19.64	
93	17.93	
149	15.85	
Max. hydr. P.	29.4	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A1E6(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions							
opt.	Size	Item	Rating/Facing	Material			
	from	to					
PIPE							
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020		
CONNECTION FLANGE							
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
11	12	14	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
BLIND FLANGE							
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
SPECTACLE BLIND							
	3/4	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020		
ELBOW							
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
3	2	24	BEND - WITH R=3 DN - TB RAC 5023		ASTM A234 WPB - SMLS GA-E-60020		
REDUCER							
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
CAP							
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
COUPLING							
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
MALE PLUG							
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020		
NIPPLES							
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020		
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020		
SWAGE NIPPLES							
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020		
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020		
TEE							
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
WELDOLET							
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020		
THREDOLET							
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020		
SOCKOLET							
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020		
FLANGED INSERT							
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND							
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING		



JOB 316800								
Piping Class A1E6(N)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60609	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A1E6(X)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1F0(L)			
Sh. 1 of 2	Rev.		
	A0	A1	

Service SULPHURIC ACID
Codes

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing

opt. from	to	Code	
1	10	ASME-B16.5	CL150 RF

Thicknesses

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1	4.55	80			
1 1/2	5.08	80			
2	3.91	40			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			

Corrosion Allowance

Size from	to	Internal	External
1	10	0	0

Welding

Size from	to	Weld. spec.

Design Limits

Temp.	Size up to
	10
°C	Pressure in bar
2	19.65
38	19.64
65	18.8

Max. hydr. P.

Notes: Plug valves limited to 180°C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees

Run size	1	1 1/2	2	3	4	6	8	10
Branch size	1	1 1/2	2	3	4	6	8	10

Legenda



JOB 316800					
Piping Class A1F0(L)					
Sh.	2	of	2		
				Rev.	

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
PIPE					
1	10	FLANGED PIPE - LINED - <MFR Std - Metallic>	CL150 RF	ASTM A106 GR.B - SMLS GA-E-60023	
BLIND FLANGE					
1	10	BLIND FLANGE - ASME-B16.5	CL150 RF	ASTM A105 Normalized GA-E-60023	
SPECTACLE BLIND					
1	10	SPECIAL SPECTACLE BLIND - <MFR Std>	CL150 RF	ASTM A515 GR.70 GA-E-60023	
ELBOW					
1	10	FLANGED ELBOW - LINED - <MFR Std - Metallic>	CL150 RF	ASTM A234 WPB - SMLS GA-E-60023	
REDUCER					
1	10	FLANGED REDUCER - LINED - <MFR Std - Metallic>	CL150 RF	ASTM A234 WPB - SMLS GA-E-60023	
TEE					
1	10	FLANGED TEE - LINED - <MFR Std - Metallic>	CL150 RF	ASTM A234 WPB - SMLS GA-E-60023	
FLAT NON-METALLIC					
1	10	FLAT NON MET. GASKET - TB GUA 5365		PTFE - REINFORCED	
BOLTS					
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
from	to				
6	1	10	GA-E-60330	Nickel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF Body Mat. ASTM A351 CN7M Trim Mat. Alloy 20	
9	1	10	GA-E-60551	Iron - Plug-Red.B-Non lubric.plug -Sleeve seat - API599 - CL150 - RF Body Mat. ASTM A395 Trim Mat. With sleeve-PTFE - ALLOY20	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	1	6	GA-E-60632	Carbon Steel - Fully Lined Y Strainer-Bolted cover - <MFR Std - Metallic> - CL150 - RF Body Mat. ASTM A216 WCB Trim Mat. ALLOY 20 - PERF.PLATE - 18 Holes/Cm2	



JOB 316800			
Piping Class A1F3			
Sh. 1 of 1		Rev.	
A0	A1		

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



JOB 316800			
Piping Class A1F3(Z)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Customer Piping Class
Ref. Doc.

Service	CAUSTIC SOLUTION CHEMICALS
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160		4.78		160
3/4	5.56	160		5.56		160
1	6.35	160		6.35		160
1 1/2	5.08	80		7.14		160
2	5.54	80		5.54		80
3	7.62	80				
4	8.56	80				
6	10.97	80				
8	12.7	80				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	8	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	8	ASME-B16.5		CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	8	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	8	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp.	Size up to
°C	8 Pressure in bar
2	19.64
38	19.64
65	18.8
Max. hydr. P.	29.4

Notes: Plug valves limited to 180°C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	S	S	S	T						
2	S	S	S	T	T					
3	S	S	S	T	T	T				
4	S	S	S	W	T	T	T			
6	S	S	S	W	W	T	T	T		
8	S	S	S	W	W	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800								
Piping Class A1F3(Z)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions									
	Size	Item		Rating/Facing	Material				
opt.	from	to							
PIPE									
	1/2	8	PIPE		ASTM A106 GR.B - SMLS				
CONNECTION FLANGE									
	1/2	8	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized				
3	1/2	8	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized				
BLIND FLANGE									
	1/2	8	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized				
SPECTACLE BLIND									
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70				
ELBOW									
	1/2	1	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized				
	1 1/2	8	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS				
REDUCER									
	1 1/2	8	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS				
CAP									
	1/2	1	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized				
	1 1/2	8	CAP - ASME-B16.9		ASTM A234 WPB - SMLS				
COUPLING									
	1/2	1	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized				
	1/2	1	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized				
MALE PLUG									
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized				
NIPPLES									
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS				
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS				
SWAGE NIPPLES									
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS				
	1/2	1	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS				
TEE									
	1/2	1	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized				
	1 1/2	8	TEE - ASME-B16.9		ASTM A234 WPB - SMLS				
WELDOLET									
	1 1/2	3	WELDOLET - MSS-SP97		ASTM A105 Normalized				
SOCKOLET									
	1/2	1	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized				
FLANGED INSERT									
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized				
SPIRAL WOUND									
	1/2	8	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING				
BOLTS									
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H				



JOB 316800								
Piping Class A1F3(Z)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60163	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20
1	2	8	GA-E-60164	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20
4	1/2	1 1/2	GA-E-60252	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20
4	2	8	GA-E-60253	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20
6	1/2	1 1/2	GA-E-60358	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20
6	2	8	GA-E-60359	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20
9	1	8	GA-E-60555	Carbon Steel - Plug-Red.B-Non lubric.plug -Sleeve seat - API599 - CL150 - RF Body Mat. ASTM A216 WCB Trim Mat. With sleeve-PTFE - ALLOY20
11	1/2	1 1/2	GA-E-60197	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	4	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1G1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH HYDROGEN
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	3.91	40	3.91	40	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5 CL300 RF 125 µin.Ra		
11	12	24	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T

Branch size 1/2 3/4 1 1 1/2 2 3 4 6 8 10 12 14 16 18 20 24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A1G1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	18	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	1 1/2	18	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A1G1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	10	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR



JOB 316800			
Piping Class A1G3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1G1
Spessori come A1A3 (A1A1 per 16"/24")
Variato c.a. da 1.3 a 3.2
Ricalcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions

Size	Item	Rating/Facing	Material
------	------	---------------	----------

VALVES

Size	Doc.	Type
------	------	------



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1G3(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing

opt. from to Code

Corrosion Allowance

Size from to Internal External

Welding

Size from to Weld. spec.
Weld. class
PWHT

Design Limits

Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees

Run size
Branch size
Legenda

Component/Material descriptions

Size	Item	Rating/Facing	Material
opt. from to			

VALVES

Size	Doc.	Type
pos. from to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1G3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Grade

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A1H1					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		

VALVES			
Size	Doc.	Type	
pos. from	to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1H3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HC
(Hydrogen Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD	10.31		
32	9.53	STD	10.31		
36	12.7	XS			
42	12.7	XS			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	42	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	14	ASME-B16.5	CL300 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra
11	26	36	ASME-B16.47 series.A	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
42	
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Run size		Branch Connections 90 Degrees																						
Run size	Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	42	
1/2	A																							
3/4	A	A																						
1	A	A	A																					
1 1/2	A	A	A	A																				
2	S	S	S	S	T																			
3	S	S	S	S	T	T																		
4	S	S	S	S	T	T	T																	
6	S	S	S	S	W	T	T	T																
8	S	S	S	S	W	W	T	T	T															
10	S	S	S	S	W	W	W	T	T	T														
12	S	S	S	S	W	W	W	T	T	T	T													
14	S	S	S	S	W	W	W	T	T	T	T	T												
16	S	S	S	S	W	W	W	W	T	T	T	T	T											
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T										
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T									
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T								
26	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	T							
28	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	T	T					
30	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	T	T				
32	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	T	T			
36	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	T		
42	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	P	P	P	P	T

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class A1H3				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	42	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	42	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	26	36	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	2	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
	26	36	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	42	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800				
Piping Class A1H3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SPIRAL WOUND				
1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	24	GA-E-60103	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	8	GA-E-60203	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	14	GA-E-60303	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	



JOB 316800			
Piping Class A1H3(X)			
Sh. 1 of 3		Rev.	
A0	A1		

Customer Piping Class
Ref. Doc.

Service HYDROGEN WITH OR WITHOUT HC
H2S
WATER
(Hydrogen Service, Severe Wet H2S Service)

Codes

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
	26	42 ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	14 ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	16 ASME-B16.5	CL150 RF 125 µin.Ra		

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	30			
16	9.53	30			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD	10.31		
32	9.53	STD	10.31		
36	12.7	XS			
42	12.7	XS			

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.55
400	6.51
Max. hydr. P.	29.4

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																							
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	42	
1/2 A																							
3/4 A A																							
1 A A A																							
1 1/2 A A A A																							
2 S S S S																							
3 S S S S																							
4 S S S S																							
6 S S S S																							
8 S S S S																							
10 S S S S																							
12 S S S S																							
14 S S S S																							
16 S S S S																							
18 S S S S																							
20 S S S S																							
24 S S S S																							
26 S S S S																							
28 S S S S																							
30 S S S S																							
32 S S S S																							
36 S S S S																							
42 S S S S																							
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	42	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800							
Piping Class A1H3(X)							
Sh.	2	of	3	Rev.			
				A0	A1		

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
	26	42	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW GA-E-60021	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	26	42	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	GA-E-60052 ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
3	2	2	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std>	CL150 RF 125 µin.Ra	GA-E-60051 ASTM A515 GR.70 GA-E-60021	
3	1 1/2	4	SPECIAL SPECTACLE BLIND - <MFR Std>	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	42	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	26	42	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD GA-E-60021	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	



JOB 316800					
Piping Class A1H3(X)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
SPIRAL WOUND					
	1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1H6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service HYDROGEN WITH OR WITHOUT HC
H2S
WATER
(Hydrogen Service, Severe Wet H2S Service)

Codes

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing				
opt. from	to	Code		
1/2	6	ASME-B16.5	CL150 RF 125 µin.Ra	
3	1/2	6	ASME-B16.5	CL300 RF 125 µin.Ra

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	XXS	XXS
3/4	7.82	XXS	7.82	XXS	XXS
1	9.09	XXS	9.09	XXS	XXS
1 1/2	10.15	XXS	10.15	XXS	XXS
2	8.74	160			
3	11.13	160			
4	8.56	80			
6	10.97	80			

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2	1 1/2		6	0
2	6		6.4	0

Welding			
from	Size	to	Weld. spec.
1/2	6		NIOEC-SP-90-02
Weld. class		10%	
PWHT		YES = > 2"	

Design Limits		
Temp.	Size up to	
	6	
°C	Pressure in bar	
2	19.65	
38	19.64	
93	17.93	
149	15.85	
204	13.81	
230	12.84	
Max. hydr. P.	29.4	

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6		
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800				
Piping Class A1H6(X)				
Sh.	2	of	3	
				Rev.
	A0	A1		

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	6	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2	6	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
3	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE					
	1/2	6	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND					
	1/2	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER					
	2	6	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2	6	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES					
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES					
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2	6	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET					
	2	2	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT					
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND					
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A1H6(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	6	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	6	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	6	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	



JOB 316800			
Piping Class A1K3(U)			
Sh.	2	of	2

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	2 6	PIPE Plastic coated per Snamprogetti GA-E-60704		ASTM A106 GR.B - SMLS
	8 24	PIPE Plastic coated per Snamprogetti GA-E-60704		API 5L GR.B PSL1 - ERW
	26 64	PIPE Plastic coated per Snamprogetti GA-E-60704		API 5L GR.B PSL1- SAW
CONNECTION FLANGE				
	2 24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	2 24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	3 3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER				
	2 24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
	26 48	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD
	50 64	REDUCER, LARGE BORE - TB RAC 5062/63		ASTM A234 WPBW - WLDD
CAP				
	2 24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
TEE				
	2 6	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
	8 48	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD
	52 64	TEE - TB RAC 5061		ASTM A234 WPBW - WLDD
FLAT NON-METALLIC				
	2 24	FLAT NON MET. GASKET - TB GUA 5365		ARAMIDIC FIBER (13%)
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size from to	Doc.	Type	
1	2 24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	2 8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	2 24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L0(L)			
Sh.	1	of	2
	A0	A1	A2

Service	SEA WATER (ABOVE GROUND)
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
56	15.88				
60	15.88				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
56	60	ASME-B16.47 series.A	CL150 FF 125 µin.Ra		

Corrosion Allowance			
Size from	to	Internal	External
56	60	0	0

Welding		
Size from	to	Weld. spec.
56	60	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp.	Size up to
	60
°C	Pressure in bar
2	16
38	16
85	16
Max. hydr. P.	24

Notes: PIPES SHALL BE GLASS FLAKE RESIN LINED AS PER SPEC GA-E 60705 (3034-PI-PMS-80705)
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees	
Run size	56 60
Branch size	56 60
Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
M	SPECIAL TEE - <MFR Std>
P	PIPE-TO-PIPE
R	TEE - TB RAC 5061
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	56	60	PIPE		API 5L GR.B PSL1- SAW
CONNECTION FLANGE					
	56	60	WN FLANGE - ASME-B16.47 series.A	CL150 FF 125 µin.Ra	ASTM A105 Normalized
ELBOW					
	56	60	LONG RADIUS ELBOW - TB RAC 5060		ASTM A234 WPBW - WLDD
REDUCER					
	56	60	REDUCER, LARGE BORE - TB RAC 5062/63		ASTM A234 WPBW - WLDD
FLAT NON-METALLIC					
	56	60	FLAT NON MET. GASKET - TB GUA 5365		ARAMIDIC FIBER (13%)
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class A1L0(L)					
Sh.	2	of	2	Rev.	
				A0	A1

VALVES				
pos.	Size from	to	Doc.	Type
2	56	60	GA-E-60501	Carbon Steel - Butterfly-Flanged-Sleeve type-Centered disk - <MFR Std> - CL150 - FF Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN16 - AL.BZ.disc
6	56	60	GA-E-60340	Copper - Check-Flanged or BW-Dual plate-Wlidd seat - API594 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L0(L)(U)			
Sh. 1 of 1	Rev.		
	A0	A1	

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Pipes shall be Glass Flake Resin Lined

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service BFW CWS CWR PWA
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	3.91	40	3.91	40	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
26	32	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra	
11	12	24	ASME-B16.5	CL150 RF 125 µin.Ra	
11	26	32	ASME-B16.47 series.A	CL150 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	32	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	32	NIOEC-SP-90-02
Weld. class		10%

Design Limits		
Temp. °C	Size up to	Pressure in bar
2	32	19.65
38	32	19.64
93	32	17.93
149	32	15.85
204	32	13.81
260	32	11.72
280	32	10.97
Max. hydr. P.	29.4	

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																					
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	
1/2	A																				
3/4	A	A																			
1	A	A	A																		
1 1/2	A	A	A	A																	
2	S	S	S	S	T																
3	S	S	S	S	T	T															
4	S	S	S	S	P	P	T														
6	S	S	S	S	P	P	P	T													
8	S	S	S	S	P	P	P	P	T												
10	S	S	S	S	P	P	P	P	P	T											
12	S	S	S	S	P	P	P	P	P	P	T										
14	S	S	S	S	P	P	P	P	P	P	P	T									
16	S	S	S	S	P	P	P	P	P	P	P	P	T								
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T							
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T						
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T					
26	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	T				
28	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	T			
30	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T		
32	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800								
Piping Class A1L1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	32	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	32	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	26	32	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	32	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
	26	32	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	32	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	32	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	32	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	32	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800								
Piping Class A1L1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SPIRAL WOUND				
1/2	32	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
from	to			
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
2	2	24	GA-E-60505	Carbon Steel - Butterfly-Lug wafer-Sleeve type-Centered disk - API609 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN 20 - C.S. disc
2	30	32	GA-E-60507	Carbon Steel - Butterfly-Flanged-Sleeve type-Centered disk - <MFR Std> - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined BUNA-N - PN 20 - AL BZ disc
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
8	1/2	6	GA-E-60401	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats
8	8	16	GA-E-60415	Carbon Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size	Doc.	Type	
from	to			
1	4	8	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L1(G)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service POTABLE WATER (ABOVE GROUND) UP TO 4"
FWA DELUGE UP TO 14"

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	3.73	80		3.73		80
3/4	3.91	80		3.91		80
1	4.55	80		4.55		80
1 1/2	5.08	80		5.08		80
2	5.54	80		5.54		80
3	5.49	40		5.49		40
4	6.02	40		6.02		40
6	7.11	40				
8	7.04	30				
10	7.8	30				
12	8.38	30				
14	9.53	30				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5		CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	4	ASME-B16.11		3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	4	---
5	14	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp.	Size up to 14 °C
	Pressure in bar
2	19.65
37	19.65
60	18.96
Max. hydr. P.	29.4

Notes: Fire water piping 6" and larger shall be galvanized after prefabrication

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size	1/2	A										
	3/4	A	A									
	1	A	A	A								
	1 1/2	A	A	A	A							
	2	A	A	A	A	A						
	3	A	A	A	A	A	A					
	4	A	A	A	A	A	A	A				
	6	B	B	B	B	B	B	B	T			
	8	B	B	B	B	B	B	B	T	T		
	10	B	B	B	B	B	B	B	T	T	T	
	12	B	B	B	B	B	B	B	T	T	T	T
	14	B	B	B	B	B	B	B	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda	A	TEE - THD ENDS - ASME-B16.11										
	B	THREDOLET - THD END - MSS-SP97										
	H	HALF COUPLING - THD END - ASME-B16.11										
	P	PIPE-TO-PIPE										
	T	TEE - ASME-B16.9										



JOB 316800								
Piping Class A1L1(G)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	4	PIPE+1 COUPLING - NPT ENDS		ASTM A53 GR.B Hot Dip GALV. - SMLS	
	5	14	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	4	THD FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED	
	6	14	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED	
SPECTACLE BLIND						
	2	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 Hot Dip GALV.	
ELBOW						
	1/2	4	ELBOW - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
	6	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	1/2	4	RED. COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
	6	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
COUPLING						
	1/2	4	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
MALE PLUG						
	1/2	4	THD MALE PLUG - HEX HEAD - ASME-B16.11		ASTM A105 Hot Dip GALVANIZED	
NIPPLES						
	1/2	4	NIPPLE - THDD/THDD - BS3799		ASTM A53 GR.B Hot Dip GALV. - SMLS	
SWAGE NIPPLES						
	1/2	4	SWAGE NIPPLE - THDD/THDD - MSS-SP95		ASTM A234 WPB HotDipGalv. A123 - SMLS	
TEE						
	1/2	4	TEE - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
	6	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
THREDOLET						
	1/2	4	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Hot Dip GALVANIZED	
FLAT NON-METALLIC						
	1/2	14	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A1L1(G)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	3	GA-E-60108	Copper - Bronze Gate-UB-Red.B-Solid wdg- Rising stem-Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze - PTFE	
1	4	14	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	1/2	3	GA-E-60208	Copper - Bronze Globe-UB-Red.B -Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze - PTFE	
6	1/2	3	GA-E-60308	Copper - Bronze Check-UB-Red.B-Swing-Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze	
6	4	14	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L1(U)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service	WATER (UNDERGROUND)
Codes	

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing			
opt. from	to	Code	
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra
3	1/2	ASME-B16.5	CL300 RF 125 µin.Ra

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	3.91	40			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.64
38	19.64
93	17.93
100	17.67
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	P	T										
4	S	S	S	S	P	P	T									
6	S	S	S	S	P	P	P	T								
8	S	S	S	S	P	P	P	P	T							
10	S	S	S	S	P	P	P	P	P	T						
12	S	S	S	S	P	P	P	P	P	P	T					
14	S	S	S	S	P	P	P	P	P	P	P	T				
16	S	S	S	S	P	P	P	P	P	P	P	P	T			
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T		
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T	
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800								
Piping Class A1L1(U)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE Plastic coated per Snamprogetti GA-E-60704		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A1L1(U)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
4	2	8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L1(V)			
Sh.	1	of	3
	A0	A1	A2

Service	POTABLE WATER (UNDERGROUND)
Codes	

Design code : ASME B 31.3

Size	Thicknesses			
	Pipe		Fitting	Nipples
	Thk	Sch	Thk	Thk
1/2	3.73	80	3.73	80
3/4	3.91	80	3.91	80
1	4.55	80	4.55	80
1 1/2	5.08	80	5.08	80
2	5.54	80	5.54	80
3	5.49	40	5.49	40
4	6.02	40	6.02	40
6				
8				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	4	ASME-B16.5		CL150 FF	
2	1	<MFR Std - Plastic>	GA-E- 60041	CL150 FF	

Fitting Class						
opt. from	to	Code	SW	THDD	PN	
1/2	4	ASME-B16.11		3000		
	5	<MFR Std - Plastic>			PN10	
2	3/4	<MFR Std - Plastic>			PN10	

Corrosion Allowance			
Size from	to	Internal	External
1/2	4	1.6	0
5	8	0	0

Welding		
Size from	to	Weld. spec.
1/2	8	---
Weld. class		

Design Limits	
Temp.	Size up to
	8
°C	Pressure in bar
2	10
37	10
60	10
Max. hydr. P.	15

Notes: 6" and 8" can be used also above ground
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
	1/2	A							
	3/4	A	A						
	1	A	A	A					
	1 1/2	A	A	A	A				
	2	A	A	A	A	A			
	3	A	A	A	A	A	A		
	4	A	A	A	A	A	A	A	
	6	S	S	S	S				B
	8	S	S	S	S				B B
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8
Legenda									
A	TEE - THD ENDS - ASME-B16.11								
B	TEE - BELL ENDS - <MFR Std - Plastic>								
H	HALF COUPLING - THD END - ASME-B16.11								
P	PIPE-TO-PIPE								
S	SADDLE WITH COUPLING THDF - <MFR Std - Plastic>								
T	TEE - ASME-B16.9								



JOB 316800							
Piping Class A1L1(V)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	4	PIPE+1 COUPLING - NPT ENDS Plastic coated per Snamprogetti GA-E-60706		ASTM A53 GR.B Hot Dip GALV. - SMLS	
	5	8	PIPE - BELL & SPIGOT ENDS - <MFR Std - Plastic>	PN10	RTR-POLYESTER GA-E-60041	
CONNECTION FLANGE						
	1/2	4	THD FLANGE - ASME-B16.5	CL150 FF	ASTM A105 Hot Dip GALVANIZED	
2	6	8	BELL FLANGE - <MFR Std - Plastic>	CL150 FF	RTRP GA-E-60041	
BLIND FLANGE						
	1/2	4	BLIND FLANGE - ASME-B16.5	CL150 FF	ASTM A105 Hot Dip GALVANIZED	
2	6	8	BLIND FLANGE - <MFR Std - Plastic>	CL150 FF	RTRP GA-E-60041	
SPECTACLE BLIND						
2	4	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 FF	ASTM A515 GR.70 Hot Dip GALV.	
ELBOW						
	1/2	4	ELBOW - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
	6	8	ELBOW - BELL ENDS - <MFR Std - Plastic>	PN10	RTRP GA-E-60041	
REDUCER						
	1/2	4	RED. COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
CAP						
	1/2	4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
COUPLING						
	1/2	4	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
MALE PLUG						
	1/2	4	THD MALE PLUG - HEX HEAD - ASME-B16.11		ASTM A105 Hot Dip GALVANIZED	
NIPPLES						
	1/2	4	NIPPLE - THDD/THDD - BS3799		ASTM A53 GR.B Hot Dip GALV. - SMLS	
SWAGE NIPPLES						
	1/2	4	SWAGE NIPPLE - THDD/THDD - MSS-SP95		ASTM A234 WPB HotDipGalv. A123 - SMLS	
TEE						
	1/2	4	TEE - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED	
	6	8	TEE - BELL ENDS - <MFR Std - Plastic>	PN10	RTRP GA-E-60041	
FLAT NON-METALLIC						
	1/2	4	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE	
2	6	8	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE	
N.M. INSERT						
2	3/4	2	SADDLE WITH COUPLING THDF - <MFR Std - Plastic>		RTRP GA-E-60041	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A1L1(V)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	3	GA-E-60108	Copper - Bronze Gate-UB-Red.B-Solid wdg- Rising stem-Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze - PTFE	
2	4	8	GA-E-60500	Carbon Steel - Butterfly-Lug wafer-Sleeve type-Centered disk - API609 - CL150 - FF Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN16 - AL.BZ.disc	
4	1/2	3	GA-E-60208	Copper - Bronze Globe-UB-Red.B -Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze - PTFE	
6	1/2	3	GA-E-60308	Copper - Bronze Check-UB-Red.B-Swing-Int.seat - MSS-SP80 - CL200 - THDF Body Mat. ASTM B62 UNS C83600 Trim Mat. Bronze	



JOB 316800			
Piping Class A1L3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1L1
Variato c.a. da 1.0 a 3.2
Ricalcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service **SOUR WATER**
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES = > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
280	10.97
Max. hydr. P.	29.4

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	P	T											
4	S	S	S	S	P	P	T										
6	S	S	S	S	P	P	P	T									
8	S	S	S	S	P	P	P	P	T								
10	S	S	S	S	P	P	P	P	P	T							
12	S	S	S	S	P	P	P	P	P	P	T						
14	S	S	S	S	P	P	P	P	P	P	P	T					
16	S	S	S	S	P	P	P	P	P	P	P	P	T				
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T			
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T		
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	
Legenda																	
A	TEE - SW ENDS - ASME-B16.11																
H	HALF COUPLING - SW END - ASME-B16.11																
P	PIPE-TO-PIPE																
S	SOCKOLET - SW END - MSS-SP97																
T	TEE - ASME-B16.9																



JOB 316800								
Piping Class A1L3(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions							
opt.	Size	Item	Rating/Facing	Material			
	from	to					
PIPE							
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020		
CONNECTION FLANGE							
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
BLIND FLANGE							
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
ELBOW							
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
REDUCER							
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
CAP							
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
COUPLING							
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020		
MALE PLUG							
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020		
NIPPLES							
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020		
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020		
SWAGE NIPPLES							
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020		
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020		
TEE							
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
THREDOLET							
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020		
SOCKOLET							
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020		
FLANGED INSERT							
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
SPIRAL WOUND							
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING		
BOLTS							
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM		



JOB 316800					
Piping Class A1L3(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



JOB 316800	
Piping Class A1L3(W)	
Sh. 1 of 3	Rev.
	A0 A1 A2

Customer Piping Class
Ref. Doc.

Service FIRE WATER (ABOVE GROUND)
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160	4.78	160	
3/4	5.56	160	5.56	160	
1	6.35	160	6.35	160	
1 1/2	5.08	80	7.14	160	
2	5.54	80	8.74	160	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	20			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	36	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	1 1/2	ASME-B16.5		CL300 RF 125 µin.Ra
11	12	24	ASME-B16.5		CL150 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance				Welding	
Size from	to	Internal	External	Size from	to
1/2	36	3.2	0	1/2	36
				Weld. spec.	NIOEC-SP-90-02
				Weld. class	10%

Design Limits	
Temp.	Size up to
°C	36
	Pressure in bar
2	16.65
38	16.65
70	16.65
Max. hydr. P.	24.9

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																					
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36
1/2	A																				
3/4	A	A																			
1	A	A	A																		
1 1/2	A	A	A	A																	
2	S	S	S	S	T																
3	S	S	S	S	P	T															
4	S	S	S	S	P	P	T														
6	S	S	S	S	P	P	P	T													
8	S	S	S	S	P	P	P	P	T												
10	S	S	S	S	P	P	P	P	P	T											
12	S	S	S	S	P	P	P	P	P	P	T										
14	S	S	S	S	P	P	P	P	P	P	P	T									
16	S	S	S	S	P	P	P	P	P	P	P	P	T								
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T							
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T						
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T					
26	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	T				
28	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	T			
30	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T		
32	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T	
36	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800								
Piping Class A1L3(W)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	36	PIPE		API 5L GR.B PSL1- SAW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	36	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	16	SPEC.MOD.WN FLANGE-wt JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	36	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	6	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
DRIP RING						
	6	6	DRIP-RING - TB DRI 5011	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	36	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized



JOB 316800					
Piping Class A1L3(W)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
FLAT NON-METALLIC				
1/2	36	FLAT NON MET. GASKET - TB GUA 5365		ARAMIDIC FIBER (13%)
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	3/4	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A1L3(X)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Customer Piping Class
Ref. Doc.

Service SOUR WATERS
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5		CL300 RF 125 µin.Ra
11	12	24	ASME-B16.5		CL150 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	24	3.2	0

Welding			
from	Size to	Weld. spec.	
1/2	24	NIOEC-SP-90-02	
Weld. class		10%	
PWHT		YES => > 2"	

Design Limits		
Temp.	Size up to	
°C	24	Pressure in bar
2		19.65
38		19.64
93		17.93
149		15.85
204		13.81
260		11.72
280		10.97
Max. hydr. P.	29.4	

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size																
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	P	T										
4	S	S	S	S	P	P	T									
6	S	S	S	S	P	P	P	T								
8	S	S	S	S	P	P	P	P	T							
10	S	S	S	S	P	P	P	P	P	T						
12	S	S	S	S	P	P	P	P	P	P	T					
14	S	S	S	S	P	P	P	P	P	P	P	T				
16	S	S	S	S	P	P	P	P	P	P	P	P	T			
18	S	S	S	S	P	P	P	P	P	P	P	P	T			
20	S	S	S	S	P	P	P	P	P	P	P	P	T			
24	S	S	S	S	P	P	P	P	P	P	P	P	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800			
Piping Class A1L3(X)			
Sh. 2 of 3	Rev.		
	A0	A1	A2

Component/Material descriptions				
	Size	Item	Rating/Facing	Material
opt.	from	to		
PIPE				
	1/2	24	PIPE	ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	1 1/2	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra ASTM A515 GR.70 GA-E-60021
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2	24	REDUCER - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	CAP - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60021
COUPLING				
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	TEE - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000 ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A1L3(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



JOB 316800			
Piping Class A1L3(Y)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Customer Piping Class
Ref. Doc.

Service	FIRE WATER (UNDERGROUND)
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	20			
40	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
26	40	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	40	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	40	NIOEC-SP-90-02
Weld. class		10%

Design Limits		
Temp.	Size up to	
°C	40	Pressure in bar
2	16.65	
38	16.65	
70	16.65	
Max. hydr. P.	24.9	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																							
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	
1/2	A																						
3/4	A	A																					
1	A	A	A																				
1 1/2	A	A	A	A																			
2	S	S	S	S	T																		
3	S	S	S	S	P	T																	
4	S	S	S	S	P	P	T																
6	S	S	S	S	P	P	P	T															
8	S	S	S	S	P	P	P	P	T														
10	S	S	S	S	P	P	P	P	P	T													
12	S	S	S	S	P	P	P	P	P	P	T												
14	S	S	S	S	P	P	P	P	P	P	P	T											
16	S	S	S	S	P	P	P	P	P	P	P	P	T										
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T									
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T								
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T							
26	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	T						
28	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	T					
30	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T				
32	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T			
36	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T		
40	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800							
Piping Class A1L3(Y)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE Plastic coated per Snamprogetti GA-E-60704		ASTM A106 GR.B - SMLS	
	26	40	PIPE Plastic coated per Snamprogetti GA-E-60704		API 5L GR.B PSL1- SAW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	40	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	3	2	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	40	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	40	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
FLAT NON-METALLIC						
	1/2	40	FLAT NON MET. GASKET - TB GUA 5365		ARAMIDIC FIBER (13%)	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800				
Piping Class A1L3(Y)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	24	GA-E-60135	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
1	26	30	GA-E-60136	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1L6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	7.47	XXS
3/4	7.82	XXS	7.82	7.82	XXS
1	9.09	XXS	9.09	9.09	XXS
1 1/2	10.15	XXS	10.15	10.15	XXS
2	8.74	160	5.54	5.54	80
3	11.13	160			
4	8.56	80			
6	8.74				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	6	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	6	ASME-B16.5		CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	1 1/2	6	0
2	6	6.4	0

Welding		
Size from	to	Weld. spec.
1/2	6	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES = > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.64
38	19.64
93	17.93
149	15.85
Max. hydr. P.	29.4

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6		
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800							
Piping Class A1L6(X)							
Sh.	2	of	3	Rev.			
				A0	A1		

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	1/2	6	PIPE			ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
	2	6	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
3	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
BLIND FLANGE						
	1/2	6	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND						
	1 1/2	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra		ASTM A515 GR.70 GA-E-60021
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
REDUCER						
	2	6	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	2	6	CAP - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60021
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11			ASTM A105 Normalized GA-E-60020
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799			ASTM A106 GR.B - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799			ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WPB - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WPB - SMLS GA-E-60020
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	2	6	TEE - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
WELDOLET						
	2	2	WELDOLET - MSS-SP97			ASTM A105 Normalized GA-E-60020
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000		ASTM A105 Normalized GA-E-60020
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000		ASTM A105 Normalized GA-E-60020
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
SPIRAL WOUND						
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A1L6(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	6	GA-E-60148	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	6	GA-E-60241	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	6	GA-E-60348	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A101					
Sh. 1 of 3		Rev.			
		A0	A1	A2	

Service	NITROGEN
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	3.91	40	3.91	40	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF	125	µin.Ra
3	1/2	24	ASME-B16.5	CL300 RF	125 µin.Ra
5	1/2	24	ASME-B16.5	CL600 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																						
Run size																						
1/2	A																					
3/4	A	A																				
1	A	A	A																			
1 1/2	A	A	A	A																		
2	S	S	S	S	T																	
3	S	S	S	S	T	T																
4	S	S	S	S	T	T	T															
6	S	S	S	S	W	T	T	T														
8	S	S	S	S	W	W	T	T	T													
10	S	S	S	S	W	W	W	T	T	T												
12	S	S	S	S	W	W	W	T	T	T	T											
14	S	S	S	S	W	W	W	W	T	T	T	T										
16	S	S	S	S	W	W	W	W	T	T	T	T	T									
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T								
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T							
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T						
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24						
Legenda																						
A	TEE - SW ENDS - ASME-B16.11																					
S	SOCKOLET - SW END - MSS-SP97																					
T	TEE - ASME-B16.9																					
W	WELDOLET - MSS-SP97																					



JOB 316800				
Piping Class A101				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	24	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
5	3	4	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
11	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	1/2	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70
3	4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER					
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET					
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT					
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND					
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800								
Piping Class A101								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR



JOB 316800			
Piping Class A103			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A101
Variato c.a. da 1.3 a 3.2
Ricalcolati spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A103(Z)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	NON ORGANIC
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160	4.78	160	
3/4	5.56	160	5.56	160	
1	6.35	160	6.35	160	
1 1/2	5.08	80	7.14	160	
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5 CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	
Legenda																	
A	TEE - SW ENDS - ASME-B16.11																
S	SOCKOLET - SW END - MSS-SP97																
T	TEE - ASME-B16.9																
W	WELDOLET - MSS-SP97																



JOB 316800								
Piping Class A103(Z)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800				
Piping Class A103(Z)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	8	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1P3(J)			
Sh.	1	of	2
	A0	A1	A2

Service	LIQUID SULPHUR
Codes	

Design code : ASME B 31.3

Size	Pipe Thicknesses		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
2	5.54	80				
3	5.49	40				
4	6.02	40				
6	7.11	40				
8	7.04	30				
10	7.8	30				
12	8.38	30				
14	9.53	STD				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
2	14	ASME-B16.5	CL150 RF 125 µin.Ra		

Corrosion Allowance			
Size from	to	Internal	External
2	14	3.2	0

Welding	
Size from	to
2	14
Weld. spec.	NIOEC-SP-90-02
Weld. class	10%
PWHT	YES

Design Limits	
Temp.	Size up to
	14
°C	Pressure in bar
2	19.65
37	19.65
93	17.93
148	15.88
204	13.81
260	11.72
315	9.67
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size													
2	T												
3	T	T											
4	T	T	T										
6		T	T	T									
8			T	T	T								
10			T	T	T	T							
12				T	T	T	T						
14					T	T	T	T	T				
Branch size	2	3	4	6	8	10	12	14					
Legenda													
A	TEE - SW ENDS - ASME-B16.11												
S	SOCKOLET - SW END - TB RAC 5380												
T	TEE - ASME-B16.9												
W	WELDOLET - TB RAC 5049												



JOB 316800								
Piping Class A1P3(J)								
Sh.	2	of	2					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	2	14	PIPE			ASTM A106 GR.B - SMLS
BLIND FLANGE						
	2	14	BLIND FLANGE - ASME-B16.5 GA-E-60050	CL150 RF 125 µin.Ra		ASTM A105 Normalized
SPECTACLE BLIND						
	2	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60050	CL150 RF 125 µin.Ra		ASTM A515 GR.70
REDUCING FLANGES						
	2	14	SO RED. FLANGE - ASME-B16.5 GA-E-60050	CL150 RF 125 µin.Ra		ASTM A105 Normalized
ELBOW						
	2	14	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS
REDUCER						
	2	14	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS
TEE						
	2	14	TEE - ASME-B16.9			ASTM A234 WPB - SMLS
CROSS						
	2	14	CROSS - ASME-B16.9			ASTM A234 WPB - SMLS
SPIRAL WOUND						
	2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365 GA-E-60050			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7 + ASTM A194 GR.2H

VALVES						
pos.	Size	Doc.	Type			
	from	to				
6	2	14	GA-E-60332	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR		
9	2	12	GA-E-60554	Carbon Steel - Plug-FB-Lubricated plug -Int.seat - API599 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Lubricated - Up to 325°C - 13CR		



Customer Piping Class
Ref. Doc.

JOB			
316800			
Piping Class A1S1			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service LPS LCC LCS COC BDN
Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	3.91	40		3.91	40
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			
26	9.53	STD			
28	9.53	STD			
30	9.53	STD			
32	9.53	STD			
36	12.7	XS			
44	12.7	XS			
48	12.7	XS			
54	15.88				
60	15.88				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing

opt. from	to	Code	
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra
26	60	ASME-B16.47 series.A	CL150 RF 125 µin.Ra
3	1/2	24 ASME-B16.5	CL300 RF 125 µin.Ra
5	1/2	24 ASME-B16.5	CL600 RF 125 µin.Ra
6	3	24 ASME-B16.5	CL900 RF 125 µin.Ra
11	12	24 ASME-B16.5	CL150 RF 125 µin.Ra
11	26	32 ASME-B16.47 series.A	CL150 RF 125 µin.Ra

Fitting Class

opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance

Size from	to	Internal	External
1/2	60	1.6	0

Welding

Size from	to	Weld. spec.
1/2	60	NIOEC-SP-90-02

Weld. class 10%

Design Limits

Temp. °C	Size up to	Pressure in bar
	60	
2		19.65
38		19.64
93		17.93
149		15.85
204		13.81
260		11.72
280		10.97
295		10.42
300		10.23

Max. hydr. P. 29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees

Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	44	48	54	60	
1/2	A																									
3/4	A	A																								
1	A	A	A																							
1 1/2	A	A	A	A																						
2	S	S	S	S	T																					
3	S	S	S	S	P	T																				
4	S	S	S	S	P	P	T																			
6	S	S	S	S	P	P	P	T																		
8	S	S	S	S	P	P	P	P	T																	
10	S	S	S	S	P	P	P	P	P	T																
12	S	S	S	S	P	P	P	P	P	P	T															
14	S	S	S	S	P	P	P	P	P	P	P	T														
16	S	S	S	S	P	P	P	P	P	P	P	P	T													
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T												
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T											
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T										
26	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	T									
28	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	T								
30	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T							
32	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T						
36	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T					
44	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T				
48	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T			
54	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	T	R	
60	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R

Legenda

A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
R	TEE - TB RAC 5061
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800							
Piping Class A1S1							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	60	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	60	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	2	8	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
6	4	4	WN FLANGE - ASME-B16.5	CL900 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
11	26	32	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
	26	48	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A105 Normalized	
3	10	10	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
	26	32	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A515 GR.70	
3	8	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	48	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
	50	60	LONG RADIUS ELBOW - TB RAC 5060		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	48	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
	50	60	REDUCER, LARGE BORE - TB RAC 5062/63		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	48	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
	54	60	TEE - TB RAC 5061		ASTM A234 WPBW - WLDD	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	



JOB 316800								
Piping Class A1S1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SOCKOLET				
1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT				
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized
SPIRAL WOUND				
1/2	60	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
Size	Doc.	Type		
pos.	from	to		
1	1/2	1 1/2	GA-E-60143	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF
1	2	24	GA-E-60103	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF
1	26	48	GA-E-60114	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF
4	1/2	1 1/2	GA-E-60238	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
4	2	18	GA-E-60203	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	24	GA-E-60303	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
11	1/2	1 1/2	GA-E-60190	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF

STRAINERS				
Size	Doc.	Type		
pos.	from	to		
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1V1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	PLA PRA ISA
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	3.91	40		3.91	40
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			
20	9.53	20			
24	9.53	20			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	24	ASME-B16.5 CL300 RF 125 µin.Ra		
11	12	24	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
280	10.97
Max. hydr. P.	29.4

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	P	T										
4	S	S	S	S	P	P	T									
6	S	S	S	S	P	P	P	T								
8	S	S	S	S	P	P	P	P	T							
10	S	S	S	S	P	P	P	P	P	T						
12	S	S	S	S	P	P	P	P	P	P	T					
14	S	S	S	S	P	P	P	P	P	P	P	T				
16	S	S	S	S	P	P	P	P	P	P	P	P	T			
18	S	S	S	S	P	P	P	P	P	P	P	P	P	T		
20	S	S	S	S	P	P	P	P	P	P	P	P	P	P	T	
24	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	T

Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
A																
H																
P																
S																
T																

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9



JOB 316800			
Piping Class A1V1			
Sh. 2 of 3	Rev.		
	A0	A1	A2

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	1/2	24	PIPE			ASTM A106 GR.B - SMLS
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized
	14	24	SO FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized
3	2	10	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra		ASTM A105 Normalized
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra		ASTM A105 Normalized
SPECTACLE BLIND						
1	16		SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra		ASTM A515 GR.70
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000		ASTM A105 Normalized
	2	24	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS
REDUCER						
	2	24	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000		ASTM A105 Normalized
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000		ASTM A105 Normalized
	2	24	CAP - ASME-B16.9			ASTM A234 WPB - SMLS
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000		ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000		ASTM A105 Normalized
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000		ASTM A105 Normalized
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11			ASTM A105 Normalized
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799			ASTM A106 GR.B - SMLS
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799			ASTM A106 GR.B - SMLS
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WPB - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WPB - SMLS
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000		ASTM A105 Normalized
	2	24	TEE - ASME-B16.9			ASTM A234 WPB - SMLS
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000		ASTM A105 Normalized
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000		ASTM A105 Normalized
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra		ASTM A105 Normalized
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class A1V1					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	24	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
2	4	24	GA-E-60505	Carbon Steel - Butterfly-Lug wafer-Sleeve type-Centered disk - API609 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN 20 - C.S. disc	
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
4	2	10	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	24	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
8	1/2	1 1/2	GA-E-60401	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats	
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	2	12	GA-E-60600	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1V1(G)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service PLA PRA ISA
(Galvanized up to 4")

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	3.73	80		3.73		80
3/4	3.91	80		3.91		80
1	4.55	80		4.55		80
1 1/2	5.08	80		5.08		80
2	5.54	80		5.54		80
3	5.49	40		5.49		40
4	6.02	40		6.02		40
6	7.11	40				
8	7.04	30				
10	7.8	30				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	10 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	4	ASME-B16.11		3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	10	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	4	---
5	10	NIOEC-SP-90-02
Weld. class		

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	19.65
37	19.65
60	18.96
Max. hydr. P.	29.4

Notes: Ball valves use is limited to 180 °C

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	A	A	A	A	A				
	3	A	A	A	A	A	A			
	4	A	A	A	A	A	A	A		
	6	B	B	B	B	B	B	B	T	
	8	B	B	B	B	B	B	B	T	T
	10	B	B	B	B	B	B	B	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - THD ENDS - ASME-B16.11									
B	THREDOLET - THD END - MSS-SP97									
H	HALF COUPLING - THD END - ASME-B16.11									
P	PIPE-TO-PIPE									
T	TEE - ASME-B16.9									



JOB 316800				
Piping Class A1V1(G)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	4	PIPE+1 COUPLING - NPT ENDS		ASTM A53 GR.B Hot Dip GALV. - SMLS
	5	10	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE					
	1/2	4	THD FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED
	6	10	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
3	1	2	THD FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED
3	10	10	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	4	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED
	6	10	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	1	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70 Hot Dip GALV.
	5	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	1/2	4	ELBOW - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER					
	1/2	4	RED. COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP					
	1/2	4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	4	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
MALE PLUG					
	1/2	4	THD MALE PLUG - HEX HEAD - ASME-B16.11		ASTM A105 Hot Dip GALVANIZED
NIPPLES					
	1/2	4	NIPPLE - THDD/THDD - BS3799		ASTM A53 GR.B Hot Dip GALV. - SMLS
SWAGE NIPPLES					
	1/2	4	SWAGE NIPPLE - THDD/THDD - MSS-SP95		ASTM A234 WPB HotDipGalv. A123 - SMLS
TEE					
	1/2	4	TEE - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
THREDOLET					
	1/2	4	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Hot Dip GALVANIZED
FLAT NON-METALLIC					
	1/2	10	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class A1V1(G)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	2	GA-E-60109	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	3	10	GA-E-60101	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	2	GA-E-60209	Carbon Steel - Globe-WB-Red.B-Int seat - BS5352 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	3	3	GA-E-60201	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	2	GA-E-60309	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	3	10	GA-E-60301	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
8	1/2	1 1/2	GA-E-60401	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-316 trim - PTFE seats



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A1Z1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	STEAM FOR JACKETING
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	3.91	40			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	7.92	20			
16	7.92	20			
18	7.92	20			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	18	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	1 1/2	ASME-B16.5	CL300 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	18	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	18	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
	18
2	19.64
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
280	10.97
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size																
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	P	T	T	T								
8	S	S	S	S	P	T	T	T	T							
10	S	S	S	S	P	P	T	T	T	T						
12	S	S	S	S	P	P	P	T	T	T	T					
14	S	S	S	S	P	P	P	T	T	T	T	T				
16	S	S	S	S	P	P	P	T	T	T	T	T	T			
18	S	S	S	S	P	P	P	T	T	T	T	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18		
Legenda																
A	TEE - SW ENDS - ASME-B16.11															
H	HALF COUPLING - SW END - ASME-B16.11															
P	PIPE-TO-PIPE															
S	SOCKOLET - SW END - MSS-SP97															
T	SPLIT TEE - FOR JACKETS - TB RAC 5005															



JOB 316800				
Piping Class A1Z1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 18	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 1 1/2	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A105 Normalized
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	3 18	SPLIT ELBOW - FOR JACKETS - TB RAC 5005		ASTM A234 WPB - SMLS
REDUCER				
	3 18	SPLIT REDUCER - FOR JACKETS - TB RAC 5005		ASTM A234 WPB - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 18	SPLIT TEE - FOR JACKETS - TB RAC 5005		ASTM A234 WPB - SMLS
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT				
	3 1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
CROSS				
	3 18	SPLIT CROSS - FOR JACKETS - ASME-B16.9		ASTM A234 WPB - SMLS
SPIRAL WOUND				
	1/2 1 1/2	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class A1Z1			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60143	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60238	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60190	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3A1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS NG FOS FOR GOS GOR BUTANE
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	9.53	STD			
14	9.53	STD			
16	12.7	XS			
18	12.7	XS			
20	12.7	30			
24	15.88				
28	9.53	STD			
30	9.53	STD			
36	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL300 RF	125 µin.Ra
26	36	ASME-B16.47 series.A		CL300 RF	125 µin.Ra
5	1/2	24	ASME-B16.5	CL600 RF	125 µin.Ra
6	3	24	ASME-B16.5	CL900 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL300 RF	125 µin.Ra
11	26	36	ASME-B16.47 series.A	CL300 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	36	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	36	NIOEC-SP-90-02
Weld. class		10%

Design Limits			
Temp. °C	Size up to	24	36
	Pressure in bar		
2		51.02	24.56
38		51	24.56
93		46.57	23.95
149		45.16	23.21
204		43.79	22.48
260		41.37	21.25
316		37.9	19.4
343		36.89	19.04
371		36.88	18.91
398		34.08	15.97
400		33.85	15.86
Max. hydr. P.		76.5	36.8

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	28	30	36
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T			
28	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T	T		
30	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	T	T	
36	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	T	

Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	28	30	36
A																			
P																			
S																			
T																			
W																			

Legenda

A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class A3A1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	24	PIPE		ASTM A106 GR.B - SMLS
	26	36	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
	26	36	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized
5	2	12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
6	3	3	WN FLANGE - ASME-B16.5	CL900 RF 125 µin.Ra	ASTM A105 Normalized
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized
11	26	36	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
	26	36	SPECIAL BLIND & SPACER - <MFR Std>	CL300 RF 125 µin.Ra	ASTM A515 GR.70
DRIP RING					
	3	3	DRIP-RING - TB DRI 5011	CL300 RF 125 µin.Ra	ASTM A105 Normalized
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
	26	36	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD
REDUCER					
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
	26	36	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2	36	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
	26	36	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD
WELDOLET					
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized



JOB 316800					
Piping Class A3A1					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
FLANGED INSERT				
1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
1/2	36	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60110	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
1	26	30	GA-E-60590	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	14	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
8	3/4	6	GA-E-60403	Carbon Steel - Ball-Top entry-FB-Floating ball - BS5351 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-304 trim - PTFE seats
8	8	16	GA-E-60404	Carbon Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats
8	18	20	GA-E-60414	Carbon Steel - Ball-Split body-FB-Trunnion ball - API6D - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60610	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2
1	14	24	GA-E-60611	Carbon Steel - T Strainer-BW - <MFR Std - Metallic> - CL300 - RF - 125 µin.Ra Body Mat. ASTM A234 WPB - SMLS Trim Mat. 316 - CLOTH - MESH 3



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3A3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL300 RF	125 µin.Ra
5	1/2	20	ASME-B16.5		CL600 RF 125 µin.Ra
11	12	20	ASME-B16.5		CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	20	3.2	0

Welding		
from	Size to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp.	Size up to
°C	20
	Pressure in bar
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
398	34.88
400	34.55
427	28.14
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800				
Piping Class A3A3				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	4	6	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A3A3					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF
1	2	20	GA-E-60111	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
4	2	12	GA-E-60211	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	20	GA-E-60311	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF
41	1/2	1 1/2	GA-E-60277	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A3A3(N)					
Sh.	1	of	1	Rev.	
				A0	A1

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A3A3(X)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Grade

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees

Run size
Branch size
Legenda

Component/Material descriptions

Size	Item	Rating/Facing	Material
------	------	---------------	----------

opt. from to

VALVES

Size	Doc.	Type
------	------	------

pos. from to



JOB 316800			
Piping Class A3A6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3A3
Variato c.a. da 3.2 a 6.4 (6.0 per inferiori)
Ricalcolato spessori
Rating 6000

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3A6(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A3B3			
Sh. 1 of 1		Rev.	
A0	A1		

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3A1
Spessori come A3A3
Variato c.a. da 1.0 a 3.2
Rating 6000
Trim 13CR come A6B1

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3B3(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A3B3(X)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C1(Z)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	STRIPPED WATER
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	10	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT	YES	

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	51.02
38	51
93	46.9
149	45.16
204	43.79
230	42.83
260	41.71
300	39.97
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800					
Piping Class A3C1(Z)					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
PIPE					
	1/2	10	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
	2	10	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	10	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	3/4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER					
	2	10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2	10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES					
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2	10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET					
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND					
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class A3C1(Z)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60106 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
1	2	10	GA-E-60112 Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
4	1/2	1 1/2	GA-E-60206 Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
4	2	8	GA-E-60212 Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
6	1/2	1 1/2	GA-E-60306 Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316
6	2	10	GA-E-60312 Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
11	1/2	1 1/2	GA-E-60198 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 316



JOB 316800			
Piping Class A3C3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata A1C3
Variato rating (300)
Ricalcolato spessori

Mancano valvole 2" ed oltre con Trim Monel

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			
24	17.48	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
230	42.67
260	41.37
265	41.06
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24

Legenda

A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class A3C3(N)			
Sh.	2	of	3

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	24	PIPE	ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2	24	REDUCER - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
	2	24	CAP - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	TEE - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2	10	WELDOLET - MSS-SP97	ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800				
Piping Class A3C3(N)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	10	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
61	2	3	GA-E-60338	Carbon Steel - Check-Lug wafer-Dual plate-Wldd seat - API594 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60612	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A3C3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Customer Piping Class
Ref. Doc.

Service HYDROCARBONS WITH H2S WATER
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits		
Temp. °C	Size up to	Pressure in bar
	20	
2		51
38		51
93		46.57
149		45.16
204		43.79
230		42.67
Max. hydr. P.	76.5	

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A3C3(X)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A3C3(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	20	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	20	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
41	1/2	1 1/2	GA-E-60278	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	6	GA-E-60612	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C3(Z)			
Sh. 1 of 3		Rev.	
A0	A1		

Service	STRIPPED WATER
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL300 RF	125 µin.Ra
11	12	20 ASME-B16.5		CL300 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	20
2	51
38	51
93	46.9
149	45.16
204	43.79
260	41.71
265	41.49
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class A3C3(Z)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 20	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
	2 20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
11	12 20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	3/4 20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER				
	2 20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2 20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET				
	2 8	WELDOLET - MSS-SP97		ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800							
Piping Class A3C3(Z)							
Sh.	3	of	3	Rev.			
				A0	A1		

VALVES					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60106	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
1	2	20	GA-E-60112	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
4	1/2	1 1/2	GA-E-60206	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
4	2	8	GA-E-60212	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
6	1/2	1 1/2	GA-E-60306	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316	
6	2	20	GA-E-60312	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316	
11	1/2	1 1/2	GA-E-60198	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 316	

STRAINERS					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	2	6	GA-E-60610	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C6			
Sh. 1 of 1	Rev.		
	A0	A1	

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata A1C3
Variato rating (300)
Variato c.a. da 3.2 a 6.4 (6.0 inferiori)
Ricalcolato spessori

Mancano valvole 2" ed oltre con Trim Monel

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	7.47	XXS		7.47		XXS
3/4	7.82	XXS		7.82		XXS
1	9.09	XXS		9.09		XXS
1 1/2	10.15	XXS		10.15		XXS
2	8.74	160		8.74		160
3	11.13	160				
4	11.13	120				
6	10.97	80				
8	12.7	80				
10	15.09	80				
12	14.27	60				
14	15.09	60				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size to	Internal	External	
1/2	1 1/2	5	0	
2	14	6.4	0	

Welding		
from	Size to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp.	Size up to
°C	14
	Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
230	42.67
240	42.24
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size													
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
12	S	S	S	S	W	W	W	T	T	T	T		
14	S	S	S	S	W	W	W	W	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	
Legenda													
A	TEE - SW ENDS - ASME-B16.11												
S	SOCKOLET - SW END - MSS-SP97												
T	TEE - ASME-B16.9												
W	WELDOLET - MSS-SP97												



JOB 316800								
Piping Class A3C6(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions							
opt.	Size	Item	Rating/Facing	Material			
	from	to					
PIPE							
	1/2	14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020		
CONNECTION FLANGE							
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
BLIND FLANGE							
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
ELBOW							
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
REDUCER							
	2	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
CAP							
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
COUPLING							
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
MALE PLUG							
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020		
NIPPLES							
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020		
SWAGE NIPPLES							
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020		
TEE							
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020		
	2	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020		
WELDOLET							
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020		
SOCKOLET							
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020		
FLANGED INSERT							
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020		
SPIRAL WOUND							
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING		
BOLTS							
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM		



JOB 316800					
Piping Class A3C6(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	14	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	14	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3C6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	XXS	
3/4	7.82	XXS	7.82	XXS	
1	9.09	XXS	9.09	XXS	
1 1/2	10.15	XXS	10.15	XXS	
2	8.74	160	8.74	160	
3	11.13	160			
4	11.13	120			
6	10.97	80			
8	12.7	80			
10	15.09	80			
12	14.27	60			
14	15.09	60			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				Welding	
from	Size to	Internal	External	from	to
1/2	1 1/2	5	0	1/2	14
2	14	6.4	0	Weld. spec. NIOEC-SP-90-02	
				Weld. class 10%	
				PWHT YES => 2"	

Design Limits	
Temp.	Size up to
°C	14
	Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
230	42.67
Max. hydr. P.	76.5

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size													
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
12	S	S	S	S	W	W	W	T	T	T	T		
14	S	S	S	S	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	
Legenda													
A	TEE - SW ENDS - ASME-B16.11												
S	SOCKOLET - SW END - MSS-SP97												
T	TEE - ASME-B16.9												
W	WELDOLET - MSS-SP97												



JOB 316800							
Piping Class A3C6(X)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A3C6(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	14	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	14	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3E3			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service LEAN AMINE
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80		5.54		80
3	7.62	80				
4	8.56	80				
6	8.74					
8	8.74					
10	12.7	XS				
12	12.7	XS				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	12
2	51
38	51
65	48.82
93	46.57
121	45.85
148	45.18
150	45.13
160	44.88
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size											
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	S	T					
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
Legenda											
A	TEE - SW ENDS - ASME-B16.11										
S	SOCKOLET - SW END - MSS-SP97										
T	TEE - ASME-B16.9										
W	WELDOLET - MSS-SP97										



JOB 316800								
Piping Class A3E3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	12	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	12	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A3E3					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	12	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	12	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
61	3	4	GA-E-60338	Carbon Steel - Check-Lug wafer-Dual plate-Wldd seat - API594 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	Size to	Doc.	Type
1	2	3	GA-E-60610	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3E3(N)			
Sh. 1 of 3		Rev.	
A0	A1		

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80		5.54	80	
3	7.62	80				
4	8.56	80				
6	8.74					
8	8.74					
10	12.7	XS				
12	12.7	XS				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	12
2	51
38	51
65	48.82
93	46.57
121	45.85
148	45.18
150	45.13
160	44.88
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	T						
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class A3E3(N)					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	12	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	12	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800					
Piping Class A3E3(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	12	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	12	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



JOB 316800			
Piping Class A3E6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3E3
Variato c.a. da 3.2 a 6.4 (6 inferiori)
Ricalcolato spessori
Rating 6000

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3E6(N)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	7.47	XXS		7.47		XXS
3/4	7.82	XXS		7.82		XXS
1	9.09	XXS		9.09		XXS
1 1/2	10.15	XXS		10.15		XXS
2	8.74	160		8.74		160
3	11.13	160				
4	11.13	120				
6	10.97	XS				
8	12.7	XS				
10	15.09	80				
12	14.27	60				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
Size from	Size to	Internal	External
1/2	1 1/2	5	0
2	12	6.4	0

Welding		
Size from	Size to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	12
2	51
38	51
65	48.82
93	46.57
121	45.85
148	45.18
150	45.13
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	T						
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	T

Branch size 1/2 3/4 1 1 1/2 2 3 4 6 8 10 12

Legenda

A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class A3E6(N)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 12	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 12	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4 8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2 12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A3E6(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	12	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	12	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3E6(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A3F3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A3F3(Z)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Customer Piping Class
Ref. Doc.

Service	CAUSTIC SOLUTION
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		
5	1/2	8 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	20
2	28.13
38	28.13
65	28.13
93	28.13
100	28.13
120	28.13
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size																		
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	W	T	T	T									
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	W	T	T	T	T						
16	S	S	S	S	W	W	W	W	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	T	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20			
Legenda																		
A	TEE - SW ENDS - ASME-B16.11																	
S	SOCKOLET - SW END - MSS-SP97																	
T	TEE - ASME-B16.9																	
W	WELDOLET - MSS-SP97																	



JOB 316800								
Piping Class A3F3(Z)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	3	8	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	1 1/2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	1 1/2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1 1/2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A3F3(Z)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60163	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20	
1	2	20	GA-E-60173	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20	
4	1/2	1 1/2	GA-E-60252	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20	
4	2	8	GA-E-60258	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20	
6	1/2	1 1/2	GA-E-60358	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. Alloy 20	
6	2	20	GA-E-60364	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20	
61	3	4	GA-E-60329	Carbon Steel - Check-Lug wafer-Dual plate-Widd seat - API594 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Alloy 20	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	2	6	GA-E-60610	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



JOB 316800			
Piping Class A3G3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Customer Piping Class
Ref. Doc.

Service	HYDROCARBON WITH HYDROGEN
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					
8	8.74					
10	12.7	XS				
12	12.7	XS				
14	12.7	XS				
16	12.7	XS				
18	14.27	40				
20	15.09	40				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL300 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class	10%	

Design Limits	
Temp.	Size up to
°C	Pressure in bar
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
398	34.88
400	34.55
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800							
Piping Class A3G3							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	1/2	20	PIPE			ASTM A106 GR.B - SMLS
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra		ASTM A105 Normalized
SPECTACLE BLIND						
	3/4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra		ASTM A515 GR.70
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
	2	20	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS
REDUCER						
	2	20	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000		ASTM A105 Normalized
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000		ASTM A105 Normalized
	2	20	CAP - ASME-B16.9			ASTM A234 WPB - SMLS
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000		ASTM A105 Normalized
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11			ASTM A105 Normalized
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799			ASTM A106 GR.B - SMLS
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WPB - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WPB - SMLS
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
	2	20	TEE - ASME-B16.9			ASTM A234 WPB - SMLS
WELDOLET						
	2	8	WELDOLET - MSS-SP97			ASTM A105 Normalized
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000		ASTM A105 Normalized
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000		ASTM A105 Normalized
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra		ASTM A105 Normalized
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800				
Piping Class A3G3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	20	GA-E-60110	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	8	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	20	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class

Ref. Doc.

JOB 316800			
Piping Class A3H1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	9.53	STD			
14	9.53	STD			
16	12.7	XS			
18	12.7	XS			
20	12.7	30			
24	15.88				
28	9.53	STD			
32	9.53	STD			
36	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL300 RF	125 µin.Ra
26	36	ASME-B16.47 series.A		CL300 RF	125 µin.Ra
5	1/2	24	ASME-B16.5	CL600 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL300 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	36	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	36	NIOEC-SP-90-02
Weld. class		10%

Design Limits			
Temp. °C	Size up to	Pressure in bar	
	24	36	
2	51.02	23.02	
38	51	23.02	
93	46.9	22.45	
149	45.16	21.75	
204	43.79	21.07	
260	41.71	19.91	
316	39.28	18.18	
343	37.94	17.84	
371	36.55	17.72	
398	34.37	15.05	
400	33.85	14.86	
Max. hydr. P.	76.5	39.3	

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T			
28	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T			
32	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T			
36	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	28	32	36

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800							
Piping Class A3H1							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	36	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	26	36	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	4	12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	36	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800					
Piping Class A3H1					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt.	from	to			
SPIRAL WOUND					
1/2	36	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS					
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	14	GA-E-60111	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	10	GA-E-60211	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	14	GA-E-60311	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
8	12	12	GA-E-60404	Carbon Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. Soft seat-CS ENP 75µm trim-PTFE seats	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	

STRAINERS					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



JOB 316800			
Piping Class A3H3			
Sh. 2 of 3	Rev.		
	A0	A1	A2

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from to			
PIPE				
	1/2 24	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
	2 24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
11	12 12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	3/4 12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER				
	2 24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET				
	2 10	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800				
Piping Class A3H3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	14	GA-E-60111	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	6	GA-E-60211	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	14	GA-E-60311	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	

STRAINERS					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3H3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	60			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			
24	17.48	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	24	3.2	0	

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24			
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800				
Piping Class A3H3(N)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	24	PIPE	ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2	24	REDUCER - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	CAP - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	24	TEE - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2	10	WELDOLET - MSS-SP97	ASTM A105 Normalized GA-E-60020
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000 ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800								
Piping Class A3H3(N)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A3H3(X)					
Sh. 1 of 3	Rev.				
	A0	A1	A2		

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	60			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES = > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
2	51.02
38	51
93	46.57
149	45.16
204	43.79
230	42.67
260	41.37
316	37.9
343	36.89
371	36.88
Max. hydr. P.	76.5

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																				
Run size																				
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20					
Legenda																				
A	TEE - SW ENDS - ASME-B16.11																			
S	SOCKOLET - SW END - MSS-SP97																			
T	TEE - ASME-B16.9																			
W	WELDOLET - MSS-SP97																			



JOB 316800							
Piping Class A3H3(X)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
DRIP RING						
	3	3	DRIP-RING - TB DRI 5011	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A3H3(X)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	20	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	20	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited



JOB 316800			
Piping Class A3H3(Z)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A3H6(X)					
Sh. 1 of 3	Rev.				
	A0	A1			

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	10.15	XXS		10.15	XXS
2	8.74	160			
3	11.13	160			
4	11.13	120			
6	10.97	XS			
8	12.7	80			
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	14.27				
18	14.27	40			
20	15.09	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2	1 1/2		5	0
2	20		6.4	0

Welding			
from	Size	to	Weld. spec.
1/2	20		NIOEC-SP-90-02
Weld. class		10%	
PWHT		YES = > 2"	

Design Limits		
Temp.	Size up to	
	20	
°C	Pressure in bar	
2	36.94	
38	36.94	
50	36.94	
100	36.94	
150	36.94	
200	36.94	
240	35.64	
Max. hydr. P.	55.4	

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																				
Run size																				
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20					
Legenda																				
A	TEE - SW ENDS - ASME-B16.11																			
S	SOCKOLET - SW END - MSS-SP97																			
T	TEE - ASME-B16.9																			
W	WELDOLET - MSS-SP97																			



JOB 316800			
Piping Class A3H6(X)			
Sh.	2	of	3

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	20	PIPE	ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
11	12	18	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4	18	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A515 GR.70 GA-E-60021
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	20	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2	20	REDUCER - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	20	CAP - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60021
COUPLING				
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	20	TEE - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2	8	WELDOLET - MSS-SP97	ASTM A105 Normalized GA-E-60020
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A3H6(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	20	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	20	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A3L1					
Sh.	1	of	3	Rev.	
				A0	A1

Service	MBW
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	12.7	XS			
24	12.7	XS			
26	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		
26	26	ASME-B16.47 series.A	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	26	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	26	NIOEC-SP-90-02
Weld. class		10%

Design Limits			
Temp. °C	Size up to	24	26
	Pressure in bar		
2	41.13	40.2	
38	41.13	40.2	
93	41.13	39.9	
149	41.13	37.99	
165	41.13	37.64	
204	41.13	36.79	
260	38.87	34.78	
315	35.61	31.76	
343	34.97	31.16	
371	33.94	30.96	
382	31.11	29.06	
Max. hydr. P.	61.6	60.3	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																									
Run size																									
1/2	A																								
3/4	A	A																							
1	A	A	A																						
1 1/2	A	A	A	A																					
2	S	S	S	S	T																				
3	S	S	S	S	T	T																			
4	S	S	S	S	T	T	T																		
6	S	S	S	S	W	T	T	T																	
8	S	S	S	S	W	W	T	T	T																
10	S	S	S	S	W	W	W	T	T	T															
12	S	S	S	S	W	W	W	T	T	T	T														
14	S	S	S	S	W	W	W	W	T	T	T	T													
16	S	S	S	S	W	W	W	W	T	T	T	T	T												
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T											
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T										
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T									
26	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T	T								
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26								
Legenda																									
A	TEE - SW ENDS - ASME-B16.11																								
H	HALF COUPLING - SW END - ASME-B16.11																								
P	PIPE-TO-PIPE																								
S	SOCKOLET - SW END - MSS-SP97																								
T	TEE - ASME-B16.9																								
W	WELDOLET - MSS-SP97																								



JOB 316800							
Piping Class A3L1							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	26	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	26	26	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	26	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	26	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	26	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	26	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class A3L1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	24	GA-E-60110	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	14	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	24	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



JOB 316800			
Piping Class A3L3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3L1
Variato c.a. da 1.0 a 3.2
Ricalcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



JOB 316800			
Piping Class A3L3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Customer Piping Class
Ref. Doc.

Service **SOUR WATER**
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			
24	17.48	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	24
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
280	40.13
315	37.95
343	36.89
371	36.88
382	36.07
Max. hydr. P.	76.5

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T

Branch size 1/2 3/4 1 1 1/2 2 3 4 6 8 10 12 14 16 18 20 24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A3L3(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

		Component/Material descriptions				
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	1 1/2	1 1/2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800					
Piping Class A3L3(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3L3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service **SOUR WATER**
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80		5.54	80	
3	7.62	80				
4	8.56	80				
6	8.74					
8	8.74					
10	12.7	XS				
12	12.7	XS				
14	12.7	XS				
16	12.7	XS				
18	14.27	40				
20	15.09	40				
24	17.48	40				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	24
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
280	40.13
315	37.95
343	36.89
371	36.88
382	36.07
Max. hydr. P.	76.5

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T

Branch size 1/2 3/4 1 1 1/2 2 3 4 6 8 10 12 14 16 18 20 24

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A3L3(X)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800					
Piping Class A3L3(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



JOB 316800			
Piping Class A3L6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3L1
Variato c.a. da 1.0 a 6.4 (6.0 per inferiori)
Ricalcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3L6(N)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service **SOUR WATER**
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	7.47	XXS		7.47	XXS	
3/4	7.82	XXS		7.82	XXS	
1	9.09	XXS		9.09	XXS	
1 1/2	10.15	XXS		10.15	XXS	
2	8.74	160				
3	11.13	160				
4	11.13	120				
6	10.97	XS				
8	12.7	XS				
10	15.09	80				
12	14.27	60				
14	15.09	60				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing			
opt. from	to	Code	
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	1 1/2	5	0
2	14	6.4	0

Welding		
from	Size to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => > 2"

Design Limits	
Temp.	Size up to
°C	14
	Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
260	41.37
280	40.13
315	37.95
343	36.89
371	36.88
382	36.07
Max. hydr. P.	76.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	W	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800							
Piping Class A3L6(N)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	1 1/2	1 1/2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800					
Piping Class A3L6(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	14	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	14	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3L6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	7.47	XXS
3/4	7.82	XXS	7.82	7.82	XXS
1	9.09	XXS	9.09	9.09	XXS
1 1/2	10.15	XXS	10.15	10.15	XXS
2	8.74	160	8.74	8.74	160
3	11.13	160			
4	11.13	120			
6	10.97	XS			
8	12.7	XS			
10	15.09	80			
12	14.27	60			
14	15.09	60			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size to	Internal	External	
1/2	1 1/2	5	0	
2	14	6.4	0	

Welding			
from	Size to	Weld. spec.	
1/2	14	NIOEC-SP-90-02	
Weld. class		10%	
PWHT		YES => > 2"	

Design Limits	
Temp.	Size up to
°C	14
	Pressure in bar
2	51
38	51
93	46.57
149	45.16
204	43.79
260	41.37
280	40.13
315	37.95
343	36.89
371	36.88
382	36.07
Max. hydr. P.	76.5

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size												
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	W	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda												
A	TEE - SW ENDS - ASME-B16.11											
H	HALF COUPLING - SW END - ASME-B16.11											
P	PIPE-TO-PIPE											
S	SOCKOLET - SW END - MSS-SP97											
T	TEE - ASME-B16.9											
W	WELDOLET - MSS-SP97											



JOB 316800				
Piping Class A3L6(X)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4 6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2 14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 1 1/2	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A3L6(X)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	14	GA-E-60149	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60242	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	14	GA-E-60349	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A301					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A101
Ricalcolati spessori
Variato rating (300)

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		

VALVES			
Size	Doc.	Type	
pos. from	to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A303			
Sh. 1 of 3		Rev.	
A0	A1		

Service NITROGEN (Unit 02)
Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80		5.54		80
3	7.62	80				
4	8.56	80				
6	8.74					

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1/2	6	ASME-B16.5
CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	6	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	6	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to
	6
	Pressure in bar
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
398	34.88
400	34.55
Max. hydr. P. 76.5	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	A	T				
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6		
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800					
Piping Class A303					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	6	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	6	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	1	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	6	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	6	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	2	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800			
Piping Class A303			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	6	GA-E-60112	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	6	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	6	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3S1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service MPS MCC MCS

Codes

Size	Pipe		Fitting Thk	Nipples	
	Thk	Sch		Thk	Sch
	1/2	3.73		80	3.73
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	8.38	30			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	12.7	XS			
24	12.7	XS			
30	12.7	XS			
32	12.7	XS			
34	12.7	XS			
40	14.27				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing

opt. from	to	Code		
1/2	24	ASME-B16.5	CL300 RF 125 μin.Ra	
26	40	ASME-B16.47 series.A	CL300 RF 125 μin.Ra	
5	1/2	24	ASME-B16.5	CL600 RF 125 μin.Ra
11	12	24	ASME-B16.5	CL300 RF 125 μin.Ra

Fitting Class

opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				Welding	
Size from	to	Internal	External	Size from	to
1/2	40	1.6	0	1/2	40
				Weld. spec. NIOEC-SP-90-02	
				Weld. class 10%	

Design Limits

Temp. °C	Size up to	Pressure in bar
2	24	41.13
38	40	29.81
93	40	29.07
149	40	28.16
204	40	27.28
260	40	25.78
315	40	23.57
343	40	23.1
371	40	22.95
382	40	21.55
Max. hydr. P.	55.4	44.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees

Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	30	32	34	40
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T				
30	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	T		
32	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	T	T
34	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	T	T
40	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	P	P	T

Branch size 1/2 3/4 1 1 1/2 2 3 4 6 8 10 12 14 16 18 20 24 30 32 34 40

Legenda

A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class A3S1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
	26	40	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	26	40	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
5	4	8	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	26	40	BLIND FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	34	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
	26	40	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	



JOB 316800								
Piping Class A3S1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	40	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60143	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	24	GA-E-60111	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60238	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	10	GA-E-60211	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	24	GA-E-60311	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60190	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	

STRAINERS			
pos.	Size	Doc.	Type
from	to		
1	2	4	GA-E-60610
			Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3V1			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service	AIR
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	9.53	STD			
14	9.53	30			
16	12.7	XS			
18	12.7	XS			
20	12.7	30			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
20	
2	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
280	40.13
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size																		
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	W	T	T	T									
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	W	T	T	T	T						
16	S	S	S	S	W	W	W	W	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20			
Legenda																		
A	TEE - SW ENDS - ASME-B16.11																	
H	HALF COUPLING - SW END - ASME-B16.11																	
P	PIPE-TO-PIPE																	
S	SOCKOLET - SW END - MSS-SP97																	
T	TEE - ASME-B16.9																	
W	WELDOLET - MSS-SP97																	



JOB 316800								
Piping Class A3V1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	20	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3	3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	20	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A3V1					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60100	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
1	2	20	GA-E-60110	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
4	1/2	1 1/2	GA-E-60200	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
4	2	8	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
6	1/2	1 1/2	GA-E-60300	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR	
6	2	20	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR	
11	1/2	1 1/2	GA-E-60142	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A3V1(G)			
Sh. 1 of 3		Rev.	
A0	A1		

Service INSTRUMENT AIR (Galvanized up to 4")
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		4.78	160	
3/4	5.56	160		5.56	160	
1	4.55	80		4.55	80	
1 1/2	5.08	80		5.08	80	
2	5.54	80		5.54	80	
3	7.62	80		7.62	80	
4	8.56	80		8.56	80	
6	7.11	40				
8	7.04	30				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	8	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	4	ASME-B16.11		3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	8	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	4	---
5	8	NIOEC-SP-90-02
Weld. class		

Design Limits	
Temp. °C	Size up to
	8
	Pressure in bar
2	51.02
37	51.02
50	50.11
85	47.5
Max. hydr. P.	29.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
1/2	A								
3/4	A	A							
1	A	A	A						
1 1/2	A	A	A	A					
2	A	A	A	A	A				
3	A	A	A	A	A	A			
4	A	A	A	A	A	A	A		
6	B	B	B	B	B	B	B	T	
8	B	B	B	B	B	B	B	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8
Legenda									
A	TEE - THD ENDS - ASME-B16.11								
B	THREDOLET - THD END - MSS-SP97								
H	HALF COUPLING - THD END - ASME-B16.11								
P	PIPE-TO-PIPE								
T	TEE - ASME-B16.9								



JOB 316800					
Piping Class A3V1(G)					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt.	from	to			
PIPE					
	1/2	4	PIPE+1 COUPLING - NPT ENDS		ASTM A53 GR.B Hot Dip GALV. - SMLS
	5	8	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE					
	1/2	4	THD FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED
	6	8	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	4	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Hot Dip GALVANIZED
	6	8	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	1 1/2	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70 Hot Dip GALV.
	5	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	1/2	4	ELBOW - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	8	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER					
	1/2	4	RED. COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	8	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP					
	1/2	4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	8	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	4	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
MALE PLUG					
	1/2	4	THD MALE PLUG - HEX HEAD - ASME-B16.11		ASTM A105 Hot Dip GALVANIZED
NIPPLES					
	1/2	4	NIPPLE - THDD/THDD - BS3799		ASTM A53 GR.B Hot Dip GALV. - SMLS
SWAGE NIPPLES					
	1/2	4	SWAGE NIPPLE - THDD/THDD - MSS-SP95		ASTM A234 WPB HotDipGalv. A123 - SMLS
TEE					
	1/2	4	TEE - THD ENDS - ASME-B16.11	3000	ASTM A105 Hot Dip GALVANIZED
	6	8	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
THREDOLET					
	1/2	4	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Hot Dip GALVANIZED
FLAT NON-METALLIC					
	1/2	8	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class A3V1(G)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	2	GA-E-60109	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	3	8	GA-E-60110	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	2	GA-E-60209	Carbon Steel - Globe-WB-Red.B-Int seat - BS5352 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	3	3	GA-E-60210	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	2	GA-E-60309	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - THDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	3	3	GA-E-60310	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A6A1					
Sh.	1	of	3	Rev.	
				A0	A1

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	15.09	80			
12	17.48	80			
14	19.05	80			
16	22.23				
18	15.88				
20	17.48				
24	20.62				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits		
Temp. °C	Size up to	Pressure in bar
	16	24
2	102.04	75.8
38	102	75.8
93	93.13	75.8
149	90.65	75.8
204	87.58	75.8
260	82.74	71.63
316	75.48	65.55
343	74.14	64.44
371	73.43	62.54
400	69.12	48.93
427	56.64	40.84
Max. hydr. P.	153	113.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																						
Run size																						
1/2	A																					
3/4	A	A																				
1	A	A	A																			
1 1/2	A	A	A	A																		
2	S	S	S	S	T																	
3	S	S	S	S	T	T																
4	S	S	S	S	T	T	T															
6	S	S	S	S	W	T	T	T														
8	S	S	S	S	W	W	T	T	T													
10	S	S	S	S	W	W	W	T	T	T												
12	S	S	S	S	W	W	W	T	T	T	T											
14	S	S	S	S	W	W	W	W	T	T	T	T										
16	S	S	S	S	W	W	W	W	T	T	T	T	T									
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T								
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T							
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	T						
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24						
Legenda																						
A	TEE - SW ENDS - ASME-B16.11																					
S	SOCKOLET - SW END - MSS-SP97																					
T	TEE - ASME-B16.9																					
W	WELDOLET - MSS-SP97																					



JOB 316800								
Piping Class A6A1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	24	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
	2	24	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800							
Piping Class A6A1							
Sh.	3	of	3	Rev.			
				A0	A1	A2	

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	24	GA-E-60115	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	12	GA-E-60215	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	24	GA-E-60315	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	

STRAINERS					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	2	12	GA-E-60613	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	
1	18	18	GA-E-60614	Carbon Steel - T Strainer-BW - <MFR Std - Metallic> - CL600 - RF - 125 µin.Ra Body Mat. ASTM A234 WPB - SMLS Trim Mat. 316 - CLOTH - MESH 3	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6A3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS
Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80		5.54	80
3	7.62	80			
4	8.56	80			
6	8.74				
8	10.31	60			
10	12.7	XS			
12	14.27	60			
14	15.09	60			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to
	14
	Pressure in bar
2	74.45
38	74.45
93	74.45
149	74.45
204	74.45
260	70.36
316	64.39
343	63.3
371	61.43
398	48.81
400	48.07
427	40.11
Max. hydr. P.	153

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size												
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda												
A	TEE - SW ENDS - ASME-B16.11											
S	SOCKOLET - SW END - MSS-SP97											
T	TEE - ASME-B16.9											
W	WELDOLET - MSS-SP97											



JOB 316800								
Piping Class A6A3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	14	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
	2	14	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A6A3					
Sh.	3	of	3	Rev.	
				A0	A1

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	
1	2	14	GA-E-60115	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF	
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
4	2	8	GA-E-60215	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF	
6	2	14	GA-E-60315	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF	
11	1/2	1 1/2	GA-E-60144	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A6B3					
Sh. 1 of 1	Rev.				
	A0	A1			

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6B3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6C3			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6C3(N)			
Sh. 1 of 3		Rev.	
A0	A1		

Service HYDROCARBONS WITH H2S WATER
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160			7.47	XXS
3/4	5.56	160			7.82	XXS
1	6.35	160			9.09	XXS
1 1/2	7.14	160			10.15	XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					
8	10.31	60				
10	12.7	60				
12	12.7	XS				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	12
2	68.74
37	68.74
93	68.74
148	68.74
160	68.74
Max. hydr. P. 103.11	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	T						
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
Legenda											
A	TEE - SW ENDS - ASME-B16.11										
S	SOCKOLET - SW END - MSS-SP97										
T	TEE - ASME-B16.9										
W	WELDOLET - MSS-SP97										



JOB 316800					
Piping Class A6C3(N)					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
opt.	Size from to	Item	Rating/Facing	Material	
PIPE					
	1/2 12	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE					
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2 12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE					
	1/2 12	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND					
	3/4 8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW					
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2 12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER					
	2 12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP					
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2 12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING					
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG					
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES					
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES					
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE					
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2 12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET					
	2 4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET					
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET					
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT					
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND					
	1/2 12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS					
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800			
Piping Class A6C3(N)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	12	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	12	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
61	3	3	GA-E-60380	Carbon Steel - Check-Lug wafer-Dual plate-Wldd seat - API594 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	3	GA-E-60615	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6C3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					
8	10.31	60				
10	12.7	60				
12	14.27	60				
14	15.09	60				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	14
2	74.45
37	74.45
93	74.45
148	74.45
160	74.45
204	74.45
260	70.36
315	64.4
343	63.29
360	62.17
Max. hydr. P.	111.6

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size													
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
12	S	S	S	S	W	W	W	T	T	T	T		
14	S	S	S	S	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	
Legenda													
A	TEE - SW ENDS - ASME-B16.11												
S	SOCKOLET - SW END - MSS-SP97												
T	TEE - ASME-B16.9												
W	WELDOLET - MSS-SP97												



JOB 316800							
Piping Class A6C3(X)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	14	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	14	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	14	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
	2	14	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	14	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A6C3(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	14	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	14	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6C3(Z)			
Sh. 1 of 3		Rev.	
A0	A1		

Service	CAUSTIC SOLUTION
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
	1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS	
1	6.35	160		9.09	XXS	
1 1/2	7.14	160		10.15	XXS	
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					
8	10.31	60				
10	12.7	60				
12	12.7	XS				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5		CL600 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp.	Size up to
°C	Pressure in bar
2	68.74
37	68.74
93	68.74
148	68.74
160	68.74
Max. hydr. P. 103.11	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size											
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	T						
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
Legenda											
A	TEE - SW ENDS - ASME-B16.11										
S	SOCKOLET - SW END - MSS-SP97										
T	TEE - ASME-B16.9										
W	WELDOLET - MSS-SP97										



JOB 316800			
Piping Class A6C3(Z)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 12	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	2 12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 12	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	3/4 4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER				
	2 12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized
	2 12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2 12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET				
	2 4	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class A6C3(Z)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	12	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	12	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	Size to	Doc.	Type
1	2	6	GA-E-60613	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A6C6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6C6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH H2S WATER
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	10.15	XXS		10.15	XXS
2	11.07	XXS		11.07	XXS
3	11.13	160			
4	11.13	120			
6	12.7				
8	14.27				
10	15.09	80			
12	17.48	80			
14	17.48				
16	19.05				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size to	Internal	External	
1/2	1 1/2	5	0	
2	16	6.4	0	

Welding		
from	Size to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits		
Temp.	Size up to	
	16	
°C	Pressure in bar	
2	70.13	
37	70.13	
93	70.13	
148	70.13	
204	70.13	
260	66.27	
315	60.72	
320	60.49	
Max. hydr. P.		105.2

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees															
Run size															
1/2	A														
3/4	A	A													
1	A	A	A												
1 1/2	A	A	A	A											
2	S	S	S	S	T										
3	S	S	S	S	T	T									
4	S	S	S	S	T	T	T								
6	S	S	S	S	W	T	T	T							
8	S	S	S	S	W	W	T	T	T						
10	S	S	S	S	W	W	W	T	T	T					
12	S	S	S	S	W	W	W	T	T	T	T				
14	S	S	S	S	W	W	W	W	T	T	T	T			
16	S	S	S	S	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16		
Legenda															
A	TEE - SW ENDS - ASME-B16.11														
S	SOCKOLET - SW END - MSS-SP97														
T	TEE - ASME-B16.9														
W	WELDOLET - MSS-SP97														



JOB 316800							
Piping Class A6C6(N)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	16	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	2	2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A6C6(N)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	16	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	16	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited



JOB 316800			
Piping Class A6C6(X)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Customer Piping Class
Ref. Doc.

Service HYDROCARBONS WITH H2S WATER
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	7.47	XXS			7.47	XXS
3/4	7.82	XXS			7.82	XXS
1	9.09	XXS			9.09	XXS
1 1/2	10.15	XXS			10.15	XXS
2	11.07	XXS				
3	11.13	160				
4	11.13	120				
6	12.7					
8	14.27					
10	15.09	80				
12	17.48	80				
14	17.48					
16	19.05					

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				Welding	
from	Size to	Internal	External	from	Size to Weld. spec.
1/2	1 1/2	5	0	1/2	16 NIOEC-SP-90-02
2	16	6.4	0	Weld. class 10%	
				PWHT YES => 2"	

Design Limits	
Temp.	Size up to
	16
°C	Pressure in bar
2	70.13
37	70.13
93	70.13
148	70.13
204	70.13
260	66.27
315	60.72
320	60.49
Max. hydr. P.	105.2

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800							
Piping Class A6C6(X)							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	16	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A6C6(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	16	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	16	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6E3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	LEAN AMINE
Codes	

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
	1/2	4.78	160		7.47	
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	XS		5.54		80
3	7.62	XS				
4	8.56	XS				
6	8.74					
8	10.31	60				
10	12.7	XS				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	10	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	74.45
37	74.45
93	74.45
148	74.45
160	74.45
Max. hydr. P. 111.68	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
	8	S	S	S	S	W	W	T	T	T
	10	S	S	S	S	W	W	W	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800								
Piping Class A6E3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
Size	Item	Rating/Facing	Material			
opt.	from	to				
PIPE						
	1/2	10	PIPE			ASTM A106 GR.B - SMLS
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized
	2	10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized
BLIND FLANGE						
	1/2	10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra		ASTM A515 GR.70
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
	2	10	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS
	3	2	BEND - WITH R=3 DN - TB RAC 5023			ASTM A234 WPB - SMLS
REDUCER						
	2	10	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000		ASTM A105 Normalized
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000		ASTM A105 Normalized
	2	10	CAP - ASME-B16.9			ASTM A234 WPB - SMLS
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000		ASTM A105 Normalized
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11			ASTM A105 Normalized
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799			ASTM A106 GR.B - SMLS
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799			ASTM A106 GR.B - SMLS
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WPB - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WPB - SMLS
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized
	2	10	TEE - ASME-B16.9			ASTM A234 WPB - SMLS
WELDOLET						
	2	4	WELDOLET - MSS-SP97			ASTM A105 Normalized
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000		ASTM A105 Normalized
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000		ASTM A105 Normalized
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra		ASTM A105 Normalized
SPIRAL WOUND						
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800				
Piping Class A6E3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size		Doc.	Type
	from	to		
1	2	6	GA-E-60613	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6E3(N)			
Sh. 1 of 3		Rev.	
A0	A1		

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	XS		5.54	80
3	7.62	XS			
4	8.56	XS			
6	8.74				
8	10.31	60			
10	12.7	XS			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	10	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	74.45
37	74.45
93	74.45
148	74.45
160	74.45
Max. hydr. P. 111.68	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800			
Piping Class A6E3(N)			
Sh.	2	of	3

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 10	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	6 6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
	3 2 10	BEND - WITH R=3 DN - TB RAC 5023		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2 10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020
	2 10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A6E3(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6E6			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service LEAN AMINE
Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	7.47	XXS	7.47	7.47	XXS	XXS
3/4	7.82	XXS	7.82	7.82	XXS	XXS
1	9.09	XXS	9.09	9.09	XXS	XXS
1 1/2	10.15	XXS	10.15	10.15	XXS	XXS
2	11.07	XXS				
3	11.13	160				
4	11.13	120				
6	12.7					
8	12.7	XS				
10	15.09	80				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	1 1/2	5	0
2	10	6.4	0

Welding		
Size from	to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	60.36
37	60.36
93	60.36
148	60.36
160	60.36
Max. hydr. P. 87.03	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800								
Piping Class A6E6								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	10	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
	2	10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized	
	2	10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A6E6					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6E6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	7.47	XXS
3/4	7.82	XXS	7.82	7.82	XXS
1	9.09	XXS	9.09	9.09	XXS
1 1/2	10.15	XXS	10.15	10.15	XXS
2	11.07	XXS	11.07	11.07	XXS
3	11.13	160			
4	11.13	120			
6	12.7				
8	12.7	XS			
10	15.09	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	1 1/2	5	0
2	10	6.4	0

Welding		
from	Size to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES

Design Limits	
Temp.	Size up to
°C	10
	Pressure in bar
2	60.36
37	60.36
93	60.36
148	60.36
160	60.36
Max. hydr. P. 87.03	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
	8	S	S	S	S	W	W	T	T	T
	10	S	S	S	S	W	W	W	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800								
Piping Class A6E6(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	10	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
	3	2	BEND - WITH R=3 DN - TB RAC 5023		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	



JOB 316800				
Piping Class A6E6(N)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6E6(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Grade

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A6F6					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		

VALVES			
Size	Doc.	Type	
pos. from	to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6F6(Z)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6H1			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



JOB 316800			
Piping Class A6H1(Z)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6H3			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	60			
12	14.27	60			
14	15.09	60			
16	16.66	60			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		
6	3	16 ASME-B16.5	CL900 RF 125 µin.Ra		
11	12	16 ASME-B16.5	CL600 RF 125 µin.Ra		
61	16	16 ASME-B16.5	CL900 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	16	3.2	0	

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
	16
2	77.03
37	77.03
93	77.03
140	77.03
Max. hydr. P. 115.55	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800				
Piping Class A6H3				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
PIPE					
	1/2	16	PIPE		ASTM A106 GR.B - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	2	16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
6	6	6	WN FLANGE - ASME-B16.5	CL900 RF 125 µin.Ra	ASTM A105 Normalized
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A105 Normalized
61	16	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL900 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE					
	1/2	16	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND					
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70
6	16	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL900 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
REDUCER					
	2	16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2	16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
MALE PLUG					
	1/2	3/4	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES					
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized
	2	16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
WELDOLET					
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND					
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class A6H3			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60102	Carbon Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13 CR / HF
1	2	16	GA-E-60115	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13 CR / HF
4	1/2	1 1/2	GA-E-60202	Carbon Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
4	2	8	GA-E-60215	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	16	GA-E-60315	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF
61	1/2	1 1/2	GA-E-60381	Carbon Steel - Check-BB-Red.B-Swing-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
61	2	10	GA-E-60382	Carbon Steel - Check-Lug wafer-Dual plate-Wldd seat - API594 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR / HF

STRAINERS				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60602	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6H3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	12.7	60			
12	17.48	80			
14	15.09	60			
16	16.66	60			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	16
2	77.03
37	77.03
93	77.03
140	77.03
Max. hydr. P. 115.55	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800				
Piping Class A6H3(N)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 16	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 16	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	3/4 8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	2 16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized GA-E-60020
	2 16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 3/4	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
	1/2 1 1/2	NIPPLE - PE/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800			
Piping Class A6H3(N)			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	16	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	16	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
61	6	6	GA-E-60380	Carbon Steel - Check-Lug wafer-Dual plate-Widd seat - API594 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60615	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class A6H3(Z)			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6H6(X)			
Sh. 1 of 3		Rev.	
A0	A1		

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	11.07	XXS		11.07	XXS
3	11.13	160			
4	11.13	120			
6	12.7				
8	14.27				
10	15.09	80			
12	17.48	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2	1 1/2		5	0
2	12		6.4	0

Welding			
from	Size	to	Weld. spec.
1/2	12		NIOEC-SP-90-02
Weld. class		10%	
PWHT		YES = > 2"	

Design Limits	
Temp.	Size up to
°C	Pressure in bar
2	70.13
37	70.13
50	70.13
100	70.13
150	70.13
200	70.13
240	67.66
Max. hydr. P.	105

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	A									
	3/4	A	A								
	1	A	A	A							
	1 1/2	A	A	A	A						
	2	S	S	S	S	T					
	3	S	S	S	S	T	T				
	4	S	S	S	S	T	T	T			
	6	S	S	S	S	W	T	T	T		
	8	S	S	S	S	W	W	T	T	T	
	10	S	S	S	S	W	W	W	T	T	
	12	S	S	S	S	W	W	W	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	
Legenda	A	TEE - SW ENDS - ASME-B16.11									
	S	SOCKOLET - SW END - MSS-SP97									
	T	TEE - ASME-B16.9									
	W	WELDOLET - MSS-SP97									



JOB 316800					
Piping Class A6H6(X)					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	12	PIPE		ASTM A106 GR.B - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
	2	12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
BLIND FLANGE						
	1/2	12	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60021	
DRIP RING						
	3	3	DRIP-RING - TB DRI 5011	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
REDUCER						
	2	12	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	12	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020	
	2	12	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020	
WELDOLET						
	2	4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020	
SPIRAL WOUND						
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800					
Piping Class A6H6(X)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	12	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	12	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60608	Carbon Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L1			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service HBW
Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		3.73	80
3/4	3.91	80		3.91	80
1	4.55	80		4.55	80
1 1/2	5.08	80		5.08	80
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	8.74				
8	10.31	60			
10	12.7	60			
12	12.7	XS			
14	15.09	60			
16	16.66	60			
18	17.48				
20	20.62	60			
24	22.23				
26	25.4				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL600 RF 125 µin.Ra	
26	26	ASME-B16.47 series.A		CL600 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	26	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	26	NIOEC-SP-90-02
Weld. class		10%

Design Limits			
Temp. °C	Size up to	24	26
	Pressure in bar		
2	82.7	88.37	
38	82.7	88.37	
93	82.7	86.16	
149	82.7	83.51	
165	82.7	82.74	
204	82.7	80.86	
260	78.15	76.44	
315	71.6	69.81	
343	70.31	68.49	
371	68.23	68.05	
398	54.22	57.44	
400	53.39	57.05	
Max. hydr. P.	113	132.5	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	P	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	
26	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	T

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class A6L1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 24	PIPE		ASTM A106 GR.B - SMLS
	26 26	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	2 24	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	26 26	WN FLANGE - ASME-B16.47 series.A	CL600 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	26 26	BLIND FLANGE - ASME-B16.47 series.A	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	1 1/2 10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
	26 26	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD
REDUCER				
	2 24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
	26 26	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2 26	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
	26 26	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD
WELDOLET				
	2 12	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 26	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800								
Piping Class A6L1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60116	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
1	2	20	GA-E-60117	Carbon Steel - Gate-BB-FB-Flex wdg-Wlidd seat - API600 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
4	1/2	1 1/2	GA-E-60216	Carbon Steel - Globe-WB-Red.B-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
4	2	8	GA-E-60217	Carbon Steel - Globe-BB-Disk-Wlidd seat - BS1873 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	20	GA-E-60316	Carbon Steel - Check-BB-FB-Swing-Wlidd seat - BS1868 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
11	1/2	1 1/2	GA-E-60192	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service BFW
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	6	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	6	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	6	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to
	6
2	74.45
38	74.45
85	74.45
Max. hydr. P. 111.68	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6		
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800								
Piping Class A6L3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	6	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
	2	6	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	6	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized	
	2	6	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized	
	2	6	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	2	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class A6L3					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60116 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
1	2	6	GA-E-60117 Carbon Steel - Gate-BB-FB-Flex wdg-Wlidd seat - API600 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
4	1/2	1 1/2	GA-E-60216 Carbon Steel - Globe-WB-Red.B-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
4	2	6	GA-E-60217 Carbon Steel - Globe-BB-Disk-Wlidd seat - BS1873 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
6	1/2	1 1/2	GA-E-60302 Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	6	GA-E-60316 Carbon Steel - Check-BB-FB-Swing-Wlidd seat - BS1868 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
11	1/2	1 1/2	GA-E-60192 Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L3(N)			
Sh.	1	of	3
	A0	A1	

Service SOUR WATER
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	6	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance				Welding	
Size from	to	Internal	External	Size from	to
1/2	6	3.2	0	1/2	6

Weld. spec. NIOEC-SP-90-02
Weld. class 10%
PWHT YES => 2"

Design Limits	
Temp.	Size up to 6
°C	Pressure in bar
2	74.45
38	74.45
85	74.45
Max. hydr. P. 111.68	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	A									
	3/4	A	A								
	1	A	A	A							
	1 1/2	A	A	A	A						
	2	S	S	S	S	T					
	3	S	S	S	S	T	T				
	4	S	S	S	S	T	T	T			
	6	S	S	S	S	W	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6			
Legenda	A	TEE - SW ENDS - ASME-B16.11									
	S	SOCKOLET - SW END - MSS-SP97									
	T	TEE - ASME-B16.9									
	W	WELDOLET - MSS-SP97									



JOB 316800					
Piping Class A6L3(N)					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	1/2	6	PIPE			ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
	2	6	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
BLIND FLANGE						
	1/2	6	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
REDUCER						
	2	6	REDUCER - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000		ASTM A105 Normalized GA-E-60020
	2	6	CAP - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11			ASTM A105 Normalized GA-E-60020
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799			ASTM A106 GR.B - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - PE/PE - BS3799			ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WPB - SMLS GA-E-60020
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WPB - SMLS GA-E-60020
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000		ASTM A105 Normalized GA-E-60020
	2	6	TEE - ASME-B16.9			ASTM A234 WPB - SMLS GA-E-60020
WELDOLET						
	2	2	WELDOLET - MSS-SP97			ASTM A105 Normalized GA-E-60020
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000		ASTM A105 Normalized GA-E-60020
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra		ASTM A105 Normalized GA-E-60020
SPIRAL WOUND						
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A6L3(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	6	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	6	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	6	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Grade

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class A6L6			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L6(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service SOUR WATER
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	XXS	
3/4	7.82	XXS	7.82	XXS	
1	9.09	XXS	9.09	XXS	
1 1/2	10.15	XXS	10.15	XXS	
2	11.07	XXS			
3	11.13	160			
4	11.13	120			
6	12.7				
8	12.7	XS			
10	15.09	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				Welding	
from	Size to	Internal	External	from	to
1/2	1 1/2	5	0	1/2	10
2	10	6.4	0	Weld. spec. NIOEC-SP-90-02	
				Weld. class 10%	
				PWHT YES => 2"	

Design Limits	
Temp. °C	Size up to
	10
2	60.36
37	60.36
93	60.36
140	60.36
Max. hydr. P. 90.54	

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800				
Piping Class A6L6(N)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from to			
PIPE				
	1/2 10	PIPE		ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
	2 10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2 10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	1 1/2 1 1/2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70 GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	1/2 1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	CAP - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A105 Normalized GA-E-60020
	2 10	TEE - ASME-B16.9		ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2 4	WELDOLET - MSS-SP97		ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2 10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800					
Piping Class A6L6(N)					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A6L6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS	7.47	XXS	
3/4	7.82	XXS	7.82	XXS	
1	9.09	XXS	9.09	XXS	
1 1/2	10.15	XXS	10.15	XXS	
2	11.07	XXS			
3	11.13	160			
4	11.13	120			
6	12.7				
8	12.7	XS			
10	15.09	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size to	Internal	External	
1/2	1 1/2	5	0	
2	10	6.4	0	

Welding		
from	Size to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES => 2"

Design Limits	
Temp.	Size up to
°C	10
	Pressure in bar
2	60.36
37	60.36
93	60.36
140	60.36
Max. hydr. P.	90.54

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
	8	S	S	S	S	W	W	T	T	T
	10	S	S	S	S	W	W	W	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda	A	TEE - SW ENDS - ASME-B16.11								
	S	SOCKOLET - SW END - MSS-SP97								
	T	TEE - ASME-B16.9								
	W	WELDOLET - MSS-SP97								



JOB 316800				
Piping Class A6L6(X)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	10	PIPE	ASTM A106 GR.B - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
	2	10	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
BLIND FLANGE				
	1/2	10	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPECTACLE BLIND				
	1 1/2	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra ASTM A515 GR.70 GA-E-60021
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	10	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
REDUCER				
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	10	REDUCER - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	10	CAP - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60021
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A105 Normalized GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A106 GR.B - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WPB - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A105 Normalized GA-E-60020
	2	10	TEE - ASME-B16.9	ASTM A234 WPB - SMLS GA-E-60020
WELDOLET				
	2	4	WELDOLET - MSS-SP97	ASTM A105 Normalized GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A105 Normalized GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra ASTM A105 Normalized GA-E-60020
SPIRAL WOUND				
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800				
Piping Class A6L6(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60147	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
1	2	10	GA-E-60150	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60240	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60243	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60347	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited
6	2	10	GA-E-60350	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60191	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A6S1					
Sh.	1	of	3	Rev.	
				A0	A1

Service	HPS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	14.27				
18	15.88				
20	17.48				
24	20.62				
28	22.23				
30	23.83				
36	26.97				
40	30.18				
42	31.75				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL600 RF	125	µin.Ra
26	42	ASME-B16.47 series.A	CL600 RF	125	µin.Ra
11	12	24 ASME-B16.5	CL600 RF	125	µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		10%

Design Limits			
Temp.	Size up to		
		24	42
°C	Pressure in bar		
2	75.39	67.68	
38	75.39	67.68	
93	75.39	65.98	
149	75.39	63.95	
204	75.39	61.92	
260	71.24	58.54	
315	65.27	53.46	
343	64.09	52.45	
371	62.2	52.11	
398	49.43	43.99	
400	48.67	43.69	
Max. hydr. P.	113	101.5	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																					
Run size																					
1/2	A																				
3/4	A	A																			
1	A	A	A																		
1 1/2	A	A	A	A																	
2	S	S	S	S	T																
3	S	S	S	S	T	T															
4	S	S	S	S	T	T	T														
6	S	S	S	S	W	T	T	T													
8	S	S	S	S	W	W	T	T	T												
10	S	S	S	S	W	W	W	T	T	T											
12	S	S	S	S	W	W	W	T	T	T	T										
14	S	S	S	S	W	W	W	W	T	T	T	T									
16	S	S	S	S	W	W	W	W	T	T	T	T	T								
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T							
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T						
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T					
28	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	T				
30	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	T	T			
36	S	S	S	S	W	W	W	W	W	W	W	T	T	T	T	T	T	T	T		
40	S	S	S	S	W	W	W	W	W	W	W	W	T	T	T	T	T	T	T		
42	S	S	S	S	W	W	W	W	W	W	W	W	W	T	T	T	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	28	30	36	40	42

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class A6S1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 24	PIPE		ASTM A106 GR.B - SMLS
	26 42	PIPE		ASTM A672 GR.C60 CL.22 (str rel) - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	2 24	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	26 42	WN FLANGE - ASME-B16.47 series.A	CL600 RF 125 µin.Ra	ASTM A105 Normalized
11	12 24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A105 Normalized
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A105 Normalized
	26 42	BLIND FLANGE - ASME-B16.47 series.A	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPECTACLE BLIND				
	3/4 24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A515 GR.70
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS
	26 42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPBW - WLDD
REDUCER				
	2 24	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS
	26 42	REDUCER - ASME-B16.9		ASTM A234 WPBW - WLDD
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	CAP - ASME-B16.9		ASTM A234 WPB - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A105 Normalized
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WPB - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WPB - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized
	2 24	TEE - ASME-B16.9		ASTM A234 WPB - SMLS
	26 42	TEE - ASME-B16.9		ASTM A234 WPBW - WLDD
WELDOLET				
	2 20	WELDOLET - MSS-SP97		ASTM A105 Normalized
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A105 Normalized
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A105 Normalized
SPIRAL WOUND				
	1/2 42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800								
Piping Class A6S1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60116	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
1	2	36	GA-E-60117	Carbon Steel - Gate-BB-FB-Flex wdg-Wlidd seat - API600 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
4	1/2	1 1/2	GA-E-60216	Carbon Steel - Globe-WB-Red.B-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
4	2	8	GA-E-60217	Carbon Steel - Globe-BB-Disk-Wlidd seat - BS1873 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
6	1/2	1 1/2	GA-E-60302	Carbon Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR / HF
6	2	24	GA-E-60316	Carbon Steel - Check-BB-FB-Swing-Wlidd seat - BS1868 - CL600 - BW Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
11	1/2	1 1/2	GA-E-60192	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	2	6	GA-E-60613	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A6V1					
Sh. 1 of 1	Rev.				
	A0	A1			

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class A7A1			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		4.78	160
3/4	3.91	80		5.56	160
1	4.55	80		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	10.31	60			
10	12.7	XS			
12	14.27	60			
14	15.09	60			
16	19.05				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	2 1/2	ASME-B16.5	CL1500 RF 125 µin.Ra		
3	16	ASME-B16.5	CL900 RF 125 µin.Ra		
11	12	16	ASME-B16.5	CL900 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	92.41
37	92.41
93	92.41
148	92.41
204	92.41
240	89.15
Max. hydr. P.	138.6

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees															
Run size															
1/2	A														
3/4	A	A													
1	A	A	A												
1 1/2	A	A	A	A											
2	S	S	S	S	T										
3	S	S	S	S	T	T									
4	S	S	S	S	T	T	T								
6	S	S	S	S	W	T	T	T							
8	S	S	S	S	W	W	T	T	T						
10	S	S	S	S	W	W	W	T	T	T					
12	S	S	S	S	W	W	W	T	T	T	T				
14	S	S	S	S	W	W	W	W	T	T	T	T			
16	S	S	S	S	W	W	W	W	T	T	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16		
Legenda															
A	TEE - SW ENDS - ASME-B16.11														
S	SOCKOLET - SW END - MSS-SP97														
T	TEE - ASME-B16.9														
W	WELDOLET - MSS-SP97														



JOB 316800								
Piping Class A7A1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	16	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A105 Normalized	
	2	16	WN FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A105 Normalized	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL900 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
1	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051		CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL1500 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800				
Piping Class A7A1				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size	Doc.	Type	
from	to			
1	1/2	1 1/2	GA-E-60151	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
1	2	2	GA-E-60152	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
1	3	16	GA-E-60153	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	1/2	1 1/2	GA-E-60244	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
4	2	2	GA-E-60213	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
4	3	8	GA-E-60214	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	1/2	1 1/2	GA-E-60351	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR
6	2	2	GA-E-60313	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR
6	3	16	GA-E-60314	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR

STRAINERS				
pos.	Size	Doc.	Type	
from	to			
1	10	12	GA-E-60633	Carbon Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class A7L1					
Sh. 1 of 3	Rev.				
	A0	A1			

Service	HBV
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80		4.78	160
3/4	3.91	80		5.56	160
1	4.55	80		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			
10	15.09	80			
12	17.48	80			
14	17.48				
16	19.05				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	2 1/2	ASME-B16.5	CL1500 RF 125 µin.Ra		
3	16	ASME-B16.5	CL900 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	105.38
37	105.38
93	105.38
148	105.38
200	105.38
Max. hydr. P.	157.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees															
Run size															
1/2	A														
3/4	A	A													
1	A	A	A												
1 1/2	A	A	A	A											
2	S	S	S	S	T										
3	S	S	S	S	T	T									
4	S	S	S	S	T	T	T								
6	S	S	S	S	W	T	T	T							
8	S	S	S	S	W	W	T	T	T						
10	S	S	S	S	W	W	W	T	T	T					
12	S	S	S	S	W	W	W	T	T	T	T				
14	S	S	S	S	W	W	W	W	T	T	T	T			
16	S	S	S	S	W	W	W	W	T	T	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16		
Legenda															
A	TEE - SW ENDS - ASME-B16.11														
S	SOCKOLET - SW END - MSS-SP97														
T	TEE - ASME-B16.9														
W	WELDOLET - MSS-SP97														



JOB 316800					
Piping Class A7L1					
Sh.	2	of	3		
				Rev.	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	16	PIPE		ASTM A106 GR.B - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A105 Normalized	
	2	16	WN FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A105 Normalized	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A105 Normalized	
SPECTACLE BLIND						
	1 1/2	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A515 GR.70	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WPB - SMLS	
REDUCER						
	2	16	REDUCER - ASME-B16.9		ASTM A234 WPB - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	CAP - ASME-B16.9		ASTM A234 WPB - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A106 GR.B - SMLS	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A106 GR.B - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799		ASTM A234 WPB - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A234 WPB - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A105 Normalized	
	2	16	TEE - ASME-B16.9		ASTM A234 WPB - SMLS	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A105 Normalized	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A105 Normalized	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL1500 RF 125 µin.Ra	ASTM A105 Normalized	
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800				
Piping Class A7L1				
Sh.	3	of	3	
				Rev.
	A0	A1		

VALVES	Size		Doc.	Type
pos.	from	to		
1	1/2	1 1/2	GA-E-60181	Carbon Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
1	2	2	GA-E-60182	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
1	3	16	GA-E-60183	Carbon Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
4	1/2	1 1/2	GA-E-60266	Carbon Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
4	2	2	GA-E-60267	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
4	3	8	GA-E-60268	Carbon Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
6	1/2	1 1/2	GA-E-60372	Carbon Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A105 Normalized Trim Mat. 13CR stellited
6	2	2	GA-E-60373	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited
6	3	16	GA-E-60374	Carbon Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A216 WCB Trim Mat. 13CR stellited



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class C1A3					
Sh.	1	of	3	Rev.	
				A0	A1

Service	HYDROCARBONS (LPG)
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	9.53	STD			
14	9.53	STD			
16	9.53	STD			
20	9.53	STD			
24	9.53	STD			
36	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
	26	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	14 ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	36	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	36	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
-46	19.65
-28	19.65
38	19.64
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
Max. hydr. P.	29.4

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																								
Run size																								
1/2	A																							
3/4	A	A																						
1	A	A	A																					
1 1/2	A	A	A	A																				
2	S	S	S	S	T																			
3	S	S	S	S	T	T																		
4	S	S	S	S	T	T	T																	
6	S	S	S	S	W	T	T	T																
8	S	S	S	S	W	T	T	T																
10	S	S	S	S	W	W	T	T	T															
12	S	S	S	S	W	W	W	T	T	T	T													
14	S	S	S	S	W	W	W	T	T	T	T	T												
16	S	S	S	S	W	W	W	W	T	T	T	T	T											
20	S	S	S	S	W	W	W	W	T	T	T	T	T	T										
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T									
36	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	T								
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	20	24	36								
Legenda																								
A	TEE - SW ENDS - ASME-B16.11																							
P	PIPE-TO-PIPE																							
S	SOCKOLET - SW END - MSS-SP97																							
T	TEE - ASME-B16.9																							
W	WELDOLET - MSS-SP97																							



JOB 316800								
Piping Class C1A3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A333 GR.6 - SMLS	
	26	36	PIPE		ASTM A671 GR.CC60 CL.22 - EFW + S2 (-46°C)	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
	36	36	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
	3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
	3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
	11	12	24	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A516 GR.70 + S5 (-46°C)	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS	
	36	36	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6W - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A350 LF2 - CL.1	
	2	24	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	24	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS	
	26	36	TEE - ASME-B16.9		ASTM A420 WPL6W - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
SPIRAL WOUND						
	1/2	36	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800								
Piping Class C1A3								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A 320 L7 + ASTM A194 GR.4	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60129	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
1	2	14	GA-E-60130	K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60228	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
4	2	10	GA-E-60229	K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60333	K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
6	2	14	GA-E-60334	K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
8	3/4	6	GA-E-60405	K.C.S. For Low Temp. - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. Soft seat-316 trim - PTFE seats
8	8	16	GA-E-60406	K.C.S. For Low Temp. - Ball-Top entry-FB-Trunnion ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. Soft seat-316 trim - PTFE seats
8	18	24	GA-E-60416	K.C.S. For Low Temp. - Ball-Split body-FB-Trunnion ball - API6D - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. Soft seat-316 trim - PTFE seats
11	1/2	1 1/2	GA-E-60132	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
41	1/2	1 1/2	GA-E-60279	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF



JOB 316800			
Piping Class C1B3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A1B3
Variato materiale
Calcolato spessori

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class C1C3(X)					
Sh. 1 of 3	Rev.				
	A0	A1			

Service **FLARE SYSTEM**
(Severe Wet H2S Service)

Codes

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF 125 µin.Ra	

Size	Thicknesses					
	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		4.78	160	
3/4	5.56	160		5.56	160	
1	6.35	160		6.35	160	
1 1/2	5.08	80		7.14	160	
2	5.54	80				
3	5.49	40				
4	6.02	40				
6	7.11	40				
8	7.04	30				
10	7.8	30				
12	8.38	30				
14	9.53	30				
16	9.53	30				
18	9.53	STD				
20	9.53	STD				
24	9.53	STD				

Fitting Class						SW	THDD	PN
opt. from	to	Code						
1/2	1 1/2	ASME-B16.11				6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		10%

Design Limits		
Temp. °C	Size up to	Pressure in bar
-46	24	19.65
-28		19.65
38		19.64
93		17.93
149		15.85
204		13.81
217		13.32
Max. hydr. P.		29.4

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	
Legenda																	
A	TEE - SW ENDS - ASME-B16.11																
S	SOCKOLET - SW END - MSS-SP97																
T	TEE - ASME-B16.9																
W	WELDOLET - MSS-SP97																



JOB 316800							
Piping Class C1C3(X)							
Sh.	2	of	3	Rev.			
				A0	A1		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A333 GR.6 - SMLS GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020	
	2	24	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60021	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1 GA-E-60020	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1 GA-E-60020	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1 GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A350 LF2 - CL.1 GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1 GA-E-60020	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL150 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020	
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A320 L7M + ASTM A194 GR.4	



JOB 316800			
Piping Class C1C3(X)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60193 K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
1	2	20	GA-E-60588 K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60274 K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60232 K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60343 K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
6	2	20	GA-E-60337 K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited
8	3	3	GA-E-60417 K.C.S. For Low Temp. - Ball-Top entry-FB-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. Soft seat-316L trim - PTFE seats



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C3A1			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80	3.73	80	
3/4	3.91	80	3.91	80	
1	4.55	80	4.55	80	
1 1/2	5.08	80	5.08	80	
2	5.54	80	5.54	80	
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	7.04	30			
10	7.8	30			
12	9.53	STD			
14	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	14 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
	14
-46	51.02
38	51
93	46.57
149	45.16
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
398	34.79
400	34.26
427	28.14
Max. hydr. P.	76.5

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size												
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	W	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	T	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda												
A	TEE - SW ENDS - ASME-B16.11											
S	SOCKOLET - SW END - MSS-SP97											
T	TEE - ASME-B16.9											
W	WELDOLET - MSS-SP97											



JOB 316800			
Piping Class C3A1			
Sh.	2	of	3

Component/Material descriptions				
	Size	Item	Rating/Facing	Material
opt.	from	to		
PIPE				
	1/2	14	PIPE	ASTM A333 GR.6 - SMLS
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A350 LF2 - CL.1
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A350 LF2 - CL.1
11	12	14	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra ASTM A350 LF2 - CL.1
BLIND FLANGE				
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A350 LF2 - CL.1
SPECTACLE BLIND				
	3/4	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A516 GR.70 + S5 (-46°C)
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
	2	14	LONG RADIUS ELBOW - ASME-B16.9	ASTM A420 WPL6 - SMLS
REDUCER				
	2	14	REDUCER - ASME-B16.9	ASTM A420 WPL6 - SMLS
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
	1/2	1 1/2	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
	2	14	CAP - ASME-B16.9	ASTM A420 WPL6 - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A350 LF2 - CL.1
NIPPLES				
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A333 GR.6 - SMLS
SWAGE NIPPLES				
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A420 WPL6 - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A420 WPL6 - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000 ASTM A350 LF2 - CL.1
	2	14	TEE - ASME-B16.9	ASTM A420 WPL6 - SMLS
WELDOLET				
	2	6	WELDOLET - MSS-SP97	ASTM A350 LF2 - CL.1
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000 ASTM A350 LF2 - CL.1
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000 ASTM A350 LF2 - CL.1
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A350 LF2 - CL.1
SPIRAL WOUND				
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A 320 L7 + ASTM A194 GR.4



JOB 316800					
Piping Class C3A1					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60129	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
1	2	14	GA-E-60131	K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60228	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
4	2	8	GA-E-60230	K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60333	K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
6	2	14	GA-E-60335	K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
8	1/2	6	GA-E-60407	K.C.S. For Low Temp. - Ball-Top entry-FB-Floating ball - BS5351 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. Soft seat-316 trim - PTFE seats	
8	8	14	GA-E-60408	K.C.S. For Low Temp. - Ball-Top entry-FB-Trunnion ball - BS5351 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. Soft seat-316 trim - PTFE seats	
11	1/2	1 1/2	GA-E-60132	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	2	12	GA-E-60616	K.C.S. For Low Temp. - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C3A3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	HYDROCARBONS
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			
18	14.27	40			
20	15.09	40			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
20	
-46	51
38	51
93	46.9
149	45.16
204	43.79
260	41.71
316	39.28
343	37.94
371	36.55
398	34.86
400	34.55
427	28.18
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800								
Piping Class C3A3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	20	PIPE		ASTM A333 GR.6 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A516 GR.70 + S5 (-46°C)	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS	
REDUCER						
	2	20	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	20	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	20	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A350 LF2 - CL.1	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A 320 L7 + ASTM A194 GR.4	



JOB 316800				
Piping Class C3A3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60129	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
1	2	14	GA-E-60131	K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60228	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
4	2	8	GA-E-60230	K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60333	K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	
6	2	14	GA-E-60335	K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60132	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF	



JOB 316800			
Piping Class C3B3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Duplicata da A3B3
Ricalcolati spessori
Variato materiale

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C3H3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	8.74				
8	8.74				
10	12.7	60			
12	12.7	XS			
14	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		
5	1/2	14	ASME-B16.5	CL600 RF 125 µin.Ra	
11	12	14	ASME-B16.5	CL300 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
from	Size to	Internal	External
1/2	14	3.2	0

Welding		
from	Size to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to Pressure in bar
	14
-46	51.02
38	51
93	46.57
149	45.16
168	44.69
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees												
Run size												
1/2	A											
3/4	A	A										
1	A	A	A									
1 1/2	A	A	A	A								
2	S	S	S	S	T							
3	S	S	S	S	T	T						
4	S	S	S	S	T	T	T					
6	S	S	S	S	W	T	T	T				
8	S	S	S	S	W	W	T	T	T			
10	S	S	S	S	W	W	W	T	T	T		
12	S	S	S	S	W	W	W	T	T	T	T	
14	S	S	S	S	W	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14
Legenda												
A	TEE - SW ENDS - ASME-B16.11											
S	SOCKOLET - SW END - MSS-SP97											
T	TEE - ASME-B16.9											
W	WELDOLET - MSS-SP97											



JOB 316800				
Piping Class C3H3				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	14	PIPE		ASTM A333 GR.6 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
5	12	12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A516 GR.70 + S5 (-46°C)	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS	
REDUCER						
	2	14	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A350 LF2 - CL.1	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	14	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A333 GR.6 - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1	
	2	14	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A350 LF2 - CL.1	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A 320 L7 + ASTM A194 GR.4	



JOB 316800				
Piping Class C3H3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60129	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
1	2	14	GA-E-60131	K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60228	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
4	2	8	GA-E-60230	K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60333	K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
6	2	14	GA-E-60335	K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60132	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C3H3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	8.74					
8	8.74					
10	12.7	60				
12	12.7	XS				
14	12.7	XS				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5		CL300 RF	125 µin.Ra
5	1/2	14	ASME-B16.5		CL600 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		10%
PWHT		YES = > 2"

Design Limits	
Temp. °C	Size up to Pressure in bar
	14
-46	51.02
38	51
93	46.57
149	45.16
168	44.69
204	43.79
260	41.37
316	37.9
343	36.89
371	36.88
Max. hydr. P.	76.5

Notes: NACE MR 0103 + HIC Test on plates and items manufactured from plate
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size													
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
12	S	S	S	S	W	W	W	T	T	T	T		
14	S	S	S	S	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	
Legenda													
A	TEE - SW ENDS - ASME-B16.11												
S	SOCKOLET - SW END - MSS-SP97												
T	TEE - ASME-B16.9												
W	WELDOLET - MSS-SP97												



JOB 316800			
Piping Class C3H3(X)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 14	PIPE		ASTM A333 GR.6 - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020
	2 14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020
5	12 12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020
BLIND FLANGE				
	1/2 14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020
SPECTACLE BLIND				
	3/4 10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A516 GR.70 + S5 (-46°C) GA-E-60021
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020
	2 14	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020
REDUCER				
	2 14	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A350 LF2 - CL.1 GA-E-60020
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020
	2 14	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60021
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1 GA-E-60020
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1 GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A333 GR.6 - SMLS GA-E-60020
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1 GA-E-60020
	2 14	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS GA-E-60020
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1 GA-E-60020
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A350 LF2 - CL.1 GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1 GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A350 LF2 - CL.1 GA-E-60020
SPIRAL WOUND				
	1/2 14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A320 L7M + ASTM A194 GR.4



JOB 316800			
Piping Class C3H3(X)			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60193	K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
1	2	14	GA-E-60194	K.C.S. For Low Temp. - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60274	K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60275	K.C.S. For Low Temp. - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60343	K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 GA-E-60020 Trim Mat. 316L stellited
6	2	14	GA-E-60345	K.C.S. For Low Temp. - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A352 LCB GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C6H3			
Sh.	1	of	1
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class C6H3(A)			
Sh. 1 of 3		Rev.	
A0			

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting Thk	Nipples	
	Thk	Sch		Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	XS			
3	7.62	XS			
4	8.56	XS			
6	8.74				
8	8.74				
10	12.7	XS			
12	12.7	XS			
14	12.7	XS			
16	12.7	XS			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	16 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		10%

Design Limits	
Temp. °C	Size up to 16 Pressure in bar
-46	54.55
-28	54.55
38	54.55
85	54.55
Max. hydr. P.	76.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800			
Piping Class C6H3(A)			
Sh.	2	of	3
A0			

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 16	PIPE		ASTM A333 GR.6 - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
	2 16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
11	12 16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
BLIND FLANGE				
	1/2 16	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
SPECTACLE BLIND				
	3/4 16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A516 GR.70 + S5 (-46°C)
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1
	2 16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A420 WPL6 - SMLS
REDUCER				
	2 16	REDUCER - ASME-B16.9		ASTM A420 WPL6 - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A350 LF2 - CL.1
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A350 LF2 - CL.1
	2 16	CAP - ASME-B16.9		ASTM A420 WPL6 - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A350 LF2 - CL.1
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A350 LF2 - CL.1
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A333 GR.6 - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A333 GR.6 - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A420 WPL6 - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A420 WPL6 - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A350 LF2 - CL.1
	2 16	TEE - ASME-B16.9		ASTM A420 WPL6 - SMLS
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A350 LF2 - CL.1
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A350 LF2 - CL.1
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A350 LF2 - CL.1
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A350 LF2 - CL.1
SPIRAL WOUND				
	1/2 16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A 320 L7 + ASTM A194 GR.4



JOB 316800			
Piping Class C6H3(A)			
Sh. 3 of 3	Rev.		
	A0		

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60129 K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60228 K.C.S. For Low Temp. - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60333 K.C.S. For Low Temp. - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60132 K.C.S. For Low Temp. - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A350 LF2 - CL.1 Trim Mat. 316 / HF



JOB 316800			
Piping Class F1H3			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F3B3			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service HYDROCARBONS WITH HYDROGEN
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	4.78	160		4.78		160
3/4	5.56	160		5.56		160
1	6.35	160		6.35		160
1 1/2	7.14	160		7.14		160
2	5.54	80				
3	5.49	40				
4	6.02	40				
6	7.11	40				
8	8.18	40				
10	9.27	40				
12	9.53	STD				
14	9.53	30				
34	14.27					
36	15.88	30				
38	15.88					
40	15.88					
42	17.48					

Flange Rating/Facing/Face Finishing			
opt. from	to	Code	
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra
26	42	ASME-B16.47 series.A	CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	14	42
		Pressure in bar	
2	40.31	29.29	
38	40.31	29.29	
93	37.71	27.38	
149	36.29	26.36	
204	35.29	25.63	
260	34.68	25.19	
315	33.68	24.46	
325	33.32	24.2	
343	32.67	23.72	
371	31.45	22.84	
398	30.67	22.26	
426	30.25	21.97	
454	29.25	21.23	
482	25.83	18.74	
510	18.8	13.65	
537	12.98	9.28	
550	10.93	7.92	
Max. hydr. P.	60.4	43.9	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	34	36	38	40	42
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
34	S	S	S	S	W	W	W	W	W	W	P	P	T				
36	S	S	S	S	W	W	W	W	W	W	P	P	T	T			
38	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T		
40	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T	T	
42	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T	T	T

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class F3B3					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions						
opt.	Size from to	Item	Rating/Facing	Material		
PIPE						
	1/2 24	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS		
	26 42	PIPE		ASTM A691 GR.1 1/4CR (A387 GR.11 CL.1) CL.22 - EFW		
CONNECTION FLANGE						
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
	2 24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
	26 42	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
BLIND FLANGE						
	1/2 24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
	26 42	BLIND FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
SPECTACLE BLIND						
	3/4 10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
ELBOW						
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS		
	26 42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD		
REDUCER						
	1/2 1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
	2 24	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS		
	26 42	REDUCER - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD		
CAP						
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.		
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
	2 42	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS		
COUPLING						
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
MALE PLUG						
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F11 CL.2 - Norm.&Temp.		
NIPPLES						
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS		
SWAGE NIPPLES						
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS		
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS		
TEE						
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
	2 24	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS		
	26 42	TEE - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD		
WELDOLET						
	2 10	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp.		
SOCKOLET						
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp.		
FLANGED INSERT						
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.		
SPIRAL WOUND						
	1/2 42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING		
BOLTS						
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B16 + ASTM A194 GR.4		



JOB 316800					
Piping Class F3B3					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60119	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
1	2	24	GA-E-60120	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60218	Low Alloy Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
4	2	8	GA-E-60219	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60317	Low Alloy Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
6	2	24	GA-E-60318	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60133	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class F3H3					
Sh.	1	of	3	Rev.	
				A0	A1

Service	HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	7.14	160		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.18	40			
10	9.27	40			
12	9.53	STD			
14	9.53	30			
34	14.27				
36	15.88	30			
38	15.88				
40	15.88				
42	17.48				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		
26	42	ASME-B16.47 series.A	CL300 RF 125 µin.Ra		
11	26	42	ASME-B16.47 series.A	CL300 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2		42	3.2	0

Welding			
from	Size	to	Weld. spec.
1/2		42	NIOEC-SP-90-02
Weld. class			100%

Design Limits			
Temp.	Size up to		
		14	42
°C	Pressure in bar		
2	40.31	29.29	
38	40.31	29.29	
93	37.71	27.38	
149	36.29	26.36	
204	35.29	25.63	
260	34.68	25.19	
315	33.68	24.46	
325	33.32	24.2	
343	32.67	23.72	
371	31.45	22.84	
398	30.67	22.26	
426	30.25	21.97	
454	29.25	21.23	
482	25.83	18.74	
510	18.8	13.65	
537	12.98	9.28	
550	10.93	7.92	

Max. hydr. P. 60.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
34	S	S	S	S	W	W	W	W	W	W	P	P	T				
36	S	S	S	S	W	W	W	W	W	W	P	P	T	T			
38	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T		
40	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T		
42	S	S	S	S	W	W	W	W	W	W	P	P	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	34	36	38	40	42

Legenda	
A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class F3H3					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS	
	26	42	PIPE		ASTM A691 GR.1 1/4CR (A387 GR.11 CL.1) CL.22 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
	26	42	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
11	34	40	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
SPECTACLE BLIND						
	1	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
	34	40	SPECIAL BLIND & SPACER - <MFR Std>	CL300 RF 125 µin.Ra	ASTM A387 GR.11 CL.2	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
	26	42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
	26	42	REDUCER - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	24	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.	
MALE PLUG						
	1/2	3/4	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F11 CL.2 - Norm.&Temp.	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	24	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
	26	42	TEE - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp.	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp.	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
SPIRAL WOUND						
	1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B16 + ASTM A194 GR.4	



JOB 316800			
Piping Class F3H3			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES				
pos.	Size		Doc.	Type
	from	to		
1	1/2	1 1/2	GA-E-60119	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
1	2	24	GA-E-60120	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60218	Low Alloy Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
4	2	8	GA-E-60219	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60317	Low Alloy Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF
6	2	24	GA-E-60318	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF

STRAINERS				
pos.	Size		Doc.	Type
	from	to		
1	2	3	GA-E-60617	Low Alloy Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F3H3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Wet H2S Service)
Codes

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	7.14	160		7.14	160
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.18	40			
10	9.27	40			
12	9.53	STD			
14	9.53	30			
42	17.48				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL300 RF	125 µin.Ra
	26	ASME-B16.47 series.A		CL300 RF	125 µin.Ra
5	12	ASME-B16.5		CL600 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	14	42
		Pressure in bar	
2		40.31	31.57
38		40.31	31.57
93		37.71	29.51
149		36.29	28.41
204		35.29	27.62
260		34.68	27.15
315		33.68	26.36
343		32.67	25.57
371		31.45	24.62
398		30.67	23.99
426		30.25	23.67
454		29.25	22.88
482		25.83	20.2
510		18.8	14.71
537		12.98	10.01
551		10.78	8.54
Max. hydr. P.		60.4	47.3

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	42
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
12	S	S	S	S	W	W	W	T	T	T	T		
14	S	S	S	S	W	W	W	W	T	T	T	T	
42	S	S	S	S	W	W	W	W	W	W	P	P	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	42

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class F3H3(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020	
	26	42	PIPE		ASTM A691 GR.1 1/4CR (A387 GR.11 CL.1) CL.22 - EFW GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	26	42	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
5	12	12	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	26	42	BLIND FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
SPECTACLE BLIND						
	3/4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
5	12	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
	26	42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020	
REDUCER						
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	2	24	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
	26	42	REDUCER - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	2	42	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
MALE PLUG						
	1/2	3/4	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	
	2	24	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020	
	26	42	TEE - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020	



JOB 316800								
Piping Class F3H3(N)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SOCKOLET				
1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
FLANGED INSERT				
1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPIRAL WOUND				
1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B16 + ASTM A194 GR.4

VALVES				
Size	Doc.	Type		
pos. from to				
1	1/2	1 1/2	GA-E-60154	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
1	2	24	GA-E-60155	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60245	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60246	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60352	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60353	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F3H3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	7.14	160		7.14	160
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.18	40			
10	9.27	40			
12	9.53	STD			
14	9.53	30			
42	17.48				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL300 RF	125 µin.Ra
26	42	ASME-B16.47 series.A		CL300 RF	125 µin.Ra
5	12	ASME-B16.5		CL600 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	42	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	42	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	14	42
		Pressure in bar	
2		40.31	31.57
38		40.31	31.57
93		37.71	29.51
149		36.29	28.41
204		35.29	27.62
260		34.68	27.15
315		33.68	26.36
343		32.67	25.57
371		31.45	24.62
398		30.67	23.99
426		30.25	23.67
454		29.25	22.88
482		25.83	20.2
510		18.8	14.71
537		12.98	10.01
551		10.78	8.54
Max. hydr. P.		60.4	47.3

Notes: Only compliance with NACE MR 0103 is required for alloy steel in severe H2S service.
No HIC Test is required.

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees															
Run size															
1/2	A														
3/4	A	A													
1	A	A	A												
1 1/2	A	A	A	A											
2	S	S	S	S	T										
3	S	S	S	S	T	T									
4	S	S	S	S	T	T	T								
6	S	S	S	S	W	T	T	T							
8	S	S	S	S	W	W	T	T	T						
10	S	S	S	S	W	W	W	T	T	T					
12	S	S	S	S	W	W	W	T	T	T	T				
14	S	S	S	S	W	W	W	W	T	T	T	T			
42	S	S	S	S	W	W	W	W	W	P	P	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	42		

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class F3H3(X)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 24	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
	26 42	PIPE		ASTM A691 GR.1 1/4CR (A387 GR.11 CL.1) CL.22 - EFW GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	26 42	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
5	12 12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	26 42	BLIND FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPECTACLE BLIND				
	2 6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	26 42	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020
REDUCER				
	1/2 1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 24	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	26 42	REDUCER - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 42	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
MALE PLUG				
	1/2 3/4	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 24	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	26 42	TEE - ASME-B16.9		ASTM A234 WP11W CL.2 - WLDD GA-E-60020
WELDOLET				
	2 10	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020



JOB 316800			
Piping Class F3H3(X)			
Sh.	3	of	3

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
FLANGED INSERT				
1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPIRAL WOUND				
1/2	42	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B16 + ASTM A194 GR.4

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60154	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
2	2	24	GA-E-60155	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60245	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60246	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60352	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	2	24	GA-E-60353	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F303			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service NITROGEN (Unit 02)
Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		4.78	160	
3/4	5.56	160		5.56	160	
1	6.35	160		6.35	160	
1 1/2	7.14	160		7.14	160	
2	5.54	80		5.54	80	
3	5.49	40				
4	6.02	40				
6	7.11	40				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1/2	6	ASME-B16.5

CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	6	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	6	NIOEC-SP-90-02

Weld. class 100%

Design Limits	
Temp. °C	Size up to
	6
	Pressure in bar
2	50.22
38	50.22
93	46.98
148	45.23
204	43.96
260	43.2
315	41.75
343	40.69
371	39.18
398	36.63
426	35.19
454	33.47
482	31.04
510	22.06
537	15.02
550	12.69

Max. hydr. P. 75.33

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees	
Run size	
1/2	A
3/4	A A
1	A A A
1 1/2	A A A A
2	S S S S T
3	S S S S T T
4	S S S S T T T
6	S S S S W T T T
Branch size	1/2 3/4 1 1 1/2 2 3 4 6
Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class F303					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	6	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.
	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.
BLIND FLANGE					
	1/2	6	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.
SPECTACLE BLIND					
	1 1/2	1 1/2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS
REDUCER					
	2	6	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.
	2	6	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A105 Normalized
NIPPLES					
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp.
	2	6	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS
WELDOLET					
	2	2	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp.
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F11 CL.2 - Norm.&Temp.
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp.
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.
SPIRAL WOUND					
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B16 + ASTM A194 GR.4



JOB 316800				
Piping Class F303				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES					
pos.	Size		Doc.	Type	
	from	to			
1	1/2	1 1/2	GA-E-60119	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
1	2	6	GA-E-60120	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60218	Low Alloy Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
4	2	6	GA-E-60219	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60317	Low Alloy Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
6	2	6	GA-E-60318	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60133	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	

STRAINERS					
pos.	Size		Doc.	Type	
	from	to			
1	2	3	GA-E-60617	Low Alloy Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



JOB 316800			
Piping Class F303(R)			
Sh. 1 of 1		Rev.	
A0	A1		

Customer Piping Class
Ref. Doc.

Service	CATALYST
Codes	

Design code : ASME B 31.3

Thicknesses						
Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
2	3	ASME-B16.5		CL300 RJ (F)	

Corrosion Allowance			
Size from	to	Internal	External

Welding			
Size from	to	Weld. spec.	

Design Limits	
Temp.	Size up to
	°C Pressure in bar
	Max. hydr. P.

Notes: See Piping Special Items List
(Axens Catalyst Line Specification)

Run size		Branch size		Branch Connections 90 Degrees	
Legenda					
A	TEE - SW ENDS - ASME-B16.11				
S	SOCKOLET - SW END - MSS-SP97				
T	TEE - ASME-B16.9				
W	WELDOLET - MSS-SP97				

Component/Material descriptions						
opt.	from	to	Size	Item	Rating/Facing	Material
PIPE						
	2	3		PIPE		ASTM A335 P11 (N.&Temp.) - SMLS

VALVES			
pos.	from	to	Type



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6B3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROCARBONS WITH HYDROGEN
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	XS			
3	7.62	XS			
4	8.56	XS			
6	10.97	XS			
8	12.7	80			
10	12.7	60			
12	14.27	60			
14	15.09	60			
16	16.66	60			
18	19.05	60			
20	20.62	60			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL600 RF 125 µin.Ra	
11	12	20 ASME-B16.5		CL600 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	77.01
38	77.01
93	72.06
148	69.37
204	67.42
260	66.25
315	64.34
343	62.42
360	61.01

Max. hydr. P. 115.52

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size																
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class F6B3				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	20	PIPE	ASTM A335 P11 (N.&Temp.) - SMLS
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
	2	20	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
11	16	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra
BLIND FLANGE				
	1/2	20	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
SPECTACLE BLIND				
	3/4	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra
				ASTM A182 F11 CL.2 - Norm.&Temp.
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000
	2	20	LONG RADIUS ELBOW - ASME-B16.9	ASTM A182 F11 CL.2 - Norm.&Temp.
				ASTM A234 WP11 CL.2 - SMLS
REDUCER				
	2	20	REDUCER - ASME-B16.9	ASTM A234 WP11 CL.2 - SMLS
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000
	2	20	CAP - ASME-B16.9	ASTM A234 WP11 CL.2 - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000
				ASTM A182 F11 CL.2 - Norm.&Temp.
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F11 CL.2 - Norm.&Temp.
NIPPLES				
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A335 P11 (N.&Temp.) - SMLS
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WP11 CL.2 - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WP11 CL.2 - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000
	2	20	TEE - ASME-B16.9	ASTM A234 WP11 CL.2 - SMLS
WELDOLET				
	2	8	WELDOLET - MSS-SP97	ASTM A182 F11 CL.2 - Norm.&Temp.
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000
				ASTM A182 F11 CL.2 - Norm.&Temp.
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra
				ASTM A182 F11 CL.2 - Norm.&Temp.
SPIRAL WOUND				
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class F6B3					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60119	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
1	2	20	GA-E-60158	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60218	Low Alloy Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
4	2	8	GA-E-60249	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60317	Low Alloy Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
6	2	20	GA-E-60356	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60133	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6B3(X)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class F6C6			
Sh. 1 of 1	Rev.		
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6C6(N)			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6H3(N)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Wet H2S Service)
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	XS				
3	7.62	XS				
4	8.56	XS				
6	10.97	XS				
8	12.7	80				
10	12.7	XS				
12	14.27	60				
14	15.09	60				
16	16.66	60				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to 16 Pressure in bar
2	77.03
38	77.01
93	72.06
148	69.37
204	67.42
260	66.25
315	64.34
343	62.42
360	61.01

Max. hydr. P. 112.28

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	W	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
H	HALF COUPLING - SW END - ASME-B16.11													
P	PIPE-TO-PIPE													
S	SOCKOLET - SW END - MSS-SP97													
T	TEE - ASME-B16.9													
W	WELDOLET - MSS-SP97													



JOB 316800								
Piping Class F6H3(N)								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item		Rating/Facing		Material
opt.	from	to				
PIPE						
	1/2	16	PIPE			ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2	16	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	11	12	16	SPEC.MOD.WN FLANGE-w/ JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
BLIND FLANGE						
	1/2	14	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPECTACLE BLIND						
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2	16	LONG RADIUS ELBOW - ASME-B16.9			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
REDUCER						
	2	16	REDUCER - ASME-B16.9			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2	16	CAP - ASME-B16.9			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799			ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2	16	TEE - ASME-B16.9			ASTM A234 WP11 CL.2 - SMLS GA-E-60020
WELDOLET						
	2	8	WELDOLET - MSS-SP97			ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800				
Piping Class F6H3(N)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60154 Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
1	2	16	GA-E-60156 Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60245 Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60247 Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60352 Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	2	14	GA-E-60354 Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6H3(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	XS			
3	7.62	XS			
4	8.56	XS			
6	10.97	XS			
8	12.7	80			
10	12.7	XS			
12	14.27	60			
14	15.09	60			
16	16.66	60			
18	19.05	60			
20	20.62	60			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	77.01
38	77.01
93	72.06
148	69.37
204	67.42
260	66.25
315	64.34
343	62.42
360	61.01

Max. hydr. P. 112.28

Notes: Only compliance with NACE MR 0103 is required for alloy steel in severe H2S service. No HIC Test is required.

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				

Legenda

A	TEE - SW ENDS - ASME-B16.11
H	HALF COUPLING - SW END - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800										
Piping Class F6H3(X)										
Sh. 2 of 3	Rev.									
	<table border="1"> <tr> <td>A0</td> <td>A1</td> <td>A2</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	A0	A1	A2						
A0	A1	A2								

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 20	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
BLIND FLANGE				
	1/2 20	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPECTACLE BLIND				
	10 10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
REDUCER				
	2 20	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
WELDOLET				
	2 8	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPIRAL WOUND				
	1/2 20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800				
Piping Class F6H3(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from	Size to	Doc.	Type
1	1/2	1 1/2	GA-E-60154	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
1	2	20	GA-E-60156	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60245	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60247	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60352	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited
6	2	20	GA-E-60354	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class F6H6(X)			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	7.47	XXS		7.47	XXS
3/4	7.82	XXS		7.82	XXS
1	9.09	XXS		9.09	XXS
1 1/2	10.15	XXS		10.15	XXS
2	11.07	XXS			
3	11.13	160			
4	13.49	160			
6	14.27	120			
8	15.09	100			
10	18.26	100			
12	17.48	80			
14	19.05	80			
16	21.44	80			
18	23.83	80			
20	26.19	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	6000	

Corrosion Allowance				
from	Size to	Internal	External	
1/2	1 1/2	5	0	
2	20	6.4	0	

Welding		
from	Size to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits		
Temp.	Size up to	
	20	
°C	Pressure in bar	
2	77.44	
38	77.44	
93	72.46	
148	69.76	
204	67.8	
260	66.62	
315	64.7	
343	62.77	
360	61.35	
Max. hydr. P. 113.34		

Notes: Only compliance with NACE MR 0103 is required for alloy steel in severe H2S service.
No HIC Test is required.
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																				
Run size																				
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	T	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	T	T	T	T	T	T	T					
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20					
Legenda																				
A	TEE - SW ENDS - ASME-B16.11																			
S	SOCKOLET - SW END - MSS-SP97																			
T	TEE - ASME-B16.9																			
W	WELDOLET - MSS-SP97																			



JOB 316800										
Piping Class F6H6(X)										
Sh. 2 of 3	Rev.									
	<table border="1"> <tr> <td>A0</td> <td>A1</td> <td>A2</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	A0	A1	A2						
A0	A1	A2								

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 20	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
BLIND FLANGE				
	1/2 20	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPECTACLE BLIND				
	6 6	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
REDUCER				
	2 20	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
NIPPLES				
	1/2 3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
	2 20	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS GA-E-60020
WELDOLET				
	2 6	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020
SPIRAL WOUND				
	1/2 20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM



JOB 316800				
Piping Class F6H6(X)				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES				
pos.	Size from to	Doc.	Type	
1	1/2 1 1/2	GA-E-60154	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	
1	2 20	GA-E-60156	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	
4	1/2 1 1/2	GA-E-60245	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	
4	2 8	GA-E-60247	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	
6	1/2 1 1/2	GA-E-60352	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	
6	2 20	GA-E-60354	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class F6V1					
Sh. 1 of 3	Rev.				
	A0	A1	A2		

Service	PRA
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	3.73	80		3.73		80
3/4	3.91	80		3.91		80
1	4.55	80		4.55		80
1 1/2	5.08	80		5.08		80
2	5.54	80				
3	5.49	40				
4	6.02	40				
6	7.11	40				
8	8.18	40				
10	9.27	40				
12	9.53	STD				
14	9.53	30				
16	12.7	40				
18	14.27	40				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	18	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	18	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	18	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	18
2	53.05
38	53.05
93	49.64
148	47.79
204	46.44
260	45.64
315	44.32
343	43
371	41.4
398	40.37
426	39.81
454	38.5
470	35.95
Max. hydr. P.	79.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size																	
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18			
Legenda																	
A	TEE - SW ENDS - ASME-B16.11																
S	SOCKOLET - SW END - MSS-SP97																
T	TEE - ASME-B16.9																
W	WELDOLET - MSS-SP97																



JOB 316800								
Piping Class F6V1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	18	PIPE		ASTM A335 P11 (N.&Temp.) - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	18	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
BLIND FLANGE						
	1/2	18	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	18	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
REDUCER						
	2	18	REDUCER - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	18	CAP - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F11 CL.2 - Norm.&Temp.	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS	
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A335 P11 (N.&Temp.) - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP11 CL.2 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
	2	18	TEE - ASME-B16.9		ASTM A234 WP11 CL.2 - SMLS	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A182 F11 CL.2 - Norm.&Temp.	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F11 CL.2 - Norm.&Temp.	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F11 CL.2 - Norm.&Temp.	
SPIRAL WOUND						
	1/2	18	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class F6V1					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60119	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
1	2	18	GA-E-60158	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60218	Low Alloy Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
4	2	8	GA-E-60249	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60317	Low Alloy Steel - Check-BB-Red.B-Ball-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
6	2	18	GA-E-60356	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60133	Low Alloy Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 / HF	
61	6	6	GA-E-60383	Low Alloy Steel - Check-Lug wafer-Dual plate-Widd seat - API594 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 WC6 - Norm.&Temp. Trim Mat. 316 / HF	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60618	Low Alloy Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F11 CL.2 - Norm.&Temp. Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class H1A1					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class H1A3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
2	5.54	80		5.54	80
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.18	40			
10	9.27	40			
12	9.53	STD			
14	9.53	STD			
16	9.53	STD			
18	9.53	STD			
20	9.53	STD			
24	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5		CL300 RF 125 µin.Ra
11	12	24	ASME-B16.5		CL150 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	19.98
38	19.98
93	17.93
149	15.85
204	13.81
260	11.72
316	9.63
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	29.9

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Run size		Branch Connections 90 Degrees																		
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24				

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class H1A3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A335 P5 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F5a	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F5a	
	3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F5a
	3	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F5a
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F5a	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F5a	
SPECTACLE BLIND						
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A182 F5a	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP5 - SMLS	
REDUCER						
	2	24	REDUCER - ASME-B16.9		ASTM A234 WP5 - SMLS	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F5a	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F5a	
	2	24	CAP - ASME-B16.9		ASTM A234 WP5 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F5a	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F5a	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P5 - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A335 P5 - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP5 - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP5 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
	2	24	TEE - ASME-B16.9		ASTM A234 WP5 - SMLS	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A182 F5a	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F5a	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F5a	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F5a
SPIRAL WOUND						
	1/2	24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800				
Piping Class H1A3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from	to			
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
	from			
	to			
1	1/2	1 1/2	GA-E-60121	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
1	2	24	GA-E-60122	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60220	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
4	2	10	GA-E-60221	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60319	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
6	2	24	GA-E-60320	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60134	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F5a Trim Mat. 316 / HF



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class H3A3			
Sh. 1 of 3		Rev.	
A0	A1		

Service	HYDROCARBONS
Codes	

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	4.78	160		7.47		XXS
3/4	5.56	160		7.82		XXS
1	6.35	160		9.09		XXS
1 1/2	7.14	160		10.15		XXS
2	5.54	80				
3	7.62	80				
4	8.56	80				
6	10.97	80				
8	12.7	80				
14	12.7	XS				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	14 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to 14 Pressure in bar
2	51.71
38	51.71
93	51.36
148	49.32
204	48.61
260	45.85
315	41.75
339	40.84
343	40.69
371	39.31
398	36.63
426	35.19
454	33.47
482	25.57
510	18.96
Max. hydr. P.	77.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
14	S	S	S	S	W	W	W	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	14
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800			
Piping Class H3A3			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	14	PIPE	ASTM A335 P5 - SMLS
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F5a
	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F5a
11	12	14	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra ASTM A182 F5a
BLIND FLANGE				
	1/2	14	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F5a
SPECTACLE BLIND				
	3/4	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A182 F5a
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000 ASTM A182 F5a
	2	14	LONG RADIUS ELBOW - ASME-B16.9	ASTM A234 WP5 - SMLS
REDUCER				
	2	14	REDUCER - ASME-B16.9	ASTM A234 WP5 - SMLS
CAP				
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000 ASTM A182 F5a
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A182 F5a
	2	14	CAP - ASME-B16.9	ASTM A234 WP5 - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000 ASTM A182 F5a
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F5a
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A335 P5 - SMLS
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A335 P5 - SMLS
	1/2	1 1/2	NIPPLE - PE/PE - BS3799	ASTM A335 P5 - SMLS
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A234 WP5 - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A234 WP5 - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000 ASTM A182 F5a
	2	14	TEE - ASME-B16.9	ASTM A234 WP5 - SMLS
WELDOLET				
	2	4	WELDOLET - MSS-SP97	ASTM A182 F5a
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000 ASTM A182 F5a
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A182 F5a
SPIRAL WOUND				
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B16 + ASTM A194 GR.4



JOB 316800			
Piping Class H3A3			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60121	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
1	2	14	GA-E-60126	Low Alloy Steel - Gate-BB-FB-Split wdg-Widd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60220	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
4	2	8	GA-E-60225	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60319	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
6	2	8	GA-E-60326	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60134	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F5a Trim Mat. 316 / HF

STRAINERS				
pos.	Size from	to	Doc.	Type
1	14	14	GA-E-60619	Low Alloy Steel - T Strainer-BW - <MFR Std - Metallic> - CL300 - RF - 125 µin.Ra Body Mat. ASTM A234 WP5 - SMLS Trim Mat. 316 - CLOTH - MESH 3



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class H6A3			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	HYDROCARBON WITHOUT HYDROGEN
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		7.47	XXS
3/4	5.56	160		7.82	XXS
1	6.35	160		9.09	XXS
1 1/2	7.14	160		10.15	XXS
2	5.54	80			
3	7.62	80			
4	8.56	80			
6	10.97	80			
8	12.7	80			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	8	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	8	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	8	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	8
2	77.01
38	77.01
93	69.76
148	67.06
204	66.26
260	65.86
315	64.72
339	64.06
Max. hydr. P. 115.5	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
1/2	A								
3/4	A	A							
1	A	A	A						
1 1/2	A	A	A	A					
2	S	S	S	S	T				
3	S	S	S	S	T	T			
4	S	S	S	S	T	T	T		
6	S	S	S	S	W	T	T	T	
8	S	S	S	S	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800								
Piping Class H6A3								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	8	PIPE		ASTM A335 P5 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F5a	
	2	8	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F5a	
BLIND FLANGE						
	1/2	8	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F5a	
SPECTACLE BLIND						
	2	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A182 F5a	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
	2	8	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP5 - SMLS	
REDUCER						
	2	8	REDUCER - ASME-B16.9		ASTM A234 WP5 - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F5a	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F5a	
	2	8	CAP - ASME-B16.9		ASTM A234 WP5 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F5a	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A335 P5 - SMLS	
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P5 - SMLS	
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A335 P5 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A234 WP5 - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP5 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F5a	
	2	8	TEE - ASME-B16.9		ASTM A234 WP5 - SMLS	
WELDOLET						
	2	3	WELDOLET - MSS-SP97		ASTM A182 F5a	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	6000	ASTM A182 F5a	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F5a	
SPIRAL WOUND						
	1/2	8	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800				
Piping Class H6A3				
Sh.	3	of	3	
				Rev.
	A0	A1	A2	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60121 Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
1	2	8	GA-E-60139 Low Alloy Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
4	1/2	1 1/2	GA-E-60220 Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
4	2	8	GA-E-60235 Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
6	1/2	1 1/2	GA-E-60319 Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F5a Trim Mat. 316 / HF
6	2	8	GA-E-60322 Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A217 C5 - Norm.&Temp. Trim Mat. 316 / HF
11	1/2	1 1/2	GA-E-60134 Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F5a Trim Mat. 316 / HF



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class I1A3					
Sh. 1 of 3	Rev.				
	A0	A1			

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160	4.78	160	
3/4	5.56	160	5.56	160	
1	6.35	160	6.35	160	
1 1/2	5.08	80	7.14	160	
2	5.54	80			
3	5.49	40			
4	6.02	40			
6	7.11	40			
8	8.18	40			
10	9.27	40			
12	9.53	STD			
14	9.53	STD			
28	7.92	10			
32	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
26	32	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	12 ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL150 RF 125 µin.Ra		
11	26	32 ASME-B16.47 series.A	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	32	3.2	0

Welding			
Size from	to	Weld. spec.	
1/2	32	NIOEC-SP-90-02	
Weld. class		100%	

Design Limits	
Temp. °C	Size up to Pressure in bar
32	
2	14.53
38	14.53
93	13.15
148	12.64
204	12.5
260	11.73
315	9.66
343	8.62
371	7.58
398	6.58
400	6.51
Max. hydr. P.	21.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size														
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	T	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	T	T	T	T	T		
28	S	S	S	S	W	W	W	W	W	W	P	P	T	
32	S	S	S	S	W	W	W	W	W	W	P	P	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	28	32
Legenda														
A	TEE - SW ENDS - ASME-B16.11													
P	PIPE-TO-PIPE													
S	SOCKOLET - SW END - TB RAC 5380													
T	TEE - ASME-B16.9													
W	WELDOLET - TB RAC 5049													



JOB 316800								
Piping Class I1A3								
Sh.	2	of	3					
				Rev.				
				A0	A1			

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	24	PIPE		ASTM A335 P9 - SMLS	
	26	32	PIPE		ASTM A691 GR.9CR (A387 GR.9 CL.1) CL.22 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F9	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F9	
	26	32	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F9	
3	12	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F9	
11	12	12	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F9	
11	32	32	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A182 F9	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F9	
	26	32	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F9	
SPECTACLE BLIND						
4	12	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A182 F9	
32	32	32	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A387 GR.9 CL.1	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F9	
	2	24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP9 - SMLS	
	26	32	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP9W - WLDD	
REDUCER						
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F9	
	2	24	REDUCER - ASME-B16.9		ASTM A234 WP9 - SMLS	
	26	32	REDUCER - ASME-B16.9		ASTM A234 WP9W - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F9	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F9	
	2	32	CAP - ASME-B16.9		ASTM A234 WP9 - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F9	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F9	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P9 - SMLS	
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A335 P9 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A234 WP9 - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP9 - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F9	
	2	24	TEE - ASME-B16.9		ASTM A234 WP9 - SMLS	
	26	32	TEE - ASME-B16.9		ASTM A234 WP9W - WLDD	
WELDOLET						
	2	10	WELDOLET - TB RAC 5049		ASTM A182 F9	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - TB RAC 5380	6000	ASTM A182 F9	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL150 RF 125 µin.Ra	ASTM A182 F9	
SPIRAL WOUND						
	1/2	32	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800			
Piping Class 11A3			
Sh.	3	of	3
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H

VALVES					
pos.	Size from to	Doc.	Type		
1	1/2	1 1/2	GA-E-60125	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
1	2	24	GA-E-60159	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60224	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60325	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
6	2	4	GA-E-60384	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60199	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class I3A3			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	4.78	160		4.78	160
3/4	5.56	160		5.56	160
1	6.35	160		6.35	160
1 1/2	5.08	80		7.14	160
6	7.11	STD			
8	8.18	40			
10	9.27	40			
12	10.31	40			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL300 RF 125 µin.Ra		
5	1/2	12	ASME-B16.5 CL600 RF 125 µin.Ra		
11	1/2	12	ASME-B16.5 CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	6000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	3.2	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	50.23
38	50.21
93	45.49
148	43.73
204	43.2
260	42.95
315	41.75
339	40.84
343	40.69
371	39.31
Max. hydr. P.	75.3

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	6	S	S	S	S	T				
	8	S	S	S	S	T	T			
	10									
	12	S	S	S	S	T	T	T		
Branch size	1/2	3/4	1	1 1/2	6	8	10	12		
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
P	PIPE-TO-PIPE									
S	SOCKOLET - SW END - TB RAC 5380									
T	TEE - ASME-B16.9									
W	WELDOLET - TB RAC 5049									



JOB 316800			
Piping Class I3A3			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions					
Size	Item			Rating/Facing	Material
opt.	from	to			
PIPE					
	1/2	12	PIPE		ASTM A335 P9 - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F9
	2	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F9
	5	8	8 WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F9
	11	12	12 SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra	ASTM A182 F9
BLIND FLANGE					
	1/2	12	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F9
SPECTACLE BLIND					
	1	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A182 F9
	5	8	8 SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A182 F9
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	6000	ASTM A182 F9
	2	12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A234 WP9 - SMLS
REDUCER					
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F9
	2	12	REDUCER - ASME-B16.9		ASTM A234 WP9 - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	6000	ASTM A182 F9
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F9
	2	12	CAP - ASME-B16.9		ASTM A234 WP9 - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	6000	ASTM A182 F9
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F9
NIPPLES					
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A335 P9 - SMLS
	1/2	1 1/2	NIPPLE - PE/PE - BS3799		ASTM A335 P9 - SMLS
SWAGE NIPPLES					
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A234 WP9 - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A234 WP9 - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	6000	ASTM A182 F9
	6	12	TEE - ASME-B16.9		ASTM A234 WP9 - SMLS
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - TB RAC 5380	6000	ASTM A182 F9
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F9
SPIRAL WOUND					
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class I3A3					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60125	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
1	2	12	GA-E-60160	Low Alloy Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 / HF	
4	1/2	1 1/2	GA-E-60224	Low Alloy Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
4	2	8	GA-E-60237	Low Alloy Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 / HF	
6	1/2	1 1/2	GA-E-60325	Low Alloy Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	
6	2	8	GA-E-60344	Low Alloy Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 / HF	
11	1/2	1 1/2	GA-E-60199	Low Alloy Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F9 Trim Mat. 316 / HF	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	12	12	GA-E-60620	Low Alloy Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A217 C12 - Norm.&Temp. Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class K1F0					
Sh. 1 of 3	Rev.				
	A0	A1	A2		

Service	CHEMICALS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			
18	4.78	10S			
20	5.54	10S			
24	6.35	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	6 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	0	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	24
2	18.96
38	18.95
93	15.87
148	14.13
150	14.11
204	13.1
260	11.72
Max. hydr. P.	28.4

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24			
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800				
Piping Class K1F0				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP304 - SMLS
	8 24	PIPE		ASTM A358 TP304 CL.1 - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
	2 24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
3	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
3	2 6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
SPECTACLE BLIND				
	1 1/2 2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP304
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304WX - WLDD
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 24	REDUCER - ASME-B16.9		ASTM A403 WP304WX - WLDD
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304
	2 24	CAP - ASME-B16.9		ASTM A403 WP304S - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304 - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304S - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304S - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2 6	TEE - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 24	TEE - ASME-B16.9		ASTM A403 WP304WX - WLDD
WELDOLET				
	2 10	WELDOLET - MSS-SP97		ASTM A182 F304
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304
FLANGED INSERT				
3	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304
SPIRAL WOUND				
	1/2 24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800								
Piping Class K1F0								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
Size	Doc.	Type		
pos. from to				
1	1/2 1 1/2	GA-E-60195	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A182 F304 Trim Mat. 304	
1	2 24	GA-E-60124	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2 1 1/2	GA-E-60236	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A182 F304 Trim Mat. 304	
6	1/2 1 1/2	GA-E-60321	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A182 F304 Trim Mat. 304	
6	2 24	GA-E-60324	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
7	1/2 6	GA-E-60400	Austenitic Steel - Ball-Top entry-Red.B-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. Soft seat-304 trim - PTFE seats	

STRAINERS				
Size	Doc.	Type		
pos. from to				
1	2 2	GA-E-60621	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



JOB 316800			
Piping Class K1F1			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Service

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: Max operating temperature for ball valves is 200 °C

Branch Connections 90 Degrees

Run size
Branch size
Legenda

Component/Material descriptions

Size	Item	Rating/Facing	Material
opt. from to			

VALVES

Size	Doc.	Type
pos. from to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class K1K0			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	SEWERS
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
12	4.57	10S			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	6 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	12	0	0

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	12 18.96
38	18.95
93	15.87
148	14.13
150	14.11
Max. hydr. P. 28.4	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
	12	S	S	S	S	W	W	W	W	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	12	
Legenda	A	TEE - SW ENDS - ASME-B16.11								
	S	SOCKOLET - SW END - MSS-SP97								
	T	TEE - ASME-B16.9								
	W	WELDOLET - MSS-SP97								



JOB 316800					
Piping Class K1K0					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP304 - SMLS	
	8	12	PIPE		ASTM A358 TP304 CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304	
	2	12	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304	
	3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
	3	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
BLIND FLANGE						
	1/2	12	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304	
SPECTACLE BLIND						
	2	3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP304	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304S - SMLS	
	8	12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304WX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP304S - SMLS	
	8	12	REDUCER - ASME-B16.9		ASTM A403 WP304WX - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304	
	2	12	CAP - ASME-B16.9		ASTM A403 WP304S - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304S - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304S - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	2	6	TEE - ASME-B16.9		ASTM A403 WP304S - SMLS	
	8	12	TEE - ASME-B16.9		ASTM A403 WP304WX - WLDD	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A182 F304	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304
SPIRAL WOUND						
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	



JOB 316800			
Piping Class K1K0			
Sh.	3	of	3
	A0	A1	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES				
pos.	Size	Doc.	Type	
	from	to		
1	1/2	1 1/2	GA-E-60157	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304
1	2	12	GA-E-60124	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
4	1/2	1 1/2	GA-E-60248	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304
4	2	6	GA-E-60223	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
6	1/2	1 1/2	GA-E-60355	Austenitic Steel - Check-WB-Red.B-Piston-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304
6	2	6	GA-E-60324	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
11	1/2	1 1/2	GA-E-60576	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304 Trim Mat. 304



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class K1L0			
Sh. 1 of 3		Rev.	
A0	A1		

Service	DEMINERALIZED WATER (PET only)
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	2.77	10S		2.77	10S
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	10	ASME-B16.5 CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	10	0	0	

Welding		
Size from	to	Weld. spec.
1/2	10	NIOEC-SP-90-02
Weld. class		100%

Design Limits		
Temp. °C	Size up to	Pressure in bar
2	10	18.96
38		18.95
93		15.87
150		14.11
Max. hydr. P.		28.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800			
Piping Class K1L0			
Sh.	2	of	3

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP304 - SMLS
	8 10	PIPE		ASTM A358 TP304 CL.1 - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
	2 10	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
	3 1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
	3 2 6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304
BLIND FLANGE				
	1/2 10	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304
SPECTACLE BLIND				
	3/4 4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP304
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 10	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304WX - WLDD
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 10	REDUCER - ASME-B16.9		ASTM A403 WP304WX - WLDD
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304
	2 10	CAP - ASME-B16.9		ASTM A403 WP304S - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP304 - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304 - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304S - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304S - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2 6	TEE - ASME-B16.9		ASTM A403 WP304S - SMLS
	8 10	TEE - ASME-B16.9		ASTM A403 WP304WX - WLDD
WELDOLET				
	2 3	WELDOLET - MSS-SP97		ASTM A182 F304
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304
FLANGED INSERT				
	3 1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304
SPIRAL WOUND				
	1/2 10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class K1L0					
Sh.	3	of	3		
				Rev.	
	A0	A1			

Component/Material descriptions					
opt.	Size from to	Item	Rating/Facing	Material	
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size from to	Doc.	Type		
1	1/2	1 1/2	GA-E-60157	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
1	2	6	GA-E-60124	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2	1 1/2	GA-E-60248	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
4	2	6	GA-E-60223	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
6	1/2	1 1/2	GA-E-60355	Austenitic Steel - Check-WB-Red.B-Piston-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
6	2	6	GA-E-60324	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
11	1/2	1 1/2	GA-E-60576	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304 Trim Mat. 304	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class K1V0					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class K6F0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	CHEMICALS
Codes	

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	2.77	40S		2.77		40S
3/4	2.87	40S		2.87		40S
1	3.38	40S		3.38		40S
1 1/2	3.68	40S		3.68		40S
2	2.77	10S		2.77		10S

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	2	ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	2	0	0

Welding		
Size from	to	Weld. spec.
1/2	2	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	99.21
38	99.21
85	85.22
Max. hydr. P. 148.8	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees	
Run size	
1/2	A
3/4	A A
1	A A A
1 1/2	A A A A
2	S S S S T
Branch size	1/2 3/4 1 1 1/2 2
Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class K6F0								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	2	PIPE		ASTM A312 TP304 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304	
	2	2	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304	
BLIND FLANGE						
	1/2	2	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304	
SPECTACLE BLIND						
	1	2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A240 TP304	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	2	2	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304S - SMLS	
REDUCER						
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304	
	2	2	CAP - ASME-B16.9		ASTM A403 WP304S - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304 - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A403 WP304S - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799		ASTM A403 WP304S - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304	
	2	2	TEE - ASME-B16.9		ASTM A403 WP304S - SMLS	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - TB RAC 5380	3000	ASTM A182 F304	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F304	
SPIRAL WOUND						
	1/2	2	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - 304 OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class K6F0					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60157	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
1	2	2	GA-E-60188	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2	1 1/2	GA-E-60248	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
6	1/2	1 1/2	GA-E-60355	Austenitic Steel - Check-WB-Red.B-Piston-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
6	2	2	GA-E-60377	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
11	1/2	1 1/2	GA-E-60576	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304 Trim Mat. 304	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	2	2	GA-E-60622	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class K7F0					
Sh. 1 of 3	Rev.				
	A0	A1			

Service	CHEMICALS
Codes	

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S	2.77	2.77	10S

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	2	ASME-B16.5	CL1500 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	2	0	0	

Welding		
Size from	to	Weld. spec.
1/2	2	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	114.53
38	114.53
85	114.53
Max. hydr. P. 148.8	

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees	
Run size	
1/2	A
3/4	A A
1	A A A
1 1/2	A A A A
2	S S S S T
Branch size	1/2 3/4 1 1 1/2 2
Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class K7F0					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
	Size	Item	Rating/Facing	Material	
opt.	from	to			
PIPE					
	1/2	2	PIPE		ASTM A312 TP304 - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A182 F304
	2	2	WN FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A182 F304
BLIND FLANGE					
	1/2	2	BLIND FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A182 F304
SPECTACLE BLIND					
	1	2	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL1500 RF 125 µin.Ra	ASTM A240 TP304
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2	2	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304S - SMLS
REDUCER					
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304
	2	2	CAP - ASME-B16.9		ASTM A403 WP304S - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304
NIPPLES					
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304 - SMLS
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A403 WP304S - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799		ASTM A403 WP304S - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304
	2	2	TEE - ASME-B16.9		ASTM A403 WP304S - SMLS
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - TB RAC 5380	3000	ASTM A182 F304
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL1500 RF 125 µin.Ra	ASTM A182 F304
SPIRAL WOUND					
	1/2	2	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - 304 OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class K7F0			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60189	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL1500 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
1	2	2	GA-E-60196	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304	
4	1/2	1 1/2	GA-E-60272	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
4	2	2	GA-E-60276	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304	
6	1/2	1 1/2	GA-E-60378	Austenitic Steel - Check-WB-Red.B-Piston-Int seat - BS5352 - CL1500 - SW Body Mat. ASTM A182 F304 Trim Mat. 304	
6	2	2	GA-E-60379	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L1A1			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Service	LOW TEMPERATURE FLR
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	40S	
3/4	2.87	40S	2.87	40S	
1	3.38	40S	3.38	40S	
1 1/2	3.68	40S	3.68	40S	
2	2.77	10S	2.77	10S	
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	6.35	10			
18	6.35	10			
24	6.35	10S			
30	7.92	10S			
34	9.53	STD			
38	9.53	STD			
40	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
26	40	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	40	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	40	NIOEC-SP-90-02
Weld. class		100%

Design Limits		
Temp. °C	Size up to	Pressure in bar
	40	
2	15.02	
38	15.02	
93	13.45	
148	12.08	
150	12.04	
Max. hydr. P.		22.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	24	30	34	38	40
1/2	A																		
3/4	A																		
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	W	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	T	T	T	T	T	T					
24	S	S	S	S	W	W	W	W	T	T	T	T	T	T	T				
30	S	S	S	S	W	W	W	W	W	W	W	W	W	P	P	P	P	T	
34	S	S	S	S	W	W	W	W	W	W	W	W	W	P	P	P	P	P	T
38	S	S	S	S	W	W	W	W	W	W	W	W	W	P	P	P	P	P	T
40	S	S	S	S	W	W	W	W	W	W	W	W	W	P	P	P	P	P	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	24	30	34	38	40

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	Pièpe To Pipe
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class L1A1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP304L - SMLS	
	8	40	PIPE		ASTM A358 TP304L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
	26	40	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F304L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
3	2	14	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
SPECTACLE BLIND						
	2	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP304L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	40	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	40	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L	
	2	24	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	40	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
WELDOLET						
	2	12	WELDOLET - MSS-SP97		ASTM A182 F304L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304L	



JOB 316800								
Piping Class L1A1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SPIRAL WOUND				
1/2	40	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
	from	to			
1	1/2	1 1/2	GA-E-60123	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
1	2	24	GA-E-60124	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2	1 1/2	GA-E-60222	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
4	2	8	GA-E-60223	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
6	1/2	1 1/2	GA-E-60323	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
6	2	24	GA-E-60324	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
11	1/2	1 1/2	GA-E-60577	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 304L	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L1E0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	CHEMICALS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			
18	4.78	10S			
20	5.54	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	20	ASME-B16.5		CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	0	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	15.84
38	15.84
93	13.45
150	12.04
Max. hydr. P.	23.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size																		
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	W	T	T	T									
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	T	T	T	T	T						
16	S	S	S	S	W	W	W	T	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	T	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	T	T	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20			

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class L1E0					
Sh.	2	of	3		
				Rev.	
	A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP304L - SMLS	
	8	20	PIPE		ASTM A358 TP304L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
	2	20	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
3	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L	
	2	20	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A182 F304L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L	
FLANGED INSERT						
	3	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304L	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class L1E0					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60123	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
1	2	20	GA-E-60124	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2	1 1/2	GA-E-60222	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
4	2	8	GA-E-60223	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
6	1/2	1 1/2	GA-E-60323	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
6	2	20	GA-E-60324	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
11	1/2	1 1/2	GA-E-60577	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 304L	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L1E1			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L101			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	REGENERATED LOOP GAS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			
18	4.78	10S			
20	5.54	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	20	ASME-B16.5 CL300 RF 125 µin.Ra		
11	12	20	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	15.85
38	15.84
93	13.45
148	12.06
150	12.04
204	11.03
256	10.06
Max. hydr. P.	23.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																				
Run size																				
1/2	A																			
3/4	A	A																		
1	A	A	A																	
1 1/2	A	A	A	A																
2	S	S	S	S	T															
3	S	S	S	S	T	T														
4	S	S	S	S	T	T	T													
6	S	S	S	S	W	T	T	T												
8	S	S	S	S	W	W	T	T	T											
10	S	S	S	S	W	W	W	T	T	T										
12	S	S	S	S	W	W	W	T	T	T	T									
14	S	S	S	S	W	W	W	W	T	T	T	T								
16	S	S	S	S	W	W	W	W	T	T	T	T	T							
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T						
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T					
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20					

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class L101								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP304L - SMLS	
	8	20	PIPE		ASTM A358 TP304L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
	2	20	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
3	2	20	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
11	14	14	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F304L	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F304L	
SPECTACLE BLIND						
	14	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP304L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L	
	2	20	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS	
	8	20	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A182 F304L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304L	



JOB 316800								
Piping Class L101								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SPIRAL WOUND				
1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
	from	to		
1	2	20	GA-E-60179	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316
4	2	8	GA-E-60264	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316
6	2	20	GA-E-60370	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316
11	1/2	1 1/2	GA-E-60578	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 316



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L3A1			
Sh. 1 of 3		Rev.	
A0	A1		

Service	HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	3.91	40S		3.91	40S
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			
8	6.35	20			
10	7.8	30			
16	9.53	STD			
24	12.7	XS			
30	15.88	30			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL300 RF 125 µin.Ra		
26	30	ASME-B16.47 series.A	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	30	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	30	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	6	30
		Pressure in bar	
2		41.37	36.39
38		41.34	36.39
50		40	36.39
90		35.53	35.2
100		34.7	34.4
Max. hydr. P.		62	62

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees													
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	16	24	30
1/2	A												
3/4	A	A											
1	A	A	A										
1 1/2	A	A	A	A									
2	S	S	S	S	T								
3	S	S	S	S	T	T							
4	S	S	S	S	T	T	T						
6	S	S	S	S	W	T	T	T					
8	S	S	S	S	W	W	T	T	T				
10	S	S	S	S	W	W	W	T	T	T			
16	S	S	S	S	W	W	W	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	T	T	T	
30	S	S	S	S	W	W	W	W	W	P	P	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	16	24	30

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	Pipe To Pipe
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800					
Piping Class L3A1					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
opt.	Size from to	Item	Rating/Facing	Material	
PIPE					
	1/2	6	PIPE		ASTM A312 TP304L - SMLS
	8	30	PIPE		ASTM A358 TP304L CL.1 - EFW
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L
	2	24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L
	30	30	WN FLANGE - ASME-B16.47 series.A	CL300 RF 125 µin.Ra	ASTM A182 F304L
BLIND FLANGE					
	1/2	10	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L
SPECTACLE BLIND					
	3/4	10	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A240 TP304L
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8	30	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD
REDUCER					
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8	30	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD
CAP					
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L
	2	10	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L
NIPPLES					
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	2	6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8	30	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD
WELDOLET					
	2	8	WELDOLET - MSS-SP97		ASTM A182 F304L
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L
FLANGED INSERT					
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304L
SPIRAL WOUND					
	1/2	30	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class L3A1					
Sh.	3	of	3		
				Rev.	
	A0	A1			

Component/Material descriptions					
opt.	Size from to	Item	Rating/Facing	Material	
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size from to	Doc.	Type		
1	1/2	1 1/2	GA-E-60123	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
1	2	10	GA-E-60165	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
1	26	30	GA-E-60591	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
4	1/2	1 1/2	GA-E-60222	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
4	2	3	GA-E-60233	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L	
6	1/2	1 1/2	GA-E-60323	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L	
11	1/2	1 1/2	GA-E-60577	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 304L	

STRAINERS			
pos.	Size from to	Doc.	Type
1	1/2	1 1/2	GA-E-60623
Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L3E0			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	CHEMICALS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S	2.77	2.77	10S
3	3.05	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	3	ASME-B16.5		CL300 RF 125 µin.Ra	
3	1/2	ASME-B16.5		CL300 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	3	0	0

Welding		
Size from	to	Weld. spec.
1/2	3	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	41.34
38	41.34
93	34.85
148	31.42
150	31.31
Max. hydr. P.	61.9

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
	1/2	A							
	3/4	A							
	1	A	A	A					
	1 1/2	A	A	A	A				
	2	S	S	S	S	T			
	3	S	S	S	S	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3			
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800			
Piping Class L3E0			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	3	PIPE		ASTM A312 TP304L - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
	2	3	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
3	2	3	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
BLIND FLANGE						
	1/2	3	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F304L	
SPECTACLE BLIND						
	2	3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A240 TP304L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	3	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS	
REDUCER						
	2	3	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L	
	2	3	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L	
	2	3	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F304L	
SPIRAL WOUND						
	1/2	3	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800			
Piping Class L3E0			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES				
pos.	Size from	to	Doc.	Type
1	1/2	1 1/2	GA-E-60123	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
4	1/2	1 1/2	GA-E-60222	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
6	1/2	1 1/2	GA-E-60323	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
11	1/2	1 1/2	GA-E-60577	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 304L



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L6A1			
Sh. 1 of 3		Rev.	
A0	A1		

Service LPG
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	3.91	40S		3.91	40S
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			
8	6.35				
12	9.53	40S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	ASME-B16.5	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	12	1.6	0	

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	6	12
		Pressure in bar	
2		64.65	42.19
38		64.65	42.19
93		64.65	42.19
148		62.85	42.19
150		62.62	42.15
Max. hydr. P.		96.9	63.3

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	A									
	3/4	A	A								
	1	A	A	A							
	1 1/2	A	A	A	A						
	2	S	S	S	S	T					
	3	S	S	S	S	T	T				
	4	S	S	S	S	T	T	T			
	6	S	S	S	S	W	T	T	T		
	8	S	S	S	S	W	W	T	T	T	
	12	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	12	
Legenda											
A	TEE - SW ENDS - ASME-B16.11										
S	SOCKOLET - SW END - MSS-SP97										
T	TEE - ASME-B16.9										
W	WELDOLET - MSS-SP97										



JOB 316800			
Piping Class L6A1			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP304L - SMLS
	8 12	PIPE		ASTM A358 TP304L CL.1 - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L
	2 12	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L
	11 12 12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F304L
BLIND FLANGE				
	1/2 12	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L
SPECTACLE BLIND				
	2 12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A240 TP304L
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8 12	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8 12	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L
	2 8	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L
	2 6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS
	8 12	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD
WELDOLET				
	2 4	WELDOLET - MSS-SP97		ASTM A182 F304L
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F304L
SPIRAL WOUND				
	1/2 12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class L6A1					
Sh.	3	of	3		
				Rev.	
	A0	A1			

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size	Doc.	Type	
	from	to		
1	1/2	1 1/2	GA-E-60123	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
1	2	12	GA-E-60188	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
4	1/2	1 1/2	GA-E-60222	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
4	2	8	GA-E-60271	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
6	1/2	1 1/2	GA-E-60323	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L Trim Mat. 304L
6	2	8	GA-E-60377	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 304L
11	1/2	1 1/2	GA-E-60577	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F304L Trim Mat. 304L

STRAINERS				
pos.	Size	Doc.	Type	
	from	to		
1	2	8	GA-E-60622	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L6H1(N)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Wet H2S Service)
Codes

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing			
opt. from	to	Code	
1/2	24	ASME-B16.5	CL600 RF 125 µin.Ra
11	12	24 ASME-B16.5	CL600 RF 125 µin.Ra

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	3.91	40S		3.91	40S
8	6.35	20			
24	14.27	30			

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	44.05
38	44.05
93	44.05
148	44.05
150	44.01
204	41.7
260	39.04
315	36.95
343	36.15
365	35.73
Max. hydr. P.	23.7

Notes: NACE MR 0103
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
1/2	A								
3/4	A	A							
1	A	A	A						
1 1/2	A	A	A	A					
2	S	S	S	S	T				
8	S	S	S	S	W	T			
24	S	S	S	S	W	W	T		
Branch size	1/2	3/4	1	1 1/2	2	8	24		
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800			
Piping Class L6H1(N)			
Sh. 2 of 3		Rev.	
A0	A1		

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP304L - SMLS GA-E-60020
	8 24	PIPE		ASTM A358 TP304L CL.1 - EFW GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
	2 24	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
11	24 24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
SPECTACLE BLIND				
	3/4 24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A240 TP304L GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 20	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 24	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L GA-E-60020
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 24	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
WELDOLET				
	2 8	WELDOLET - MSS-SP97		ASTM A182 F304L GA-E-60020
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
SPIRAL WOUND				
	1/2 24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class L6H1(N)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt. from to					
BOLTS					
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES					
pos.	Size	Doc.	Type		
from to					
1	1/2	1 1/2	GA-E-60171	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
1	2	24	GA-E-60172	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60256	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60257	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60362	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
6	2	24	GA-E-60363	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class L6H1(X)			
Sh. 1 of 3		Rev.	
A0	A1		

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS, WATER H2S (Severe Wet H2S Service)
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	2.77	40S		3.73		80S
3/4	2.87	40S		3.91		80S
1	3.38	40S		4.55		80S
1 1/2	3.68	40S		5.08		80S
2	3.91	40S				
3	3.05	10S				
4	6.02	40S				
6	7.11	40S				
8	6.35	20				
10	6.35	20				
12	7.14					
14	7.92	20				
16	9.53	30				
18	9.53	STD				
24	12.7	XS				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	24	1	0

Welding		
Size from	to	Weld. spec.
1/2	24	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to 24 Pressure in bar
2	37.44
38	37.44
50	37.44
93	37.44
100	37.44
114	37.44
Max. hydr. P.	23.7

Notes: Only compliance with NACE MR 0103 is required for stainless steel in severe H2S service. No HIC Test is required.
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	24	
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	24	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class L6H1(X)			
Sh.	2	of	3

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP304L - SMLS GA-E-60020
	8 24	PIPE		ASTM A358 TP304L CL.1 - EFW GA-E-60020
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
	2 24	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
	11 12 24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
SPECTACLE BLIND				
	3/4 24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A240 TP304L GA-E-60020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 24	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 24	REDUCER - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 24	CAP - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F304L GA-E-60020
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP304L - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP304LS - SMLS GA-E-60020
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP304LS - SMLS GA-E-60020
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F304L GA-E-60020
	2 6	TEE - ASME-B16.9		ASTM A403 WP304LS - SMLS GA-E-60020
	8 24	TEE - ASME-B16.9		ASTM A403 WP304LWX - WLDD GA-E-60020
WELDOLET				
	2 8	WELDOLET - MSS-SP97		ASTM A182 F304L GA-E-60020
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F304L GA-E-60020
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F304L GA-E-60020
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra	ASTM A182 F304L GA-E-60020
SPIRAL WOUND				
	1/2 24	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class L6H1(X)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt. from to					
BOLTS					
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES					
pos.	Size	Doc.	Type		
from to					
1	1/2	1 1/2	GA-E-60171	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
1	2	18	GA-E-60172	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60256	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60257	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60362	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F304L GA-E-60020 Trim Mat. 316L stellited	
6	2	18	GA-E-60363	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8 GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class M1F1			
Sh. 1 of 1	Rev.		
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from to			

VALVES			
Size	Doc.	Type	
pos. from to			



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class M1L1			
Sh. 1 of 3	Rev.		
	A0	A1	

Service BFW CAUSTIC SOLUTION DMW
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80S	3.73	3.73	80S
3/4	3.91	80S	3.91	3.91	80S
1	4.55	80S	4.55	4.55	80S
1 1/2	5.08	80S	5.08	5.08	80S
2	3.91	40S	3.91	3.91	40S
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	6	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	6 ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
from	Size	to	Internal	External
1/2		6	1.6	0

Welding			
from	Size	to	Weld. spec.
1/2		6	NIOEC-SP-90-02
		Weld. class	100%

Temp.		Size up to
°C		6
	Pressure in bar	
2		18.96
38		18.95
93		16.22
149		14.82
204		13.45
260		11.72
Max. hydr. P.		28.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6		
Legenda	A	TEE - SW ENDS - ASME-B16.11								
	S	SOCKOLET - SW END - MSS-SP97								
	T	TEE - ASME-B16.9								
	W	WELDOLET - MSS-SP97								



JOB 316800			
Piping Class M1L1			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from to			
PIPE				
	1/2 6	PIPE		ASTM A312 TP316 - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316
	2 6	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316
	3 1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316
	3 2 4	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316
BLIND FLANGE				
	1/2 6	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316
SPECTACLE BLIND				
	1 1/2 4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316S - SMLS
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP316S - SMLS
CAP				
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316
	2 6	CAP - ASME-B16.9		ASTM A403 WP316S - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316 - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316 - SMLS
SWAGE NIPPLES				
	1/2 2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316S - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316S - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316
	2 6	TEE - ASME-B16.9		ASTM A403 WP316S - SMLS
WELDOLET				
	2 2	WELDOLET - MSS-SP97		ASTM A182 F316
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316
FLANGED INSERT				
	3 1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316
SPIRAL WOUND				
	1/2 6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800					
Piping Class M1L1					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60176	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
1	2	4	GA-E-60177	Austenitic Steel - Gate-BB-FB-Split wdg-Widd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60261	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
4	2	2	GA-E-60262	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60367	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
6	2	2	GA-E-60368	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60579	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60624	Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class M3L1			
Sh. 1 of 3	Rev.		
	A0	A1	

Service BFW CAUSTIC SOLUTION DMW CHEMICALS
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	3.73	80S	3.73	3.73	80S
3/4	3.91	80S	3.91	3.91	80S
1	4.55	80S	4.55	4.55	80S
1 1/2	5.08	80S	5.08	5.08	80S
2	3.91	40S	3.91	3.91	40S
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	6	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	6	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	6	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to 6 Pressure in bar
2	49.61
38	49.61
93	42.78
149	38.6
204	35.52
260	33.09
Max. hydr. P.	28.4

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
1/2	A								
3/4	A	A							
1	A	A	A						
1 1/2	A	A	A	A					
2	S	S	S	S	T				
3	S	S	S	S	T	T			
4	S	S	S	S	T	T	T		
6	S	S	S	S	W	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800								
Piping Class M3L1								
Sh.	2	of	3					
				Rev.				
				A0	A1			

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP316 - SMLS	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316	
	2	6	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316	
BLIND FLANGE						
	1/2	6	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316	
SPECTACLE BLIND						
	3/4	4	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A240 TP316	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316S - SMLS	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316S - SMLS	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316	
	2	6	CAP - ASME-B16.9		ASTM A403 WP316S - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316 - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316 - SMLS	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316S - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316S - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316	
	2	6	TEE - ASME-B16.9		ASTM A403 WP316S - SMLS	
WELDOLET						
	2	2	WELDOLET - MSS-SP97		ASTM A182 F316	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316	
SPIRAL WOUND						
	1/2	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H	



JOB 316800					
Piping Class M3L1					
Sh.	3	of	3		
				Rev.	
	A0	A1			

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60176	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
1	2	6	GA-E-60178	Austenitic Steel - Gate-BB-FB-Split wdg-Widd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60261	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
4	2	6	GA-E-60263	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60367	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	
6	2	6	GA-E-60369	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8M Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60579	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1C0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	ACID GAS SOUR WATER
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			
18	4.78	10S			
20	5.54	10S			
24	6.35	10S			
26	6.35				
30	7.92	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	30	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	ASME-B16.5		CL300 RF	125 µin.Ra
11	1/2	ASME-B16.5		CL150 RF	125 µin.Ra
11	26	ASME-B16.47 series.A		CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	30	0	0

Welding		
Size from	to	Weld. spec.
1/2	30	NIOEC-SP-90-02
Weld. class		100%

Design Limits		
Temp. °C	Size up to	Pressure in bar
2	30	15.85
38		15.84
93		13.45
150		12.04
Max. hydr. P.		23.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	30	
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T			
26	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	T		
30	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	T	T	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class N1C0								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
opt.	Size	Item	Rating/Facing	Material		
	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP316L - SMLS	
	8	30	PIPE		ASTM A358 TP316L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	26	30	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
	3	2	16	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
	11	12	24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F316L
	11	26	30	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A182 F316L
BLIND FLANGE						
	1/2	24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	26	30	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F316L	
SPECTACLE BLIND						
	3/4	24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L	
	26	30	SPECIAL BLIND & SPACER - <MFR Std>	CL150 RF 125 µin.Ra	ASTM A240 TP316L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	30	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	30	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L	
	2	30	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	30	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
WELDOLET						
	2	12	WELDOLET - MSS-SP97		ASTM A182 F316L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L	
FLANGED INSERT						
	3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L



JOB 316800								
Piping Class N1C0								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
SPIRAL WOUND				
1/2	30	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7 + ASTM A194 GR.2H	

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60127	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
1	2	12	GA-E-60128	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60226	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
4	2	8	GA-E-60227	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60327	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
6	2	12	GA-E-60328	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60580	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	

STRAINERS			
pos.	Size	Doc.	Type
from	to		
1	1/2	1 1/2	GA-E-60625 Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1C0(N)			
Sh.	1	of	1
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



JOB 316800			
Piping Class N1C0(X)			
Sh. 1 of 3		Rev.	
A0	A1	A2	

Customer Piping Class
Ref. Doc.

Service ACID GAS SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S	2.77	2.77	10S
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	16	ASME-B16.5 CL300 RF 125 µin.Ra		
11	12	16	ASME-B16.5 CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	0	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	16
2	15.84
38	15.84
93	13.45
150	12.04
Max. hydr. P.	23.7

Notes: Only compliance with NACE MR 0103 is required for stainless steel in severe H2S service.
No HIC Test is required.

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	

Legenda

A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class N1C0(X)				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1/2	6	PIPE		ASTM A312 TP316L - SMLS GA-E-60020
	8	16	PIPE		ASTM A358 TP316L CL.1 - EFW GA-E-60020
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
	2	16	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
3	2	16	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
11	12	16	SPEC.MOD.WN FLANGE-w/ft JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
BLIND FLANGE					
	1/2	16	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020
SPECTACLE BLIND					
	3/4	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L GA-E-60020
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020
	8	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020
REDUCER					
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020
	8	16	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020
CAP					
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
	2	16	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020
COUPLING					
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L GA-E-60020
NIPPLES					
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS GA-E-60020
SWAGE NIPPLES					
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS GA-E-60020
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020
	2	6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020
	8	16	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020
WELDOLET					
	2	6	WELDOLET - MSS-SP97		ASTM A182 F316L GA-E-60020
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L GA-E-60020
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L GA-E-60020
FLANGED INSERT					
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020



JOB 316800								
Piping Class N1C0(X)								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60138	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited
1	2	16	GA-E-60161	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60234	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited
4	2	8	GA-E-60250	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60341	Austenitic Steel - Check-BB-Red.B-Swing-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited
6	2	16	GA-E-60342	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
11	1/2	3/4	GA-E-60581	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited

STRAINERS				
pos.	Size	Doc.	Type	
from to				
1	1/2	1 1/2	GA-E-60626	Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2
1	2	12	GA-E-60627	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



JOB 316800			
Piping Class N1C1			
Sh.	1	of	1
	A0	A1	

Customer Piping Class
Ref. Doc.

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1E0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service LEAN AMINE
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		2.77	40S
3/4	2.87	40S		2.87	40S
1	3.38	40S		3.38	40S
1 1/2	3.68	40S		3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			
18	4.78	10S			
20	5.54	10S			
24	6.35	10S			
26	6.35				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5	CL150 RF 125 µin.Ra		
	26	ASME-B16.47 series.A	CL150 RF 125 µin.Ra		
3	1/2	16 ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	24 ASME-B16.5	CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	26	0	0

Welding		
Size from	to	Weld. spec.
1/2	26	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
2	15.84
38	15.84
93	13.45
150	12.04
Max. hydr. P.	23.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																	
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26
1/2	A																
3/4	A	A															
1	A	A	A														
1 1/2	A	A	A	A													
2	S	S	S	S	T												
3	S	S	S	S	T	T											
4	S	S	S	S	T	T	T										
6	S	S	S	S	W	T	T	T									
8	S	S	S	S	W	W	T	T	T								
10	S	S	S	S	W	W	W	T	T	T							
12	S	S	S	S	W	W	W	T	T	T	T						
14	S	S	S	S	W	W	W	W	T	T	T	T					
16	S	S	S	S	W	W	W	W	T	T	T	T	T				
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T			
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T		
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T	
26	S	S	S	S	W	W	W	W	W	P	P	P	P	P	P	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26

Legenda

A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800							
Piping Class N1E0							
Sh.	2	of	3	Rev.			
				A0	A1	A2	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	6	PIPE		ASTM A312 TP316L - SMLS	
	8	26	PIPE		ASTM A358 TP316L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	2	24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	26	26	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F316L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L	
3	2	16	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L	
11	12	18	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F316L	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
SPECTACLE BLIND						
	3/4	18	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	26	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	26	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L	
	2	16	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316L - SMLS	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	26	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
WELDOLET						
	2	10	WELDOLET - MSS-SP97		ASTM A182 F316L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L	



JOB 316800								
Piping Class N1E0								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	26	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60127	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
1	2	12	GA-E-60128	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60226	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
4	2	8	GA-E-60227	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60327	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
6	2	12	GA-E-60328	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60580	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	

STRAINERS			
pos.	Size	Doc.	Type
from	to		
1	2	12	GA-E-60628
			Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1E0(N)			
Sh. 1 of 3		Rev.	
A0	A1		

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S	2.77	2.77	10S
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	16	ASME-B16.5		CL300 RF 125 µin.Ra
11	12	16	ASME-B16.5		CL150 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	16	0	0

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	16
2	15.84
38	15.84
93	13.45
150	12.04
Max. hydr. P.	23.7

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees														
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	
1/2	A													
3/4	A	A												
1	A	A	A											
1 1/2	A	A	A	A										
2	S	S	S	S	T									
3	S	S	S	S	T	T								
4	S	S	S	S	T	T	T							
6	S	S	S	S	W	T	T	T						
8	S	S	S	S	W	W	T	T	T					
10	S	S	S	S	W	W	W	T	T	T				
12	S	S	S	S	W	W	W	T	T	T	T			
14	S	S	S	S	W	W	W	W	T	T	T	T		
16	S	S	S	S	W	W	W	W	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800			
Piping Class N1E0(N)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	6	PIPE		ASTM A312 TP316L - SMLS GA-E-60020	
	8	16	PIPE		ASTM A358 TP316L CL.1 - EFW GA-E-60020	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
	2	16	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
3	2	16	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	
SPECTACLE BLIND						
	3/4	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L GA-E-60020	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020	
	8	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020	
	8	16	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020	
CAP						
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
	2	16	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L GA-E-60020	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316L - SMLS GA-E-60020	
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS GA-E-60020	
SWAGE NIPPLES						
	1/2	2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS GA-E-60020	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS GA-E-60020	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L GA-E-60020	
	2	6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS GA-E-60020	
	8	16	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD GA-E-60020	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A182 F316L GA-E-60020	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L GA-E-60020	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L GA-E-60020	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L GA-E-60020	



JOB 316800					
Piping Class N1E0(N)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions						
Size	Item	Rating/Facing			Material	
opt. from to						
SPIRAL WOUND						
1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365			316 SS+GRAPH 98% - C.S. OUT.RING	
BOLTS						
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368			ASTM A193 B7M + ASTM A194 GR.2HM	

VALVES						
pos.	Size	Doc.	Type			
from	to					
1	1/2	1 1/2	GA-E-60138	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited		
1	2	16	GA-E-60161	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited		
4	1/2	1 1/2	GA-E-60234	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited		
4	2	8	GA-E-60250	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited		
6	1/2	1 1/2	GA-E-60341	Austenitic Steel - Check-BB-Red.B-Swing-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited		
6	2	16	GA-E-60342	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1E0(X)			
Sh.	1	of	1
	A0	A1	

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec.
Weld. class
PWHT

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes: NACE MR 0103 + HIC TEST

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions
Size Item Rating/Facing Material
opt. from to

VALVES
Size Doc. Type
pos. from to



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class N1E1					
Sh.	1	of	1	Rev.	
				A0	A1

Code

Design code : ASME B 31.3

Thicknesses					
Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch

Flange Rating/Facing/Face Finishing
opt. from to Code

Corrosion Allowance
Size from to Internal External

Welding
Size from to Weld. spec. Weld. class

Design Limits
Temp. Size up to
°C Pressure in bar
Max. hydr. P.

Notes:

Branch Connections 90 Degrees
Run size
Branch size
Legenda

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		

VALVES			
Size	Doc.	Type	
pos. from	to		



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1F0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service	CHEMICALS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			
14	4.78	10S			
16	4.78	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	16	ASME-B16.5		CL150 RF	125 µin.Ra
3	1/2	16	ASME-B16.5		CL300 RF 125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	16	0	0	

Welding		
Size from	to	Weld. spec.
1/2	16	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	16
2	15.85
38	15.84
93	13.45
149	12.06
204	11.04
260	9.99
316	9.63
Max. hydr. P.	23.7

Notes: Ball valves use is limited to 180 °C
Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees															
Run size															
1/2	A														
3/4	A	A													
1	A	A	A												
1 1/2	A	A	A	A											
2	S	S	S	S	T										
3	S	S	S	S	T	T									
4	S	S	S	S	T	T	T								
6	S	S	S	S	W	T	T	T							
8	S	S	S	S	W	W	T	T	T						
10	S	S	S	S	W	W	W	T	T	T					
12	S	S	S	S	W	W	W	T	T	T	T				
14	S	S	S	S	W	W	W	W	T	T	T	T			
16	S	S	S	S	W	W	W	W	T	T	T	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16		
Legenda															
A	TEE - SW ENDS - ASME-B16.11														
S	SOCKOLET - SW END - MSS-SP97														
T	TEE - ASME-B16.9														
W	WELDOLET - MSS-SP97														



JOB 316800								
Piping Class N1F0								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP316L - SMLS	
	8	16	PIPE		ASTM A358 TP316L CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
	2	16	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
3	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L	
3	2	16	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L	
BLIND FLANGE						
	1/2	16	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L	
SPECTACLE BLIND						
	1 1/2	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	16	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	16	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L	
	2	16	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS	
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L	
	2	6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS	
	8	16	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD	
WELDOLET						
	2	6	WELDOLET - MSS-SP97		ASTM A182 F316L	
THREDOLET						
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L	
FLANGED INSERT						
3	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L	
SPIRAL WOUND						
	1/2	16	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+PTFE - C.S. OUT.RING	



JOB 316800			
Piping Class N1F0			
Sh. 3 of 3	Rev.		
	A0	A1	A2

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES				
pos.	Size from to	Doc.	Type	
1	1/2 1 1/2	GA-E-60140	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
1	2 16	GA-E-60141	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
4	1/2 1 1/2	GA-E-60226	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
4	2 8	GA-E-60227	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
6	1/2 1 1/2	GA-E-60327	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
6	2 16	GA-E-60328	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
8	3/4 6	GA-E-60409	Austenitic Steel - Ball-Top entry-Red.B-Floating ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. Soft seat-316L trim - PTFE seats	
8	8 12	GA-E-60410	Austenitic Steel - Ball-Top entry-FB-Trunnion ball - BS5351 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. Soft seat-316L trim - PTFE seats	
11	1/2 1 1/2	GA-E-60582	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	

STRAINERS				
pos.	Size from to	Doc.	Type	
1	1/2 1 1/2	GA-E-60625	Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	2 12	GA-E-60628	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N1L0			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service DMW DIW
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	6.35	20			
10	6.35	20			
12	6.35	20			
14	6.35	10			
16	6.35	10			
18	6.35	10			
20	6.35	10			
24	6.35	10S			
32	7.92	10			
40	9.53	STD			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	24	ASME-B16.5		CL150 RF	125 µin.Ra
26	40	ASME-B16.47 series.A		CL150 RF	125 µin.Ra
3	1/2	24	ASME-B16.5	CL300 RF	125 µin.Ra
11	12	24	ASME-B16.5	CL150 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	40	0	0

Welding		
Size from	to	Weld. spec.
1/2	40	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	40
2	15.85
37	15.85
50	15.32
100	13.27
150	12.04
Max. hydr. P.	23.7

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	32	40
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	W	T	T	T									
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	W	T	T	T	T						
16	S	S	S	S	W	W	W	W	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T			
24	S	S	S	S	W	W	W	W	W	W	T	T	T	T	T	T		
32	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	T	
40	S	S	S	S	W	W	W	W	W	W	P	P	P	P	P	P	P	T

Legenda	
A	TEE - SW ENDS - ASME-B16.11
P	PIPE-TO-PIPE
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800				
Piping Class N1L0				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 6	PIPE		ASTM A312 TP316L - SMLS
	8 40	PIPE		ASTM A358 TP316L CL.1 - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L
	2 24	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L
	26 40	WN FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F316L
3	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
3	2 24	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
11	12 24	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM A182 F316L
BLIND FLANGE				
	1/2 24	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM A182 F316L
	26 40	BLIND FLANGE - ASME-B16.47 series.A	CL150 RF 125 µin.Ra	ASTM A182 F316L
SPECTACLE BLIND				
	3/4 24	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM A240 TP316L
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2 6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS
	8 40	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LWX - WLDD
REDUCER				
	2 6	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS
	8 40	REDUCER - ASME-B16.9		ASTM A403 WP316LWX - WLDD
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F316L
	2 24	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316L - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2 6	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS
	8 40	TEE - ASME-B16.9		ASTM A403 WP316LWX - WLDD
WELDOLET				
	2 10	WELDOLET - MSS-SP97		ASTM A182 F316L
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L
FLANGED INSERT				
3	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L



JOB 316800								
Piping Class N1L0								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
SPIRAL WOUND				
1/2	40	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H

VALVES					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60127	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
1	2	24	GA-E-60128	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60226	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
4	2	14	GA-E-60227	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60327	Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	
6	2	24	GA-E-60328	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60580	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L Trim Mat. 316L stellited	

STRAINERS					
pos.	Size	Doc.	Type		
from	to				
1	1/2	1 1/2	GA-E-60625	Austenitic Steel - Y Strainer - Bolted cover - ASME-B16.34 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316 - PERF.PLATE - 40 Holes/Cm2	
1	2	12	GA-E-60628	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	
1	14	14	GA-E-60629	Austenitic Steel - T Strainer-BW - <MFR Std - Metallic> - CL150 - RF - 125 µin.Ra Body Mat. ASTM A403 WP316LWX - WLDD Trim Mat. 316 - CLOTH - MESH 3	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N3C0(X)			
Sh. 1 of 3	Rev.		
	A0	A1	

Service SOUR WATER
(Severe Wet H2S Service)

Codes

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	2.77	10S			
3	3.05	10S			
4	3.05	10S			
6	3.4	10S			
8	3.76	10S			
10	4.19	10S			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	10	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				Welding	
Size from	to	Internal	External	Size from	to
1/2	10	0	0	1/2	10
				Weld. spec.	NIOEC-SP-90-02
				Weld. class	100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	31.27
37	31.27
50	31.27
93	31.27
100	31.27
148	31.27
150	31.23
160	30.82
Max. hydr. P.	46.9

Notes: Only compliance with NACE MR 0103 is required for stainless steel in severe H2S service. No HIC Test is required.

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size										
1/2	A									
3/4	A	A								
1	A	A	A							
1 1/2	A	A	A	A						
2	S	S	S	S	T					
3	S	S	S	S	T	T				
4	S	S	S	S	T	T	T			
6	S	S	S	S	W	T	T	T		
8	S	S	S	S	W	W	T	T	T	
10	S	S	S	S	W	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Legenda										
A	TEE - SW ENDS - ASME-B16.11									
S	SOCKOLET - SW END - MSS-SP97									
T	TEE - ASME-B16.9									
W	WELDOLET - MSS-SP97									



JOB 316800			
Piping Class N3C0(X)			
Sh.	2	of	3
	A0	A1	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	6	PIPE	ASTM A312 TP316L - SMLS GA-E-60020
	8	10	PIPE	ASTM A358 TP316L CL.1 - EFW GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
	2	10	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
BLIND FLANGE				
	1/2	10	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
SPECTACLE BLIND				
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A240 TP316L GA-E-60020
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	10	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
REDUCER				
	2	6	REDUCER - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	10	REDUCER - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
CAP				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	10	CAP - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F316L GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A312 TP316L - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A312 TP316L - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A403 WP316LS - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A403 WP316LS - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	6	TEE - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	10	TEE - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
WELDOLET				
	2	4	WELDOLET - MSS-SP97	ASTM A182 F316L GA-E-60020
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000 ASTM A182 F316L GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000 ASTM A182 F316L GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
SPIRAL WOUND				
	1/2	10	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class N3C0(X)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60138	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
1	2	10	GA-E-60162	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60234	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60251	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60341	Austenitic Steel - Check-BB-Red.B-Swing-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
6	2	10	GA-E-60357	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60581	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	

STRAINERS					
pos.	Size from	to	Doc.	Type	
1	2	10	GA-E-60630	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N3E0			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	LEAN AMINE
Codes	

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	2.77	40S		2.77		40S
3/4	2.87	40S		2.87		40S
1	3.38	40S		3.38		40S
1 1/2	3.68	40S		3.68		40S
2	2.77	10S				
3	3.05	10S				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	3	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	3	0	0

Welding		
Size from	to	Weld. spec.
1/2	3	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	3
2	41.37
37	41.37
50	39.93
100	34.4
150	31.31
200	28.83
250	26.63
295	25.33
Max. hydr. P.	62

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
	1/2	A							
	3/4	A	A						
	1	A	A	A					
	1 1/2	A	A	A	A				
	2	S	S	S	S	T			
	3	S	S	S	S	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3			
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800			
Piping Class N3E0			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from to			
PIPE				
	1/2 3	PIPE		ASTM A312 TP316L - SMLS
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
	2 3	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
BLIND FLANGE				
	1/2 3	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra	ASTM A182 F316L
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2 3	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS
REDUCER				
	2 3	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L
	2 3	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L
NIPPLES				
	1/2 3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316L - SMLS
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS
	1/2 1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2 3	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS
THREDOLET				
	1/2 1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra	ASTM A182 F316L
SPIRAL WOUND				
	1/2 3	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class N3E0			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60127 Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
1	2	3	GA-E-60162 Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60226 Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
4	2	3	GA-E-60251 Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60327 Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
6	2	3	GA-E-60357 Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited
11	1/2	1 1/2	GA-E-60580 Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N3E0(N)			
Sh. 1 of 3		Rev.	
A0	A1		

Service RICH AMINE
(Wet H2S Service)

Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	2.77	40S	2.77	2.77	40S	40S
3/4	2.87	40S	2.87	2.87	40S	40S
1	3.38	40S	3.38	3.38	40S	40S
1 1/2	3.68	40S	3.68	3.68	40S	40S
2	2.77	10S				
3	3.05	10S				
4	3.05	10S				
6	3.4	10S				
8	3.76	10S				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1/2	8	ASME-B16.5
CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	8	0	0

Welding		
Size from	to	Weld. spec.
1/2	8	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to Pressure in bar
	8
2	35
37	35
50	35
100	34.4
150	31.31
165	30.57
Max. hydr. P.	52.5

Notes: NACE MR 0103

Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees										
Run size	1/2	A								
	3/4	A	A							
	1	A	A	A						
	1 1/2	A	A	A	A					
	2	S	S	S	S	T				
	3	S	S	S	S	T	T			
	4	S	S	S	S	T	T	T		
	6	S	S	S	S	W	T	T	T	
	8	S	S	S	S	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	
Legenda	A	TEE - SW ENDS - ASME-B16.11								
	S	SOCKOLET - SW END - MSS-SP97								
	T	TEE - ASME-B16.9								
	W	WELDOLET - MSS-SP97								



JOB 316800			
Piping Class N3E0(N)			
Sh.	2	of	3

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
	1/2	6	PIPE	ASTM A312 TP316L - SMLS GA-E-60020
	8	8	PIPE	ASTM A358 TP316L CL.1 - EFW GA-E-60020
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
	2	8	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
BLIND FLANGE				
	1/2	8	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
SPECTACLE BLIND				
	3/4	8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra ASTM A240 TP316L GA-E-60020
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	8	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
REDUCER				
	2	6	REDUCER - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	8	REDUCER - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
CAP				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	8	CAP - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F316L GA-E-60020
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A312 TP316L - SMLS GA-E-60020
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A312 TP316L - SMLS GA-E-60020
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95	ASTM A403 WP316LS - SMLS GA-E-60020
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A403 WP316LS - SMLS GA-E-60020
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000 ASTM A182 F316L GA-E-60020
	2	6	TEE - ASME-B16.9	ASTM A403 WP316LS - SMLS GA-E-60020
	8	8	TEE - ASME-B16.9	ASTM A403 WP316LWX - WLDD GA-E-60020
WELDOLET				
	2	3	WELDOLET - MSS-SP97	ASTM A182 F316L GA-E-60020
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000 ASTM A182 F316L GA-E-60020
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000 ASTM A182 F316L GA-E-60020
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A182 F316L GA-E-60020
SPIRAL WOUND				
	1/2	8	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	316 SS+GRAPH 98% - C.S. OUT.RING



JOB 316800					
Piping Class N3E0(N)					
Sh.	3	of	3		
				Rev.	

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7M + ASTM A194 GR.2HM

VALVES					
pos.	Size from	to	Doc.	Type	
1	1/2	1 1/2	GA-E-60138	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
1	2	8	GA-E-60162	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
4	1/2	1 1/2	GA-E-60234	Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
4	2	8	GA-E-60251	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
6	1/2	1 1/2	GA-E-60341	Austenitic Steel - Check-BB-Red.B-Swing-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	
6	2	8	GA-E-60357	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M GA-E-60020 Trim Mat. 316L stellited	
11	1/2	1 1/2	GA-E-60581	Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F316L GA-E-60020 Trim Mat. 316L stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class N6L0			
Sh. 1 of 3	Rev.		
	A0	A1	

Service	DEMI WATER
Codes	

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Sch	Sch
1/2	2.77	40S		2.77		40S
3/4	2.87	40S		2.87		40S
1	3.38	40S		3.38		40S
1 1/2	3.68	40S		3.68		40S
2	2.77	10S				
3	3.05	10S				

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code		CL600 RF 125 µin.Ra	
1/2	3	ASME-B16.5			

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	3	0	0

Welding		
Size from	to	Weld. spec.
1/2	3	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp. °C	Size up to
	3
2	70.83
37	70.83
50	70.83
85	70.83
Max. hydr. P.	106

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
	1/2	A							
	3/4	A	A						
	1	A	A	A					
	1 1/2	A	A	A	A				
	2	S	S	S	S	T			
	3	S	S	S	S	T	T		
Branch size	1/2	3/4	1	1 1/2	2	3			
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - MSS-SP97								
T	TEE - ASME-B16.9								
W	WELDOLET - MSS-SP97								



JOB 316800					
Piping Class N6L0					
Sh.	2	of	3	Rev.	
				A0	A1

Component/Material descriptions					
Size	Item	Rating/Facing	Material		
opt.	from	to			
PIPE					
	1/2	3	PIPE		ASTM A312 TP316L - SMLS
CONNECTION FLANGE					
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F316L
	2	3	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F316L
BLIND FLANGE					
	1/2	3	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra	ASTM A182 F316L
SPECTACLE BLIND					
	1/2	3	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra	ASTM A240 TP316L
ELBOW					
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2	3	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP316LS - SMLS
REDUCER					
	2	3	REDUCER - ASME-B16.9		ASTM A403 WP316LS - SMLS
CAP					
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F316L
	2	3	CAP - ASME-B16.9		ASTM A403 WP316LS - SMLS
COUPLING					
	1/2	1 1/2	COUPLING - SW/THDD ENDS - ASME-B16.11	3000	ASTM A182 F316L
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
MALE PLUG					
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F316L
NIPPLES					
	1/2	3/4	NIPPLE - THDD/THDD - BS3799		ASTM A312 TP316L - SMLS
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM A312 TP316L - SMLS
SWAGE NIPPLES					
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - MSS-SP95		ASTM A403 WP316LS - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP316LS - SMLS
TEE					
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F316L
	2	3	TEE - ASME-B16.9		ASTM A403 WP316LS - SMLS
THREDOLET					
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000	ASTM A182 F316L
SOCKOLET					
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F316L
SPIRAL WOUND					
	1/2	3	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		316 SS+GRAPH 98% - C.S. OUT.RING
BOLTS					
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B7 + ASTM A194 GR.2H



JOB 316800			
Piping Class N6L0			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60127 Austenitic Steel - Gate-BB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
1	2	3	GA-E-60187 Austenitic Steel - Gate-BB-FB-Split wdg-Widd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited
4	1/2	1 1/2	GA-E-60226 Austenitic Steel - Globe-BB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
4	2	3	GA-E-60270 Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited
6	1/2	1 1/2	GA-E-60327 Austenitic Steel - Check-BB-Red.B-Piston-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F316L Trim Mat. 316L stellited
6	2	3	GA-E-60376 Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF3M Trim Mat. 316L stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class P300			
Sh. 1 of 3		Rev.	
A0	A1		

Service REGENERATION LOOP GAS (Unit 02)
Codes

Size	Thickesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	2.77	40S
3/4	2.87	40S	2.87	2.87	40S
1	3.38	40S	3.38	3.38	40S
1 1/2	3.68	40S	3.68	3.68	40S
2	3.91	40S			
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			
8	3.76	10S			
10	4.19	10S			
12	4.57	10S			

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	12	ASME-B16.5	CL300 RF 125 µin.Ra		
11	12	ASME-B16.5	CL300 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance				
Size from	to	Internal	External	
1/2	12	0	0	

Welding		
Size from	to	Weld. spec.
1/2	12	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	6	12
		Pressure in bar	
2		49.62	34.41
38		49.62	34.41
50		48.5	34.41
100		44.06	34.41
150		40.96	34.41
200		38.17	34.41
250		35.94	33.42
300		34.02	31.97
350		32.84	30.63
400		31.68	29.57
450		30.73	28.79
500		27.9	28.34
550		23.25	22.88
565		21.76	16.52
Max. hydr. P.		74.4	51.6

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees											
Run size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
1/2	A										
3/4	A	A									
1	A	A	A								
1 1/2	A	A	A	A							
2	S	S	S	S	T						
3	S	S	S	S	T	T					
4	S	S	S	S	T	T	T				
6	S	S	S	S	W	T	T	T			
8	S	S	S	S	W	W	T	T	T		
10	S	S	S	S	W	W	W	T	T	T	
12	S	S	S	S	W	W	W	T	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12
Legenda											
A	TEE - SW ENDS - ASME-B16.11										
S	SOCKOLET - SW END - MSS-SP97										
T	TEE - ASME-B16.9										
W	WELDOLET - MSS-SP97										



JOB 316800			
Piping Class P300			
Sh. 2 of 3	Rev.		
	A0	A1	

Component/Material descriptions				
	Size	Item	Rating/Facing	Material
opt.	from	to		
PIPE				
	1/2	6	PIPE	ASTM A312 TP321 - SMLS
	8	12	PIPE	ASTM A358 TP321 CL.1 - EFW
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F321
	2	12	WN FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F321
11	12	12	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL300 RF 125 µin.Ra ASTM A182 F321
BLIND FLANGE				
	1/2	12	BLIND FLANGE - ASME-B16.5	CL300 RF 125 µin.Ra ASTM A182 F321
SPECTACLE BLIND				
1	12	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL300 RF 125 µin.Ra	ASTM A240 TP321
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000 ASTM A182 F321
	2	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP321S - SMLS
	8	12	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP321WX - WLDD
REDUCER				
	2	6	REDUCER - ASME-B16.9	ASTM A403 WP321S - SMLS
	8	12	REDUCER - ASME-B16.9	ASTM A403 WP321WX - WLDD
CAP				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A182 F321
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000 ASTM A182 F321
	2	12	CAP - ASME-B16.9	ASTM A403 WP321S - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000 ASTM A182 F321
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000 ASTM A182 F321
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F321
NIPPLES				
	1/2	3/4	NIPPLE - THDD/THDD - BS3799	ASTM A312 TP321 - SMLS
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A312 TP321 - SMLS
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799	ASTM A403 WP321S - SMLS
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95	ASTM A403 WP321S - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000 ASTM A182 F321
	2	6	TEE - ASME-B16.9	ASTM A403 WP321S - SMLS
	8	12	TEE - ASME-B16.9	ASTM A403 WP321WX - WLDD
WELDOLET				
	2	4	WELDOLET - MSS-SP97	ASTM A182 F321
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000 ASTM A182 F321
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL300 RF 125 µin.Ra ASTM A182 F321
SPIRAL WOUND				
	1/2	12	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	321 SS+GRAPH 98% - 321 OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A453 GR. 660



JOB 316800			
Piping Class P300			
Sh. 3 of 3	Rev.		
	A0	A1	

VALVES	Size	Doc.	Type
pos.	from	to	
1	1/2	1 1/2	GA-E-60174 Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited
1	2	12	GA-E-60175 Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited
4	1/2	1 1/2	GA-E-60259 Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited
4	2	8	GA-E-60260 Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited
6	1/2	1 1/2	GA-E-60365 Austenitic Steel - Check-WB-Red.B-Piston-Int seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited
6	2	12	GA-E-60366 Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL300 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited
11	1/2	1 1/2	GA-E-60583 Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM A182 F321 Trim Mat. 321 stellited



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class P6H1			
Sh. 1 of 3	Rev.		
	A0	A1	A2

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes

Design code : ASME B 31.3

Size	Thickesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	3.73	80S	
3/4	2.87	40S	3.91	80S	
1	3.38	40S	4.55	80S	
1 1/2	3.68	40S	5.08	80S	
2	3.91	40S			
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			
8	12.7	80S			
10	12.7	80S			
12	12.7	80S			
14	12.7				
16	14.27				
18	15.88				
20	17.48				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	6	20
		Pressure in bar	
2		77.43	75.42
38		77.43	75.42
50		77.43	75.42
100		77.43	75.42
150		77.43	75.42
200		76.65	75.42
250		71.94	71.94
300		68.28	68.28
350		65.43	65.43
400		63.04	63.04
450		61.76	61.76
470		61.32	61.32
Max. hydr. P.		116.1	113.1

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																			
Run size																			
1/2	A																		
3/4	A	A																	
1	A	A	A																
1 1/2	A	A	A	A															
2	S	S	S	S	T														
3	S	S	S	S	T	T													
4	S	S	S	S	T	T	T												
6	S	S	S	S	W	T	T	T											
8	S	S	S	S	W	W	T	T	T										
10	S	S	S	S	W	W	W	T	T	T									
12	S	S	S	S	W	W	W	T	T	T	T								
14	S	S	S	S	W	W	W	W	T	T	T	T							
16	S	S	S	S	W	W	W	W	T	T	T	T	T						
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T					
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T				
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20				
Legenda																			
A	TEE - SW ENDS - ASME-B16.11																		
S	SOCKOLET - SW END - MSS-SP97																		
T	TEE - ASME-B16.9																		
W	WELDOLET - MSS-SP97																		



JOB 316800				
Piping Class P6H1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
	Size	Item	Rating/Facing	Material
opt.	from	to		
PIPE				
	1/2	6	PIPE	ASTM A312 TP321 - SMLS
	8	20	PIPE	ASTM A358 TP321 CL.1 - EFW
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
	2	20	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
11	12	20	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra
BLIND FLANGE				
	1/2	20	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra
SPECTACLE BLIND				
	2	20	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra
				ASTM A240 TP321
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000
	2	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM A182 F321
	8	20	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP321S - SMLS
				ASTM A403 WP321WX - WLDD
REDUCER				
	2	6	REDUCER - ASME-B16.9	ASTM A403 WP321S - SMLS
	8	20	REDUCER - ASME-B16.9	ASTM A403 WP321WX - WLDD
CAP				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000
	2	20	CAP - ASME-B16.9	ASTM A403 WP321S - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000
				ASTM A182 F321
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F321
NIPPLES				
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799	ASTM A312 TP321 - SMLS
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799	ASTM A403 WP321S - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799	ASTM A403 WP321S - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000
	2	6	TEE - ASME-B16.9	ASTM A182 F321
	8	20	TEE - ASME-B16.9	ASTM A403 WP321S - SMLS
				ASTM A403 WP321WX - WLDD
WELDOLET				
	2	8	WELDOLET - MSS-SP97	ASTM A182 F321
THREDOLET				
	1/2	1 1/2	THREDOLET - THD END - MSS-SP97	3000
				ASTM A182 F321
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000
				ASTM A182 F321
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra
				ASTM A182 F321
SPIRAL WOUND				
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	321 SS+GRAPH 98% - 321 OUT.RING



JOB 316800								
Piping Class P6H1								
Sh.	3	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt. from to				
BOLTS				
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A453 GR. 660

VALVES				
Size	Doc.	Type		
pos. from to				
1	1/2	1 1/2	GA-E-60174	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited
1	2	20	GA-E-60166	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited
4	1/2	1 1/2	GA-E-60259	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited
4	2	8	GA-E-60254	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited
6	2	20	GA-E-60360	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class P7H1					
Sh. 1 of 3	Rev.				
	A0	A1	A2		

Service	HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes	

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S		3.73	80S
3/4	2.87	40S		3.91	80S
1	3.38	40S		4.55	80S
1 1/2	3.68	40S		5.08	80S
2	3.91	40S			
3	5.49	40S			
4	6.02	40S			
6	10.97	80S			
8	12.7	80S			
10	12.7	80S			
12	12.7	80S			
14	15.09				
16	15.88				
18	17.48				
20	19.05				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	2 1/2	ASME-B16.5		CL1500 RF	125 µin.Ra
	3	ASME-B16.5		CL900 RF	125 µin.Ra
11	12	ASME-B16.5		CL900 RF	125 µin.Ra

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	6	20
		Pressure in bar	
2		85.36	83
37		85.36	83
50		85.36	83
100		85.36	83
150		85.36	83
200		85.36	83
250		82.91	80.62
300		79.3	77.11
350		75.98	73.89
380		74.28	72.23
Max. hydr. P.		128	124.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																		
Run size																		
1/2	A																	
3/4	A	A																
1	A	A	A															
1 1/2	A	A	A	A														
2	S	S	S	S	T													
3	S	S	S	S	T	T												
4	S	S	S	S	T	T	T											
6	S	S	S	S	W	T	T	T										
8	S	S	S	S	W	W	T	T	T									
10	S	S	S	S	W	W	W	T	T	T								
12	S	S	S	S	W	W	W	T	T	T	T							
14	S	S	S	S	W	W	W	W	T	T	T	T						
16	S	S	S	S	W	W	W	W	T	T	T	T	T					
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T				
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T			
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20			

Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - MSS-SP97
T	TEE - ASME-B16.9
W	WELDOLET - MSS-SP97



JOB 316800								
Piping Class P7H1								
Sh.	2	of	3					
				Rev.				
				A0	A1	A2		

Component/Material descriptions						
	Size	Item	Rating/Facing	Material		
opt.	from	to				
PIPE						
	1/2	6	PIPE		ASTM A312 TP321 - SMLS	
	8	20	PIPE		ASTM A358 TP321 CL.1 - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra	ASTM A182 F321	
	2	20	WN FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A182 F321	
11	12	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL900 RF 125 µin.Ra	ASTM A182 F321	
BLIND FLANGE						
	1/2	20	BLIND FLANGE - ASME-B16.5	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A182 F321	
SPECTACLE BLIND						
	1	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL1500 RF 125 µin.Ra CL900 RF 125 µin.Ra	ASTM A240 TP321	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM A182 F321	
	2	6	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP321S - SMLS	
	8	20	LONG RADIUS ELBOW - ASME-B16.9		ASTM A403 WP321WX - WLDD	
REDUCER						
	2	6	REDUCER - ASME-B16.9		ASTM A403 WP321S - SMLS	
	8	20	REDUCER - ASME-B16.9		ASTM A403 WP321WX - WLDD	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM A182 F321	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM A182 F321	
	2	20	CAP - ASME-B16.9		ASTM A403 WP321S - SMLS	
COUPLING						
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000	ASTM A182 F321	
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM A182 F321	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM A182 F321	
NIPPLES						
	1/2	3/4	NIPPLE - THDD/PE - BS3799		ASTM A312 TP321 - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM A403 WP321S - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM A403 WP321S - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM A182 F321	
	2	6	TEE - ASME-B16.9		ASTM A403 WP321S - SMLS	
	8	20	TEE - ASME-B16.9		ASTM A403 WP321WX - WLDD	
WELDOLET						
	2	8	WELDOLET - MSS-SP97		ASTM A182 F321	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000	ASTM A182 F321	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL1500 RF 125 µin.Ra	ASTM A182 F321	
SPIRAL WOUND						
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		321 SS+GRAPH 98% - 321 OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A453 GR. 660	



JOB 316800			
Piping Class P7H1			
Sh. 3 of 3	Rev.		
	A0	A1	A2

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60169	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL1500 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited	
1	2	2	GA-E-60168	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL1500 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited	
1	3	20	GA-E-60167	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited	
4	1/2	1 1/2	GA-E-60280	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL1500 - SW Body Mat. ASTM A182 F321 Trim Mat. 321 stellited	
4	3	8	GA-E-60255	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL900 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 321 stellited	



Customer Piping Class
Ref. Doc.

JOB 316800					
Piping Class R6H1					
Sh.	1	of	3	Rev.	
				A0	A1

Service HYDROGEN WITH OR WITHOUT HYDROCARBONS
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	3.73	80S	
3/4	2.87	40S	3.91	80S	
1	3.38	40S	4.55	80S	
1 1/2	3.68	40S	5.08	80S	
2	3.91	40S			
3	5.49	40S			
4	6.02	40S			
6	7.11	40S			
8	8.18	40S			
10	12.7	80S			
12	12.7	80S			
14	12.7				
16	14.27				
18	15.88				
20	17.48				

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	20	ASME-B16.5	CL600 RF 125 µin.Ra		
11	12	20 ASME-B16.5	CL600 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	20	1.6	0

Welding		
Size from	to	Weld. spec.
1/2	20	NIOEC-SP-90-02
Weld. class		100%

Design Limits		
Temp. °C	Size up to	Pressure in bar
	6	20
2	92.72	71.43
37	92.72	71.43
50	92.72	71.43
100	90.26	71.43
150	84.68	71.43
200	79.41	71.43
250	75.27	71.14
300	71.73	69.53
350	69.3	67.51
400	67.88	66.06
Max. hydr. P.	139	107.1

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees																
Run size																
1/2	A															
3/4	A	A														
1	A	A	A													
1 1/2	A	A	A	A												
2	S	S	S	S	T											
3	S	S	S	S	T	T										
4	S	S	S	S	T	T	T									
6	S	S	S	S	W	T	T	T								
8	S	S	S	S	W	W	T	T	T							
10	S	S	S	S	W	W	W	T	T	T						
12	S	S	S	S	W	W	W	T	T	T	T					
14	S	S	S	S	W	W	W	W	T	T	T	T				
16	S	S	S	S	W	W	W	W	T	T	T	T	T			
18	S	S	S	S	W	W	W	W	W	T	T	T	T	T		
20	S	S	S	S	W	W	W	W	W	T	T	T	T	T	T	
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	
Legenda																
A	TEE - SW ENDS - ASME-B16.11															
S	SOCKOLET - SW END - MSS-SP97															
T	TEE - ASME-B16.9															
W	WELDOLET - MSS-SP97															



JOB 316800				
Piping Class R6H1				
Sh.	2	of	3	
				Rev.
	A0	A1	A2	

Component/Material descriptions				
	Size	Item	Rating/Facing	Material
opt.	from	to		
PIPE				
	1/2	6	PIPE	ASTM A312 TP347 - SMLS
	8	20	PIPE	ASTM A358 TP347 CL.1 - EFW
CONNECTION FLANGE				
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A182 F347
	2	20	WN FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A182 F347
11	16	16	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL600 RF 125 µin.Ra ASTM A182 F347
BLIND FLANGE				
	1/2	20	BLIND FLANGE - ASME-B16.5	CL600 RF 125 µin.Ra ASTM A182 F347
SPECTACLE BLIND				
	16	16	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL600 RF 125 µin.Ra ASTM A240 TP347
ELBOW				
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000 ASTM A182 F347
	2	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP347S - SMLS
	8	20	LONG RADIUS ELBOW - ASME-B16.9	ASTM A403 WP347WX - WLDD
REDUCER				
	2	6	REDUCER - ASME-B16.9	ASTM A403 WP347S - SMLS
	8	20	REDUCER - ASME-B16.9	ASTM A403 WP347WX - WLDD
CAP				
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000 ASTM A182 F347
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000 ASTM A182 F347
	2	20	CAP - ASME-B16.9	ASTM A403 WP347S - SMLS
COUPLING				
	1/2	1 1/2	COUPLING - THD ENDS - ASME-B16.11	3000 ASTM A182 F347
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000 ASTM A182 F347
MALE PLUG				
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11	ASTM A182 F347
NIPPLES				
	1/2	3/4	NIPPLE - THDD/PE - BS3799	ASTM A312 TP347 - SMLS
SWAGE NIPPLES				
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799	ASTM A403 WP347S - SMLS
	1/2	1 1/2	SWAGE NIPPLE - PE/THDD - BS3799	ASTM A403 WP347S - SMLS
TEE				
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000 ASTM A182 F347
	2	6	TEE - ASME-B16.9	ASTM A403 WP347S - SMLS
	8	20	TEE - ASME-B16.9	ASTM A403 WP347WX - WLDD
WELDOLET				
	2	8	WELDOLET - MSS-SP97	ASTM A182 F347
SOCKOLET				
	1/2	1 1/2	SOCKOLET - SW END - MSS-SP97	3000 ASTM A182 F347
FLANGED INSERT				
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL600 RF 125 µin.Ra ASTM A182 F347
SPIRAL WOUND				
	1/2	20	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	347 SS+GRAPH 98% - 347 OUT.RING
BOLTS				
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A453 GR. 660



JOB 316800					
Piping Class R6H1					
Sh.	3	of	3		
				Rev.	
	A0	A1	A2		

VALVES					
pos.	Size from	Size to	Doc.	Type	
1	1/2	1 1/2	GA-E-60584	Austenitic Steel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SW Body Mat. ASTM A182 F347 Trim Mat. 347 stellited	
1	2	20	GA-E-60170	Austenitic Steel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 347 stellited	
4	1/2	1 1/2	GA-E-60281	Austenitic Steel - Globe-WB-Red.B-Thdd seat - BS5352 - CL800 - SW Body Mat. ASTM A182 F347 Trim Mat. 347H stellited	
6	2	20	GA-E-60361	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL600 - RF - 125 µin.Ra Body Mat. ASTM A351 CF8C Trim Mat. 347 stellited	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class T1A1			
Sh.	1	of	2
	A0	A1	

Service	HYDROCARBONS WITH HYDROGEN
Codes	

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
6	3.4	10S			

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
6	6	ASME-B16.5
		CL150 RF 125 µin.Ra

Corrosion Allowance		
Size from	to	Internal External
6	6	1.6 0

Welding		
Size from	to	Weld. spec.
6	6	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp.	Size up to
	6
°C	Pressure in bar
2	9
38	9
50	9
100	9
Max. hydr. P.	13.5

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees	
Run size	6 T
Branch size	6
Legenda	
A	TEE - SW ENDS - ASME-B16.11
S	SOCKOLET - SW END - TB RAC 5380
T	TEE - ASME-B16.9
W	WELDOLET - TB RAC 5049

Component/Material descriptions			
Size	Item	Rating/Facing	Material
opt. from	to		
PIPE			
6	6	PIPE	ASTM B725 UNS N04400 (Ann.) Cat.1(Hydr.Tst) -EFW
CONNECTION FLANGE			
6	6	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM B564 UNS N04400 (Ann.)
BLIND FLANGE			
6	6	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra ASTM B564 UNS N04400 (Ann.)
SPECTACLE BLIND			
6	6	SPECIAL SPECTACLE BLIND - <MFR Std>	CL150 RF 125 µin.Ra ASTM B127 UNS N04400 (Ann.)
ELBOW			
6	6	LONG RADIUS ELBOW - ASME-B16.9	ASTM B366 WPNC-W (UNS N04400) - WLDD
TEE			
6	6	TEE - ASME-B16.9	ASTM B366 WPNC-W (UNS N04400) - WLDD
SPIRAL WOUND			
6	6	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365	MONEL 400+GRAPH 98%
BOLTS			
1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368	ASTM A193 B8 CL.2 + ASTM A194 GR.8



JOB 316800					
Piping Class T1A1					
Sh.	2	of	2	Rev.	
				A0	A1

VALVES				
pos.	Size from	to	Doc.	Type
1	6	6	GA-E-60184	Nickel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A494 M35-1 Trim Mat. Monel



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class W1L0			
Sh. 1 of 3	Rev.		
	A0	A1	

Service DEMI REGENERATION EFFLUENT
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1/2	2.77	40S		2.77	40S	
3/4	2.87	40S		2.87	40S	
1	3.38	40S		3.38	40S	
1 1/2	3.68	40S		3.68	40S	
2	2.77	10S				
3	3.05	10S				
4	3.05	10S				
6	3.4	10S				
8	3.76	10S				

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1/2	8	ASME-B16.5
CL150 RF 125 µin.Ra		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	8	0	0

Welding		
Size from	to	Weld. spec.
1/2	8	NIOEC-SP-90-02
Weld. class		100%

Design Limits	
Temp.	Size up to
°C	8
2	4
50	4
85	4
Max. hydr. P.	6

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees									
Run size									
1/2	A								
3/4	A	A							
1	A	A	A						
1 1/2	A	A	A	A					
2	S	S	S	S	T				
3	S	S	S	S	T	T			
4	S	S	S	S	T	T	T		
6	S	S	S	S	W	T	T	T	
8	S	S	S	S	W	W	T	T	T
Branch size	1/2	3/4	1	1 1/2	2	3	4	6	8
Legenda									
A	TEE - SW ENDS - ASME-B16.11								
S	SOCKOLET - SW END - TB RAC 5380								
T	TEE - ASME-B16.9								
W	WELDOLET - TB RAC 5049								



JOB 316800				
Piping Class W1L0				
Sh.	2	of	3	
				Rev.
	A0	A1		

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
	1/2 1 1/2	PIPE		ASTM B729 UNS N08020 (Ann.) - SMLS
	2 8	PIPE		ASTM B464 UNS N08020 (Ann.) - EFW
CONNECTION FLANGE				
	1/2 1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM B462 UNS N08020 (Ann.)
	2 8	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM B462 UNS N08020 (Ann.)
BLIND FLANGE				
	1/2 8	BLIND FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM B462 UNS N08020 (Ann.)
SPECTACLE BLIND				
	8 8	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM B463 UNS N08020
ELBOW				
	1/2 1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
	2 8	LONG RADIUS ELBOW - ASME-B16.9		ASTM B366 WP20CB-W - EFW
REDUCER				
	1/2 1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
	2 8	REDUCER - ASME-B16.9		ASTM B366 WP20CB-W - EFW
CAP				
	1/2 1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
	1/2 3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
	2 8	CAP - ASME-B16.9		ASTM B729 UNS N08020 (Ann.) - SMLS
COUPLING				
	1/2 1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
MALE PLUG				
	1/2 1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM B462 UNS N08020 (Ann.)
NIPPLES				
	1/2 1 1/2	NIPPLE - THDD/PE - BS3799		ASTM B729 UNS N08020 (Ann.) - SMLS
	1/2 1 1/2	NIPPLE - PE/PE - BS3799		ASTM B729 UNS N08020 (Ann.) - SMLS
SWAGE NIPPLES				
	1/2 1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM B729 UNS N08020 (Ann.) - SMLS
	1/2 3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM B729 UNS N08020 (Ann.) - SMLS
TEE				
	1/2 1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM B462 UNS N08020 (Ann.)
	2 8	TEE - ASME-B16.9		ASTM B366 WP20CB-W - EFW
WELDOLET				
	2 3	WELDOLET - TB RAC 5049		ASTM B462 UNS N08020 (Ann.)
SOCKOLET				
	1/2 1 1/2	SOCKOLET - SW END - TB RAC 5380	3000	ASTM B462 UNS N08020 (Ann.)
FLANGED INSERT				
	1 1 1/2	LWN FLANGE - TB FLG 5040	CL150 RF 125 µin.Ra	ASTM B462 UNS N08020 (Ann.)
SPIRAL WOUND				
	1/2 8	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		INCONEL 600+GRAPH 98% - I.600 OUT.RING
BOLTS				
	1/4 4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B8 CL.2 + ASTM A194 GR.8



JOB 316800					
Piping Class W1L0					
Sh.	3	of	3	Rev.	
				A0	A1

VALVES					
pos.	Size from	to	Doc.	Type	
1	2	8	GA-E-60185	Nickel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A351 CN7M Trim Mat. Alloy 20	
6	2	8	GA-E-60330	Nickel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF Body Mat. ASTM A351 CN7M Trim Mat. Alloy 20	
11	1/2	1 1/2	GA-E-60585	Nickel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM B462 UNS N08020 (Ann.) Trim Mat. Alloy 20	



JOB 316800					
Piping Class Y1K0					
Sh.	1	of	2	Rev.	
				A0	A1

Customer Piping Class
Ref. Doc.

Service WASTE WATER
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting	Nipples	
	Thk	Sch		Thk	Thk
1					
1 1/2					
2					
3					
4					
6					
8					
10					
12					
14					
16					
18					
20					
24					
26					
28					
30					
32					
34					
36					
38					
40					
44					
46					
52					
56					
60					
64					

Flange Rating/Facing/Face Finishing			
opt. from	to	Code	
1	60	<MFR Std - Plastic>	GA-E- 60040 CL150 FF
62	64	AWWA-C207	GA-E- 60040 CL275 FF

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1	64	<MFR Std - Plastic>			PN16

Corrosion Allowance			
Size from	to	Internal	External
1	64	0	0

Welding		
Size from	to	Weld. spec.
1	64	---
Weld. class		

Design Limits		
Temp. °C	Size up to	Pressure in bar
	64	
2	16	
75	16	
85	16	
Max. hydr. P. 24		

Notes:

Branch Connections 90 Degrees																												
Run size	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	34	36	38	40	44	46	52	56	60	64
1	A																											
1 1/2	A	A																										
2	A	A	A																									
3	A	A	A	A																								
4	A	A	A	A	A																							
6	S	S	S	A	A	A																						
8	S	S	S	A	A	A	A																					
10	S	S	S	P	A	A	A	A																				
12	S	S	S	P	P	A	A	A	A																			
14	S	S	S	P	P	P	A	A	A	A																		
16	S	S	S	P	P	P	P	A	A	A	A																	
18	S	S	S	P	P	P	P	P	A	A	A	A	A															
20	S	S	S	P	P	P	P	P	P	A	A	A	A	A														
24	S	S	S	P	P	P	P	P	P	P	A	A	A	A	A													
26	S	S	S	P	P	P	P	P	P	P	P	A	A	A	A													
28	S	S	S	P	P	P	P	P	P	P	P	P	P	P	A	A												
30	S	S	S	P	P	P	P	P	P	P	P	P	P	P	A	A	A											
32	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A										
34	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A								
36	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A							
38	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A						
40	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	A	A					
44	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R			
46	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R		
52	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R	R	
56	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R	R	
60	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R	R	
64	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R	R	R	R	

Legenda	
A	TEE - BELL ENDS - <MFR Std - Plastic>
P	Pipe to Pipe
R	TEE - PE ENDS - <MFR Std - Plastic>
S	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>



JOB 316800			
Piping Class Y1K0			
Sh.	2	of	2
	A0	A1	

Component/Material descriptions				
opt.	Size from to	Item	Rating/Facing	Material
PIPE				
1	40	PIPE - BELL & SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
42	64	PIPE - BELL & SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
CONNECTION FLANGE				
1	40	BELL FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040
42	60	WN FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-VINYLESTER GA-E-60040
62	64	SO FLANGE - Flat Ring - AWWA-C207	CL275 FF	RTR-VINYLESTER GA-E-60040
BLIND FLANGE				
1	40	BLIND FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040
42	60	BLIND FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-VINYLESTER GA-E-60040
SPECTACLE BLIND				
28	28	SPECIAL BLIND & SPACER - <MFR Std>	CL150 FF	ASTM A240 TP316
ELBOW				
1	40	ELBOW - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
42	64	ELBOW - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
REDUCER				
1	40	REDUCER - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
42	64	REDUCER - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
COUPLING				
1	40	COUPLING - SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
TEE				
1	40	TEE - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
44	64	TEE - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
FLAT NON-METALLIC				
1	60	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE GA-E-60040
62	64	FLAT NON MET.GASKET - AWWA-C207		NEOPRENE GA-E-60040
N.M. INSERT				
1	2	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040
BOLTS				
1/4	4	ST.BOLT+2 NUTS+2 WASH. - ANSI Thdd - TB BUL 5368		ASTM A307 GR.B+ A563 GR.A

VALVES				
pos.	Size from to	Doc.	Type	
1	1 24	GA-E-60180	Austenitic Steel - Gate-BB-FB-Split wdg-Wlidd seat - API600 - CL150 - FF Body Mat. ASTM A351 CF8M Trim Mat. 316	
2	3 24	GA-E-60503	Austenitic Steel - Butterfly-Lug wafer-Triple Off Set-Int.seat-Fire safe - API609 - CL150 - FF Body Mat. ASTM A351 CF8M Trim Mat. Metal seat - 316 - 316 disc	
2	26 40	GA-E-60504	Austenitic Steel - Butterfly-Flanged-Triple Off Set-Int.seat-Fire safe - API609 - CL150 - FF Body Mat. ASTM A351 CF8M Trim Mat. Metal seat - 316 - 316 disc	
4	1 8	GA-E-60265	Austenitic Steel - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - FF Body Mat. ASTM A351 CF8M Trim Mat. 316	
6	1 24	GA-E-60371	Austenitic Steel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - FF Body Mat. ASTM A351 CF8M Trim Mat. 316	

STRAINERS				
pos.	Size from to	Doc.	Type	
1	2 12	GA-E-60631	Austenitic Steel - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - FF - N/A Body Mat. ASTM A351 CF8M Trim Mat. 316 - PERF.PLATE - 18 Holes/Cm2	



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class Y1L0			
Sh.	1	of	4
		A0	A1
		A2	

Service SWS SWR PN 16 U/G and A/G
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1					
1 1/2					
2					
3					
4					
6					
8					
10					
12					
14					
16					
18					
20					
24					
26					
28					
30					
32					
34					
36					
38					
40					
44					
46					
52					
56					
60					
64					
68					
72					
76					
80					
88					
90					
92					
96					

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1	60	<MFR Std - Plastic> GA-E- 60040	CL150 FF		
62	96	AWWA-C207 GA-E- 60040	CL275 FF		
3	1 1/2	<MFR Std - Plastic> GA-E- 60042	CL300 FF		

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1	96	<MFR Std - Plastic>			PN16

Corrosion Allowance			
Size from	to	Internal	External
1	96	0	0

Welding		
Size from	to	Weld. spec.
1	96	---
Weld. class		

Design Limits	
Temp. °C	Size up to Pressure in bar
	96
2	16
75	16
85	16
Max. hydr. P.	24

Notes:



JOB 316800					
Piping Class Y1L0					
Sh. 2 of 4		Rev.			
		A0	A1	A2	

Branch Connections 90 Degrees

Run size	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	34	36	38	40	44	46	52	56	60	64	68	72	76	80
1	A																															
1 1/2	A	A																														
2	A	A	A																													
3	A	A	A	A																												
4	A	A	A	A	A																											
6	S	S	S	S	A	A																										
8	S	S	S	S	A	A	A																									
10	S	S	S	S	P	P	A	A																								
12	S	S	S	S	P	P	P	A	A																							
14	S	S	S	S	P	P	P	P	A	A																						
16	S	S	S	S	P	P	P	P	P	A	A																					
18	S	S	S	S	P	P	P	P	P	P	A	A																				
20	S	S	S	S	P	P	P	P	P	P	P	A	A																			
24	S	S	S	S	P	P	P	P	P	P	P	P	P	A																		
26	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	A																
28	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	A															
30	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	A														
32	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A													
34	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A												
36	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A											
38	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A										
40	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A									
44	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A								
46	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R							
52	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
56	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
60	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
64	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
68	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
72	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
76	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
80	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
88	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
90	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
92	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						
96	S	S	S	S	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	R						

Legenda

A	TEE - BELL ENDS - <MFR Std - Plastic>
P	Pipe to Pipe
R	TEE - PE ENDS - <MFR Std - Plastic>
S	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>



JOB 316800			
Piping Class Y1L0			
Sh. 3 of 4	Rev.		
	A0	A1	A2

Branch Connections 90 Degrees

Run size				
1				
1 1/2				
2				
3				
4				
6				
8				
10				
12				
14				
16				
18				
20				
24				
26				
28				
30				
32				
34				
36				
38				
40				
44				
46				
52				
56				
60				
64				
68				
72				
76				
80				
88	R			
90	R	R		
92	R	R	R	
96	R	R	R	R
Branch size	88	90	92	96

Component/Material descriptions					
opt.	Size from	to	Item	Rating/Facing	Material
PIPE					
	1	40	PIPE - BELL & SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
	42	96	PIPE - BELL & SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
CONNECTION FLANGE					
	1	40	BELL FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040
	42	60	WN FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-VINYLESTER GA-E-60040
	62	96	SO FLANGE - Flat Ring - AWWA-C207	CL275 FF	RTR-VINYLESTER GA-E-60040
3	1	1 1/2	BELL FLANGE - <MFR Std - Plastic>	CL300 FF	RTR-EPOXY GA-E-60042
BLIND FLANGE					
	1	40	BLIND FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040
	42	60	BLIND FLANGE - <MFR Std - Plastic>	CL150 FF	RTR-VINYLESTER GA-E-60040
SPECTACLE BLIND					
	6	20	SPECIAL SPECTACLE BLIND - <MFR Std>	CL150 FF	ASTM B171 UNS C70600 (Ann.)
ELBOW					
	1	40	ELBOW - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
	42	96	ELBOW - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
REDUCER					
	1	40	REDUCER - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
	42	96	REDUCER - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
COUPLING					
	1	40	COUPLING - SPIGOT ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
TEE					
	1	40	TEE - BELL ENDS - <MFR Std - Plastic>	PN16	RTR-EPOXY GA-E-60040
	44	96	TEE - PE ENDS - <MFR Std - Plastic>	PN16	RTR-VINYLESTER GA-E-60040
FLAT NON-METALLIC					
	1	60	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE GA-E-60040
	62	96	FLAT NON MET. GASKET - AWWA-C207		NEOPRENE GA-E-60040



JOB 316800								
Piping Class Y1L0								
Sh.	4	of	4					
				Rev.				
				A0	A1	A2		

Branch Connections 90 Degrees

Run size		Branch size		Component/Material descriptions		
opt.	Size from	to	Item	Rating/Facing	Material	
N.M. INSERT						
	1	2	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>	CL150 FF	RTR-EPOXY GA-E-60040	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS+2 WASH. - ANSI Thdd - TB BUL 5368		ASTM A307 GR.B+ A563 GR.A	

VALVES				
pos.	Size from	to	Doc.	Type
1	1	2	GA-E-60137	Copper - Bronze Gate-UB-Red.B-Solid wdg- Rising stem-Int.seat - MSS-SP80 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE
2	3	24	GA-E-60500	Carbon Steel - Butterfly-Lug wafer-Sleeve type-Centered disk - API609 - CL150 - FF Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN16 - AL.BZ.disc
2	26	60	GA-E-60501	Carbon Steel - Butterfly-Flanged-Sleeve type-Centered disk - <MFR Std> - CL150 - FF Body Mat. ASTM A216 WCB Trim Mat. Sleeve/lined EPDM - PN16 - AL.BZ.disc
4	1	10	GA-E-60273	Copper - Globe-BB-Disk-Thdd seat - BS1873 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE
6	4	24	GA-E-60339	Copper - Check-Lug wafer-Dual plate-Wlidd seat - API594 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze
6	26	40	GA-E-60340	Copper - Check-Flanged or BW-Dual plate-Wlidd seat - API594 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze

STRAINERS				
pos.	Size from	to	Doc.	Type
1	2	12	GA-E-60601	Copper - Y Strainer-Bolted cover - ASME-B16.34 - CL150 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. MONEL - PERF.PLATE - 18 Holes/Cm2



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class Y3L0			
Sh. 1 of 2		Rev.	
A0			

Service SWS SWR PN 32 A/G
Codes

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1						
1 1/2						
2						
3						
4						
6						
8						
10						

Design code : ASME B 31.3

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1	10	<MFR Std - Plastic> GA-E- 60042 CL300 FF

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1	10	<MFR Std - Plastic>			PN32

Corrosion Allowance			
Size from	to	Internal	External
1	10	0	0

Welding		
Size from	to	Weld. spec.
1	10	---
Weld. class		

Design Limits	
Temp. °C	Size up to
	10
2	32
75	32
85	32
Max. hydr. P.	48

Notes:

Branch Connections 90 Degrees										
Run size										
1	A									
1 1/2	A	A								
2	A	A	A							
3	A	A	A	A						
4	A	A	A	A	A					
6	S	S	S	A	A	A				
8	S	S	S	A	A	A	A			
10	S	S	P	A	A	A	A	A		
Branch size	1	1 1/2	2	3	4	6	8	10		
Legenda										
A	TEE - BELL ENDS - <MFR Std - Plastic>									
P	PIPE TO PIPE									
S	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>									



JOB 316800			
Piping Class Y3L0			
Sh.	2	of	2
	A0		

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
1	10	PIPE - PE ENDS - <MFR Std - Plastic>	PN32	RTR-EPOXY GA-E-60042
CONNECTION FLANGE				
1	10	WN FLANGE - <MFR Std - Plastic>	CL300 FF	RTR-EPOXY GA-E-60042
BLIND FLANGE				
1	10	BLIND FLANGE - ASME-B16.5	CL300 FF	RTR-EPOXY GA-E-60042
ELBOW				
1	10	ELBOW - PE ENDS - <MFR Std - Plastic>	PN32	RTR-EPOXY GA-E-60042
REDUCER				
1	10	REDUCER - PE ENDS - <MFR Std - Plastic>	PN32	RTR-EPOXY GA-E-60042
CAP				
1	10	CAP - PE END - <MFR Std - Plastic>	PN32	RTR-EPOXY GA-E-60042
TEE				
1	10	TEE - BELL ENDS - <MFR Std - Plastic>	PN32	RTR-EPOXY GA-E-60042
FLAT NON-METALLIC				
1	10	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE GA-E-60042
N.M. INSERT				
1	2	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>	CL300 FF	RTR-EPOXY GA-E-60042
BOLTS				
1/4	4	ST.BOLT+2 NUTS+2 WASH. - ANSI Thdd - TB BUL 5368		ASTM A307 GR.B+ A563 GR.A

VALVES				
pos.	Size	Doc.	Type	
	from	to		
1	1	2	GA-E-60586	Copper - Bronze Gate-UB-Red.B-Solid wdg- Rising stem-Int.seat - MSS-SP80 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE
2	3	10	GA-E-60502	Copper - Butterfly-Lug wafer-Triple Off Set-Int.seat-Fire safe - API609 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Metal seat - MONEL
4	3	8	GA-E-60269	Copper - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class Y3L0(A)			
Sh. 1 of 2	Rev.		
	A0	A1	

Service SWS SWR PN 50 A/G
Codes

Design code : ASME B 31.3

Size	Pipe		Fitting		Nipples	
	Thk	Sch	Thk	Thk	Thk	Sch
1						
1 1/2						
2						
3						
4						
6						
8						
10						

Flange Rating/Facing/Face Finishing		
opt. from	to	Code
1	10	<MFR Std - Plastic> GA-E- 60042 CL300 FF

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1	10	<MFR Std - Plastic>			PN50

Corrosion Allowance			
Size from	to	Internal	External
1	10	0	0

Welding		
Size from	to	Weld. spec.
1	10	---
Weld. class		

Design Limits	
Temp. °C	Size up to Pressure in bar
	10
2	50
75	50
85	50
Max. hydr. P.	75

Notes:

Branch Connections 90 Degrees										
Run size										
	1	A								
	1 1/2	A	A							
	2	A	A	A						
	3	A	A	A	A					
	4	A	A	A	A	A				
	6	S	S	S	A	A	A			
	8	S	S	S	A	A	A	A		
	10	S	S	S	P	A	A	A	A	
Branch size	1	1 1/2	2	3	4	6	8	10		
Legenda										
A	TEE - BELL ENDS - <MFR Std - Plastic>									
P	PIPE TO PIPE									
S	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>									



JOB 316800			
Piping Class Y3L0(A)			
Sh.	2	of	2

Component/Material descriptions				
Size	Item	Rating/Facing	Material	
opt.	from	to		
PIPE				
1	10	PIPE - PE ENDS - <MFR Std - Plastic>	PN50	RTR-EPOXY GA-E-60043
CONNECTION FLANGE				
1	10	WN FLANGE - <MFR Std - Plastic>	CL300 FF	RTR-EPOXY GA-E-60043
BLIND FLANGE				
1	10	BLIND FLANGE - ASME-B16.5	CL300 FF	RTR-EPOXY GA-E-60043
ELBOW				
1	10	ELBOW - PE ENDS - <MFR Std - Plastic>	PN50	RTR-EPOXY GA-E-60043
REDUCER				
1	10	REDUCER - PE ENDS - <MFR Std - Plastic>	PN50	RTR-EPOXY GA-E-60043
CAP				
1	10	CAP - PE END - <MFR Std - Plastic>	PN50	RTR-EPOXY GA-E-60043
TEE				
1	10	TEE - BELL ENDS - <MFR Std - Plastic>	PN50	RTR-EPOXY GA-E-60043
FLAT NON-METALLIC				
1	10	FLAT NON MET. GASKET - TB GUA 5365		NEOPRENE GA-E-60043
N.M. INSERT				
1	2	SPECIAL FLANGED SADDLE - <MFR Std - Plastic>	CL300 FF	RTR-EPOXY GA-E-60043
BOLTS				
1/4	4	ST.BOLT+2 NUTS+2 WASH. - ANSI Thdd - TB BUL 5368		ASTM A307 GR.B+ A563 GR.A

VALVES				
pos.	Size	Doc.	Type	
	from	to		
1	1	2	GA-E-60586	Copper - Bronze Gate-UB-Red.B-Solid wdg- Rising stem-Int.seat - MSS-SP80 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE
2	3	10	GA-E-60502	Copper - Butterfly-Lug wafer-Triple Off Set-Int.seat-Fire safe - API609 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Metal seat - MONEL
4	3	8	GA-E-60269	Copper - Globe-BB-Disk-Thdd seat - BS1873 - CL300 - FF Body Mat. ASTM B148 UNS C95800 Trim Mat. Aluminum Bronze - PTFE



Customer Piping Class
Ref. Doc.

JOB 316800			
Piping Class Z100			
Sh. 1 of 3	Rev.		
	A0	A1	

Service REGENERATION LOOP GAS + SALTS (Unit 02)
Codes

Design code : ASME B 31.3

Size	Thicknesses				
	Pipe		Fitting	Nipples	
	Thk	Sch	Thk	Thk	Sch
1/2	2.77	40S	2.77	40S	
3/4	2.87	40S	2.87	40S	
1	3.38	40S	3.38	40S	
1 1/2	3.68	40S	3.68	40S	
3	3.05	10S			
14	4.78	10S			

Flange Rating/Facing/Face Finishing					
opt. from	to	Code			
1/2	14	ASME-B16.5	CL150 RF 125 µin.Ra		
3	1/2	1 1/2	ASME-B16.5	CL300 RF 125 µin.Ra	
11	12	14	ASME-B16.5	CL150 RF 125 µin.Ra	

Fitting Class					
opt. from	to	Code	SW	THDD	PN
1/2	1 1/2	ASME-B16.11	3000	3000	

Corrosion Allowance			
Size from	to	Internal	External
1/2	14	0	0

Welding		
Size from	to	Weld. spec.
1/2	14	NIOEC-SP-90-02
Weld. class		100%

Design Limits			
Temp. °C	Size up to	Pressure in bar	
	3		14
2	13.8		8
50	13.8		8
85	13.8		8
256			8
Max. hydr. P.	20.7		12

Notes: Flanges welding neck and butt welding fittings have the same thickness of relevant pipe.

Branch Connections 90 Degrees							
Run size							
1/2	A						
3/4	A	A					
1	A	A	A				
1 1/2	A	A	A	A			
3	S	S	S	S	T		
14	S	S	S	S	W	T	
Branch size	1/2	3/4	1	1 1/2	3	14	
Legenda							
A	TEE - SW ENDS - ASME-B16.11						
S	SOCKOLET - SW END - TB RAC 5380						
T	TEE - ASME-B16.9						
W	WELDOLET - TB RAC 5049						



JOB 316800							
Piping Class Z100							
Sh.	2	of	3	Rev.			
				A0	A1		

Component/Material descriptions						
opt.	Size from	to	Item	Rating/Facing	Material	
PIPE						
	1/2	1 1/2	PIPE		ASTM B622 UNS N10276 (HAST.C276) - SMLS	
	2	14	PIPE		ASTM B619 UNS N10276 CL. I (Hydr.Test) - EFW	
CONNECTION FLANGE						
	1/2	1 1/2	SW FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM B564 UNS N10276 (Sol.Ann.)	
	2	14	WN FLANGE - ASME-B16.5	CL150 RF 125 µin.Ra	ASTM B564 UNS N10276 (Sol.Ann.)	
11	14	14	SPEC.MOD.WN FLANGE-w/t JACKSCREW - <MFR Std> GA-E-60052	CL150 RF 125 µin.Ra	ASTM B564 UNS N10276 (Sol.Ann.)	
SPECTACLE BLIND						
	14	14	SPECIAL SPECTACLE BLIND - <MFR Std> GA-E-60051	CL150 RF 125 µin.Ra	ASTM B575 UNS N10276 (Sol.Ann.)	
ELBOW						
	1/2	1 1/2	ELBOW - SW ENDS - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
	2	14	LONG RADIUS ELBOW - ASME-B16.9		ASTM B366 WPHC276-W (UNS N10276) - WLDD	
REDUCER						
	1/2	1 1/2	RED. COUPLING - SW ENDS - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
CAP						
	1/2	3/4	FEMALE CAP - THD END - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
	1/2	1 1/2	FEMALE CAP - SW END - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
COUPLING						
	1/2	1 1/2	COUPLING - SW ENDS - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
MALE PLUG						
	1/2	1 1/2	THD MALE PLUG - RND HEAD - ASME-B16.11		ASTM B564 UNS N10276 (Sol.Ann.)	
NIPPLES						
	1/2	1 1/2	NIPPLE - THDD/PE - BS3799		ASTM B622 UNS N10276 (HAST.C276) - SMLS	
SWAGE NIPPLES						
	1/2	1 1/2	SWAGE NIPPLE - PE/PE - BS3799		ASTM B366 WPHC276 (UNS N10276) - SMLS	
	1/2	3/4	SWAGE NIPPLE - PE/THDD - MSS-SP95		ASTM B366 WPHC276 (UNS N10276) - SMLS	
TEE						
	1/2	1 1/2	TEE - SW ENDS - ASME-B16.11	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
	3	14	TEE - ASME-B16.9		ASTM B366 WPHC276-W (UNS N10276) - WLDD	
WELDOLET						
	3	3	WELDOLET - TB RAC 5049		ASTM B564 UNS N10276 (Sol.Ann.)	
SOCKOLET						
	1/2	1 1/2	SOCKOLET - SW END - TB RAC 5380	3000	ASTM B564 UNS N10276 (Sol.Ann.)	
FLANGED INSERT						
	1	1 1/2	LWN FLANGE - TB FLG 5040	CL150 RF 125 µin.Ra	ASTM B564 UNS N10276 (Sol.Ann.)	
SPIRAL WOUND						
	1/2	14	SP.WOUND GSKT-with OUT.& INN.RINGS - TB GUA 5365		HAST.C-276+GRAPH 98% -C-276 OUT.RING	
BOLTS						
	1/4	4	ST.BOLT+2 NUTS - ANSI Thdd - TB BUL 5368		ASTM A193 B8 CL.2 + ASTM A194 GR.8	



JOB 316800					
Piping Class Z100					
Sh.	3	of	3	Rev.	
				A0	A1

VALVES					
pos.	Size from	to	Doc.	Type	
1	2	14	GA-E-60186	Nickel - Gate-BB-FB-Flex wdg-Thdd seat - API600 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A494 CW-12MW (HAST.C276) Trim Mat. Hastelloy C	
6	2	14	GA-E-60375	Nickel - Check-BB-FB-Swing-Thdd seat - BS1868 - CL150 - RF - 125 µin.Ra Body Mat. ASTM A494 CW-12MW (HAST.C276) Trim Mat. Hastelloy C	
11	1/2	1 1/2	GA-E-60587	Nickel - Gate-WB-Red.B-Solid wdg-Exp.seat - API602 - CL800 - SWxTHDF Body Mat. ASTM B564 UNS N10276 (Sol. Ann.) Trim Mat. Hastelloy C	