SERVICE:	See Service Table, Page 3	**MATERIAL:**	Carbon Steel
RATING CLASS:	300	**DESIGN CODE:**	ASME B31.4
TEMPERATURE LIMIT:	-20F TO 250F	**DESIGN FACTOR**	0.72
NOMINAL CORROSION ALLOWANCE:	0.063 in. (0.05 in. MIN)	**STRESS RELIEF:**	ASME B31.4
		EXAMINATION:	ASME B31.4

PRESSURE-TEMPERATURE RATINGS					HYDROTEST
TEMP F	-20 to 100	150	200	250	AMBIENT
psig	740	708	675	665	925

ITEM	NPS	SCH/RAT	WALL, in.	ENDS	DESCRIPTION	NOTES
PIPE	<2	XS	-		ASTM A106-B,, SMLS (Ej = 1.00)	
	2	Std	0.154		ASTM A106-B, SMLS (Ej = 1.00)	Stock Item
	3	Std	0.216		API 5L-B, ERW (Ej = 1.00)	Stock Item
	4	Std	0.237		API 5L-B, ERW (Ej = 1.00)	Stock Item
	6	Std	0.280		API 5L-B, ERW (Ej = 1.00)	Stock Item
	8	20	0.250		API 5L-B, ERW (Ej = 1.00)	
	10	20	0.250		API 5L-B, ERW (Ej = 1.00)	
	12	20	0.250		API 5L-B, ERW (Ej = 1.00)	
	14	Std	0.375		API 5L-B, ERW (Ej = 1.00)	
	16	Std	0.375		API 5L-B, ERW (Ej = 1.00)	Stock Item
	18	Std	0.375		API 5L-B, DSAW(Ej = 1.00)	
	20	Std	0.375		API 5L-B, DSAW (Ej = 1.00)	Stock Item
	24	XS	0.500		API 5L-B, DSAW (Ej = 1.00)	
NIPPLES						03, 18
Branch	1/2 - 2	XS			ASTM A106-B (Ej = 1.00)	
Swage	1/2 - 2	XS			ASTM A234-WPB-S, MSS SP-95	
FITTINGS						02
45 ELL	1/2 - 1-1/2	Class 3000		SW	ASTM A105, ASME B16.11	
90 ELL	1/2 - 1-1/2	Class 3000		SW	ASTM A105, ASME B16.11	
Cap	1/2 - 1-1/2	Class 3000		SW	ASTM A105, ASME B16.11	
Cap	1/2 - 1-1/2	Class 3000		THRD	ASTM A105, ASME B16.11	03
Coupling	1/2 - 1-1/2	Class 3000		SW	ASTM A105, ASME B16.11	
Coupling	1/2 - 1-1/2	Class 3000		THRD	ASTM A105, ASME B16.11	03
Laterolet	1/2 - 1-1/2	Class 3000		THRD	ASTM A105	03
Plug	1/2 - 1-1/2			THRD	ASTM A105, ASME B16.11	03
Sockolet	1/2 - 1-1/2	Class 3000		SW	ASTM A105, MSS SP-97	
Tee	1/2 - 1-1/2	Class 3000		SW	ASTM A105, ASME B16.11	
Thredolet	1/2 - 1-1/2	Class 3000		THRD	ASTM A105, MSS SP-97	03
Union	1/2 - 1-1/2	Class 3000		SW	ASTM A105, MSS SP-83	
Weldolet	2 - 48			W	ASTM A105, MSS SP-97	05
45 ELL LR	2 - 48			W	ASTM A234-WPB-W, ASME B16.9	
90 ELL LR	2 - 48			W	ASTM A234-WPB-W, ASME B16.9	
Cap	2 - 48			W	ASTM A234-WPB-S, ASME B16.9	
Reducer	2 - 48			W	ASTM A234-WPB-W, ASME B16.9	
Tee	2 - 48			W	ASTM A234-WPB-W, ASME B16.9	
FLANGES						02
Blind	1/2 - 24	Class 300		RF	ASTM A105, ASME B16.5	
Paddle Blank	1/2 - 24	Class 300		RF	API 590, Material Group 1.1	
Orifice	2 - 24	Class 300		RF	ASTM A105, ASME B16.36, SW Taps	
Slip-On	2 - 24	Class 300		RF	ASTM A105, ASME B16.5	
Socket Weld	1/2 - 1-1/2	Class 300		RF	ASTM A105, ASME B16.5	
Weld Neck	2 - 24	Class 300		RF	ASTM A105, ASME B16.5	

ITEM	NPS	SCH/RAT	WALL, in.	ENDS	DESCRIPTION	NOTES
GASKETS						
	1/2 - 24	Class 300			ASME B16.21, 1/16" thick flexible graphite w/304 or 316 SS insert	
BOLTING						
Stud Bolts					ASTM A193, B7 stud w/2 ASTM A194 Gr 2H heavy hex nuts	
VALVES						
Gate	1/2 - 2	Class 300	V-102F4	RF	CS body w/13 CR trim, HF ST	
Gate	1/2 - 2	Class 800	V-112H6	SW	CS body w/13 CR trim, HF ST	
Gate	1/2 - 2	Class 800	V-113H2	T/SW	CS body w/13 CR trim, HF ST	06
Gate	1/2 - 2	Class 800	V-114H9	THRD	CS body w/13 CR trim, HF ST	
Gate	2 - 24	Class 300	V-100F1	RF	CS body w/13 CR trim, HF ST	
Globe	1/2 - 2	Class 800	V-302H3	SW	CS body w/13 CR trim, HF ST	
Globe	3 - 12	Class 300	V-300F1	RF	CS body w/13 CR trim, HF ST	
Check, Ball	1/2 - 2	Class 800	V-605H4	SW	CS body w/13 CR trim, HF ST	61
Check, Swing	2 - 24	Class 300	V-600F1	RF	CS body w/13 CR trim, HF ST	62
Check, Dual PLT	2 - 4	Class 300	V-611F7		CS body w/410 SS disc/ST	26, 63
Check, Dual PLT	6 - 24	Class 300	V-609F8		CS body w/410 SS disc/ST	26, 63
Ball	1/2 - 2	Class 300		SW	CS body w/316 SS B&S, RTFE ST	09
Ball	2 - 6	Class 300		RF	CS body w/316 SS B&S, RTFE ST	09
Ball	2 - 6	Class 300		RF	CS body w/316 SS B&S, RTFE ST, FP	09
Ball	8 - 10	Class 300		RF	CS body w/316 SS B&S, RTFE ST, GO	09
Ball	12 - 24	Class 300		RF	CS body w/316 SS B&S, RTFE ST, GO	09
Ball	8 - 10	Class 300		RF	CS body w/316 SS B&S, RTFE ST, GO, FP	09
Ball	12 - 24	Class 300		RF	CS body w/316 SS B&S, RTFE ST, GO, FP	09

90? BRANCH CONNECTION
Legend and Chart

BRANCH SIZE	HEADER SIZE																			
	48	42	36	30	24	20	18	16	14	12	10	8	6	4	3	2	1-1/2	1	3/4	1/2
48	T																			
42	C	T																		
36	C	C	T																	
30	C	C	C	T																
24	R	R	R	R	T															
20	R	R	R	R	R	T														
18	R	R	R	R	R	R	T													
16	R	R	R	R	R	R	R	T												
14	R	R	R	R	R	R	R	R	T											
12	R	R	R	R	R	R	R	R	R	T										
10	R	R	R	W	W	W	W	W	W	W	T									
8	R	R	R	W	W	W	W	W	W	W	W	T								
6	W	W	W	W	W	W	W	W	W	W	W	W	T							
4	W	W	W	W	W	W	W	W	W	W	W	W	W	T						
3	W	W	W	W	W	W	W	W	W	W	W	W	W	W	T					
2	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	T				
1-1/2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	T			
1	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	E	T		
3/4	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	E	E	T	
1/2	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	E	E	E	E	T

LEGEND
- B Branch Weld
- C Full Encirclement Saddle
- E Reducing Tee
- R Reinforced Branch
- S Sockolet
- T Tee
- W Weldolet

NOTES

01 Where "Calc" is shown, the pressure limit may be lower than full flange rating.
02 All Butt-welded component thickness shall match pipe thickness.
03 Threaded joints are permitted only at outlet of vent and drain valves, at hydrostatic connections, at outlet of instrument take-off valves and to match equipment.
05 Integrally reinforced branch connections are permitted outside the sizes shown in the branch connection tables for special applications (e.g., hot tap connections, etc.). Designer shall check PWHT requirements.
06 T/SW valves shall be used only for vent, drain, and instrument connections.
08 Full port valves shall be used when indicated on the P&ID.
09 Pressure and temperature may be limited. Refer to manufacturer's restrictions.
11 Provide flat face flanges adjacent to flat face equipment nozzles.
14 Use full face gaskets at flat face flanges.
18 Sch 80 pipe and pipe nipples shall be used for threaded connections for sizes NPS 1/2 - 1-1/2.
19 Sch 160 pipe and pipe nipples shall be used for threaded connections for sizes NPS 1/2 - 1-1/2.
26 To be used only when indicated on P&ID.
27 Pipe and pipe components thicker than 1/2 inch may require impact testing at minimum design temperatures less than 100 F.
61 Install in horizontal position with cover up.
62 Install in horizontal position with cover up or in vertical position with upward flow.
63 Install in horizontal position with hinge pin vertical or in vertical position with upward flow.
64 The minimum test period for pressure testing shall refer to pressure testing duration table in Section 8.3.3 of J2D.
65 Reinforcement calculations must be performed to determine if repad is required.
66 Any branch connection is acceptable, these are recommended based on economics and that consideration should be given to additional inspection requirements that may be required for reinforced branches.
67 14” and 18” diameter are for maintenance only and should not be used for new construction.

SERVICE TABLE

Service	Service Symbol
Crude Oil	CO
Generator Feed Water	GFW
Natural Gas Condensate	NGC
Produced Fluid	PF
Water – Produced (and Injection)	WI/PW
Water - Kill	WK/KW