TopSTOPP™ & ValveSTOPP™ Fittings

T.D. Williamson

Bulletin No: 1130.001.03

Version: 10.2024

Supersedes: 1130.001.02 (54.2024)

ASME B31.3 / B31.8 / CSA Z662 CAT I

Sizes: 1, 1.25, and 2-inches







ValveSTOPP Fitting

Description

TDW's new TopSTOPP™ and ValveSTOPP fittings are used as branching fittings, typically off larger main lines. The fitting body is similar to the 3-WAY™ TOR fitting however the internal parts are much different. These fittings have integral plugs inside the fitting body that can be used to isolate the branch connection of the fitting.

The TopStopp fitting comes with a driver and a key that allows the operator to open or close the branch outlet from the surface of the ground, eliminated the need for excavation.

The ValveStopp fitting has the same internal plug and has the same application but requires the operator to actuate the outlet plug by accessing the top of the completion cap on the fitting.

These fittings are designed for hot tap tie-ins eliminating the need to leave a valve on the connection. Common applications include farm taps, customer service lines, gauge points, regulator sense lines, and fuel gas lines.

Fittings are available in three sizes:

1, 1.25, and 2-inch (DN25, DN32, and DN50).

Features

These fittings can be used with a T-101 or TD-1XX Drilling Machine.

If tapping a 1- or 1.25-inch fitting a valve-tofitting adapter, PN 12392662, is necessary and for a 2-inch application, PN 12392663, is used.

Fittings and associated products are shipped rapidly to meet customer needs. Contact your local TDW representative for pricing and availability.





TopSTOPP Fittings

ValveSTOPP Fittings

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Si	ze	
Inches	DN	Part Number
1	25	12392738
1.25	32	12392739
2	50	12392740

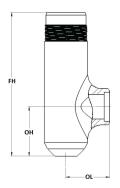
Siz	е	
Inches	DN	Part Number
1	25	12392735
1.25	32	12392736
2	50	12392737

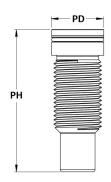
ValveSTOPP™ Dimensions

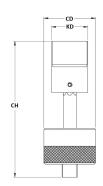
	Si	ze	C	D	С	Н	К	D	P	D	P	Н	F	Н	0	Н	O	DL	1	١
	Inches	DN	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
12392735	1	25	2.500	63.5	2.000	50.8	N/A	N/A	1.503	38.2	4.000	101.6	6.603	167.7	2.500	63.5	2.125	54.0	6.524	165.7
12392736	1.25	32	2.500	63.5	2.000	50.8	N/A	N/A	1.503	38.2	4.125	104.8	6.541	166.1	2.250	57.2	2.000	50.8	6.416	163.0
12392737	2	50	3.000	76.2	2.000	50.8	N/A	N/A	1.863	47.3	4.438	112.7	7.448	189.2	2.562	65.1	2.188	55.6	7.229	183.6

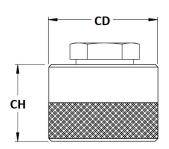
TopSTOPP™ Dimensions

	Si	ze	C	D	C	Н	К	D	P	D	P	Н	F	Н	0	Н	0	L	1	A
	Inches	DN	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
12392738	1	25	2.500	63.5	6.625	168.3	1.75	44.45	1.503	38.2	4.000	101.6	6.603	167.7	2.500	63.5	2.125	54.0	6.524	165.7
12392739	1.25	32	2.500	63.5	6.625	168.3	1.75	44.45	1.503	38.2	4.125	104.8	6.541	166.1	2.250	57.2	2.000	50.8	6.416	163.0
12392740	2	50	3.000	76.2	6.625	168.3	1.75	44.45	1.863	47.3	4.438	112.7	7.448	189.2	2.562	65.1	2.188	55.6	7.229	183.6









Spare Parts

Description	Size (inches)	Part Number
ValveStopp Cap Assy	1 and 1.25	12392602
ValveStopp Cap Assy	2	12392603
TopStopp Cap Assy*	1 and 1.25	12392599
TopStopp Cap Assy*	2	12392600
Plug Assembly	1	12392576
Plug Assembly	1.25	12392577
Plug Assembly	2	12392578
ValveStopp Driver Key A	Assy*	12392819
Set Screw		12394386

^{*}includes Driver, Key, and Set Screw

T.D. Williamson

ValveSTOPP Fittings

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		Minim	um Require	d Pipeline Wa	all Thicknes	s† (in inches	For Listed	Design Factor	r (DF) and N	1aximum Wo	rking Pressi	ure (in psi)		
			Pe	r ASME B31.	4, ASME B3	1.8 and CSA	Z662 CAT I	at -20°F to 25	0°F					
NC	Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure	l	ME B31.3 to 100°F
2735 CONNECTION	1.25	1.66	0.049	1480	0.059	1480	0.071	1480	0.088	1480	0.116	970	0.063	1480
35 ONNE	1.5	1.9	0.056	1480	0.067	1480	0.081	1480	0.101	1480	0.132	970	0.072	1480
273 1 CO	2	2.375	0.070	1480	0.084	1480	0.101	1480	0.126	1480	0.165	970	0.089	1480
123927 \NCH C	2.5	2.875	0.085	1480	0.102	1480	0.122	1480	0.152	1480	0.200	970	0.107	1480
BRA	3	3.5	0.103	1480	0.124	1480	0.148	1480	0.185	1480	0.243	970	0.130	1480
ä	3.5	4	0.118	1480	0.141	1480	0.170	1480	0.212	1480	0.278	970	0.148	1480
	4	4.5	0.133	1480	0.159	1480	0.191	1480	0.238	1480	0.312	970	0.166	1480
	>4*	*	*	1480	*	1480	*	1480	*	1480	*	970	CONSULT E	NGINEERING

		Minim	um Require	d Pipeline Wa	all Thicknes	s† (in inches	For Listed	Design Factor	r (DF) and N	1aximum Wo	rking Pressi	ure (in psi)			
			Pe	r ASME B31.	4, ASME B3	1.8 and CSA	Z662 CAT I	at -20°F to 25	0°F						
NO	Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure		ИЕ В31.3 to 100°F	
E E	Size 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 970														
9 8	2	2.375	0.070	1480	0.084	1480	0.101	1480	0.126	1480	0.165	970	0.089	1480	
32736 H CON	2.5	2.875	0.085	1480	0.102	1480	0.122	1480	0.152	1480	0.200	970	0.107	1480	
12392 ANCH	3	3.5	0.103	1480	0.124	1480	0.148	1480	0.185	1480	0.243	970	0.130	1480	
	3.5	4	0.118	1480	0.141	1480	0.170	1480	0.212	1480	0.278	970	0.148	1480	
1.25in	4	4.5	0.133	1480	0.159	1480	0.191	1480	0.238	1480	0.312	970	0.166	1480	
- 4	5	5.563	0.164	1480	0.197	1480	0.236	1480	0.295	1480	0.386	970	0.204	1480	
	>5*	*	*	1480	*	1480	*	1480	*	1480	*	970	CONSULT E	NGINEERING	

		Minim	um Require	d Pipeline Wa	all Thicknes	s† (in inches)	For Listed	Design Factor	r (DF) and N	1aximum Wo	rking Pressu	ure (in psi)			
	Per ASME B31.4, ASME B31.8 and CSA Z662 CAT I at -20°F to 250°F														
z	Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure	Per ASN at -20°F	1E B31.3 to 100°F	
P	Size														
NEC	3	3.5	0.103	1480	0.124	1480	0.148	1480	0.174	1390	0.174	695	0.120	1480	
	3.5	4	0.118	1480	0.141	1480	0.170	1480	0.199	1390	0.199	695	0.137	1480	
1239; NCH (4	4.5	0.133	1480	0.159	1480	0.191	1480	0.224	1390	0.224	695	0.154	1480	
BRA	5	5.563	0.164	1480	0.197	1480	0.236	1480	0.277	1390	0.277	695	0.190	1480	
Zin, I	6	6.625	0.195	1480	0.234	1480	0.281	1480	0.329	1390	0.329	695	0.225	1480	
	8	8.625	0.254	1480	0.304	1480	0.365	1480	0.429	1390	0.429	695	0.293	1480	
	>8*	8.625*	*	1480	*	1480	*	1480	*	1390	*	695	CONSULT ENGINEERING		

The Maximum Working Pressures listed in this Table are valid for the stated pipeline size provided the pipeline minimum yield strength is greater than or equal to 35ksi and the pipeline wall thickness is greater than or equal to the value listed in this Table. Contact TDW Engineering for applications involving pipeline minimum yield strengths less than 35ksi or pipeline wall thicknesses less than those stated above.

^{*} Exempt from reinforcement calculations per Table 404.3.4-1 of ASME B31.4 or Table 831.4.2-1 of ASME B31.8 or Table 4.6 of CSA Z662.

[†] Maximum Working Pressure values assume 35ksi minimum yield strength for pipeline (header) material.



TopSTOPP Fittings

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Minimum Required Pipeline Wall Thickness† (in inches) For Listed Design Factor (DF) and Maximum Working Pressure (in psi)													
Per ASME B31.4, ASME B31.8 and CSA Z662 CAT I at -20°F to 250°F Nominal p. 00													
Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure		ЛЕ В31.3 to 100°F
1.25	1.66	0.049	1480	0.059	1480	0.071	1480	0.088	1480	0.116	970	0.063	1480
1.5	1.9	0.056	1480	0.067	1480	0.081	1480	0.101	1480	0.132	970	0.072	1480
2	2.375	0.070	1480	0.084	1480	0.101	1480	0.126	1480	0.165	970	0.089	1480
2.5	2.875	0.085	1480	0.102	1480	0.122	1480	0.152	1480	0.200	970	0.107	1480
3	3.5	0.103	1480	0.124	1480	0.148	1480	0.185	1480	0.243	970	0.130	1480
3.5	4	0.118	1480	0.141	1480	0.170	1480	0.212	1480	0.278	970	0.148	1480
4	4.5	0.133	1480	0.159	1480	0.191	1480	0.238	1480	0.312	970	0.166	1480
>4*	*	*	1480	*	1480	*	1480	*	1480	*	970	CONSULT E	NGINEERING
	ipeline Size 1.25 1.5 2 2.5 3 3.5 4	peline Size (in) 1.25 1.66 1.5 1.9 2 2.375 2.5 2.875 3 3.5 3.5 4 4 4.5	ominal peline Size Pipe OD (in) 0.72 DF 1.25 1.66 0.049 1.5 1.9 0.056 2 2.375 0.070 2.5 2.875 0.085 3 3.5 0.103 3.5 4 0.118 4 4.5 0.133	ominal pleline Size Pipe OD (in) 0.72 DF Pressure 1.25 1.66 0.049 1480 1.5 1.9 0.056 1480 2 2.375 0.070 1480 2.5 2.875 0.085 1480 3 3.5 0.103 1480 3.5 4 0.118 1480 4 4.5 0.133 1480	ominal peline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF 1.25 1.66 0.049 1480 0.059 1.5 1.9 0.056 1480 0.067 2 2.375 0.070 1480 0.084 2.5 2.875 0.085 1480 0.102 3 3.5 0.103 1480 0.124 3.5 4 0.118 1480 0.141 4 4.5 0.133 1480 0.159	ominal peline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 1.25 1.66 0.049 1480 0.059 1480 1.5 1.9 0.056 1480 0.067 1480 2 2.375 0.070 1480 0.084 1480 2.5 2.875 0.085 1480 0.102 1480 3 3.5 0.103 1480 0.124 1480 3.5 4 0.118 1480 0.141 1480 4 4.5 0.133 1480 0.159 1480	ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF 1.25 1.66 0.049 1480 0.059 1480 0.071 1.5 1.9 0.056 1480 0.067 1480 0.081 2 2.375 0.070 1480 0.084 1480 0.101 2.5 2.875 0.085 1480 0.102 1480 0.122 3 3.5 0.103 1480 0.124 1480 0.148 3.5 4 0.118 1480 0.141 1480 0.170 4 4.5 0.133 1480 0.159 1480 0.191	ominal peline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 2 2.375 0.070 1480 0.084 1480 0.101 1480 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 3 3.5 0.103 1480 0.124 1480 0.148 1480 3.5 4 0.118 1480 0.141 1480 0.170 1480 4 4.5 0.133 1480 0.159 1480 0.191 1480	ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 0.088 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 4 4.5 0.133 1480 0.159 1480 0.191 1480 0.238	ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 0.088 1480 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 1480 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 1480 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 1480 4 4.5 0.133 1480 0.159 1480 0.191 1480 0.238 1480	ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 0.088 1480 0.116 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 0.165 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 1480 0.200 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 1480 0.243 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 1480 0.278 4 4.5 0.133 1480 0.159 1480 <t< td=""><td>Ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 0.088 1480 0.116 970 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 970 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 0.165 970 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 1480 0.200 970 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 1480 0.243 970 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 1480 0.312 970 </td></t<> <td> Pipe OD </td>	Ominal ipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 1.25 1.66 0.049 1480 0.059 1480 0.071 1480 0.088 1480 0.116 970 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 970 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 0.165 970 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 1480 0.200 970 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 1480 0.243 970 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 1480 0.312 970	Pipe OD

	Minim	um Required	l Pipeline Wa	all Thicknes	s† (in inches	For Listed	Design Factor	r (DF) and N	Maximum Wo	rking Pressi	ure (in psi)			
		Pe	r ASME B31.	4, ASME B3	1.8 and CSA	Z662 CAT I	at -20°F to 25	0°F						
Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure	l	ЛЕ В31.3 to 100°F	
1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 970 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 0.165 970														
2	2.375	0.070	1480	0.084	1480	0.101	1480	0.126	1480	0.165	970	0.089	1480	
2.5	2.875	0.085	1480	0.102	1480	0.122	1480	0.152	1480	0.200	970	0.107	1480	
3	3.5	0.103	1480	0.124	1480	0.148	1480	0.185	1480	0.243	970	0.130	1480	
3.5	4	0.118	1480	0.141	1480	0.170	1480	0.212	1480	0.278	970	0.148	1480	
4	4.5	0.133	1480	0.159	1480	0.191	1480	0.238	1480	0.312	970	0.166	1480	
5	5.563	0.164	1480	0.197	1480	0.236	1480	0.295	1480	0.386	970	0.204	1480	
>5*	*	*	1480	*	1480	*	1480	*	1480	*	970	CONSULT E	NGINEERING	
	Pipeline Size 1.5 2 2.5 3 3.5 4 5	Nominal Pipeline Size Pipe OD (in) 1.5 1.9 2 2.375 2.5 2.875 3 3.5 3.5 4 4 4.5 5 5.563	Nominal Pipeline Size Pipe OD (in) 0.72 DF 1.5 1.9 0.056 2 2.375 0.070 2.5 2.875 0.085 3 3.5 0.103 3.5 4 0.118 4 4.5 0.133 5 5.563 0.164	Per ASME B31. Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 1.5 1.9 0.056 1480 2 2.375 0.070 1480 2.5 2.875 0.085 1480 3 3.5 0.103 1480 3.5 4 0.118 1480 4 4.5 0.133 1480 5 5.563 0.164 1480	Nominal Pipeline Size	Nominal Pipe Inches Pipe OD (in)	Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF	Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 1.5 1.9 0.056 1480 0.067 1480 0.081 1480 0.101 1480 0.132 970 2 2.375 0.070 1480 0.084 1480 0.101 1480 0.126 1480 0.165 970 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.152 1480 0.200 970 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.185 1480 0.243 970 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.212 1480 0.278 970 4 4.5 0.133 1480 0.159 1480 0.191 1480 0.238 1480 0.312 970	Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 0.72 DF Pressure					

	Minim	um Require	d Pipeline Wa	all Thicknes	s† (in inches	For Listed	Design Factor	r (DF) and N	1aximum Wo	rking Pressi	ure (in psi)			
		Pe	r ASME B31.	4, ASME B3	1.8 and CSA	Z662 CAT I	at -20°F to 25	0°F						
Nominal Pipeline Size	Pipe OD (in)	0.72 DF	Pressure	0.6 DF	Pressure	0.5 DF	Pressure	0.4 DF	Pressure	0.2 DF	Pressure		ME B31.3 to 100°F	
No. No.														
3	3.5	0.103	1480	0.124	1480	0.148	1480	0.174	1390	0.174	695	0.120	1480	
3.5	4	0.118	1480	0.141	1480	0.170	1480	0.199	1390	0.199	695	0.137	1480	
4	4.5	0.133	1480	0.159	1480	0.191	1480	0.224	1390	0.224	695	0.154	1480	
5	5.563	0.164	1480	0.197	1480	0.236	1480	0.277	1390	0.277	695	0.190	1480	
6	6.625	0.195	1480	0.234	1480	0.281	1480	0.329	1390	0.329	695	0.225	1480	
8	8.625	0.254	1480	0.304	1480	0.365	1480	0.429	1390	0.429	695	0.293	1480	
>8*	8.625*	*	1480	*	1480	*	1480	*	1390	*	695	CONSULT ENGINEERING		
	Pipeline Size 2.5 3 3.5 4 5 6	Nominal Pipeline Size Pipe OD (in) 2.5 2.875 3 3.5 4 4.5 5 5.563 6 6.625 8 8.625	Nominal Pipeline Size	Per ASME B31. Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 2.5 2.875 0.085 1480 3 3.5 0.103 1480 3.5 4 0.118 1480 4 4.5 0.133 1480 5 5.563 0.164 1480 6 6.625 0.195 1480 8 8.625 0.254 1480	Per ASME B31.4, ASME B3 Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF 2.5 2.875 0.085 1480 0.102 3 3.5 0.103 1480 0.124 3.5 4 0.118 1480 0.141 4 4.5 0.133 1480 0.159 5 5.563 0.164 1480 0.197 6 6.625 0.195 1480 0.234 8 8.625 0.254 1480 0.304	Nominal Pipeline Size Pipe OD (in) No.72 DF Pressure No.6 DF Pressure No.5 DF No.5 D	Nominal Pipeline Size Pipe OD (in) 0.72 DF Pressure 0.6 DF Pressure 0.5 DF Pressure 0.4 DF Pressure 0.2 DF Pressure 2.5 2.875 0.085 1480 0.102 1480 0.122 1480 0.143 1390 0.143 695 3 3.5 0.103 1480 0.124 1480 0.148 1480 0.174 1390 0.174 695 3.5 4 0.118 1480 0.141 1480 0.170 1480 0.199 1390 0.199 695 4 4.5 0.133 1480 0.159 1480 0.191 1480 0.224 1390 0.224 695 5 5.563 0.164 1480 0.197 1480 0.236 1480 0.277 1390 0.277 695 6 6.625 0.195 1480 0.281 1480 0.329 1390 0.429 695 8 8.62	Nominal Pipeline Size Pipe OD (in) No.						

The Maximum Working Pressures listed in this Table are valid for the stated pipeline size provided the pipeline minimum yield strength is greater than or equal to 35ksi and the pipeline wall thickness is greater than or equal to the value listed in this Table. Contact TDW Engineering for applications involving pipeline minimum yield strengths less than 35ksi or pipeline wall thicknesses less than those stated above.

^{*} Exempt from reinforcement calculations per Table 404.3.4-1 of ASME B31.4 or Table 831.4.2-1 of ASME B31.8 or Table 4.6 of CSA Z662.

[†] Maximum Working Pressure values assume 35ksi minimum yield strength for pipeline (header) material.