

PIPE SPEC: 1ADA6

Date: 8/4/2016 4:52:27 PM



DESCRIPTION:	GRAVITY DRAINS
MATERIAL:	Cast Iron, ASTM A74, SERVICE WEIGHT, BELL & SPIGOT JOINTS
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	32F to 212F
RATING CLASS:	125, ASME B16.1 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	10
212	10

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 GASKET MATERIAL INDICATED INCLUDES FLANGED AND BELL AND SPIGOT JOINTS. DIMENSIONS AND RATING ARE PER THE TYPE OF GASKET SELECTED.
- 4 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	2-15	-		Pipe , A 74 , Double Bell/Spigot Ends , Cast Iron
	2-15	-	S-SV	Pipe , A 74 , PE , Cast Iron
	2-15	-	S-SV	Pipe , A 74 , Single Bell/Spigot End , Cast Iron
Large Bore Fittings				
	2-12	-	S-SV	1/4 Bend Long Sweep , A 74 , Bell/Spigot End , Cast Iron
	2-12	-	S-SV	One-Eighth Bend , A 74 , Bell/Spigot End , Cast Iron
	2-12	-	S-SV	Sanitary Tee, Single , A 74 , Spigot End/Bell , Cast Iron
	2-8	-	S-SV	Y & One Eighth Bend , Tyler , Spigot End/Bell , A 74
	2-12	-	S-SV	Y Branch, Single , A 74 , Spigot End/Bell , Cast Iron
	3-15	2-12	S-SV	Increaser C.I. , A 74 , Bell/Spigot End , Cast Iron
	3-15	2-12	S-SV	Reducer C.I. , A 74 , Spigot End/Bell , Cast Iron
	3-8	2-6	S-SV	Reducing Y & 1/8Bend , Tyler , Spigot End/Bell , A 74
	6-12	4-10	S-SV	45 Deg Red. Lateral , American , BLE , A 74
Small Bore Fittings				
Bolts				
	2-15			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	2-15			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	2-15			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
Flanges				
	2-15	-	S-SV	Flange Connecting Pc , Romac Style "FCA501" , CL125 , FF , Ductile Iron
	2-15	-		Blind Flg. , B16.1 , CL125 , FF , Cast Iron
Gate Valves				
	3-14	-		Gate Valve Underground , AWWA C509 and/or C515 , FF , Bltd Bonnet , Post Indicator , Ductile Iron , Resilient Wedge, 250 Psig Working Pressure\125 deg F or better
	3-14	-		Gate Valve Underground , AWWA C509 and/or C515 , FF , Bltd Bonnet , Ductile Iron , With Valve Box, Resilient Wedge, 250 Psig Working Pressure\125 deg F or better
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1AGA0

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DESCRIPTION:	POTABLE WATER (UNDERGROUND)
MATERIAL:	HDPE SDR 11, PE 4710
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	0F to 140F
RATING CLASS:	125, ASME B16.1 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
0	150
32	150
73	150
90	150
100	146
110	140
120	118
130	112
140	93

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 POTABLE WATER PIPING SHALL BE CERTIFIED ACCORDING TO NSF 14 AND NSF 61. PIPING SHALL ALSO BE CONTINUOUSLY MARKED WITH A BLUE STRIPE.
- 5 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 6 FINAL LEAK TESTING SHALL BE HYDROSTATIC ONLY IN ACCORDANCE WITH ASTM F2164, FIELD LEAK TESTING OF POLYETHYLENE PRESSURE PIPING SYSTEM USING HYDROSTATIC PRESSURE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-24	-	SDR 11	Pipe , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	0.75-8	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	0.75-8	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	0.75-8	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-24	0.75-22	SDR 11	Concentric Reducer , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	1-24	0.75-22	SDR 11	Eccentric Reducer , WOLSELEY , ASTM D3261, PE4710 , Butt Fusion , IPS
				Eccentric Reducer , WOLSELEY , ASTM D3350, PE4710 , Butt Fusion , 3 Piece
	1-24	0.75-22	SDR 11	Fabbed
	1-24	-	SDR 11	Flange Adapter , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS -
	2-24	-	SDR 11	Cross , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	-		Pipe, 25D Bend, ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	-		Pipe, 25D Bend, ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-12	2-10	SDR 11	Branch Saddle , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	-	SDR 11	Lateral , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
	3-24	2-16	SDR 11	Reducing Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
				45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece
	10-24	-	SDR 11	Fabbed
				90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece
	10-24	-	SDR 11	Fabbed
				90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 5 Piece
	10-24	-	SDR 11	Fabbed
	10-24	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
Small Bore Fittings				
	0.5-2	-		Male Adapter , ISCO or eq. , ASTM D3350, PE4710 , TF x MTE , IPS
Bolts				

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	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.75-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760-V , 0.125" non compressed thickness
Flanges				
	2-24	-	SDR 11	Backing Ring , ISCO or eq. , CL125 , FF , Ductile Iron -
Gate Valves				
	2.5-24	-		Gate Vlv , Powell B16.10 or eq. , CL125 , FF , Bltd Bonnet , Handwheel Operator , Cast Iron
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1AGA1

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DESCRIPTION:	GRAVITY DRAINS (UNDERGROUND)
MATERIAL:	HDPE SDR 11, PE 4710
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-10F to 140F
RATING CLASS:	125, ASME B16.1 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-10	5
32	5
73	5
90	5
100	5
110	5
120	5
130	5
140	5

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 7 SUPPLY FLAT WASHERS WHEN RECOMMENDED BY MANUFACTURER.
- 8 FLANGE ASSEMBLIES SHALL BE PROTECTED WITH POLYETHYLENE SLEEVE SEALED TO PIPE.
- 9 FINAL LEAK TESTING SHALL BE HYDROSTATIC ONLY IN ACCORDANCE WITH ASTM F2164, FIELD LEAK TESTING OF POLYETHYLENE PRESSURE PIPING SYSTEM USING HYDROSTATIC PRESSURE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples	1-24	-	SDR 11	Pipe , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	1-8	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-8	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-24	-	SDR 11	Flange Adapter , ISCO or eq. , ASTM PE4710, D3261 , Butt Fusion , IPS -
	1-8	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-24	-	SDR 11	22.5 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 2 Piece Fabbed
	2-12	-	SDR 11	Branch Saddle , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	1-22	SDR 11	Concentric Reducer , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-22	SDR 11	Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-16	SDR 11	Reducing Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Branch Saddle
	4-24	-		CAP , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	4-8	-	SDR 11	Combination Wye , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	4-24	-	SDR 11	Lateral , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
	6-24	4-22	SDR 11	45 Deg Red Lateral , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Fabbed
	6-10	4-8	SDR 11	Red Combination Wye , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS

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	10-24	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
	10-24	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 5 Piece Fabbed
	10-24	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
Small Bore Fittings				
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
	14-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8M / A 194 B8M
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL125 , FF , Neoprene Rubber , 0.125" non compressed thickness
	1-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
	2-24			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	2-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges				
	1-24	-		Blind Flg. , B16.1 , CL125 , FF , A 126 Gr. B
	1-26	-	SDR 11	Backing Ring , B16.5 , CL150 , FF , Ductile Iron
Gate Valves				
	0.25-24	-		Gate Vlv , Mueller B16.10 or eq. , CL125 , FF , Bltd Bonnet , Wrench Operator , A 126 Gr. B , FM Approved , 2" Nut
	2.5-24	-		Gate Valve Underground , B16.10 App. Mfg. , CL125 , FF , Bltd Bonnet , Post Indicator , Cast Iron
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1AGA6

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DESCRIPTION:	GENERAL SERVICE WATER (UNDERGROUND)
MATERIAL:	HDPE SDR 11, PE 4710
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-10F to 140F
RATING CLASS:	125, ASME B16.1 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-10	150
32	150
73	150
90	150
100	146
110	140
120	118
130	112
140	93

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 7 SUPPLY FLAT WASHERS WHEN RECOMMENDED BY MANUFACTURER.
- 8 FLANGE ASSEMBLIES SHALL BE PROTECTED WITH POLYETHYLENE SLEEVE SEALED TO PIPE.
- 9 FINAL LEAK TESTING SHALL BE HYDROSTATIC ONLY IN ACCORDANCE WITH ASTM F2164, FIELD LEAK TESTING OF POLYETHYLENE PRESSURE PIPING SYSTEM USING HYDROSTATIC PRESSURE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples	1-24	-	SDR 11	Pipe , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	1-8	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-8	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-24	-	SDR 11	Flange Adapter , ISCO or eq. , ASTM PE4710, D3261 , Butt Fusion , IPS -
	1-8	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-24	-	SDR 11	22.5 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 2 Piece Fabbed
	2-12	-	SDR 11	Branch Saddle , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	1-22	SDR 11	Concentric Reducer , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-22	SDR 11	Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-16	SDR 11	Reducing Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Branch Saddle
	4-24	-		CAP , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	4-8	-	SDR 11	Combination Wye , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	6-8	4-6	SDR 11	45 Deg Red Lateral , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Fabbed
	6-8	4-6	SDR 11	Red Combination Wye , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	10-24	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed

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	10-24	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 5 Piece Fabbed
	10-24	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
Small Bore Fittings				
	1-2	1-2	S-80	Red. Thd. Flg. , B16.5 , CL150 , FF , A105 , Galvanized
Bolts				
	1-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	1-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				
	1-26	-	SDR 11	Backing Ring , ISCO or eq. , CL150 , FF Lap Flgd , Ductile Iron -
	1-24	-		Blind Flg. , B16.1 , CL125 , FF , A 126 Gr. B
Gate Valves				
	1-2	-		Gate Vlv , American Valve or eq. , CL125 , FTE , Union Bonnet , Handwheel Operator , BRASS / BRONZE B62
	2.5-24	-		Gate Vlv , Powell B16.10 or eq. , CL125 , FF , Bltd Bonnet , Handwheel Operator , Cast Iron
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1AGA7

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DESCRIPTION:	CLOSED COOLING WATER (UNDERGROUND)
MATERIAL:	HDPE, PE 4710
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-10F to 140F
RATING CLASS:	125, ASME B16.1 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-10	175
32	175
80	175
90	175
100	175
110	175
120	175
130	165
140	153

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 7 SUPPLY FLAT WASHERS WHEN RECOMMENDED BY MANUFACTURER.
- 8 FLANGE ASSEMBLIES SHALL BE PROTECTED WITH POLYETHYLENE SLEEVE SEALED TO PIPE.
- 9 FINAL LEAK TESTING SHALL BE HYDROSTATIC ONLY IN ACCORDANCE WITH ASTM F2164, FIELD LEAK TESTING OF POLYETHYLENE PRESSURE PIPING SYSTEM USING HYDROSTATIC PRESSURE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples	1-26	-	SDR 9	Pipe , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	1-6	-	SDR 9	45 Deg Elbow , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , Molded
	1-6	-	SDR 9	90 Deg Elbow , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , Molded
	1-26	-	SDR 9	Flange Adapter , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS -
	1-6	-	SDR 9	Tee , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , Molded
	2-26	-	SDR 7	22.5 Deg Elbow , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , 2 Piece
	2-26	1.5-24	SDR 9	Fabbed
				Concentric Reducer , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS
	3-26	2-24	SDR 9	Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion ,
				IPS
	3-26	2-24	SDR 9	Reducing Tee , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , Branch
				Saddle
	8-24	-	SDR 7	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece
				Fabbed
	8-26	-	SDR 7	90 Deg Elbow , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , 5 Piece
	8-26	-	SDR 7	Fabbed
				Tee , ISCO or eq. , ASTM D3261, PE4710 , Butt Fusion , IPS , 3 Piece
Small Bore Fittings				Fabbed
Bolts				

PIPE SPEC:

1AGA7

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	0.5-26			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	1-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				
	2-26	-		Blind Flg. , B16.5 , CL150 , FF , A105
	1-26	-	SDR 9	Backing Ring , B16.5 , CL150 , FF , A105
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:GENERAL SERVICE WATER (UNDERGROUND)

MATERIAL:HDPE, PE 4710

EXAMINATION:Per ASME B31.1 - 2010

TEMPERATURE LIMIT:32F to 140F

RATING CLASS:125, ASME B16.1 -2005

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2010

STRESS RELIEF:None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	175
80	175
90	175
100	156
110	150
120	126
130	120
140	100

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 ALL FITTINGS SHALL BE MOLDED. FABRICATED FITTINGS ARE NOT ALLOWED TO BE USED ON THIS PIPE CODE.
- 3 FLANGE ASSEMBLIES SHALL BE PROTECTED WITH POLYETHYLENE SLEEVE SEALED TO PIPE.
- 4 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 5 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 6 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 7 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 8 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08.
- 9 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 10 SUPPLY FLAT WASHERS WHEN RECOMMENDED BY MANUFACTURER.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	1-24	-	SDR 11	Pipe , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	1-12	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-12	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-12	-	SDR 11	Flange Adapter , ISCO or eq. , ASTM PE4710, D3261 , Butt Fusion , IPS -
	1-12	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-12	-	SDR 11	Branch Saddle , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-12	1-10	SDR 11	Concentric Reducer , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
				Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion ,
	3-12	2-10	SDR 11	IPS
				Reducing Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Branch
	3-12	2-10	SDR 11	Saddle
Small Bore Fittings				
Bolts				
	1-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	1-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				

PIPE SPEC:

1AGA8

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	1-12	-	SDR 11	Backing Ring , B16.5 , CL150 , FF , Ductile Iron
	1-12	-		Blind Flg. , B16.1 , CL125 , FF , A 126 Gr. B
Gate Valves				
	1-2	-		Gate Vlv , American Valve or eq. , CL125 , FTE , Union Bonnet , Handwheel Operator , BRASS / BRONZE B62
	3-12	-		Gate Vlv , Powell B16.10 or eq. , CL125 , FF , Bltd Bonnet , Handwheel Operator , Cast Iron
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION: POTABLE WATER (UNDERGROUND)

MATERIAL: HDPE SDR 11, PE4710, PRE-INSULATED

EXAMINATION: Per ASME B31.1 - 2014

TEMPERATURE LIMIT: 0F to 140F

RATING CLASS: 125, ASME B16.1 - 2010

CORROSION ALLOWANCE: 0.0000 in

DESIGN CODE: Per ASME B31.1 - 2014

STRESS RELIEF: None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	150
32	150
73	150
90	150
100	146
110	140
120	118
130	112
140	93

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 THREADED JOINTS ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES
- 7 POTABLE WATER PIPING SHALL BE CERTIFIED ACCORDING TO NSF 14 AND NSF 61. PIPING SHALL ALSO BE CONTINUOUSLY MARKED WITH A BLUE STRIPE.
- 8 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.
- 9 FINAL LEAK TESTING SHALL BE HYDROSTATIC ONLY IN ACCORDANCE WITH ASTM F2164, FIELD LEAK TESTING OF POLYETHYLENE PRESSURE PIPING SYSTEM USING HYDROSTATIC PRESSURE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-24	-	SDR 11	Pipe , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	0.75-8	-	SDR 11	45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	0.75-8	-	SDR 11	90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	0.75-8	-	SDR 11	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	1-24	0.75-22	SDR 11	Concentric Reducer , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	-	SDR 11	Flange Adapter , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS -
	3-12	2-10	SDR 11	Branch Saddle , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	-	SDR 11	Cross , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	-	SDR 9	Lateral , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
	3-24	2-16	SDR 11	Reducing Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
				45 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece
	10-24	-	SDR 9	Fabbed
				90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece
	10-24	-	SDR 9	Fabbed
				90 Deg Elbow , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 5 Piece
	10-24	-	SDR 9	Fabbed
	10-24	-	SDR 9	Tee , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
Small Bore Fittings				

PIPE SPEC:

1AGJ0

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Bolts				
	0.75-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				
	0.75-24	-	SDR 11	Backing Ring , ISCO or eq. , CL125 , FF , Ductile Iron -
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1BAA1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 4 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
	1-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg Eq Lat Custom , Manuf. Std , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. Elbow 3D , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-36	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A105
	2.5-36	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A105
	2.5-48	2-24	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	3-3	1-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	6-10	0.75-0.75		Elbolet , Manuf. Std , CL3000 , SWE , A105
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				

PIPE SPEC:

1BAA1

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A105
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-8
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-12
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W

Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				

	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , Max Temp: 250 deg -F , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness

Flanges				
	0.75-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	0.75-24	-		Blind Flg. , B16.5 , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	0.75-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N

	1-8	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.75-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem
	24-48	-		Butterfly Valve , Bray Controls , CL150 , FF w/Integral Gaskets , Gear Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BAA2

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DESCRIPTION:	LUBE/HYDRAULIC OIL, LOW AND INTERMEDIATE TEMP
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 4 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE/TE , A 106 Gr. B , 3" Long, SMLS
	1-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-24	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	3-3	1-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A105
	0.5-2	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W

PIPE SPEC: 1BAA2

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	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
Flanges				
	0.75-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	0.75-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	1-24	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	0.75-24	-		Blind Flg. , B16.5 , CL150 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-	MATCH	Globe Valve , Manf. Std. , CL800 , BE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
Ball Valves				
	0.5-2	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB

PIPE SPEC: 1BAA6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
Large Bore Fittings				
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. Elbow 3D , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-20	-	MATCH	Eq. Cross , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	2-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A105
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				

PIPE SPEC: 1BAA6

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	0.5-24			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A105
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1BAB1

Date: 8/4/2016 5:03:11 PM



DESCRIPTION:	GENERAL SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0625 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.2.1
- 4 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 53 Gr. B , ERW
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 3" Long, SMLS
Large Bore Fittings				
	1-14	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	6-48	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				

PIPE SPEC: 1BAB1

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-8
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-12
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL150 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A105

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	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	1-24	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	8-24	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BAB6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 53 Gr. B , ERW
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 12" Long, SMLS
Large Bore Fittings				
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-48	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105

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	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL150 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , FF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
Gate Valves				
	3-14	-		Gate Valve Underground , AWWA C509 and/or C515 , FF , Bltd Bonnet , Post Indicator , Ductile Iron , Resilient Wedge, 250 Psig Working Pressure\125 deg F or better
	3-14	-		Gate Valve Underground , AWWA C509 and/or C515 , FF , Bltd Bonnet , Ductile Iron , With Valve Box, Resilient Wedge, 250 Psig Working Pressure\125 deg F or better
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1BAB7

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DESCRIPTION:	NO. 2 FUEL OIL BELOW GRADE DOUBLE WALL CONTAINMENT PIPE
MATERIAL:	Carbon Steel
EXAMINATION:	Per NFPA 24 - 2010
TEMPERATURE LIMIT:	-29C to 150C
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0787 in
DESIGN CODE:	NFPA 24 - 2010
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	269.6
100	269.6
122	263.8
212	242
302	214.5

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 PIPE SHALL BE PERMALERT ULTRA FS OR EQUAL.
- 4 INNER PIPE SHALL BE STANDARD WEIGHT A53 GR B. OUTER CONTAINMENT PIPE SHALL BE 10GAUGE OR THICKER WITH A FRP EXTERNAL COATING A MINIMUM OF 0.1" THICK (100-MILS).
- 5 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , ERW
	0.75-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.75-2	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.75-2	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.75-2	-	S-80	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-24	0.75-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.75-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.75-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	2-22	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB , SMLS
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
Small Bore Fittings				
	0.75-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.75-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	1-2	0.75-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	1-2	0.75-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB , SMLS
	1-2	0.75-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
Bolts				
	0.75-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				

PIPE SPEC:

1BAB7

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	0.75-48			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.75-48			Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.75-48			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.75-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.75-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.75-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
	0.75-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.75-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.75-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.75-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
Flanges				
	0.75-24	-		Blind Fig. , B16.5 , CL150 , FF , A105
	0.75-24	-	MATCH	WN Fig. , B16.5 , CL150 , FF , A105
	0.75-24	-	MATCH	WN Fig. , B16.5 , CL150 , RF , A105
	0.75-24	-		Blind Fig. , B16.5 , CL150 , RF , A105
	0.75-24	-		Blind Fig. , B16.5 , CL300 , RF , A105
	0.75-24	-	MATCH	WN Fig. , B16.5 , CL300 , RF , A105
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1BAB8

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	Galvanized Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	285
100	285
200	260

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 3 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-4	-	Calc	Pipe , B36.10M , MTE , A 53 Gr. B , Galvanized
	0.5-4	-	Calc	Nipple , B36.10M , TBE , A 53 Gr. B , 3" Long, Galvanized
	0.5-4	-	Calc	Nipple , B36.10M , TBE , A 53 Gr. B , 6" Long, Galvanized
Large Bore Fittings				
	0.5-4	-		45 Deg. Elbow , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.5-4	-		45 Deg. Elbow , B16.11 , CL6000 , FTE , A105 , Galvanized
	0.5-4	-		90 Deg. Elbow , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.5-4	-		90 Deg. Elbow , B16.11 , CL6000 , FTE , A105 , Galvanized
	0.5-4	-		Cap , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.5-4	-		Cap , B16.11 , CL6000 , FTE , A105 , Galvanized
	0.5-4	-		Cplg. , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.5-4	-		Cplg. , B16.11 , CL6000 , FTE , A105 , Galvanized
	0.5-4	-		Equal Tee , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.5-4	-		Equal Tee , B16.11 , CL6000 , FTE , A105 , Galvanized
	0.5-4	-		Plug Hex Head , B16.11 , MTE , A105 , Galvanized
	0.5-3	-		Union , MSS SP-83 , CL3000 , FTE , A105 , Galvanized
	0.5-3	-		Union , MSS SP-83 , CL6000 , FTE , A105 , Galvanized
	0.75-4	0.5-3	MATCH	Con. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , Galvanized, SMLS
	0.75-4	0.5-3	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , Galvanized, SMLS
	0.75-4	0.5-3		Red. Tee , B16.11 , CL3000 , FTE , A105 , Galvanized
	0.75-4	0.5-3		Red. Tee , B16.11 , CL6000 , FTE , A105 , Galvanized
Small Bore Fittings				
Bolts				
	0.5-4			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				

0.75-48	Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
0.75-48	Insulating Gskt Set , B16.21 , CL150 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
0.75-48	Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
0.75-48	Non Metal Flat Gskt , B16.21 , CL150 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
0.75-48	Non Metal Flat Gskt , B16.21 , CL300 , RF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness

PIPE SPEC: 1BAB8

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Flanges				
	0.5-4	-		Blind Flg. , B16.5 , CL150 , RF , A105 , Galvanized
	0.5-4	-		Blind Flg. , B16.5 , CL150 , FF , A105 , Galvanized
	0.5-4	-		Blind Flg. , B16.5 , CL300 , RF , A105 , Galvanized
	0.5-4	-		Thd. Flg. , B16.5 , CL150 , FF , A105 , Galvanized
	0.5-4	-		Thd. Flg. , B16.5 , CL150 , RF , A105 , Galvanized
	0.5-4	-		Thd. Flg. , B16.5 , CL300 , RF , A105 , Galvanized
Gate Valves				
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-4	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 105
	2.5-4	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-4	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
Butterfly Valves				
	2.5-4	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-4	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BAM1

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DESCRIPTION:	STEAM AND WATER SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230
400	200
500	170
600	140
650	125
700	110
750	95
800	80

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , API 5L Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , API 5L Gr. B , SMLS
	0-0	-	S-XXS	Nipple , B36.10M , BE x PE , API 5L Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , API 5L Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , API 5L Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , API 5L Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , API 5L Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , API 5L Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , API 5L Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-48	2-24	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS

PIPE SPEC:

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	3-3	1-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	6-10	0.75-0.75		Elbolet , Manuf. Std , CL3000 , SWE , A105
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A105
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
				Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	-		
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
1-1	-			
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
0.5-48				
Flanges				
0.75-48	-			Blind Flg. , B16.5 , CL150 , RF , A105
0.5-2	-	MATCH		SW Flg. , B16.5 , CL300 , RF , A105
0.5-2	-	MATCH		SW Flg. , B16.5 , CL300 , FF , A105
10-24	-	MATCH		WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
0.75-48	-			Blind Flg. , B16.5 , CL300 , RF , A105
30-48	-	MATCH		WN Flg. , B16.47 Sr. A , CL300 , FF , A105
22-22	-	MATCH		WN Flg. , MSS-SP-44-NB , CL150 , RF , A105
30-48	-	MATCH		WN Flg. , B16.47 Sr. A , CL300 , RF , A105 , 125 - 250 Ra Finish
26-48	-	MATCH		WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
2.5-24	-	MATCH		WN Flg. , B16.5 , CL300 , RF , A105
2.5-24	-	MATCH		WN Flg. , B16.5 , CL150 , FF , A105
2.5-24	-	MATCH		WN Flg. , B16.5 , CL300 , FF , A105
0.5-2	-	MATCH		SW Flg. , B16.5 , CL150 , RF , A105
2.5-24	-	MATCH		WN Flg. , B16.5 , CL150 , RF , A105
26-48	-	MATCH		WN Flg. , B16.47 Sr. A , CL150 , FF , A105
0.5-2	-	MATCH		SW Flg. , B16.5 , CL150 , FF , A105
1-8	-	MATCH		WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.75-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB

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	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem

DESCRIPTION:DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	2.5-2.5	-	Calc	Nipple , B36.19M , BE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	2.5-2.5	-	Calc	Nipple , B36.19M , BE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	2.5-2.5	-	Calc	Nipple , B36.19M , BE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.

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	2.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	0.5-1.5		Red. Cplg. , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.5-1.5		Red. Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.5-1.5		Red. Cplg. , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.5-1.5		Red. Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
				Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.25-1.5		Union , MSS SP-83 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
				Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	-		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.

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	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 2
	10-24	-	MATCH	Taps , 180deg apart
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert. WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 2
	1-8	-	MATCH	Taps , 180deg apart
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A536 Gr 65-45-12 , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BCA2

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DESCRIPTION:	DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1000F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 7 E HAS BEEN SELECTED BASED ON INSPECTION ACCORDANCE WITH BASE MATERIAL SPECIFICATION. E MAY BE INCREASED DEPENDING ON LEVEL OF INSPECTION. CONSULT THE EXACT CODE LANGUAGE FOR THIS CHANGE. ANY CHANGES TO INSPECTION SHALL BE ENGINEER APPROVED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , EFW (E = 0.8)
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , EFW (E = 0.8)
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.

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	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	6-48	2.5-22	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304/304L Dual Cert.
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 2 Taps , 180deg apart
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.

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	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 351 Gr. CF3 , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 351 Gr. CF3 , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 351 Gr. CF3 , EPDM / BUNA-N Seat, SS Stem

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DESCRIPTION:	LUBE/HYDRAULIC OIL, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1000F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 6 ALL PIPING SHALL BE PICKLED, PASSIVATED AND SOLVENT CLEANED AFTER FABRICATION.
- 7 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 8 PIPE IN LUBE OIL SERVICE SHALL BE PICKLED AND PASSIVATED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , TBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , TBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , TBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , TBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	0.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.

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	0.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	1-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	30-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 2
	4-8	-		Taps , 180deg apart
	0.5-24	-	MATCH	SO Flg. - Hub Type , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-	MATCH	Gate Valve , App. Mfg. , CL800 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-	MATCH	Globe Valve , Manf. Std. , CL800 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Welded Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-	MATCH	Check Valve Pistn Lft , App. Mfg. , CL800 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , BE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8

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Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball ,
Gear Operator , A 351 Gr. CF8

Butterfly Valves	14-24	-		
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PIPE SPEC: 1BCB6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195
300	175
400	160

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304L , SMLS
Large Bore Fittings				
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304L
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304L
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304L
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	2-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304L
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304L
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL6000 , PE x SWE , A 182 Gr. F304L

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Bolts					
	0.5-24				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets					
	0.5-24				Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24				Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24				Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges					
	0.5-2	-	MATCH		SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH		WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.5-2	-	MATCH		SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.5-24	-			Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH		WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
Gate Valves					
	2-2	-			Gate Valve Underground , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , Wrench Operator , A 351 Gr. CF8
	2.5-24	-			Gate Valve Underground , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , Wrench Operator , A 351 Gr. CF8
Globe Valves					
Check Valves					
Ball Valves					
Butterfly Valves					

DESCRIPTION:DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS USED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP316/316L Dual Cert. , SMLS
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP316/316L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS

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	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F316/316L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
1-1	-			
Bolts				
	0.5-48			Cap Screw , ASME B18.2.1 / B18.2.2 , A193 B7
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Red Rubber or EPDM , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F316/316L Dual Cert. , 2 Taps , 180deg apart
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.

PIPE SPEC: 1BCD1

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Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 351 Gr. CF3M
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
Butterfly Valves				
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BCD2

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DESCRIPTION:	DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1000F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS USED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 7 E HAS BEEN SELECTED BASED ON INSPECTION ACCORDANCE WITH BASE MATERIAL SPECIFICATION. E MAY BE INCREASED DEPENDING ON LEVEL OF INSPECTION. CONSULT THE EXACT CODE LANGUAGE FOR THIS CHANGE. ANY CHANGES TO INSPECTION SHALL BE ENGINEER APPROVED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP316/316L Dual Cert. , EFW (E = 0.8)
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP316/316L Dual Cert. , EFW (E = 0.8)
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.

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	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	6-48	2.5-22	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F316/316L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 234 Gr. WPB , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F316/316L Dual Cert. , 2
	0.5-24	-		Taps , 180deg apart
	26-48	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-	MATCH	Blind Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	26-48	-		WN Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F316/316L Dual Cert.

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	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 351 Gr. CF3M
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL150 , RF , Three Piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
Butterfly Valves				
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BCE6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195
300	175
400	160

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 5 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP316L , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP316L , SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 3" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 3" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 9" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 12" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 9" Long, SMLS
	0.5-2	-	S-80S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F316L
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F316L
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316L
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316L
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP316L
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP316L
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316L , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP316L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F316L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F316L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F316L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F316L
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP316L
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP316L
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP316L
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316L
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F316L
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F316L

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	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F316L
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F316L
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP316L , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP316L , SMLS
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F316L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL6000 , PE x SWE , A 182 Gr. F316L
	0.75-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F316L
	0.75-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F316L
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316L
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316L
Bolts				
				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
	0.5-24			
Gaskets				
				Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.75-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
Gate Valves				
				Gate Valve Underground , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , Wrench Operator , A 351 Gr. CF3M
	2-2	-		Gate Valve Underground , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , Wrench Operator , A 351 Gr. CF3M
	2.5-24	-		
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:DEMINERALIZED WATER, INSTRUMENT AIR, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 200F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 CHOICE OF PIPE SCHEDULE IS LIMITED TO S-10S.
- 2 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 3 GROOVED-END PIPE AND FITTINGS SHALL BE VICTAULIC OR EQUAL. MECHANICAL COUPLINGS SHALL BE RIGID TYPE VICTAULIC STYLE 489 STAINLESS STEEL OR EQUAL.
- 4 BOLTS FOR MECHANICAL COUPLINGS SHALL BE TYPE 316 SS OVAL NECK TRACK BOLTS AND HEAVY HEX NUTS CONFORMING TO ASTM A193.
- 5 FOR MATING TO THREADED PIPE OR VALVES A VICTAULIC FEMALE THREAD ADAPTER OR VICTAULIC MALE THREAD ADAPTER SHALL BE USED. SPECIFY 304SS MATERIALS.
- 6 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 7 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 8 USE VICTAULIC VIC-PRESS SERIES P569 BALL VALVE FOR INSTRUMENT AIR SERVICE, FOR ALL OTHER SYSTEMS USE VICTAULIC VIC-PRESS SERIES P589 BALL VALVE

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-12	-	S-10S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP304L , SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
Large Bore Fittings				
	2.5-12	-	S-10S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 411
	2.5-12	-	S-10S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 410
	2.5-12	-	S-10S	Cap , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 460
	2.5-12	2-10	S-10S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 450
	2.5-12	2-10	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 425
	2.5-12	-		Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304L , Style 489, Type E
	2.5-12	-		Gasket
	2.5-12	-	S-10S	Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 420
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P591
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P586
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP304L , Style P599
	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP304L , Style P596
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F304 , SS-810-1-12
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F304L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P597
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P592
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P584
	0.5-2	-	S-10S	Weld Adapter , Victaulic Vic-Press , PE x VPS , A 312 Gr. TP304L , Style P561
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P594
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F304 , SS-810-1-12
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P593
Bolts				
	0.5-12			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8 / A 194 Gr 8 ,CS CR, 304SS IR
Gaskets				
	0.5-12			Dielectric FlangeKit , CL150 , 0.175" non compressed thickness

PIPE SPEC:

1BCH1

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	0.5-12			Dielectric FlangeKit , CL300 , 0.175" non compressed thickness
	0.5-12			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-12			Non Metal Flat Gskt , B16.21 , CL150 , FF , Red Rubber , 0.175" non compressed thickness, use Red Rubber up to 150 Deg F
	0.5-12			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-12			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-12	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304
	2.5-12	-	S-10S	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 182 Gr. F304L , No. 445F
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F304L , Style P595
	2.5-12	-	S-10S	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 182 Gr. F304L , No. 445R
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-12	-		Gate Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-12	-		Globe Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
Check Valves				
	0.75-2	-		Swing Chk Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , A 182 Gr. F304L
	2.5-12	-		Swing Chk Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	1.5-6	-		Ball Vlv FB , Victaulic Grooved or eq. , MGE , Lever Operator , A 351 Gr. CF8M , Series 726S
Butterfly Valves				
	2.5-10	-		Butterfly Vlv , Victaulic Grooved Series 763 , MGE , Lever Operator , A 351 Gr. CF8M

PIPE SPEC: 1BCH2

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Stainless Steel - Type 304L
EXAMINATION:	Per ASME B31.1 - 2012
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2012
STRESS RELIEF:	Per ASME B31.1 - 2012

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 CHOICE OF PIPE SCHEDULE IS LIMITED TO S-40S FOR SMALL BORE AND S-10S FOR LARGE BORE.
- 2 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 3 GROOVED-END PIPE AND FITTINGS SHALL BE VICTAULIC OR EQUAL. MECHANICAL COUPLINGS SHALL BE RIGID TYPE VICTAULIC STYLE 489 STAINLESS STEEL OR EQUAL.
- 4 BOLTS FOR MECHANICAL COUPLINGS SHALL BE TYPE 304 SS OVAL NECK TRACK BOLTS AND HEAVY HEX NUTS CONFORMING TO ASTM A193.
- 5 FOR MATING TO THREADED PIPE OR VALVES A VICTAULIC FEMALE THREAD ADAPTER OR VICTAULIC MALE THREAD ADAPTER SHALL BE USED. SPECIFY 304SS MATERIALS.
- 6 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 7 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-2	-	S-40S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP304L , SMLS
	2.5-12	-	S-10S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP304L , SMLS
				Adapter Nipple , Victaulic Grooved , MGE x BE , A 312 Gr. TP304L , No. 442H SS
	0.75-2	-	S-40S	
				Adapter Nipple , Victaulic Grooved , MGE x FTE , A 312 Gr. TP304L , No. 440H SS
	0.75-2	-	S-40S	
	0.75-2	-	S-40S	Adapter Nipple , Victaulic Grooved , MGE , A 312 Gr. TP304L , No. 443H SS
				Adapter Nipple , Victaulic Grooved , MGE x BE , A 312 Gr. TP304L , No. 442 SS
	2.5-12	-	S-10S	
	2.5-12	-	S-10S	Adapter Nipple , Victaulic Grooved , MGE , A 312 Gr. TP304L , No. 443 SS
Large Bore Fittings				
				Rigid Coupling , Victaulic Grooved , FGE , A 351 Gr. CF8M , Style 489, Type E
	1.5-12	-		Gasket
	2.5-12	-	S-10S	11.25 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 413 SS
	2.5-12	-	S-10S	22.5 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 412 SS
	2.5-12	-	S-10S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 411 SS
	2.5-12	-	S-10S	45 Deg Lateral , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 430 SS
	2.5-12	-	S-10S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 410 SS
	2.5-12	-	S-10S	Cap , Victaulic Grooved , MGE , A 351 Gr. CF8M , No. 460 SS
	2.5-12	1-10	S-10S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 450 SS
	2.5-12	-	S-10S	Cross , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 435 SS
	2.5-6	1-4	S-10S	Eccentric Reducer , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 451 SS
	2.5-2.5	0.75-2	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 425 SS
	2.5-12	-	S-10S	Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 420 SS
	2.5-12	-	S-10S	Wye , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 433 SS
	3-12	0.75-10	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 312 Gr. TP304L , No. 425 SS
Small Bore Fittings				
	0.75-2	-	S-40S	11.25 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 413H SS
	0.75-2	-	S-40S	22.5 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 412H SS
	0.75-2	-	S-40S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 411H SS
	0.75-2	-	S-40S	45 Deg Lateral , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 430H SS
	0.75-2	-	S-40S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 410H SS
	0.75-2	-	S-40S	Cap , Victaulic Grooved , MGE , A 351 Gr. CF8M , No. 60 SS
	0.75-2	-	S-40S	Cross , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 435H SS
				Flexible Coupling , Victaulic Grooved , FGE , A 890 Gr. CE8MN , Style 77DX, Type E
	0.75-1	-		Gasket
	0.75-2	-	S-40S	Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 420H SS
	0.75-2	-	S-40S	Wye , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 433H SS

PIPE SPEC: 1BCH2

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	2-2	0.75-1.5	S-40S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 50H SS
	2-2	0.75-1.5	S-40S	Eccentric Reducer , Victaulic Grooved , MGE , A 403 Gr. TP304L , No. 51H SS
	2-2	0.75-1.5	S-40S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP304L , No. 425H SS
Bolts				
	0.75-12			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8 / A 194 Gr 8 ,CS CR, 304SS IR
Gaskets				
	0.75-12			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.75-12			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.75-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.75-12	-		Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 182 Gr. F304L , No. 45F
	0.75-12	-		
	0.75-12	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	0.75-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 182 Gr. F304L , NO. 45R
Gate Valves				
	0.75-2	-		Gate Valve , App. Mfg. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-12	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
Globe Valves				
	0.75-2	-		Globe Valve , Manf. Std. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-12	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
Check Valves				
	0.75-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , FTE , Bltd Bonnet , A 182 Gr. F304L
	2.5-12	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
Ball Valves				
	0.75-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8 , Series P569
	1.5-6	-		Ball Vlv FB , Victaulic Grooved or eq. , MGE , Lever Operator , A 351 Gr. CF8 , Series 726
Butterfly Valves				
	2-10	-		Butterfly Vlv , Victaulic Grooved Series 763 , MGE , Lever Operator , A 351 Gr. CF8

PIPE SPEC: 1BCH3

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DESCRIPTION:	DEMINERALIZED WATER, INSTRUMENT AIR, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 CHOICE OF PIPE SCHEDULE IS LIMITED TO S-10S.
- 2 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 3 GROOVED-END PIPE AND FITTINGS SHALL BE VICTAULIC OR EQUAL. MECHANICAL COUPLINGS SHALL BE RIGID TYPE VICTAULIC STYLE 489 STAINLESS STEEL OR EQUAL.
- 4 BOLTS FOR MECHANICAL COUPLINGS SHALL BE TYPE 316 SS OVAL NECK TRACK BOLTS AND HEAVY HEX NUTS CONFORMING TO ASTM A193.
- 5 FOR MATING TO THREADED PIPE OR VALVES A VICTAULIC FEMALE THREAD ADAPTER OR VICTAULIC MALE THREAD ADAPTER SHALL BE USED. SPECIFY 316SS MATERIALS.
- 6 GASKETS FOR LARGE BORE MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 7 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 8 USE VICTAULIC VIC-PRESS SERIES P569 BALL VALVE FOR INSTRUMENT AIR SERVICE, FOR ALL OTHER SYSTEMS USE VICTAULIC VIC-PRESS SERIES P589 BALL VALVE
- 9 GASKETS FOR SMALL BORE MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE H (HNBR).

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP316L , SMLS
	2.5-12	-	S-10S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP316L , SMLS
Large Bore Fittings				
	2.5-12	-	S-10S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 411 SS
	2.5-12	-	S-10S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 410 SS
	2.5-12	-	S-10S	Cap , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 460 SS
	2.5-12	2-10	S-10S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 450 SS
	2.5-12	2-10	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 425 SS
	2.5-12	-		Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP316L , Style 489, Type E
	2.5-12	-	S-10S	Gasket Tee , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 420 SS
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P571
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P568
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP316L , Style P579
	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP316L , Style P576
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F316L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P507
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P572
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P585
	0.5-2	-	S-10S	Weld Adapter , Victaulic Vic-Press , PE x VPS , A 312 Gr. TP304L , Style P561
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P574
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P573
Bolts				
	0.5-12			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8M / A 194 8M , CS CR, 316SS IR
Gaskets				
	0.5-12			Dielectric FlangeKit , CL150 , 0.175" non compressed thickness
	0.5-12			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness

PIPE SPEC: 1BCH3

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	0.5-12			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-12			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
	0.5-12	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F316L , Style P575
	2.5-12	-	S-10S	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 182 Gr. F316L , No. 445R
	2.5-12	-	S-10S	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 182 Gr. F316L , No. 445F
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-12	-		Gate Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-12	-		Globe Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
Check Valves				
	0.75-2	-		Swing Chk Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , A 182 Gr. F316L
	2.5-12	-		Swing Chk Vlv , Powell B16.10 or eq. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	1.5-6	-		Ball Vlv FB , Victaulic Grooved or eq. , MGE , Lever Operator , A 351 Gr. CF8M , Series 726S
Butterfly Valves				
	2.5-10	-		Butterfly Vlv , Victaulic Grooved Series 763 , MGE , Lever Operator , A 351 Gr. CF8M

PIPE SPEC: 1BCH4

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Stainless Steel - Type 316L
EXAMINATION:	Per ASME B31.1 - 2012
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2012
STRESS RELIEF:	Per ASME B31.1 - 2012

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 CHOICE OF PIPE SCHEDULE IS LIMITED TO S-40S FOR SMALL BORE AND S-10S FOR LARGE BORE.
- 2 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 3 GROOVED-END PIPE AND FITTINGS SHALL BE VICTAULIC OR EQUAL. MECHANICAL COUPLINGS SHALL BE RIGID TYPE VICTAULIC STYLE 489 STAINLESS STEEL OR EQUAL.
- 4 BOLTS FOR MECHANICAL COUPLINGS SHALL BE TYPE 304 SS OVAL NECK TRACK BOLTS AND HEAVY HEX NUTS CONFORMING TO ASTM A193.
- 5 FOR MATING TO THREADED PIPE OR VALVES A VICTAULIC FEMALE THREAD ADAPTER OR VICTAULIC MALE THREAD ADAPTER SHALL BE USED. SPECIFY 304SS MATERIALS.
- 6 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 7 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-2	-	S-40S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP316L , SMLS
	2.5-12	-	S-10S	Pipe , Victaulic Grooved , MGE , A 312 Gr. TP316L , SMLS
				Adapter Nipple , Victaulic Grooved , MGE x BE , A 312 Gr. TP316L , No. 442H SS
	0.75-2	-	S-40S	
				Adapter Nipple , Victaulic Grooved , MGE x FTE , A 312 Gr. TP316L , No. 440H SS
	0.75-2	-	S-40S	
	0.75-2	-	S-40S	Adapter Nipple , Victaulic Grooved , MGE , A 312 Gr. TP316L , No. 443H SS
				Adapter Nipple , Victaulic Grooved , MGE x BE , A 312 Gr. TP316L , No. 442 SS
	2.5-12	-	S-10S	
	2.5-12	-	S-10S	Adapter Nipple , Victaulic Grooved , MGE , A 312 Gr. TP316L , No. 443 SS
Large Bore Fittings				
				Rigid Coupling , Victaulic Grooved , FGE , A 351 Gr. CF8M , Style 489, Type E
	1.5-12	-		Gasket
	2.5-12	-	S-10S	11.25 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 413 SS
	2.5-12	-	S-10S	22.5 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 412 SS
	2.5-12	-	S-10S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 411 SS
	2.5-12	-	S-10S	45 Deg Lateral , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 430 SS
	2.5-12	-	S-10S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 410 SS
	2.5-12	-	S-10S	Cap , Victaulic Grooved , MGE , A 351 Gr. CF8M , No. 460 SS
	2.5-12	1-10	S-10S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 450 SS
	2.5-12	-	S-10S	Cross , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 435 SS
	2.5-6	1-4	S-10S	Eccentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 451 SS
	2.5-2.5	0.75-2	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 312 Gr. TP316L , No. 425 SS
	2.5-12	-	S-10S	Tee , Victaulic Grooved , MGE , A 312 Gr. TP316L , No. 420 SS
	2.5-12	-	S-10S	Wye , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 433 SS
	3-12	0.75-10	S-10S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 425 SS
Small Bore Fittings				
	0.75-2	-	S-40S	11.25 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 413H SS
	0.75-2	-	S-40S	22.5 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 412H SS
	0.75-2	-	S-40S	45 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 411H SS
	0.75-2	-	S-40S	45 Deg Lateral , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 430H SS
	0.75-2	-	S-40S	90 Deg Elbow , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 410H SS
	0.75-2	-	S-40S	Cap , Victaulic Grooved , MGE , A 351 Gr. CF8M , No. 60 SS
	0.75-2	-	S-40S	Cross , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 435H SS
				Flexible Coupling , Victaulic Grooved , FGE , A 890 Gr. CE8MN , Style 77DX, Type E
	0.75-1	-		Gasket
	0.75-2	-	S-40S	Tee , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 420H SS

PIPE SPEC:

1BCH4

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	0.75-2	-	S-40S	Wye , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 433H SS
	2-2	0.75-1.5	S-40S	Concentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 50H SS
	2-2	0.75-1.5	S-40S	Eccentric Reducer , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 51H SS
	2-2	0.75-1.5	S-40S	Reducing Tee , Victaulic Grooved , MGE , A 403 Gr. WP316L , No. 425H SS
Bolts				
	0.75-12			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8M / A 194 8M , CS CR, 316SS IR
Gaskets				
	0.75-12			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.75-12			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.75-12	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.75-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 182 Gr. F316L , NO. 45R
	0.75-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
	0.75-12	-		Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 182 Gr. F316L , No. 45F
Gate Valves				
	0.75-2	-		Gate Valve , App. Mfg. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-12	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
Globe Valves				
	0.75-2	-		Globe Valve , Manf. Std. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-12	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
Check Valves				
	0.75-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , FTE , Bltd Bonnet , A 182 Gr. F316L
	2.5-12	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8M
Ball Valves				
	0.75-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	1.5-6	-		Ball Vlv FB , Victaulic Grooved or eq. , MGE , Lever Operator , A 351 Gr. CF8M , Series 726
Butterfly Valves				
	2-10	-		Butterfly Vlv , Victaulic Grooved Series 763 , MGE , Lever Operator , A 351 Gr. CF8M

DESCRIPTION:GENERAL WATER AND STEAM SERVICE

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	275
100	275
200	230
300	205
400	190
500	170
600	140
650	125
700	110
750	95
800	80
850	65
900	50
950	35
1000	20

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 358 Gr. 304L , SMLS
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 358 Gr. 304L , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 358 Gr. 304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 358 Gr. 304L , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 358 Gr. 304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 358 Gr. 304L , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 358 Gr. 304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 358 Gr. 304L , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 358 Gr. 304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 358 Gr. 304L , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304L
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304L
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304L
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304L
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304L
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304L
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304L

	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304L
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304L
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304L
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304L
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F304L , 2 Taps , 180deg apart
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A 182 Gr. F304L
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3

	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL150 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 351 Gr. CF8
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL600 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 351 Gr. CF3 , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 351 Gr. CF3 , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray Controls or eq. , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 351 Gr. CF3M , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1BGD6

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DESCRIPTION:	UNDERGROUND SEWER DRAINAGE
MATERIAL:	PVC, ASTM D1785
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	32F to 140F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
32	150
73	150
100	150
110	135
120	110
130	75
140	50

GENERAL NOTES

- 1 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 4 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 5 UNDERGROUND VALVES SHALL BE PROVIDED WITH A VALVE BOX AS A MINIMUM.
- 6 MINIMUM PIPE WALL THICKNESS SHALL BE SCH 40.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-24	-	S-80	Pipe , Spears or eq. , PVC 1120, ASTM D 1785 , PE , IPS , Seamless
Large Bore Fittings				
	0.75-24	-	S-80	22.5 Deg Elbow , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-	S-80	45 Deg Elbow , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-	S-80	90 Deg Elbow , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-	S-80	CAP , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-		Coupling , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-	S-80	Tee , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	0.75-24	-	S-80	Wye , Spears or eq. , PVC 1120, ASTM D 2467 , Socket End , IPS
	1-24	0.75-20	S-80	Concentric Reducer , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	1-24	0.75-20	S-80	Reducing Tee , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
	1-24	0.75-20	S-80	Reducing Wye , Spears or eq. , PVC 1120, ASTM D 2467 , Socket End , IPS
	2-18	1-16	S-80	Eccentric Reducer , Spears or eq. , PVC 1120, ASTM D 2466 , Socket End , IPS
Small Bore Fittings				
Bolts				
	0.75-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.75-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges				
	0.75-24	-		Blind Flg. , Spears or eq. , CL150 , FF , PVC 1120, ASTM D 1784
	0.75-24	-	MATCH	SW Flg. , Spears or eq. , CL150 , FF , PVC 1120, ASTM D 1784
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:CHEMICAL FEED

MATERIAL:CPVC, ASTM D1784 CELL CLASSIFICATION 23447

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:32F to 200F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
32	150
73	150
100	123
110	116
120	98
130	93
140	75
150	71
160	60
170	48
180	38
190	33
200	30

GENERAL NOTES

- 1 THREADED JOINTS ARE PERMITTED IN CATEGORY D FLUID SERVICE ONLY (REF. TO ART.300.2 FOR DEFINITION OF FLUID SERVICES).
- 2 PRESSURE RATING FOR REDUCING WYE SHALL BE PER MANUFACTURER. PRESSURE RATING FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES. BLIND FLANGES LARGER THAN 12" SHALL FOLLOW MANUFACTURER'S PRESSURE RATING.
- 3 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PRESSURE RATING ONLY GOOD FOR PIPE 16" DIAMETER AND SMALLER
- 6 MINIMUM PIPE WALL THICKNESS SHALL BE SCH 80.
- 7 ALL FITTINGS ARE TO BE INJECTION MOLDED.
- 8 JOINING METHOD OF "SOCKET TYPE" CAN ALSO UTILIZE VAN STONE TYPE OR SOCKET GLUED FLANGE TYPE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-16	-	S-80	Pipe , ASTM F 441 , CPVC ASTM D 1784 class 23447 , PE , IPS , Seamless
Large Bore Fittings				
	0.5-16	-	S-80	45 Deg Elbow , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	90 Deg Elbow , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	CAP , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Coupling , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Female Adapter , Spears or eq. , CPVC ASTM F439 , SE X FTE , IPS
	0.5-16	-	S-80	Male Adapter , Spears or eq. , CPVC ASTM F439 , SE X MTE , IPS
	0.5-16	-	S-80	Tee , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Wye , Spears , CPVC ASTM F439 , Socket End , IPS
	0.75-16	0.5-14	S-80	Concentric Reducer , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.75-16	0.5-14	S-80	Eccentric Reducer , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.75-6	0.5-4	S-80	Reducer Bushing , F439 , CPVC ASTM F439 , Spigot X SE , IPS
	0.75-6	0.5-4	S-80	Reducer Bushing , Spears or eq. , CPVC ASTM F439 , Spig X FTE , IPS
	0.75-16	0.5-14	S-80	Reducing Tee , F439 , CPVC ASTM D 1784 class 23447 , SE , IPS
	0.75-16	0.5-14	S-80	Reducing Tee , Spears or eq. , CPVC ASTM F439 , SE X FTE , IPS
	0.75-16	0.5-14	S-80	Reducing Wye , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
Small Bore Fittings				
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 105
	1-1	0.5-0.75	S-80	Red. Male Adapter , Spears or eq. , CPVC ASTM F439 , SE X MTE , IPS
Bolts				
	0.5-16			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-16			Non Metal Flat Gskt , B16.21 , CL150 , FF , PTFE , 0.175" non compressed thickness
Flanges				
	0.5-12	-	S-80	SW Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439

PIPE SPEC:

1BGE1

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	0.5-16	-		Blind Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439
	0.5-16	-	S-80	Van Stone Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439
Gate Valves				
Globe Valves				
Check Valves				
	0.5-6	-		T-U Ball Check Valve , Spears or eq. , CL150 , Socket End , True Union , CPVC
Ball Valves				
	0.5-4	-		Ball Vlv LP FB , Spears or eq. , CL150 , Socket End , Lever Operator , ASTM D 1784 , CPVC 4120
	0.5-4	-		Ball Vlv LP FB , Spears or eq. , CL150 , FF , Three Piece Fltg. Ball , Lever Operator , ASTM D 1784 , CPVC 4120
Butterfly Valves				
	2.5-12	-		Bfly Vlv Lug Type , Nibco API 609 Cat. B , CL150 , FF , Lever Operator , A536 Gr.60-42-10

PIPE SPEC: 1BGE6

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DESCRIPTION:	CHEMICAL FEED
MATERIAL:	CPVC, ASTM D1784 CELL CLASSIFICATION 23447
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	32F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
32	150
73	150
100	123
110	116
120	98
130	93
140	75
150	71
160	60
170	48
180	38
190	33
200	30

GENERAL NOTES

- 1 ALL FITTINGS ARE TO BE INJECTION MOLDED.
- 2 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 3 JOINING METHOD OF "SOCKET TYPE" CAN ALSO UTILIZE VAN STONE TYPE OR SOCKET GLUED FLANGE TYPE. DO NOT USE IN SUN EXPOSED AREA UNLESS UV PROTECTED.
- 4 MINIMUM PIPE WALL THICKNESS SHALL BE SCH 80.
- 5 PRESSURE RATING ONLY GOOD FOR PIPE 16" DIAMETER AND SMALLER
- 6 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 7 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-16	-	S-80	Pipe , ASTM F 441 , CPVC ASTM D 1784 class 23447 , PE , IPS , Seamless
Large Bore Fittings				
	0.5-16	-	S-80	45 Deg Elbow , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	90 Deg Elbow , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	CAP , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Coupling , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Tee , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.5-16	-	S-80	Wye , Spears , CPVC ASTM F439 , Socket End , IPS
	0.75-16	0.5-14	S-80	Concentric Reducer , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.75-16	0.5-14	S-80	Eccentric Reducer , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
	0.75-6	0.5-4	S-80	Reducer Bushing , F439 , CPVC ASTM F439 , Spigot X SE , IPS
	0.75-16	0.5-14	S-80	Reducing Tee , F439 , CPVC ASTM D 1784 class 23447 , SE , IPS
	0.75-16	0.5-14	S-80	Reducing Wye , Spears or eq. , CPVC ASTM F439 , Socket End , IPS
Small Bore Fittings				
Bolts				
	0.5-16			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-16			Non Metal Flat Gskt , B16.21 , CL150 , FF , PTFE , 0.175" non compressed thickness
Flanges				
	14-16	-	S-80	Van Stone Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439
	0.5-12	-		Blind Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439
	0.5-12	-	S-80	SW Flg. , Spears or eq. , CL150 , FF , CPVC ASTM F439
Gate Valves				
Globe Valves				
Check Valves				

PIPE SPEC:

1BGE6

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	0.5-6	-		T-U Ball Check Valve , Spears or eq. , CL150 , Socket End , True Union , CPVC
Ball Valves				
	0.5-4	-		Ball Vlv LP FB , Spears or eq. , CL150 , Socket End , Lever Operator , ASTM D 1784 ,CPVC 4120
Butterfly Valves				
	2.5-12	-		Bfly Vlv Lug Type , Nibco API 609 Cat. B , CL150 , FF , Lever Operator , A536 Gr.60-42-10

PIPE SPEC: 1BGH6

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DESCRIPTION:	UNDERGROUND SERVICE / INSTRUMENT AIR
MATERIAL:	Asahi Air-Pro, SDR 7.4
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	32F to 140F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-22	230
32	230
86	202
104	181
140	149

GENERAL NOTES

- 1 ALL FITTINGS ARE TO BE INJECTION MOLDED.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 4 ALL PIPE SHALL BE CONTINUOUSLY MARKED WITH DURABLE PRINTING, INCLUDING THE FOLLOWING INFORMATION: DIMENSION RATIO, MANUFACTURER'S NAME, CELL CLASS, ASTM BASIS, AND LOT NUMBER.
- 5 ASAHI AIR PRO PIPING EXPOSED TO SUNLIGHT AFTER INSTALLATION SHALL BE APPROPRIATELY JACKETED OR COATED WITH AN ENGINEERING APPROVED MATERIAL OR SYSTEM.
- 6 FITTINGS SHALL HAVE SAME PRESSURE RATING AS PIPE.
- 7 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
GASKET FOR BURIED FLANGES SHALL BE GARLOCK TYPE 3760. GASKETS FOR EXPOSED FLANGES SHALL BE GARLOCK TYPE 3545
- 8 HYDROSTATIC DESIGN BASIS SHALL BE PER ASTM D-2837-88.
- 9 PIPE AND FITTINGS SHALL BE JOINED USING SOCKET FUSION PER ASTM D-2657 SECTION 8 AND ACCORDING TO PIPE MFG INSTRUCTIONS.
- 10 PIPE FITTINGS SHALL BE JOINED USING SOCKET FUSION WITH A ONE FOOT TRANSITION PIECE. PIPE-TO-PIPE CONNECTIONS MAY BE JOINED USING BUTT FUSION. IF BUTT FUSION IS NOT USED, THEN A ONE FOOT TRANSITION PIECE WILL BE UTILIZED WITH SOCKET FUSION.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-4	-	SDR 7.4	Pipe , Asahi Air-Pro or eq. , ASTM D3035, PE100 , PE , IPS
Large Bore Fittings				
	0.5-4	-	SDR 7.4	45 Deg Elbow , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
	0.5-4	-	SDR 7.4	90 Deg Elbow , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
	0.5-4	-	SDR 7.4	CAP , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
	0.5-4	-	SDR 7.4	Coupling , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
	0.5-4	-	SDR 7.4	Flange Adapter , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS -
	0.5-4	-	SDR 7.4	Tee , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
	0.75-4	0.5-3	SDR 7.4	Reducer Bushing , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
Small Bore Fittings				
	0.5-2	-		Female Adapter , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE X FTE , IPS
	0.5-2	-		Male Adapater , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE X MTE , IPS
	0.75-2	0.5-1.5	SDR 7.4	Reducing Tee , Asahi Air-Pro or eq. , ASTM D3035, PE100 , SE , IPS
Bolts				
	0.5-4			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-4			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3545 , 0.125" non compressed thickness
	0.5-4			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				
	0.5-4	-	SDR 7.4	Backing Ring , ISCO or eq. , CL150 , FF Lap Flgd , Ductile Iron , (Non-Coated)
Gate Valves				
	2.5-4	-		Gate Vlv , App. Mfg. , CL150 , FF , Wrench Operator , BRASS / BRONZE B62 , 2" Nut
Globe Valves				

PIPE SPEC:

1BGH6

Date:

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Check Valves				
Ball Valves				
	0.75-2	-		Ball Vlv FB , Asahi Air-Pro or eq. , SE , One or Two piece Trun. Mount. Ball , Lever Operator , PE100
Butterfly Valves				

PIPE SPEC:

1BJA1

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DESCRIPTION:	CIRCULATING WATER
MATERIAL:	FIBERGLASS
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	32F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	217
200	0
200	217

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 2 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 3 CAP SCREWS ARE ACCEPTABLE EXCLUSIVELY FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES.
- 4 PIPE SHALL MEET ASTM D2996 - STANDARD FOR FILAMENT-WOUND GLASS FIBER REINFORCED THERMOSETTING RESIN PRESSURE PIPE (SIZES 1" TO 20")
- 5 THE FABRICATOR SHALL BE RESPONSIBLE FOR THE BASIC DESIGN OF PIPE AND FITTINGS INCLUDING WALL THICKNESS & STIFFENERS , AND SHALL RECOMMEND METHODS AND LOCATIONS OF SUPPORTS
- 6 THE MECHANICAL PROPERTIES OF PIPE AND FITTINGS SHALL COMPLY WITH ASTM C-582 -CONTACT-MOLDED REINFORCED THERMOSETTING PLASTIC (RTP) LAMINATES FOR CORROSIONRESISTANTEQUIPMENT
- 7 DESIGN FOR THE SPECIFIED PRESSURE AND FOR FULL VACUUM SERVICE, AND IN ACCORDANCE WITH AWWA MANUAL M45 - FIBERGLASS PIPE DESIGN
- 8 ELBOWS SHALL HAVE A TAKE-OUT DIMENSION EQUAL TO ONE (1.0) PIPE DIAMETER (R/D = 1.0)

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	1-1	-	0.057" min	Pipe , NOV Fiber Glass Green Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11FX1-3110
	1-1	-	0.057" min	Pipe , NOV Fiber Glass Green Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11FX1-3110
	1.5-1.5	-	0.062" min	Pipe , NOV Fiber Glass Green Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11FX1-3110
	1.5-1.5	-	0.062" min	Pipe , NOV Fiber Glass Green Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11FX1-3110
	2-2	-	0.058" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	2-2	-	0.058" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	3-3	-	0.086" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	3-3	-	0.086" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	4-4	-	0.083" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	4-4	-	0.083" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	6-6	-	0.122" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	6-6	-	0.122" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	8-8	-	0.127" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	8-8	-	0.127" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	10-10	-	0.156" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
	10-10	-	0.156" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	12-12	-	0.185" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
	12-12	-	0.185" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1

14-14	-	0.238" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
14-14	-	0.238" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
16-16	-	0.272" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
16-16	-	0.272" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
18-18	-	0.277" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1
18-18	-	0.277" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
20-20	-	0.286" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , Bell/Spigot End , ASTM D2996 , RTRP-11AW1
20-20	-	0.286" min	Pipe , NOV Fiber Glass Red Thread HP 16 or eq. , PE , ASTM D2996 , RTRP-11AW1

Large Bore Fittings				
	2-16	-	MATCH	45 Deg Elbow , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	-	MATCH	90 Deg Elbow , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-4	1-1	MATCH	Branch Saddle , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End CAP , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	-	MATCH	Concentric Reducer , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	1-14	MATCH	Coupling , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	-		Eccentric Reducer , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	1-14	MATCH	Tee , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	2-16	-	MATCH	Branch Saddle , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	3-14	2-4	MATCH	Reducing Tee , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Belled-NOV RT pipe
	8-16	6-14	MATCH	45 Deg Elbow , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	-	MATCH	90 Deg Elbow , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	-	MATCH	Branch Saddle , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	2-12	MATCH	Concentric Reducer , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	16-18	MATCH	Coupling , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	-		Eccentric Reducer , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	14-16	MATCH	Reducing Tee , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	14-18	MATCH	Tee , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , ASTM D5685 , Belled-NOV RT pipe
	18-20	-	MATCH	

Small Bore Fittings				
1-1.5	-	MATCH	45 Deg Elbow , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End	
1-1.5	-	MATCH	90 Deg Elbow , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End	
1-1.5	-	MATCH	CAP , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End	
1-1.5	-		Coupling , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End	
1-1.5	-	MATCH	Tee , NOV Fiber Glass Green Thread HP or eq. , ASTM D5685 , Bell End	

Bolts				
1-20				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8M / A 194 B8M

Gaskets				
1-20				Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 600 , 0.125" non compressed thickness
1-20				Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , furnish with 0.625" PTFE compensation ring , 0.125" non compressed thickness

Flanges				
				Blind Flg. , NOV Fiber Glass Green Thread HP or eq. , CL150 , FF , ASTM D4024
1-16	-			
				Bell End Flange , NOV Fiber Glass Green Thread HP or eq. , CL300 , FF x BLE
2-6	-			NOV RT , ASTM D4024
				Bell End Flange , NOV Fiber Glass Green Thread EPOXY HP 16 or eq. , CL150 , FF
18-20	-			x BLE NOV RT , ASTM D4024
				Bell End Flange , NOV Fiber Glass Green Thread HP or eq. , CL150 , FF x Bell ,
1-1.5	-			ASTM D4024
				Bell End Flange , NOV Fiber Glass Green Thread HP or eq. , CL150 , FF x BLE
2-16	-			NOV RT , ASTM D4024

Gate Valves				
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Globe Valves				
Check Valves				
	8-8	-		Swing Chk Vlv , American Valve or eq. , CL125 , FF , Bltd Bonnet , Epoxy Coated A536
Ball Valves				
	0.75-10	-		Ball Vlv SP FB , American Valve B16.10 or eq. , CL150 , FF , Lever Operator , A 126 Teflon Fused
	2-2	-		Ball Vlv FB , PBM or eq. , CL150 , FF , Lever Operator , B61, C92200
Butterfly Valves				
	3-6	-		Bfly Vlv Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Lever Operator , A536 Gr.65-45-12
	8-18	-		Bfly Vlv Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Gear Operator , A536 Gr.65-45-12

PIPE SPEC: 1BKA1

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DESCRIPTION:	CHEMICAL INJECTION
MATERIAL:	Alloy (N08020)
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 600F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	290
100	290
200	260
300	230
400	200
500	170
600	140

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE SPIRAL WOUND ALLOY 20/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-4	-	Calc	Pipe , B36.19M , PE , B 729 UNS N08020 Annld , SMLS
	0.5-4	-	Calc	Nipple , B36.19M , PBE , B 729 UNS N08020 Annld , 6" Long, SMLS
	0.5-4	-	Calc	Nipple , B36.19M , PBE , B 729 UNS N08020 Annld , 3" Long, SMLS
	0.5-4	-		Nipple , B36.19M , PE/TE , B 729 UNS N08020 Annld , 3" Long, SMLS
	0.5-4	-		Nipple , B36.19M , PE/TE , B 729 UNS N08020 Annld , 6" Long, SMLS
Large Bore Fittings				
	0.5-4	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , B 462 UNS N08020 Annld
	0.5-4	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , B 462 UNS N08020 Annld
	0.5-4	-		Cap , B16.11 , CL3000 , FTE , B 462 UNS N08020 Annld
	0.5-4	-		Cplg. , B16.11 , CL3000 , SWE , B 462 UNS N08020 Annld
	0.5-4	-		Equal Tee , B16.11 , CL3000 , SWE , B 462 UNS N08020 Annld
	0.75-4	-	MATCH	Cap , B16.9 , BE , B 462 UNS N08020 Annld
	1-4	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , B 462 UNS N08020 Annld
	1-4	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , B 462 UNS N08020 Annld
	1-4	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , B 462 UNS N08020 Annld
Small Bore Fittings				
Bolts				
	0.5-4			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-4			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness
	0.5-4			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
	0.5-4			Sp. Wound Gskt , B16.20 , CL150 , RF , Alloy 20, Graphite Fill, CS CR, A20 IR , 0.125" non compressed thickness
	0.5-4			Sp. Wound Gskt , B16.20 , CL300 , RF , Alloy 20, Graphite Fill, CS CR, A20 IR , 0.125" non compressed thickness
Flanges				
	0.5-4	-		SW Flg. , B16.5 , CL150 , RF , B 462 UNS N08020 Annld
	0.5-4	-		SW Flg. , B16.5 , CL300 , RF , B 462 UNS N08020 Annld
	0.5-4	-		Blind Flg. , B16.5 , CL150 , RF , B 462 UNS N08020 Annld
	0.5-4	-	MATCH	SW Flg. , B16.5 , CL150 , FF , B 462 UNS N08020 Annld
Gate Valves				
Globe Valves				
Check Valves				
	0.5-2	-		Swing Chk Vlv , Bonney Forge Red. Port or eq. , CL800 , SWE , Bltd Bonnet , B 462 UNS N08020 Annld
Ball Valves				

PIPE SPEC:

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Ball Viv LP FB , App. Mfg. , CL600 , SWE , Three Piece , Lever Operator , A 351 Gr.
CN7M

Butterfly Valves	0.5-2	-		
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DESCRIPTION:LOW PRESSURE GENERAL SERVICE

MATERIAL:Carbon Steel / Stainless Steel (304L)

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 200F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BUTTERFLY VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES. MANUFACTURER'S RECOMEND PRESSURE-TEMPERATURE RESTRICTIONS SHALL BE CONSULTED.
- 2 INSTALLERS MUST BE TRAINED IN THE INSTALLATION OF THE VICTAULIC VIC-PRESS SYSTEM AND UTILIZE ALL PROCEDURES INCLUDING MARKING OF THE PIPE TO ENSURE PROPER INSERTION DEPTH UPON PRESSING
- 3 GROOVED-END PIPE AND FITTINGS SHALL BE VICTAULIC OR EQUAL. MECHANICAL COUPLINGS SHALL BE RIGID TYPE VICTAULIC STYLE 489 STAINLESS STEEL OR EQUAL.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 5 FOR STD PIPE, ALL PIPE GROOVE DIMENSIONS AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT PUBLISHED PIPE ROLL GROOVING STANDARDS. PIPE NPS 14 AND LARGER SHALL BE PREPARED TO VICTAULIC AGS GROOVE SPECIFICATIONS WITH WEDGE SHAPED ROLL GROOVES
- 6 VICTAULIC FLANGE WASHERS ARE REQUIRED BETWEEN VIC FLANGES AND SERRATED FACES (SUCH AS B16.5 FLANGE FACES AND FLANGED VALVES). A FLANGE GASKET MUST THEN USED BETWEEN THE FLANGE WASHER AND THE SERRATED FACE, NO GASKET IS REQUIRED BETWEEN THE VIC FLANGE AND THE VICTAULIC FLANGE WASHER. A FLANGE WASHER IS ALSO REQUIRED BETWEEN RUBBER FACED BUTTERFLY VALVES AND VIC FLANGES
- 7 BOLTS AND NUTS ARE SUPPLIED WITH GROOVED COUPLING (E.G., VIC STYLE 177) PURCHASE
- 8 DIELECTRIC UNIONS ARE NOT REQUIRED WHEN JOINING SMALL BORE STAINLESS STEEL THREADED BRANCH CONNECTIONS TO A LARGE BORE VICTAULIC CARBON STEEL SYSTEM. APPLIES TO SERVICE WATER, POTABLE WATER, CLOSED COOLING WATER, PLANT DRAINS, AND NITROGEN SYSTEMS. IN ADDITION, PIPE DOPE SHALL BE USED AT THE THREADED CONNECTION FROM STAINLESS TO CARBON STEEL.
- 9 FOR CLASS 300 FLANGE ADAPTER, THE FLANGES SHALL BE USED ONLY TO MATCH CLASS 300 FLANGE CONNECTIONS AT CONTROL VALVES AND SPECIAL EQUIPMENT
- 10 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , BEV x GRV , A 53 Gr. B , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , MGE , A 53 Gr. B , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , BE , A 53 Gr. B , SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, SMLS
				Transition Nipple , Victaulic Grooved , PE x MGE , A 312 Gr. TP304L , Style P587
	1-2	-	S-10S	
	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , FTE x MGE , A 53 Gr. B , No. 55
	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , MGE x FTE , A 53 Gr. B , No. 54
	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , MGE , A 53 Gr. B , No. 53
	2-3	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 4" long
	2-12	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x THD , A 53 Gr. B , No. 40
	2-3	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 4" long
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 6" long
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 6" long

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	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 8" long
	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 8" long
	14-24	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. W43, 8" long
	14-24	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. A , No. W42, 8" long
Large Bore Fittings				
	2-4	-	S-STD	Female Adapter , Victaulic Vic-Press , MGE x FTE , A536 Gr 65-45-12 , No 80
	2-10	1-8		Red. Coupling , Victaulic Grooved , FGE , A536 Gr 65-45-12 , Style 750
	2-12	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , QuickVic, Style 107
	2.5-12	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 13
	2.5-12	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 12
	2.5-12	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 30
	2.5-12	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 110
	2.5-12	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 11
	2.5-24	-	S-STD	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	S-STD	45 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-12	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 100
	2.5-12	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 10
	2.5-24	-	S-STD	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	S-STD	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-12	-	S-STD	Cap , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 60
	2.5-24	2-22	S-STD	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-12	2-10	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 50
	2.5-12	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B , No. 35
	2.5-24	2-22	S-STD	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-12	2-10	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 51
	2.5-24	-	S-STD	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	2-22	S-STD	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-12	2-10	S-STD	Reducing Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 25
	2.5-12	-		Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304L , Style 489, Type E Gasket
	2.5-12	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 20
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-12	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B , No. 33
	3-12	2-10	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 53 Gr. B , No. 30-R
	6-24	2.5-18	S-STD	Weldolet , MSS SP-97 , BE , A105 , SMLS
	14-24	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W13
	14-24	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W12
	14-24	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W30
	14-24	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W110
	14-24	4-20	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W30-R
	14-24	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W11
	14-24	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W100
	14-24	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W10
	14-24	-	S-STD	Cap , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W60
	14-24	6-20	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W50
	14-24	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B , AGS, Style W35
	14-24	6-20	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W51
	14-24	6-20	S-STD	Reducing Tee , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W25
	14-24	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , AGS, Style W07
	14-24	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W20
	14-24	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B , AGS, Style W33
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P591
	0.5-2	-	S-10S	45 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP304L , Style P543
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P586
	0.5-2	-	S-10S	90 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP304L , Style P542
	0.5-2	-	S-10S	Cap , Victaulic Vic-Press , PE , A 312 Gr. TP304L , Style P540
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP304L , Style P599
	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP304L , Style P596
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F304L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P597
	0.5-2	0.5-1	S-10S	Reducing Tee , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP304L , Style P588
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P592
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P584

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	0.5-2	-	S-10S	Weld Adapter , Victaulic Vic-Press , PE x VPS , A 312 Gr. TP304L , Style P561
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P594
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P593
Bolts				
	2-24			Cap Screw , ASME B18.2.1 / B18.2.2 , A193 B7
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Xylan Coated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , Thick Flat Ring , Garlock 3200 , Non-Asbestos , 0.0625" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F304L , Style P595
	2.5-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 , Style 741
	0.5-2	-	S-STD	SW Flg. , B16.5 , CL150 , RF , A105
	0.5-12	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. 45R
	14-24	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 , Style W741
	14-24	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. W45R, Galvanized
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , FFFE X MGE , A 53 Gr. B , No. 45F
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 53 Gr. B , No. 45F
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , RF x MGE , A 53 Gr. B , No. 46R
	0.5-2	-	S-10S	Van Stone Flg. , Victaulic Pressfit , CL150 , RFFE X VPS , A 403 Gr. F304L , Style P565
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Swing Chk Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , A 182 Gr. F304L
	2-12	-		Victaulic Chk Vlv , Victaulic Grooved or eq. , MGE , A536 Gr.65-45-12 , Series 716H/716
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	0.75-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS x MGE , Lever Operator , A 351 Gr. CF8M , Series P569
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCB
	2.5-6	-		Ball Vlv LP FB , Victaulic Grooved or eq. , 1000 psi , MGE , Lever Operator , A536 Gr.65-45-12 , Series 726
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB

PIPE SPEC:

1BMA1

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Butterfly Valves				
	2-12	-		Butterfly Vlv , Victaulic Grooved Series 761 , MGE , Lever Operator , A536 Gr.65-45-12
	2.5-6	-		Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	8-20	-		Butterfly Valve Lug Type , Bray , CL150 , FF w/Integral Gaskets , Gear Operator , A 216 Gr. WCB , 316 SS Trim
	14-24	-		Butterfly Vlv , Victaulic Grooved Series W761 , MGE , Gear Side mounted Handwheel (Without Z offset) , A536 Gr.65-45-12

PIPE SPEC: 1BMA8

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DESCRIPTION: LOW PRESSURE GENERAL SERVICE
MATERIAL: Carbon Steel (Galvanized) / Stainless Steel (304L)
EXAMINATION: Per ASME B31.1 - 2014
TEMPERATURE LIMIT: -20F to 200F
RATING CLASS: 150, ASME B16.5 - 2013
CORROSION ALLOWANCE: 0.0000 in
DESIGN CODE: Per ASME B31.1 - 2014
STRESS RELIEF: Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BUTTERFLY VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES. MANUFACTURER'S RECOMEND PRESSURE-TEMPERATURE RESTRICTIONS SHALL BE CONSULTED.
- 2 INSTALLERS MUST BE TRAINED IN THE INSTALLATION OF THE VICTAULIC VIC-PRESS SYSTEM AND UTILIZE ALL PROCEDURES INCLUDING MARKING OF THE PIPE TO ENSURE PROPER INSERTION DEPTH UPON PRESSING
- 3 GROOVED-END PIPE AND FITTINGS SHALL MEET VICTAULIC SPECIFICATIONS. MECHANICAL COUPLINGS SHALL BE VICTAULIC RIGID TYPE OR EQUAL.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 5 FOR STD PIPE, ALL PIPE GROOVE DIMENSIONS AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT PUBLISHED PIPE ROLL GROOVING STANDARDS. PIPE NPS 14 AND LARGER SHALL BE PREPARED TO VICTAULIC AGS GROOVE SPECIFICATIONS WITH WEDGE SHAPED ROLL GROOVES
- 6 VICTAULIC FLANGE WASHERS ARE REQUIRED BETWEEN VIC FLANGES AND SERRATED FACES (SUCH AS B16.5 FLANGE FACES AND FLANGED VALVES). A FLANGE GASKET MUST THEN USED BETWEEN THE FLANGE WASHER AND THE SERRATED FACE, NO GASKET IS REQUIRED BETWEEN THE VIC FLANGE AND THE VICTAULIC FLANGE WASHER. A FLANGE WASHER IS ALSO REQUIRED BETWEEN RUBBER FACED BUTTERFLY VALVES AND VIC FLANGES
- 7 BOLTS AND NUTS ARE SUPPLIED WITH GROOVED COUPLING (E.G., VIC STYLE 177) PURCHASE
- 8 DIELECTRIC UNIONS ARE NOT REQUIRED WHEN JOINING SMALL BORE STAINLESS STEEL THREADED BRANCH CONNECTIONS TO A LARGE BORE VICTAULIC CARBON STEEL SYSTEM. APPLIES TO SERVICE WATER, POTABLE WATER, CLOSED COOLING WATER, PLANT DRAINS, AND NITROGEN SYSTEMS. IN ADDITION, PIPE DOPE SHALL BE USED AT THE THREADED CONNECTION FROM STAINLESS TO CARBON STEEL.
- 9 FOR CLASS 300 FLANGE ADAPTER, THE FLANGES SHALL BE USED ONLY TO MATCH CLASS 300 FLANGE CONNECTIONS AT CONTROL VALVES AND SPECIAL EQUIPMENT
- 10 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , MGE , A 53 Gr. B Galvanized , SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 6" Long, SMLS, Galvanized
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 3" Long, SMLS, Galvanized
				Transition Nipple , Victaulic Grooved , PE x MGE , A 312 Gr. TP304L , Style P587
	1-2	-	S-10S	
				Adapter Nipple , Victaulic Grooved , GRV x THD , A 53 Gr. B , No. 40, Galvanized
	2-12	-	S-STD	
				Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 4" long, Galvanized
	2-3	-	S-STD	
				Swage Nipple , Victaulic Grooved , FTE x MGE , A 53 Gr. B Galvanized , No. 55
	2-6	1-5	S-STD	
				Swage Nipple , Victaulic Grooved , MGE x FTE , A 53 Gr. B Galvanized , No. 54
	2-6	1-5	S-STD	

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	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , MGE , A 53 Gr. B Galvanized , No. 53
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 6" long, Galvanized
	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 8" long, Galvanized
	14-24	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. B Galvanized , AGS, Style W43
Large Bore Fittings				
	2-4	-	S-STD	Female Adapter , Victaulic Grooved , MGE x FTE , A536 Gr 65-45-12, Galvanized , No 80
	2-10	1-8		Red. Coupling , Victaulic Grooved , FGE , A536 Gr 65-45-12, Galvanized , Style 750
	2-12	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , QuickVic, Style 107
	2.5-12	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 13
	2.5-12	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 12
	2.5-12	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 30
	2.5-12	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 110
	2.5-12	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 11
	2.5-12	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 100
	2.5-12	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 10
	2.5-12	-	S-STD	Cap , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 60
	2.5-12	2-10	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 50
	2.5-12	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 35
	2.5-12	2-10	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 51
	2.5-12	2-10	S-STD	Reducing Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 25
	2.5-12	-		Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304L , Style 489, Type E Gasket
	2.5-12	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 20
	2.5-12	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 33
	3-12	2-10	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 30-R
	14-24	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W13
	14-24	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W12
	14-24	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W30
	14-24	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W110
	14-24	4-20	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W30-R
	14-24	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W11
	14-24	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W100
	14-24	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W10
	14-24	-	S-STD	Cap , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W60
	14-24	6-20	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W50
	14-24	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , AGS, Style W35
	14-24	6-20	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W51
	14-24	6-20	S-STD	Reducing Tee , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W25
	14-24	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 Galvanized , AGS, Style W07
	14-24	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W20
	14-24	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , AGS, Style W33
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P591
	0.5-2	-	S-10S	45 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP304L , Style P543
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P586
	0.5-2	-	S-10S	90 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP304L , Style P542
	0.5-2	-	S-10S	Cap , Victaulic Vic-Press , PE , A 312 Gr. TP304L , Style P540
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP304L , Style P599

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	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP304L , Style P596
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F304L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P597
	0.5-2	0.5-1	S-10S	Reducing Tee , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP304L , Style P588
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P592
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P584
	0.5-2	-		Weld Adapter , Victaulic Vic-Press , PE x VPS , A 312 Gr. TP304L , Style P561
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P594
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP304L , Style P593
Bolts				
	0.5-24			Cap Screw , ASME B18.2.1 / B18.2.2 , A193 B7
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Xylan Coated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , Thick Flat Ring , Garlock 3200 , Non-Asbestos -
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	0.5-2	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105 , Galvanized
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B, Galvanized , No. 45R
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 53 Gr. B, Galvanized , No. 45F
	0.5-2	-	S-10S	Van Stone Flg. , Victaulic Pressfit , CL150 , RFFE X VPS , A 403 Gr. F304L , Style P565
	14-24	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 Galvanized , Style W741
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , FFFE X MGE , A 53 Gr. B , No. 46F, Galvanized
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F304L , Style P595
	0.5-2	-	S-STD	Thd. Flg. , B16.5 , CL150 , RF , A105 , Galvanized
	14-24	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. W45R, Galvanized
	2.5-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 Galvanized , Style 741
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , RF x MGE , A 53 Gr. B , No. 46R, Galvanized
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , FTE , Bltd Bonnet , A 351 Gr. CF3M
	2-12	-		Victaulic Chk Vlv , Victaulic Grooved or eq. , MGE , A536 Gr.65-45-12 , Series 716H/716
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				

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	0.5-2	-	Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	0.75-2	-	Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS x MGE , Lever Operator , A 351 Gr. CF8M , Series P569
	2.5-6	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCB
	2.5-6	-	Ball Vlv LP FB , Victaulic Grooved or eq. , 1000 psi , MGE , Lever Operator , A536 Gr.65-45-12 , Series 726
	8-12	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves			
	2-12	-	Butterfly Vlv , Victaulic Grooved Series 761 , MGE , Lever Operator , A536 Gr.65-45-12
	2.5-6	-	Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-	Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	8-20	-	Butterfly Valve Lug Type , Bray , CL150 , FF w/Integral Gaskets , Gear Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	14-24	-	Butterfly Vlv , Victaulic Grooved Series W761 , MGE , Gear Side mounted Handwheel (Without Z offset) , A536 Gr.65-45-12

PIPE SPEC: 1BMB1

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DESCRIPTION:	LOW PRESSURE GENERAL SERVICE
MATERIAL:	Carbon Steel / Stainless Steel (316L)
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BUTTERFLY VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES. MANUFACTURER'S RECOMEND PRESSURE-TEMPERATURE RESTRICTIONS SHALL BE CONSULTED.
- 2 INSTALLERS MUST BE TRAINED IN THE INSTALLATION OF THE VICTAULIC VIC-PRESS SYSTEM AND UTILIZE ALL PROCEDURES INCLUDING MARKING OF THE PIPE TO ENSURE PROPER INSERTION DEPTH UPON PRESSING
- 3 GROOVED-END PIPE AND FITTINGS SHALL MEET VICTAULIC SPECIFICATIONS. MECHANICAL COUPLINGS SHALL BE VICTAULIC RIGID TYPE OR EQUAL.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 5 FOR STD PIPE, ALL PIPE GROOVE DIMENSIONS AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT PUBLISHED PIPE ROLL GROOVING STANDARDS. PIPE NPS 14 AND LARGER SHALL BE PREPARED TO VICTAULIC AGS GROOVE SPECIFICATIONS WITH WEDGE SHAPED ROLL GROOVES
- 6 VICTAULIC FLANGE WASHERS ARE REQUIRED BETWEEN VIC FLANGES AND SERRATED FACES (SUCH AS B16.5 FLANGE FACES AND FLANGED VALVES). A FLANGE GASKET MUST THEN USED BETWEEN THE FLANGE WASHER AND THE SERRATED FACE, NO GASKET IS REQUIRED BETWEEN THE VIC FLANGE AND THE VICTAULIC FLANGE WASHER. A FLANGE WASHER IS ALSO REQUIRED BETWEEN RUBBER FACED BUTTERFLY VALVES AND VIC FLANGES
- 7 BOLTS AND NUTS ARE SUPPLIED WITH GROOVED COUPLING (E.G., VIC STYLE 177) PURCHASE
- 8 DIELECTRIC UNIONS ARE NOT REQUIRED WHEN JOINING SMALL BORE STAINLESS STEEL THREADED BRANCH CONNECTIONS TO A LARGE BORE VICTAULIC CARBON STEEL SYSTEM. APPLIES TO SERVICE WATER, POTABLE WATER, CLOSED COOLING WATER, PLANT DRAINS, AND NITROGEN SYSTEMS. IN ADDITION, PIPE DOPE SHALL BE USED AT THE THREADED CONNECTION FROM STAINLESS TO CARBON STEEL.
- 9 FOR CLASS 300 FLANGE ADAPTER, THE FLANGES SHALL BE USED ONLY TO MATCH CLASS 300 FLANGE CONNECTIONS AT CONTROL VALVES AND SPECIAL EQUIPMENT
- 10 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP316L , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , BE , A 53 Gr. B , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , BEV x GRV , A 53 Gr. B , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , MGE , A 53 Gr. B , SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , PE/TE , A 53 Gr. B , 6" Long, SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , PE/TE , A 53 Gr. B , 3" Long, SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 6" Long, SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 3" Long, SMLS
				Transition Nipple , Victaulic Grooved , PE x MGE , A 312 Gr. TP316L , Style P587
	1-2	-	S-10S	
	2-3	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 4" long
	2-12	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x THD , A 53 Gr. B , No. 40
	2-3	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 4" long
	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , FTE x MGE , A 53 Gr. B , No. 55

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	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , MGE x FTE , A 53 Gr. B , No. 54
	2-6	1-5	S-STD X S-10S	Swage Nipple , Victaulic Grooved , MGE , A 53 Gr. B , No. 53
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 6" long
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 6" long
	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 8" long
	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. 42, 8" long
				Adapter Nipple , Victaulic Grooved , GRV x BEV , A 53 Gr. B , No. W42, 8" long
	14-24	-	S-STD	
	14-24	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. B , No. W43, 8" long
Large Bore Fittings				
	2-4	-	S-STD	Female Adapter , Victaulic Vic-Press , MGE x FTE , A536 Gr 65-45-12 , No 80
	2-10	1-8		Red. Coupling , Victaulic Grooved , FGE , A536 Gr 65-45-12 , Style 750
	2-12	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , QuickVic, Style 107
	2.5-12	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 13
	2.5-12	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 12
	2.5-12	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 30
	2.5-12	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 110
	2.5-12	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 11
	2.5-12	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 100
	2.5-12	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 10
	2.5-12	-	S-STD	Cap , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 60
	2.5-12	2-10	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 50
	2.5-12	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B , No. 35
	2.5-12	2-10	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 51
	2.5-12	2-10	S-STD	Reducing Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 25
				Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304L , Style 489, Type E
	2.5-12	-		Gasket
	2.5-12	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 20
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-12	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B , No. 33
	3-12	2-10	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 53 Gr. B , No. 30-R
	6-24	2.5-18	S-STD	Weldolet , MSS SP-97 , BE , A105 , SMLS
	14-24	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W13
	14-24	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W12
	14-24	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W30
	14-24	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W110
	14-24	4-20	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W30-R
	14-24	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W11
	14-24	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W100
	14-24	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W10
	14-24	-	S-STD	Cap , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W60
	14-24	6-20	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W50
	14-24	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B , AGS, Style W35
	14-24	6-20	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W51
	14-24	6-20	S-STD	Reducing Tee , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W25
	14-24	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , AGS, Style W07
	14-24	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 , AGS, Style W20
	14-24	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B , AGS, Style W33
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P571
				45 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP316L , Style
	0.5-2	-	S-10S	P563
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P568
				90 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP316L , Style
	0.5-2	-	S-10S	P562
	0.5-2	-	S-10S	Cap , Victaulic Vic-Press , PE , A 312 Gr. TP316L , Style P560
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP316L , Style P579
	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP316L , Style P576
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F316L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P597
	0.5-2	0.5-1	S-10S	Reducing Tee , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP316L , Style P578
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P572
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P585
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P574
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P573
Bolts				
	2-24			Cap Screw , ASME B18.2.1 / B18.2.2 , A193 B7

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	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Xylan Coated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , Thick Flat Ring , Garlock 3200 , Non-Asbestos -
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , FFFE X MGE , A 53 Gr. B , No. 45F
	14-24	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. W45R, Galvanized
	2.5-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 , Style 741
	0.5-2	-	S-10S	Van Stone Flg. , Victaulic Pressfit , CL150 , RFFE X VPS , A 403 Gr. F316L , Style P566
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F316L , Style P595
	0.5-2	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.5-2	-	S-STD	SW Flg. , B16.5 , CL150 , RF , A105
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. 45R
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , RF x MGE , A 53 Gr. B , No. 46R
	14-24	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 , Style W741
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 53 Gr. B , No. 45F
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , FTE , Bltd Bonnet , A 351 Gr. CF3M
	2-12	-		Victaulic Chk Vlv , Victaulic Grooved or eq. , MGE , A536 Gr.65-45-12 , Series 716H/716
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569
	0.75-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS x MGE , Lever Operator , A 351 Gr. CF8M , Series P569
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCB
	2.5-6	-		Ball Vlv LP FB , Victaulic Grooved or eq. , 1000 psi , MGE , Lever Operator , A536 Gr.65-45-12 , Series 726
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				
	2-12	-		Butterfly Vlv , Victaulic Grooved Series 761 , MGE , Lever Operator , A536 Gr.65-45-12
	2.5-6	-		Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-		Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem

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8-20	-	Butterfly Valve Lug Type , Bray , CL150 , FF w/Integral Gaskets , Gear Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
14-24	-	Butterfly Vlv , Victaulic Grooved Series W761 , MGE , Gear Side mounted Handwheel (Without Z offset) , A536 Gr.65-45-12

DESCRIPTION:LOW PRESSURE GENERAL SERVICE

MATERIAL:Carbon Steel (Galvanized) / Stainless Steel (316L)

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 200F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	230
100	230
200	195

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BUTTERFLY VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES. MANUFACTURER'S RECOMEND PRESSURE-TEMPERATURE RESTRICTIONS SHALL BE CONSULTED.
- 2 INSTALLERS MUST BE TRAINED IN THE INSTALLATION OF THE VICTAULIC VIC-PRESS SYSTEM AND UTILIZE ALL PROCEDURES INCLUDING MARKING OF THE PIPE TO ENSURE PROPER INSERTION DEPTH UPON PRESSING
- 3 GROOVED-END PIPE AND FITTINGS SHALL MEET VICTAULIC SPECIFICATIONS. MECHANICAL COUPLINGS SHALL BE VICTAULIC RIGID TYPE OR EQUAL.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VICTAULIC GRADE E (EPDM).
- 5 FOR STD PIPE, ALL PIPE GROOVE DIMENSIONS AND PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT PUBLISHED PIPE ROLL GROOVING STANDARDS. PIPE NPS 14 AND LARGER SHALL BE PREPARED TO VICTAULIC AGS GROOVE SPECIFICATIONS WITH WEDGE SHAPED ROLL GROOVES
- 6 VICTAULIC FLANGE WASHERS ARE REQUIRED BETWEEN VIC FLANGES AND SERRATED FACES (SUCH AS B16.5 FLANGE FACES AND FLANGED VALVES). A FLANGE GASKET MUST THEN USED BETWEEN THE FLANGE WASHER AND THE SERRATED FACE, NO GASKET IS REQUIRED BETWEEN THE VIC FLANGE AND THE VICTAULIC FLANGE WASHER. A FLANGE WASHER IS ALSO REQUIRED BETWEEN RUBBER FACED BUTTERFLY VALVES AND VIC FLANGES
- 7 BOLTS AND NUTS ARE SUPPLIED WITH GROOVED COUPLING (E.G., VIC STYLE 177) PURCHASE
- 8 DIELECTRIC UNIONS ARE NOT REQUIRED WHEN JOINING SMALL BORE STAINLESS STEEL THREADED BRANCH CONNECTIONS TO A LARGE BORE VICTAULIC CARBON STEEL SYSTEM. APPLIES TO SERVICE WATER, POTABLE WATER, CLOSED COOLING WATER, PLANT DRAINS, AND NITROGEN SYSTEMS. IN ADDITION, PIPE DOPE SHALL BE USED AT THE THREADED CONNECTION FROM STAINLESS TO CARBON STEEL.
- 9 FOR CLASS 300 FLANGE ADAPTER, THE FLANGES SHALL BE USED ONLY TO MATCH CLASS 300 FLANGE CONNECTIONS AT CONTROL VALVES AND SPECIAL EQUIPMENT
- 10 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-10S	Pipe , B36.19M , PE , A 312 Gr. TP316L , SMLS
	2.5-24	-	S-STD	Pipe , B36.10M , MGE , A 53 Gr. B Galvanized , SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PBE , A 312 Gr. TP316L , 3" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 6" Long, SMLS
	0.5-2	-	S-10S	Nipple , B36.19M , PE/TE , A 312 Gr. TP316L , 3" Long, SMLS
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 6" Long, SMLS, Galvanized
	0.5-2	-	S-STD	Nipple , B36.19M , TBE , A 53 Gr. B , 3" Long, SMLS, Galvanized
				Transition Nipple , Victaulic Vic-Press , MGE x PE , A 312 Gr. TP316L , Style P577
	1-2	-	S-10S	
				Adapter Nipple , Victaulic Grooved , GRV x THD , A 53 Gr. B , No. 40, Galvanized
	2-12	-	S-STD	
				Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 4" long, Galvanized
	2-3	-	S-STD	
				Swage Nipple , Victaulic Grooved , FTE x MGE , A 53 Gr. B Galvanized , No. 55
	2-6	1-5	S-STD	
				Swage Nipple , Victaulic Grooved , MGE x FTE , A 53 Gr. B Galvanized , No. 54
	2-6	1-5	S-STD	

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	2-6	1-5	S-STD	Swage Nipple , Victaulic Grooved , MGE , A 53 Gr. B Galvanized , No. 53
	4-8	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 6" long, Galvanized
	10-12	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. A , No. 43, 8" long, Galvanized
	14-24	-	S-STD	Adapter Nipple , Victaulic Grooved , MGE , A 53 Gr. B Galvanized , AGS, Style W43
Large Bore Fittings				
	2-4	-	S-STD	Female Adapter , Victaulic Grooved , MGE x FTE , A536 Gr 65-45-12, Galvanized , No 80
	2-10	1-8		Red. Coupling , Victaulic Grooved , FGE , A536 Gr 65-45-12, Galvanized , Style 750
	2-12	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 , QuickVic, Style 107
	2.5-12	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 13
	2.5-12	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 12
	2.5-12	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 30
	2.5-12	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 110
	2.5-12	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 11
	2.5-12	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 100
	2.5-12	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 10
	2.5-12	-	S-STD	Cap , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 60
	2.5-12	2-10	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 , No. 50
	2.5-12	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 35
	2.5-12	2-10	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 51
	2.5-12	2-10	S-STD	Reducing Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 25
	2.5-12	-		Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304L , Style 489, Type E Gasket
	2.5-12	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , No. 20
	2.5-12	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 33
	3-12	2-10	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , No. 30-R
	14-24	-	S-STD	11.25 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W13
	14-24	-	S-STD	22.5 Deg Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W12
	14-24	-	S-STD	45 Deg Lateral , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W30
	14-24	-	S-STD	45 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W110
	14-24	4-20	S-STD	45 Deg Red. Lateral , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , AGS, Style W30-R
	14-24	-	S-STD	45 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W11
	14-24	-	S-STD	90 Deg LR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W100
	14-24	-	S-STD	90 Deg SR Elbow , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W10
	14-24	-	S-STD	Cap , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W60
	14-24	6-20	S-STD	Concentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB , AGS, Style W50
	14-24	-	S-STD	Cross , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , AGS, Style W35
	14-24	6-20	S-STD	Eccentric Reducer , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W51
	14-24	6-20	S-STD	Reducing Tee , Victaulic Grooved , MGE , A 234 Gr. WPB Galvanized , AGS, Style W25
	14-24	-		Rigid Coupling , Victaulic Grooved , FGE , A536 Gr.65-45-12 Galvanized , AGS, Style W07
	14-24	-	S-STD	Tee , Victaulic Grooved , MGE , A536 Gr.65-45-12 Galvanized , AGS, Style W20
	14-24	-	S-STD	True Y , Victaulic Grooved , MGE , A 53 Gr. B, Galvanized , AGS, Style W33
Small Bore Fittings				
	0.5-2	-	S-10S	45 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P571
	0.5-2	-	S-10S	45 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP316L , Style P563
	0.5-2	-	S-10S	90 Deg Elbow , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P568
	0.5-2	-	S-10S	90 Deg Street Elbow , Victaulic Vic-Press , VPS x PE , A 312 Gr. TP316L , Style P562
	0.5-2	-	S-10S	Cap , Victaulic Vic-Press , PE , A 312 Gr. TP316L , Style P560
	0.5-2	0.5-2	S-10S	Female Adapter , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP316L , Style P579

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	0.5-2	0.5-2	S-10S	Male Adapter , Victaulic Vic-Press , MTE x VPS , A 312 Gr. TP316L , Style P576
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F316L
	0.5-2	-	S-10S	PressFit Coupling , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P507
	0.5-2	0.5-1	S-10S	Reducing Tee , Victaulic Vic-Press , FTE x VPS , A 312 Gr. TP316L , Style P578
	0.5-2	-	S-10S	Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P572
	0.5-2	-	S-10S	Union , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P585
	0.75-2	0.5-1.5	S-10S	Concentric Reducer , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P574
	0.75-2	0.5-1.5	S-10S	Reducing Tee , Victaulic Vic-Press , VPS , A 312 Gr. TP316L , Style P573
Bolts				
	0.5-24			Cap Screw , ASME B18.2.1 / B18.2.2 , A193 B7
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Xylan Coated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , Thick Flat Ring , Garlock 3200 , Non-Asbestos -
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Seal Ring , Victaulic , Seal Ring , EPDM Victaulic Gr.E , 0.0625" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-		Thd. Flg. , B16.5 , CL150 , FF , A 182 Gr. F316L
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B, Galvanized , No. 45R
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , FFFE X MGE , A 53 Gr. B, Galvanized , No. 45F
	0.5-2	-	S-10S	Van Stone Flg. , Victaulic Pressfit , CL150 , RF , A 403 Gr. WP316L , Style P566
	14-24	-	S-STD	Flg. Adapter , Victaulic Grooved , CL150 , RF x MGE , A 53 Gr. B , No. W45R, Galvanized
	0.5-2	-	S-10S	Flg. Adapter , Victaulic Pressfit , CL150 , RFFE X VPS , A 182 Gr. F316L , Style P575
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , FFFE X MGE , A 53 Gr. B , No. 46F, Galvanized
	2-12	-	S-STD	Flg. Adapter , Victaulic Grooved , CL300 , RF x MGE , A 53 Gr. B , No. 46R, Galvanized
	14-24	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 Galvanized , Style W741
	0.5-2	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F316L
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105 , Galvanized
	2.5-12	-		Flg. Adapter , Victaulic Grooved , CL150 , RFFE X FGE , A536 Gr.65-45-12 Galvanized , Style 741
	0.5-2	-	S-STD	Thd. Flg. , B16.5 , CL150 , RF , A105 , Galvanized
Gate Valves				
	0.5-2	-		Gate Vlv , Bonney Forge RP or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Vlv , Bonney Forge Red. Port or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F316L
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , FTE , Bltd Bonnet , A 351 Gr. CF3M
	2-12	-		Victaulic Chk Vlv , Victaulic Grooved or eq. , MGE , A536 Gr.65-45-12 , Series 716H/716
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL150 , FFTBE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS , Lever Operator , A 351 Gr. CF8M , Series P569

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	0.75-2	-	Ball Vlv LP FB , Victaulic Vic-Press or eq. , VPS x MGE , Lever Operator , A 351 Gr. CF8M , Series P569
	2.5-6	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCB
	2.5-6	-	Ball Vlv LP FB , Victaulic Grooved or eq. , 1000 psi , MGE , Lever Operator , A536 Gr.65-45-12 , Series 726
	8-12	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-	Ball Valve LP FB , B16.10 App. Mfg. , CL150 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves			
	2-12	-	Butterfly Vlv , Victaulic Grooved Series 761 , MGE , Lever Operator , A536 Gr.65-45-12
	2.5-6	-	Butterfly Valve Wafer Type , Bray Controls or eq. , CL150 , FF w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	2.5-6	-	Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , Lugged FF w/ Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	8-20	-	Butterfly Valve Lug Type , Bray , CL150 , FF w/Integral Gaskets , Gear Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem
	14-24	-	Butterfly Vlv , Victaulic Grooved Series W761 , MGE , Gear Side mounted Handwheel (Without Z offset) , A536 Gr.65-45-12

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	740
100	740
200	680
300	655
400	635
500	605
600	570
650	550
700	530
750	505
800	410

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	0.75-24	-		Flatolet , MSS SP-97 , BE , A105 , SMLS
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS

	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	6-10	0.75-0.75		Elbolet , Manuf. Std , CL3000 , SWE , A105
	6-48	2.5-24	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL9000 , SWE , A105
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-8
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , SS-810-1-12
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	0.5-0.5		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A105
	22-22	-	MATCH	WN Flg. , MSS-SP-44-NB , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
	8-12	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A105
	1-16	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL300 , RF , A105 , 2 Taps , 180deg apart
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	22-22	-	MATCH	WN Flg. , MSS-SP-44-NB , CL300 , FF , A105
Gate Valves				

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	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-36	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-36	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 105
	2.5-20	-	MATCH	Check Valve Tilting Disc , B16.10 App. Mfg. , CL600 , BE , Pressure Seal Bonnet , A 216 Gr. WCB
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 216 Gr. WCB
	4-24	-		Check Valve Tilting Disc , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 216 Gr. WCB
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL300 , FTE , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve , B16.10 App. Mfg. , CL300 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Fltg. Ball , Lever Operator , A 216 Gr. WCB
Butterfly Valves				
	3-6	-		Butterfly Valve Wafer Type , Bray API 609 Cat. B , CL300 , FFTBE w/Integral Gaskets , Lever Operator , A 216 Gr. WCB , EPDM / BUNA-N Seat, SS Stem

PIPE SPEC: 1DAA6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	740
100	740
200	680
300	655
400	635

GENERAL NOTES

- 1 UNDERGROUND VALVES SHALL BE PROVIDED WITH A VALVE BOX AS A MINIMUM.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	S-80	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.75-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.75-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105

PIPE SPEC: 1DAA6

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	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
Gate Valves				
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-12	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-12	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1DAA7

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DESCRIPTION:	UNDERGROUND FUEL GAS
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2010
TEMPERATURE LIMIT:	-20F to 220F
RATING CLASS:	300, ASME B16.5 -2009
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2010
STRESS RELIEF:	Per ASME B31.1 - 2010

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	740
100	740
200	680
220	675

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.75-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	0.75-2	-	S-80	Pipe , B36.10M , MTE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.75-0.75	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.75-0.75	-	S-80	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
Large Bore Fittings				
	1-24	0.75-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.75-2		Socketolet , MSS SP-97 , CL3000 , SWE , A105
	1-24	0.25-2		Threadolet , MSS SP-97 , CL3000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-		Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	2.5-24	-		Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	2.5-24	2.5-22	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
Small Bore Fittings				
	0.75-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.75-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	1-2	0.75-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	1-2	0.75-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	1-2	0.75-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Insulating Gskt Set , B16.21 , CL300 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness

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	0.5-24			Insulating Gskt Set , B16.21 , CL600 , RF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL600 , FF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS Winding , Graphite Fill, CS CR , 800 deg F or better , 0.175" non compressed thickness
Flanges				
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
	0.75-24	-		Blind Flg. , B16.5 , CL600 , RF , A105
	0.75-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1DBA1

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	1.25Cr-0.5Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	750
100	750
200	750
300	720
400	695
500	665
600	605
650	590
700	570
750	530
800	510
850	485
900	450
950	320
1000	215
1050	145
1100	95

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P11 , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P11 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 12" Long, SMLS
Large Bore Fittings				
	2.5-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F11 Cl. 2
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F11 Cl. 2
	3-48	2.5-40	MATCH	Con. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-48	2.5-40	MATCH	Ecc. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-48	2.5-40	MATCH	Red. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	6-48	2.5-42	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F11 Cl. 2
Small Bore Fittings				

PIPE SPEC: 1DBA1

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
	0.75-2	-		Flatolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.75-1	0.5-0.5		Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F11 Cl. 2
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F11 Cl. 2
	30-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F11 Cl. 2
	0.5-2		MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F11 Cl. 2
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F11 Cl. 2
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F11 Cl. 2
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F11 Cl. 2
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F11 Cl. 2
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F11 Cl. 2
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	8-36	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
	8-36	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 182 Gr. F11 Cl. 2
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 182 Gr. F11 Cl. 2
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 217 Gr. WC6
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 217 Gr. WC6
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1DBB1

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	2.25Cr-1Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	750
100	750
200	750
300	730
400	705
500	665
600	605
650	590
700	570
750	530
800	510
850	485
900	450
950	385
1000	265
1050	175
1100	110

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P22 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 3" Long, SMLS
Large Bore Fittings				
	2.5-16	0.5-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-16	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-16	0.5-2		45 Deg Latrolet , Bonney Forge , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	3-18	-		45 Deg Latrolet , Bonney Forge , BE , A 182 Gr. F22 Cl. 1
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	3-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	3-6	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	3-48	2.5-42	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1

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Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL9000 , SWE , A105
	0.5-0.75	-		Plug Round Head , 0.5in Swagelok or Eq , CTBE , 316 SS , SS-810-P
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F22 Cl. 3
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL300 , RF , Per Specification 81.33.08 , 0.125" compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F22 Cl. 3
	30-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F22 Cl. 3
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A 182 Gr. F11 Cl. 2
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F22 Cl. 3
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F22 Cl. 3
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F11 Cl. 2
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 182 Gr. F22 Cl. 3

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0.5-2	-			Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 182 Gr. F22 Cl. 3
2.5-24	-	MATCH		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 217 Gr. WC9
2.5-24	-			Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 217 Gr. WC9

Ball Valves				
Butterfly Valves				

DESCRIPTION:DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1100F

RATING CLASS:300, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	720
100	720
200	600
300	540
400	495
500	465
600	440
650	430
700	420
750	415
800	405
850	395
900	390
950	380
1000	355
1050	325
1100	255

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS

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	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-24	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-1	0.5-0.5		Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Square Head , MSS SP-114 , MTE , A 182 Gr. F304L
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Insulating Gskt Set , B16.21 , CL300 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Insulating Gskt Set , B16.21 , CL300 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Red Rubber or EPDM , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-	MATCH	WN OriFlg0.75"SW tap , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 1
	2.5-24	-	MATCH	Tap
				WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3

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	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL300 , FFTBE , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL300 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-4	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	6-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				

DESCRIPTION:DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1100F

RATING CLASS:300, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	720
100	720
200	600
300	540
400	495
500	465
600	440
650	430
700	420
750	415
800	405
850	395
900	390
950	380
1000	355
1050	325
1100	255

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 6 E HAS BEEN SELECTED BASED ON INSPECTION ACCORDANCE WITH BASE MATERIAL SPECIFICATION. E MAY BE INCREASED DEPENDING ON LEVEL OF INSPECTION. CONSULT THE EXACT CODE LANGUAGE FOR THIS CHANGE. ANY CHANGES TO INSPECTION SHALL BE ENGINEER APPROVED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , EFW (E = 0.8)
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , EFW (E = 0.8)
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.

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	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2-2	-		Plug Square Head , MSS SP-114 , MTE , A 182 Gr. F304L
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Insulating Gskt Set , B16.21 , CL300 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Insulating Gskt Set , B16.21 , CL300 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , Neoprene Rubber , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , FF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-	MATCH	WN OriFlg0.75"SW tap , B16.36 , CL300 , RF , A 182 Gr. F304/304L Dual Cert. , 1
	2.5-24	-	MATCH	Tap
	0.5-2	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3

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	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL300 , FFTBE , A 351 Gr. CF3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL300 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				

PIPE SPEC: 1DCB6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	600
100	600
200	510
300	455
400	420

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 UNDERGROUND VALVES SHALL BE PROVIDED WITH A VALVE BOX AS A MINIMUM.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304L , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304L
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304L
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304L
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304L
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304L
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304L
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304L
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304L

PIPE SPEC:

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	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL6000 , PE x SWE , A 182 Gr. F304L
	0.75-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304L
Bolts				
				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
	0.5-24			
Gaskets				
				Insulating Gskt Set , B16.21 , CL300 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304L
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304L
Gate Valves				
Globe Valves				
				Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-		
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1DCD1

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DESCRIPTION:	DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	720
100	720
200	620
300	560
400	515
500	480
600	450
650	440
700	435
750	425
800	420
850	420
900	415
950	385
1000	365
1050	360
1100	305

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP316/316L Dual Cert. , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP316/316L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS

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	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2-2	-		Plug Square Head , MSS SP-114 , MTE , A 182 Gr. F304L
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
				WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F316/316L Dual Cert. , 2
	10-24	-	MATCH	Taps , 180deg apart
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8M

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	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8M
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL300 , FFTBE , A 351 Gr. CF3M
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL300 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
Butterfly Valves				

PIPE SPEC: 1DCD2

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DESCRIPTION:	DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	300, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	720
100	720
200	620
300	560
400	515
500	480
600	450
650	440
700	435
750	425
800	420
850	420
900	415
950	385
1000	365
1050	360
1100	305

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 7 E HAS BEEN SELECTED BASED ON INSPECTION ACCORDANCE WITH BASE MATERIAL SPECIFICATION. E MAY BE INCREASED DEPENDING ON LEVEL OF INSPECTION. CONSULT THE EXACT CODE LANGUAGE FOR THIS CHANGE. ANY CHANGES TO INSPECTION SHALL BE ENGINEER APPROVED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP316/316L Dual Cert. , EFW (E = 0.8)
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP316/316L Dual Cert. , EFW (E = 0.8)
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP316/316L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.

PIPE SPEC: 1DCD2

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	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP316/316L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP316/316L Dual Cert. , SMLS
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F316/316L Dual Cert.
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F316/316L Dual Cert.
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL300 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A 182 Gr. F316/316L Dual Cert.
				WN Ori Flg 0.75" Thd , B16.36 , CL300 , RF , A 182 Gr. F316/316L Dual Cert. , 2 Taps , 180deg apart
	10-24	-	MATCH	
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F316/316L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F316/316L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M

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	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	8-24	-		Gate Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-24	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3M
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8M
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8M
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3M
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8M
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 351 Gr. CF3M
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , A 351 Gr. CF8M
	6-24	-		Check Valve Wafer Dual PI LP , B16.10 App. Mfg. , CL300 , FFTBE , A 351 Gr. CF3M
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3M
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL300 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Fltg. Ball , Lever Operator , A 351 Gr. CF8M
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Two piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8M
Butterfly Valves				

PIPE SPEC: 1EAA1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1480
100	1480
200	1360
300	1310
400	1265
500	1205
600	1135
650	1100
700	1060
750	1015
800	825

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	28-28	-	0.725" min	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 12" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 106 Gr. B , 3" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	0.5-24	0.25-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105

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	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	6-48	2.5-24	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A105 , SMLS
	28-28	18-26	0.725" min X MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	28-28	22-22	0.725" min X S-60	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	28-28	-	0.725" min X MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	28-28	22-24	0.725" min X MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	28-28	2.5-20	0.725" min X MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A105
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , TBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PE/TE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , TBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL600 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Insulating Gskt Set , B16.21 , CL600 , RF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL600 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , FF , A105
	4-16	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL600 , RF , A105 , 2 Taps , 180deg apart
	26-48	-	MATCH	WN Flg. , B16.47 Sr. B , CL600 , RF , A105/A105N
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , FF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A105
	26-48	-		Blind Flg. , B16.47 Sr. B , CL600 , RF , A105/A105N
	0.75-24	-		Blind Flg. , B16.5 , CL600 , RF , A105
	1-8	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL600 , RF , A105 , 2 Taps , 180deg apart
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 105

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	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-48	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.75-2	-		Angle Globe Valve , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-12	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-48	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 105
	0.5-2	-		Check Valve Swing , App. Mfg. , CL600 , SWE , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 105
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL600 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-4	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Lever Operator , A 216 Gr. WCB
	6-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
	14-24	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				

PIPE SPEC: 1EAA6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	1480
100	1480
200	1360
300	1310
400	1265

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 UNDERGROUND VALVES SHALL BE PROVIDED WITH A VALVE BOX AS A MINIMUM.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
Large Bore Fittings				
	0.5-24	0.25-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	0.5-24	0.25-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.75-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.75-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105

PIPE SPEC:

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	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A105
Gate Valves				
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1EAC1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1480
100	1480
200	1360
300	1310
400	1265
500	1205
600	1135
650	1100
700	1060
750	1015
800	825

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. C , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. C , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. C , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	6-48	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				

PIPE SPEC: 1EAC1

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-1	0.5-0.5		Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Insulating Gskt Set , B16.21 , CL600 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL600 , RF , NM Comp. Gskt. , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A105
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A105/A105N
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , FF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , FF , A105
	30-48	-		Blind Flg. , B16.47 Sr. A , CL600 , RF , A105/A105N
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-48	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-48	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
	8-10	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
	8-10	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 105

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	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 216 Gr. WCB
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 105
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL600 , RF , Three Piece Fltg. Ball , Lever Operator , A 105
	2.5-4	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Lever Operator , A 216 Gr. WCB
	6-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 216 Gr. WCB
Butterfly Valves				

PIPE SPEC: 1EBA1

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	1.25Cr-0.5Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1500
100	1500
200	1500
300	1445
400	1385
500	1330
600	1210
650	1175
700	1135
750	1065
800	1015
850	975
900	900
950	640
1000	430
1050	290
1100	190

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P11 , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P11 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F11 Cl. 2
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	3-48	-	MATCH	Cap , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-48	2.5-42	MATCH	Con. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-48	2.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS

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	3-48 6-48	2.5-42 2.5-42	MATCH MATCH	Red. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS Weldolet , MSS SP-97 , BE , A 182 Gr. F11 Cl. 2
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , FF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A 182 Gr. F11 Cl. 2
	30-48	-		Blind Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F11 Cl. 2
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F11 Cl. 2
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F11
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F11 Cl. 2
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A 182 Gr. F11 Cl. 2
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F11 Cl. 2
	30-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL900 , RF , A 182 Gr. F11
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A 182 Gr. F11 Cl. 2
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC6
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC6
Check Valves				
	0.5-2	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 182 Gr. F11 Cl. 2
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 182 Gr. F11 Cl. 2

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	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 217 Gr. WC6
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 217 Gr. WC6
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC6
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC6
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC6
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC6
Butterfly Valves				
	3-6	-		Butterfly Valve Lug Type , Bray , CL600 , Lugged FF w/ Integral Gaskets , Lever Operator , A 217 Gr. WC6 , Metal Seat
	3-6	-		Butterfly Valve Lug Type , Bray , CL600 , FF w/Integral Gaskets , Lever Operator , A 217 Gr. WC6 , Metal Seat
	8-24	-		Butterfly Valve , Bray , CL600 , FF w/Integral Gaskets , Gear Operator , A 217 Gr. WC6 , Metal Seat
	8-24	-		Butterfly Valve , Bray , CL600 , Lugged FF w/ Integral Gaskets , Gear Operator , A 217 Gr. WC6 , Metal Seat

PIPE SPEC: 1EBB1

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	2.25Cr-1Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1500
100	1500
200	1500
300	1455
400	1410
500	1330
600	1210
650	1175
700	1135
750	1065
800	1015
850	975
900	900
950	755
1000	535
1050	350
1100	220

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.2.1
- 5 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.
- 6 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P22 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P22 , 3" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 3" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	1-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS

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	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	6-48	2.5-24	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F22
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Flatolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F22
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22
	0.5-2	-		Flatolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F22
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Square Head , B16.11 , MTE , A 105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , FF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	26-48	-		Blind Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F22 Cl. 3
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL900 , RF , A 182 Gr. F11
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F22 Cl. 3
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F11
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A 182 Gr. F22 Cl. 3
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A 182 Gr. F22 Cl. 3
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9

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	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217 Gr. WC9
	8-24	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217 Gr. WC9
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 182 Gr. F22 Cl. 3
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 217 Gr. WC9
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 217 Gr. WC9
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 217 Gr. WC9
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
Butterfly Valves				
	3-6	-		Butterfly Valve Lug Type , Bray , CL600 , FF w/Integral Gaskets , Lever Operator , A 217 Gr. WC9 , Metal Seat
	3-6	-		Butterfly Valve Lug Type , Bray , CL600 , FF w/Integral Gaskets , Lever Operator , A 217 Gr. WC9 , Metal Seat
	8-24	-		Butterfly Valve , Bray , CL600 , FF w/Integral Gaskets , Gear Operator , A 217 Gr. WC9 , Metal Seat
	8-24	-		Butterfly Valve , Bray , CL600 , Lugged FF w/ Integral Gaskets , Gear Operator , A 217 Gr. WC9 , Metal Seat

PIPE SPEC: 1EBD1

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DESCRIPTION: HOT REHEAT STEAM
MATERIAL: 9Cr-1Mo-V
EXAMINATION: Per ASME B31.1 - 2014
TEMPERATURE LIMIT: -20F to 1100F
RATING CLASS: 600, ASME B16.5 - 2013
CORROSION ALLOWANCE: 0.0313 in
DESIGN CODE: Per ASME B31.1 - 2014
STRESS RELIEF: Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1500
100	1500
200	1500
300	1455
400	1410
500	1330
600	1210
650	1175
700	1135
750	1065
800	1015
850	975
900	900
950	775
1000	725
1050	720
1100	605

GENERAL NOTES

- 1 SPECIAL WALL PIPE SHALL CONFORM TO ASTM A530.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.2.1
- 7 TRANSITIONS FROM P91 LARGE BORE PIPE TO P22 ARE SHOWN ON MECHANICAL DETAILS AND THE ISOMETRIC. THE CONTRACTOR/MANUFACTURER SHALL FOLLOW THOSE DESIGN DOCUMENTS.
- 8 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.
- 9 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P91 , SMLS
	2.5-28	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P91 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P91 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P91 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P91 , 3" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 3" Long, SMLS
	0.75-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 6" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	2.5-28	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS

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	2.5-28	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	1-26	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-28	1-26	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	1-26	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F91
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	6-28	1-20	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
	6-28	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F91
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
Bolts				
	0.5-28			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-28			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-28			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F91
	26-28	-		Blind Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F91
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F91
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A 182 Gr. F91
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A 182 Gr. F91
	26-28	-	MATCH	WN Flg. , B16.47 Sr. A , CL600 , RF , A 182 Gr. F91
	26-28	-	MATCH	WN Flg. , B16.47 Sr. A , CL900 , RF , A 182 Gr. F91
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F91
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F91
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F91
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217-C12A
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217-C12A
	8-30	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217-C12A
	8-28	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217-C12A
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F91
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F91
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 217-C12A
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 217-C12A
	8-12	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 217-C12A
	8-14	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 217-C12A
Check Valves				

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	0.5-2	-		Check Valve Swing , App. Mfg. , CL600 , SWE , Bltd Bonnet , A 182 Gr. F91
	0.5-2	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 182 Gr. F91
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 217-C12A
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 217-C12A
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F91
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F91
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217-C12A
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL600 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217-C12A
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217-C12A
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL600 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217-C12A
Butterfly Valves				
	3-6	-		Butterfly Valve Lug Type , Bray , CL600 , FFTBE , Lever Operator , A 217-C12A , Metal Seat
	8-28	-		Butterfly Valve , Bray , CL600 , FFTBE , Gear Operator , A 217-C12A , Metal Seat

DESCRIPTION:DEMINERALIZED WATER, LOW AND INTERMEDIATE TEMP

MATERIAL:Stainless Steel

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1100F

RATING CLASS:600, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	1440
100	1440
200	1200
300	1075
400	995
500	930
600	885
650	865
700	845
750	825
800	810
850	790
900	780
950	765
1000	710
1050	650
1100	515

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , BE x PE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	1.5-2	-	S-XXS	
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304L
	1-12	0.5-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.

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	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	2-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304/304L Dual Cert.
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL600 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , FF , A 182 Gr. F304/304L Dual Cert.
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-24	-		Blind Flg. , B16.5 , CL600 , RF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	8-36	-		Gate Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3

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	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-36	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-36	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 351 Gr. CF8
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , A 351 Gr. CF3
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , A 351 Gr. CF8
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	0.75-2	-		Ball Valve , B16.10 App. Mfg. , CL600 , RF , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	2.5-4	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Lever Operator , A 351 Gr. CF8
	6-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL600 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				

PIPE SPEC: 1ECB6

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DESCRIPTION:	GENERAL UG SERVICE
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 400F
RATING CLASS:	600, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	1440
100	1440
200	1240
300	1120
400	1025

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	2.5-24	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304L , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304L , 12" Long, SMLS
Large Bore Fittings				
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL3000 , SWE , A 182 Gr. F304L
	1-12	0.75-2		45 Deg Latrolet , Manuf. Std , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304L
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304L
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F304L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304L
	2.5-24	0.75-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304L
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304L
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304L
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304L
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304L
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304L

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	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304L , SMLS
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL6000 , PE x SWE , A 182 Gr. F304L
	0.75-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	-		Union , MSS SP-83 , CL6000 , SWE , A 182 Gr. F304L
Bolts				
				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
	0.5-24			
Gaskets				
				Insulating Gskt Set , B16.21 , CL600 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Non Metal Flat Gskt , B16.21 , CL600 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL600 , RF , 304L SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.5-24			
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , RF , A 182 Gr. F304L
	0.75-24	-		Blind Flg. , B16.5 , CL600 , RF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , RF , A 182 Gr. F304L
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL600 , FF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL600 , FF , A 182 Gr. F304L
Gate Valves				
Globe Valves				
				Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304L
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL600 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF3
	8-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL600 , RF , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
	8-24	-		
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1FAA1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	900, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG

-20	2220
100	2220
200	2035
300	1965
400	1900
500	1810
600	1705
650	1650
700	1590
750	1520
800	1235

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-48	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-48	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-48	2.5-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-48	2.5-22	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL900 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	2.5-24			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	26-48	-		Blind Flg. , B16.47 Sr. A , CL900 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL900 , RF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL900 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL900 , FF , A105
	2.5-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL1500 , RF , A105 , 2 Taps , 180deg apart
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , FF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-48	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-48	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-14	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-48	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL900 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 105

PIPE SPEC:

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	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , A 216 Gr. WCB
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1FAC1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	900, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG

-20	2220
100	2220
200	2035
300	1965
400	1900
500	1810
600	1705
650	1650
700	1590
750	1520
800	1235

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. C , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. C , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Socketlet , MSS SP-97 , CL9000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS

PIPE SPEC: 1FAC1

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Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL900 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , FF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL900 , RF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-24	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL900 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , A 216 Gr. WCB
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1FBB1

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DESCRIPTION:	GENERAL SERVICE
MATERIAL:	2.25Cr-1Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	900, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	2250
100	2250
200	2250
300	2185
400	2115
500	1995
600	1815
650	1765
700	1705
750	1595
800	1525
850	1460
900	1350
950	1160
1000	800
1050	525
1100	330

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 6 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P22 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	1-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F22 Cl. 1

	3-3 6-24 6-24	1.5-2 2.5-20 3-3	S-XXS MATCH MATCH X S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1 Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Square Head , B16.11 , MTE , A 105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A 182 Gr. F22 Cl. 3
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-		Blind Flg. , B16.5 , CL900 , RF , A 182 Gr. F22 Cl. 3
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	6-24	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
	6-24	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL900 , RF , Welded Bonnet , A 182 Gr. F22 Cl. 3
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , A 217 Gr. WC9
Ball Valves				

PIPE SPEC: 1FBB1

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	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL900 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL900 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL900 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL900 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL900 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL900 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
Butterfly Valves				

PIPE SPEC: 1FBD1

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DESCRIPTION: HOT REHEAT
MATERIAL: 9Cr-1Mo-V
EXAMINATION: Per ASME B31.1 - 2014
TEMPERATURE LIMIT: -20F to 1100F
RATING CLASS: 900, ASME B16.5 - 2013
CORROSION ALLOWANCE: 0.0313 in
DESIGN CODE: Per ASME B31.1 - 2014
STRESS RELIEF: Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	2250
100	2250
200	2250
300	2185
400	2115
500	1995
600	1815
650	1765
700	1705
750	1595
800	1525
850	1460
900	1350
950	1160
1000	1090
1050	1080
1100	905

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 TRANSITIONS FROM P91 LARGE BORE PIPE TO P22 ARE SHOWN ON MECHANICAL DETAILS AND THE ISOMETRIC. THE CONTRACTOR/MANUFACTURER SHALL FOLLOW THOSE DESIGN DOCUMENTS.
- 6 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 7 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.
- 8 SPECIAL WALL PIPE SHALL CONFORM TO ASTM A530.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P91 , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P91 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 3" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS

	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F91
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F91
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F91
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
				Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-
	0.75-0.75	-		810-1-12W
	0.75-2	-		Plug Square Head , B16.11 , MTE , A 105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-
	1-1	-		16W
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR ,
				0.175" Thick , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR ,
				0.175" Thick , 0.175" non compressed thickness
Flanges				
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL900 , RF , A 182 Gr. F91
	0.5-24	-		Blind Flg. , B16.5 , CL900 , RF , A 182 Gr. F91
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A 182 Gr. F91
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A 182 Gr. F91
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL900 , RF , A 182 Gr. F91
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel
				Operator , A 182 Gr. F91
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A
				182 Gr. F91
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel
				Operator , A 182 Gr. F91
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Handwheel
				Operator , A 217-C12A
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Handwheel
				Operator , A 217-C12A
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear Operator
				, A 217-C12A
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear
				Operator , A 217-C12A
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel
				Operator , A 182 Gr. F91
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A
				182 Gr. F91
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Welded Bonnet , Handwheel
				Operator , A 182 Gr. F91
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet ,
				Handwheel Operator , A 217-C12A
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet ,
				Handwheel Operator , A 217-C12A
	6-24	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , Gear
				Operator , A 217-C12A
	6-24	-		Globe Valve LP , B16.10 App. Mfg. , CL900 , RF , Pressure Seal Bonnet , Gear
				Operator , A 217-C12A
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL900 , RF , Welded Bonnet , A 182 Gr. F91

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	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 182 Gr. F91
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL900 , BE , Pressure Seal Bonnet , A 217-C12A
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL900 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F91
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL900 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F91
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL900 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217-C12A
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL900 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217-C12A
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL900 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217-C12A
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL900 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217-C12A
Butterfly Valves				

PIPE SPEC: 1GAA1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	1500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0625 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3705
100	3705
200	3395
300	3270
400	3170
500	3015
600	2840
650	2745
700	2655
750	2535
800	2055

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Flg. , B16.5 , CL1500 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-		
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 216 Gr. WCB
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1GAC1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	1500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0625 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3705
100	3705
200	3395
300	3270
400	3170
500	3015
600	2840
650	2745
700	2655
750	2535
800	2055

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. C , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. C , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPC
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPC
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105

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	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-2	-		Union , MSS SP-83 , CL3000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , FTE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL1500 , RF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
Globe Valves				
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	6-24	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
	6-14	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 216 Gr. WCC
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1GBA1

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DESCRIPTION:
MATERIAL: 1.25Cr-0.5Mo
EXAMINATION: Per ASME B31.1 - 2014
TEMPERATURE LIMIT: -20F to 1100F
RATING CLASS: 1500, ASME B16.5 - 2013
CORROSION ALLOWANCE: 0.0313 in
DESIGN CODE: Per ASME B31.1 - 2014
STRESS RELIEF: Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3750
100	3750
200	3750
300	3610
400	3465
500	3325
600	3025
650	2940
700	2840
750	2660
800	2440
850	2435
900	2245
950	1595
1000	1080
1050	720
1100	480

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P11 , SMLS
	2.5-30	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P11 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P11 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P11 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 335 Gr. P11 , 12" Long, SMLS
Large Bore Fittings				
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		45 Deg Latrolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		Socketlet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		Socketlet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	1-24	0.5-2		Socketlet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	2.5-30	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-30	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-30	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-30	-	MATCH	Cap , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A234 Grade WP11 Cl. 1 , SMLS

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	2.5-30	-	MATCH	Eq. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-30	2.5-24	MATCH	Con. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-30	2.5-24	MATCH	Ecc. Reducer , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	3-30	2.5-24	MATCH	Red. Tee , B16.9 , BE , A234 Grade WP11 Cl. 1 , SMLS
	6-30	2.5-24	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F11 Cl. 2
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
	1-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A234 Grade WP11 Cl. 1 , SMLS
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F11 Cl. 2
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F11 Cl. 2
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F11 Cl. 2
Bolts				
	0.5-30			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-30			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-30			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.75-30			Sp. Wound Gskt , B16.20 , CL600 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.75-30			Sp. Wound Gskt , B16.20 , CL900 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL2500 , RF , A 182 Gr. F11 Cl. 2
	0.5-30	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A 182 Gr. F11 Cl. 2
	0.5-30	-		Blind Flg. , B16.5 , CL1500 , RF , A 182 Gr. F11 Cl. 2
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A 182 Gr. F11 Cl. 2
	0.5-30	-	MATCH	WN Flg. , B16.5 , CL2500 , RF , A 182 Gr. F11 Cl. 2
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.75-2	-		Gate Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC6
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC6
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC6
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	0.75-2	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Welded Bonnet , Handwheel Operator , A 182 Gr. F11 Cl. 2
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC6
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC6
	6-14	-		Globe Valve LP , B16.10 App. Mfg. , CL1500 , RF , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC6
	6-24	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC6
Check Valves				

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	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , RF , Welded Bonnet , A 182 Gr. F11 Cl. 2
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 182 Gr. F11 Cl. 2
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 217 Gr. WC6
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL1500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F11 Cl. 2
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL1500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F11 Cl. 2
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL1500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC6
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL1500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC6
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL1500 , RF , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC6
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL1500 , RF , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC6
Butterfly Valves				

DESCRIPTION:HIGH PRESSURE & TEMPERATURE STEAM

MATERIAL:2.25Cr-1Mo

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1100F

RATING CLASS:1500, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0313 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3750
100	3750
200	3750
300	3640
400	3530
500	3325
600	3025
650	2940
700	2840
750	2660
800	2540
850	2435
900	2245
950	1930
1000	1335
1050	875
1100	550

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 7 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P22 , SMLS
	0.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 12" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
Large Bore Fittings				
	2.5-36	0.5-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-36	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	1-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS

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	2.5-48	1-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	1-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-48	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-48	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-48	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	6-48	2.5-24	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Flatolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22
	0.5-2	-		Flatolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F22
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 182 Gr. F22
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F22 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F22 , SS-810-1-16W
Bolts				
	0.5-42			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-42			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
	0.5-42			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL1500 , RF , A 182 Gr. F22 Cl. 3
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL2500 , RF , A 182 Gr. F22 Cl. 3
	2.5-42	-	MATCH	WN Flg. , B16.5 , CL2500 , RF , A 182 Gr. F22 Cl. 3
	0.5-42	-		Blind Flg. , B16.5 , CL1500 , RF , A 182 Gr. F22 Cl. 3
	2.5-42	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A 182 Gr. F22 Cl. 3
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-	MATCH	Gate Valve , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	6-48	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	6-48	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Check Valves				
	0.5-2	-		Check Valve Swing , App. Mfg. , CL1500 , SWE , Welded Bonnet , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 217 Gr. WC9
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL1500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F22 Cl. 3

PIPE SPEC: 1GBB1

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	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL1500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL1500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL1500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
Butterfly Valves				

PIPE SPEC: 1GCA1

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DESCRIPTION:	HYDRAULIC OIL, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1000F
RATING CLASS:	1500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3600
100	3600
200	3000
300	2690
400	2485
500	2330
600	2210
650	2160
700	2110
750	2065
800	2030
850	1980
900	1945
950	1910
1000	1770

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	0.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	1-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.

PIPE SPEC: 1GCA1

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Small Bore Fittings				
	0.5-2	-	MATCH	Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL1500 , FF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL1500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" non compressed thickness
Flanges				
	0.5-12	-		Blind Flg. , B16.5 , CL1500 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-12	-	MATCH	WN Flg. , B16.5 , CL1500 , FF , A 182 Gr. F304/304L Dual Cert.
	10-12	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL1500 , RF , A 182 Gr. F304/304L Dual Cert. , 2 Taps , 180deg apart
	0.5-12	-	MATCH	WN Flg. , B16.5 , CL1500 , RF , A 182 Gr. F304/304L Dual Cert.
Gate Valves				
	0.5-2	-	MATCH	Gate Valve , App. Mfg. , CL1500 , BE , Welded Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-4	-	MATCH	Gate Valve , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 351 Gr. CF3
	6-18	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-	MATCH	Globe Valve , Manf. Std. , CL1500 , BE , Welded Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 351 Gr. CF3
	6-12	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-	MATCH	Check Valve Pistn Lft , App. Mfg. , CL1500 , BE , Welded Bonnet , A 351 Gr. CF3
	2.5-12	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL1500 , BE , Pressure Seal Bonnet , A 351 Gr. CF3
Ball Valves				
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL1500 , RF , Two or Three Piece Metal Seated , Lever Operator , A 351 Gr. CF8
Butterfly Valves				

PIPE SPEC: 1HAA1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	2500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6170
100	6170
200	5655
300	5450
400	5280
500	5025
600	4730
650	4575
700	4425
750	4230
800	3430

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-		Nipple , B36.10M , PBE , A 106 Gr. B , 9" Long, SMLS
	0.5-2	-		Nipple , B36.10M , PBE , A 106 Gr. B , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPB
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105

PIPE SPEC: 1HAA1

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	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPB
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-24	-		Blind Fig. , B16.5 , CL2500 , RF , A105
	0.5-2	-	MATCH	SW Fig. , B16.5 , CL2500 , RF , A105
	2.5-24	-	MATCH	WN Fig. , B16.5 , CL2500 , RF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL2500 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-24	-		Gate Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL2500 , RF , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	2.5-4	-		Globe Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCB
	6-24	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
	6-24	-		Globe Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCB
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL2500 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL2500 , SWE , Welded Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 216 Gr. WCB
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 105
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 216 Gr. WCB
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCB
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL2500 , RF , Two or Three Piece Metal Seated , Gear Operator , A 216 Gr. WCB

PIPE SPEC:

1HAA1

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Ball Valve LP FB , App. Mfg. , CL2500 , RF , Two or Three Piece Metal Seated ,
Lever Operator , A 216 Gr. WCB

Butterfly Valves	2.5-6	-		
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PIPE SPEC: 1HAC1

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DESCRIPTION:	GENERAL AG SERVICE
MATERIAL:	Carbon Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 800F
RATING CLASS:	2500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6170
100	6170
200	5655
300	5450
400	5280
500	5025
600	4730
650	4575
700	4425
750	4230
800	3430

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST); FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 INSULATING GASKET SETS SHALL BE LIMITED TO 250 DEG-F MAXIMUM DESIGN TEMPERATURE INSTALLATIONS.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. C , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 106 Gr. C , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. C , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. C , 3" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPC
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A105
	3-24	2.5-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-6	2.5-4	MATCH	Con. Swage , MSS SP-95 , BBE , A 234 Gr. WPC
	3-24	2.5-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPC , SMLS
	3-6	2.5-4	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 234 Gr. WPC
	3-24	2.5-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPC , SMLS
	6-24	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A105

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	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A105
	0.5-2	0.25-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL9000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.75-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.75-2	-		Cap , B16.11 , CL9000 , SWE , A105
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WPC
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	0.5-0.5		Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
	1-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-24			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.75-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	2.5-2.5	-	MATCH	WN OriFlg0.75"SW tap , B16.36 , CL2500 , RF , A105 , 2 Taps , 180deg apart
	10-24	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL2500 , RF , A105 , 2 Taps , 180deg apart
	0.5-24	-		Blind Flg. , B16.5 , CL2500 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL2500 , RF , A105
	1-8	-	MATCH	WN Ori Flg 0.5" Thd , B16.36 , CL2500 , RF , A105 , 2 Taps , 180deg apart
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL2500 , RF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Gate Valve LP , B16.10 App. Mfg. , CL2500 , RF , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-		Gate Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	2.5-12	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
	2.5-4	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	6-12	-		Gate Valve , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
Globe Valves				
	0.5-2	-		Globe Valve LP , B16.10 App. Mfg. , CL2500 , RF , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 105
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 105
	2.5-4	-		Globe Valve LP , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	2.5-12	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 216 Gr. WCC
	6-12	-		Globe Valve LP , B16.10 App. Mfg. , CL2500 , RF , Pressure Seal Bonnet , Gear Operator , A 216 Gr. WCC
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL2500 , RF , Welded Bonnet , A 105
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL2500 , SWE , Welded Bonnet , A 105
	2.5-24	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 216 Gr. WCC

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	2.5-12	-		Check Valve Tilting Disc , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 216 Gr. WCC
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 105
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 105
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 216 Gr. WCC
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCC
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL2500 , RF , Two or Three Piece Metal Seated , Gear Operator , A 216 Gr. WCC
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL2500 , RF , Two or Three Piece Metal Seated , Lever Operator , A 216 Gr. WCC
Butterfly Valves				

PIPE SPEC: 1HBB1

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DESCRIPTION:	HIGH PRESSURE STEAM
MATERIAL:	2.25Cr-1Mo
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1100F
RATING CLASS:	2500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0313 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6250
100	6250
200	6250
300	6070
400	5880
500	5540
600	5040
650	4905
700	4730
750	4430
800	4230
850	4060
900	3745
950	3220
1000	2230
1050	1455
1100	915

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 5 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P22 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P22 , 3" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P22 , 6" Long, SMLS
Large Bore Fittings				
	2.5-12	0.5-2		45 Deg Latrolet , Bonney Forge , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	2-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	2.5-24	0.5-2		Threadolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP22 Cl. 1 , SMLS
	6-24	2.5-20	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
	6-24	3-3	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F22 Cl. 1
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1

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	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
				Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.5-0.5	-		Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F22 Cl. 1
	0.75-2	-		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B16 / A 194 3
Gaskets				
	0.5-24			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" Thick , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL2500 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-		Blind Flg. , B16.5 , CL2500 , RF , A 182 Gr. F22 Cl. 3
	0.5-24	-	MATCH	WN Flg. , B16.5 , CL2500 , RF , A 182 Gr. F22 Cl. 3
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-	MATCH	Gate Valve , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	3-24	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217 Gr. WC9
	6-24	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 217 Gr. WC9
Check Valves				
	0.5-2	-		Check Valve Swing , App. Mfg. , CL2500 , SWE , Welded Bonnet , A 182 Gr. F22 Cl. 3
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 217 Gr. WC9
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F22 Cl. 3
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217 Gr. WC9
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217 Gr. WC9
Butterfly Valves				

PIPE SPEC: 1HBD1

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DESCRIPTION: HIGH PRESSURE STEAM
MATERIAL: 9Cr-1Mo-V
EXAMINATION: Per ASME B31.1 - 2014
TEMPERATURE LIMIT: -20F to 1100F
RATING CLASS: 2500, ASME B16.5 - 2013
CORROSION ALLOWANCE: 0.0313 in
DESIGN CODE: Per ASME B31.1 - 2014
STRESS RELIEF: Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6250
100	6250
200	6250
300	6070
400	5880
500	5540
600	5040
650	4905
700	4730
750	4430
800	4230
850	4060
900	3745
950	3220
1000	3030
1050	3000
1100	2515

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 2 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 3 TRANSITIONS FROM P91 LARGE BORE PIPE TO P22 ARE SHOWN ON MECHANICAL DETAILS AND THE ISOMETRIC. THE CONTRACTOR/MANUFACTURER SHALL FOLLOW THOSE DESIGN DOCUMENTS.
- 4 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P91 , SMLS
	2.5-28	-	Calc	Pipe , B36.10M , BE , A 335 Gr. P91 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 335 Gr. P91 , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 12" Long, SMLS
	1.5-2	-	S-XXS	Nipple , B36.10M , BE x PE , A 335 Gr. P91 , 6" Long, SMLS
Large Bore Fittings				
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	1-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F91
	2.5-28	-	MATCH	45 Deg. Elbow 3D , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	90 Deg. Elbow 3D , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	2-24	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-28	2-24	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-6	0.5-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WP91 , SMLS
	2.5-28	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-48	2-46	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WP91 , SMLS
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F91
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A 182 Gr. F91
	2.5-28	0.5-2		Sockolet , MSS SP-97 , CL9000 , SWE , A 182 Gr. F91

PIPE SPEC:

1HBD1

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	3-3	1.5-2	S-XXS	Con. Reducer , B16.9 , BE , A 234 Gr. WP91 , SMLS
	4-28	0.5-24	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
	6-24	0.5-24	MATCH X S-XXS	Weldolet , MSS SP-97 , BE , A 182 Gr. F91
	16-20	12-12	MATCH	45Deg Red Lat Custom , Manuf. Std , BE , A 234 Gr. WP91 , SMLS
	16-16	14-14	MATCH	45Deg Red Lat Custom , Manuf. Std , BE , A 234 Gr. WP91 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
	0.5-2	-		Flatolet , MSS SP-97 , BE , A 182 Gr. F91
	0.5-0.5	-		Male Connector , 0.5 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-8W
	0.5-0.5	-		Plug Round Head , Swagelok or Eq , SWGLK , A 182 Gr. F316 , SS-810-1-P
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP91 , SMLS
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	-		Plug Square Head , B16.11 , MTE , A 105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F91
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F91
Bolts				
Gaskets				
Flanges				
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F91
	0.5-2	-		Gate Valve , App. Mfg. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F91
	2.5-4	-	MATCH	Gate Valve , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217-C12A
	6-28	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 217-C12A
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F91
	0.5-2	-		Globe Valve , Manf. Std. , CL2500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F91
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 217-C12A
	6-28	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 217-C12A
Check Valves				
	0.5-2	-		Check Valve Swing , App. Mfg. , CL2500 , SWE , Welded Bonnet , A 182 Gr. F91
	2.5-48	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 217-C12A
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Gear Operator , A 182 Gr. F91
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL2500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F91
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Gear Operator , A 217-C12A
	2.5-6	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Two or Three Piece Metal Seated , Lever Operator , A 217-C12A
Butterfly Valves				

PIPE SPEC: 1HCA1

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DESCRIPTION:	LIFT OIL, LOW AND INTERMEDIATE TEMP
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1000F
RATING CLASS:	2500, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6000
100	6000
200	5000
300	4480
400	4140
500	3880
600	3680
650	3600
700	3520
750	3440
800	3380
850	3300
900	3240
950	3180
1000	2950

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE.
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	2.5-48	-	Calc	Pipe , B36.19M , BE , A 312 Gr. TP304/304L Dual Cert. , SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304/304L Dual Cert. , 12" Long, SMLS
Large Bore Fittings				
	0.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	0.75-48	0.5-42	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	1-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	2.5-24	0.5-18	MATCH	Weldolet , MSS SP-97 , BE , A 182 Gr. F304/304L Dual Cert.

PIPE SPEC: 1HCA1

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Small Bore Fittings				
	0.5-2	-	MATCH	Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-	MATCH	Cap , B16.11 , CL6000 , FTE , A 182 Gr. F304/304L Dual Cert.
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-48			Sp. Wound Gskt , B16.20 , CL2500 , RF , 304 SS, Graphite Fill, CS CR, 304 SS IR , 0.175" non compressed thickness
Flanges				
	0.5-12	-		Blind Flg. , B16.5 , CL2500 , RF , A 182 Gr. F304/304L Dual Cert.
	0.5-12	-	MATCH	WN Flg. , B16.5 , CL2500 , FF , A 182 Gr. F304/304L Dual Cert.
	0.5-12	-	MATCH	WN Flg. , B16.5 , CL2500 , RF , A 182 Gr. F304/304L Dual Cert.
	10-12	-	MATCH	WN Ori Flg 0.75" Thd , B16.36 , CL2500 , RF , A 182 Gr. F304/304L Dual Cert. , 2 Taps , 180deg apart
Gate Valves				
	0.5-2	-	MATCH	Gate Valve , App. Mfg. , CL2500 , BE , Welded Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-4	-	MATCH	Gate Valve , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 351 Gr. CF3
	6-18	-	MATCH	Gate Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 351 Gr. CF3
Globe Valves				
	0.5-2	-	MATCH	Globe Valve , Manf. Std. , CL2500 , BE , Welded Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-4	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Handwheel Operator , A 351 Gr. CF3
	6-12	-	MATCH	Globe Valve SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , Gear Operator , A 351 Gr. CF3
Check Valves				
	0.5-2	-	MATCH	Check Valve Pistn Lft , App. Mfg. , CL2500 , BE , Welded Bonnet , A 351 Gr. CF3
	2.5-12	-	MATCH	Check Valve Swing SP , B16.10 App. Mfg. , CL2500 , BE , Pressure Seal Bonnet , A 351 Gr. CF3
Ball Valves				
	0.5-2	-	MATCH	Ball Valve LP FB , App. Mfg. , CL2500 , BE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
	2.5-6	-		Ball Valve LP FB , App. Mfg. , CL2500 , RF , Two or Three Piece Metal Seated , Lever Operator , A 351 Gr. CF8
Butterfly Valves				

DESCRIPTION:HIGH PRESSURE AND HIGH TEMPERATURE STEAM

MATERIAL:2.25Cr-1Mo

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1100F

RATING CLASS:4500, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0313 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	11250
100	11250
200	11250
300	10925
400	10585
500	9965
600	9070
650	8825
700	8515
750	7970
800	7610
850	7305
900	6740
950	5795
1000	4010
1050	2625
1100	1645

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 4 PIPE BENDING PROCEDURES SHALL BE SUBMITTED FOR APPROVAL.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 335 Gr. P22 , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P22 , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 335 Gr. P91 , 6" Long, SMLS
Large Bore Fittings				
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		45 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		90 Deg. Elbow , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cap , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Cplg. , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.5-2	-		Equal Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 234 Gr. WP22 Cl. 1 , SMLS
				Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-0.75	-		
	0.75-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A 182 Gr. F22 Cl. 1
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL9000 , SWE , A 182 Gr. F22 Cl. 1
				Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
	1-1	-		
Bolts				
Gaskets				
Flanges				

Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL4500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Gate Valve , App. Mfg. , CL4500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL4500 , SWE x FTE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
	0.5-2	-		Globe Valve , Manf. Std. , CL4500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F22 Cl. 3
Check Valves				
	0.5-2	-		Check Valve Pistn Lft , App. Mfg. , CL4500 , SWE , Welded Bonnet , A 182 Gr. F22 Cl. 3
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL4500 , SWE , Two or Three Piece Metal Seated , Lever Operator , A 182 Gr. F22 Cl. 3
Butterfly Valves				

PIPE SPEC: 1KFB0

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DESCRIPTION:	ABOVE GROUND POTABLE WATER
MATERIAL:	Copper
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	275
100	275
200	230

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 POTABLE WATER PIPING SHALL BE CERTIFIED ACCORDING TO NSF 14 AND NSF 61.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples	0.5-8	-	Type K	Pipe , Copper Tubing , Male Solder End , B 88 Cl.C10200, drwn
Large Bore Fittings	0.5-8	-	Type K	45 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 606
	0.5-4	-	Type K	45 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 606-2
	0.5-8	-	Type K	90 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	0.5-4	-	Type K	90 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 607-2
	0.5-8	-	Type K	Cap , Nibco , FSC , Wrought Copper Alloy , 617
	0.5-8	-	Type K	Coupling , Nibco , FSC , Wrought Copper Alloy , 600-DS
	0.5-3	-	Type K	Female Adapter , Nibco , FTE x FSC , Wrought Copper Alloy , 603
	0.5-3	-	Type K	Male Adapter , Nibco , MTE x FSC , Wrought Copper Alloy , 604
	0.5-8	-	Type K	Tee , Nibco , FSC , Wrought Copper Alloy , 611
	0.75-8	0.5-6	Type K	Red. Coupling , Nibco , FSC , Wrought Copper Alloy , 600
	0.75-8	0.5-6	Type K	Reducing Tee , Nibco , FSC , Wrought Copper Alloy , 611
	1.25-3	-	Type K	Union , Nibco , FSC , Brass / Bronze B62 , 733
	2-3	1.5-2	Type K	Concentric Reducer , Nibco , FSC x MSC , Wrought Copper Alloy , 600-2
	3-3	-	Type K	Male Adapter , Nibco , MTE x FSC , Brass / Bronze B62 , 704
Small Bore Fittings	0.5-1	-	Type K	Union , Nibco , FSC , Brass / Bronze B62 , 733
	0.5-1	-	Type K	Union , Nibco , FSC , Wrought Copper Alloy , 633-W
	0.75-2	0.5-1.5	Type K	90 Deg. Red. Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	1-2	0.75-1.5	Type K	90 Deg. Red. Elbow , Nibco , FSC , Wrought Copper Alloy , 607
Bolts	0.5-8	-	Type K	Machine Bolt , B18.2.1 , B98 Alloy 651 , Nuts Silicon Bronze ASME 18.2.2 Std, Integral thread UN, B98 Alloy 651
Gaskets	0.5-8	-	Type K	Non Metal Flat Gskt , B16.21 , CL125 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges	0.5-8	-	Type K	SW Flg. , Nibco , CL125 , FF , BRASS / BRONZE B584
Gate Valves	0.5-3	-	Type K	Gate Valve , App. Mfg. , CL125 , FSC , Thd. Bonnet , Handwheel Operator , BRASS / BRONZE B62
Globe Valves	0.5-3	-	Type K	Globe Valve , Manf. Std. , CL125 , FSC , Thd. Bonnet , Handwheel Operator , BRASS / BRONZE B62
Check Valves	0.5-4	-	Type K	Check Valve Swing LP , App. Mfg. , CL125 , FSC , Thd. Bonnet , BRASS / BRONZE B62
Ball Valves	0.5-3	-	Type K	Ball Valve LP FB , App. Mfg. , CL600 , FSC , Side Entry Fltg. Ball , Lever Operator , BRASS / BRONZE B62
	0.5-2	-	Type K	Ball Valve , App. Mfg. , CL400 , FTE , Lever Operator , Bronze
	0.5-2	-	Type K	Ball Valve , App. Mfg. , CL400 , FSC , Lever Operator , Bronze
Butterfly Valves				

DESCRIPTION:ABOVE GROUND COMPRESSED AIR

MATERIAL:Copper

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 200F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	275
100	275
200	230

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.25-8	-	Type K	Pipe , Copper Tubing , Male Solder End , B 88 Cl.C10200, drwn
Large Bore Fittings				
	0.25-3	-	Type K	Female Adapter , Nibco , FTE x FSC , Wrought Copper Alloy , 603
	0.5-8	-	Type K	45 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 606
	0.5-4	-	Type K	45 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 606-2
	0.5-8	-	Type K	90 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	0.5-4	-	Type K	90 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 607-2
	0.5-8	-	Type K	Cap , Nibco , FSC , Wrought Copper Alloy , 617
	0.5-8	-	Type K	Coupling , Nibco , FSC , Wrought Copper Alloy , 600-DS
	0.5-3	-	Type K	Male Adapter , Nibco , MTE x FSC , Wrought Copper Alloy , 604
	0.5-8	-	Type K	Tee , Nibco , FSC , Wrought Copper Alloy , 611
	0.75-8	0.5-6	Type K	Red. Coupling , Nibco , FSC , Wrought Copper Alloy , 600
	0.75-8	0.5-6	Type K	Reducing Tee , Nibco , FSC , Wrought Copper Alloy , 611
	1.25-3	-		Union , Nibco , FSC , Brass / Bronze B62 , 733
	3-3	-	Type K	Male Adapter , Nibco , MTE x FSC , Brass / Bronze B62 , 704
Small Bore Fittings				
	0.5-2	-		Dieletric Union , Wilkins , FTE x FSC , Brass
	0.5-1	-		Union , Nibco , FSC , Brass / Bronze B62 , 733
	0.5-1	-		Union , Nibco , FSC , Wrought Copper Alloy , 633-W
	0.75-2	0.5-1.5	Type K	90 Deg. Red. Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	0.75-2	-	Type K	Male Adapter , Nibco , MSC x FTE , Wrought Copper Alloy , 603
	0.75-0.75	-		Plug Hex Head , B16.11 , MTE , Brass
	1-2	0.75-1.5	Type K	90 Deg. Red. Elbow , Nibco , FSC , Wrought Copper Alloy , 607
Bolts				
	0.5-8			Machine Bolt , B18.2.1 , B98 Alloy 651 , Nuts Silicon Bronze ASME 18.2.2 Std, Integral thread UN, B98 Alloy 651
Gaskets				
	0.5-8			Non Metal Flat Gskt , B16.21 , CL125 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges				
	0.5-8	-	Type K	SW Flg. , Nibco , CL125 , FF , BRASS / BRONZE B584
Gate Valves				
	0.5-3	-		Gate Valve , App. Mfg. , CL125 , FSC , Thd. Bonnet , Handwheel Operator , BRASS / BRONZE B62
Globe Valves				
	0.5-3	-		Globe Valve , Manf. Std. , CL125 , FSC , Thd. Bonnet , Handwheel Operator , BRASS / BRONZE B62
Check Valves				
	0.5-4	-		Check Valve Swing LP , App. Mfg. , CL125 , FSC , Thd. Bonnet , BRASS / BRONZE B62
Ball Valves				
	0.5-4	-		Ball Valve LP FB , App. Mfg. , CL600 , FSC , Side Entry Fltg. Ball , Lever Operator , BRASS / BRONZE B62
	0.5-2	-		Ball Valve , App. Mfg. , CL400 , FTE , Lever Operator , Bronze
	0.5-2	-		Ball Valve , App. Mfg. , CL400 , FSC , Lever Operator , Bronze
Butterfly Valves				

PIPE SPEC: 1KFB6

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DESCRIPTION:	UNDERGROUND COMPRESSED AIR
MATERIAL:	Copper
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	275
100	275
200	230

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 3 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	2-6	-	Type K	Pipe , Copper Tubing , Male Solder End , B 88 Cl.C10200, drwn
Large Bore Fittings				
	2-6	-	Type K	45 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 606
	2-6	-	Type K	45 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 606-2
	2-6	-	Type K	90 Deg Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	2-6	-	Type K	90 Deg Street Elbow , Nibco , FSC x MSC , Wrought Copper Alloy , 607-2
	2-6	-	Type K	Cap , Nibco , FSC , Wrought Copper Alloy , 617
	2-6	-	Type K	Coupling , Nibco , FSC , Wrought Copper Alloy , 600-DS
	2-6	-	Type K	Female Adapter , Nibco , FTE x FSC , Wrought Copper Alloy , 603
	2-6	-	Type K	Male Adapter , Nibco , MTE x FSC , Wrought Copper Alloy , 604
	2-6	-	Type K	Tee , Nibco , FSC , Wrought Copper Alloy , 611
	2-6	-		Union , Nibco , FSC , Wrought Copper Alloy , 633-W
	3-6	2-4	Type K	90 Deg. Red. Elbow , Nibco , FSC , Wrought Copper Alloy , 607
	3-6	2-4	Type K	Reducing Tee , Nibco , FSC , Wrought Copper Alloy , 611
Small Bore Fittings				
Bolts				
	2-6			Machine Bolt , B18.2.1 , B98 Alloy 651 , Nuts Silicon Bronze ASME 18.2.2 Std, Integral thread UN, B98 Alloy 651
Gaskets				
	2-6			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal , 300 deg F or better , 0.125" non compressed thickness
	2-6			Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better , 0.125" non compressed thickness
Flanges				
	2-6	-		SW Flg. , Nibco , CL125 , FF , BRASS / BRONZE B584
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1KFD0

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DESCRIPTION:	POTABLE WATER
MATERIAL:	Copper
EXAMINATION:	Per ASME B31.1 - 2012
TEMPERATURE LIMIT:	32F to 200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2012
STRESS RELIEF:	Per ASME B31.1 - 2012

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	200
200	200

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 COMPONENT RATINGS (FLANGES, FITTINGS, ETC.) SHALL, AT A MINIMUM, MEET THE PRESSURE AND TEMPERATURE LIMITS SHOWN ON THIS PIPE CODE. COMPONENTS (FITTINGS, FLANGES, ETC.) SELECTED SHALL CORRESPOND TO THE PIPING SCHEDULE SHOWN.
- 3 SEALING ELEMENTS AND FLANGE GASKET MATERIAL, AS SHOWN, ARE TO MATCH.
- 4 POTABLE WATER PIPING SHALL BE CERTIFIED ACCORDING TO NSF 61.
- 5 GASKETS FOR MECHANICAL COUPLINGS SHALL BE VIEGA GRADE EPDM
- 6 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 7 NON-METALLIC GASKETS SHALL NOT BE UTILIZED FOR STEAM AND GAS APPLICATIONS

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-4	-	Type K	Pipe , Copper Tubing , Male Solder End , B 88 Cl.C10200, drwn , NSF 61 Certified
Large Bore Fittings				
	2.5-4	-	Type K	45 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0926XL, NSF 61 Certified
	2.5-4	-		Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0915XL, CPLG W/O STOP, NSF 61 Certified
	2.5-4	0.75-3	Type K	Red. Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0915.2XL, NSF 61 Certified
	2.5-4	0.75-3	Type K	Reducing Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0918XL, NSF 61 Certified
	2.5-4	-	Type K	Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0918XL, NSF 61 Certified
Small Bore Fittings				
	0.5-2	-	Type K	45 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2926
	0.5-2	-	Type K	90 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2916
	0.5-2	-	Type K	Cap , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2956
	0.5-2	-		Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2915, CPLG W/O STOP
	0.5-2	-		Dielectric Union , Viega ProPress , MTE x FMJE , Wrought Copper Alloy , Model 4067
	0.5-2	-	Type K	Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2918
	0.5-2	-		Union , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2960ZL
	0.75-2	-	Type K	Female Adapter , Viega ProPress , FTE x FMJE , Wrought Copper Alloy , Model 2912ZL
	0.75-2	-	Type K	Male Adapter , Viega ProPress , MTE x FMJE , Wrought Copper Alloy , Model 2911ZL
	0.75-2	0.5-1.5	Type K	Red. Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2915.2
	0.75-2	0.5-1.5	Type K	Reducing Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2918
Bolts				
	0.5-4			Machine Bolt , B18.2.1 , B98 Alloy 651 , Nuts Silicon Bronze ASME 18.2.2 Std, Integral thread UN, B98 Alloy 651
Gaskets				
	0.5-4			Insulating Gskt Set , B16.21 , CL150 , FF , G10 Retainer with PTFE Seal Rings, G10 Full Length Sleeves, Steel ZP and G10 Washers, Double Washer Configuration, LineBacker or equal ,300 deg F or better, NSF 61 Certified , 0.125" non compressed thickness

PIPE SPEC: 1KFD0

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				Non Metal Flat Gskt , B16.21 , CL150 , FF , Aramid Fiber/ NBR Binder (Blue-Gard 3000 or equal) , Max Continuous Temp- 400 deg F or better, PT- 250,000 deg FxPsig or better, NSF 61 Certified , 0.125" non compressed thickness
Flanges	0.5-4			
				Flg. Adapter , Viega ProPress , CL150 , FFFE x FMJE , Bronze , Model 0959.5XL
	2.5-4	-		
				Flg. Adapter , Viega ProPress , CL150 , FFFE x FMJE , Bronze , Model 2959.5ZL, NSF 61 Certified
Gate Valves	1-2	-		
Globe Valves				
Check Valves				
				Pistn Lft Chk Vlv LP , Viega ProPress or eq. , FMJE , BRONZE , Model 2974ZL, NSF 61 Certified
Ball Valves	0.5-2	-		
				Ball Vlv LP FB , Viega ProPress or eq. , FMJE , Two piece Fltg. Ball , Lever Operator , BRONZE , SS Ball and Stem , Model 2970.3, NSF 61 Certified
Butterfly Valves	0.5-2	-		
				Bfly Vlv Lug Type , Viega ProPress , FFTBE , Lever Operator , Ductile iron , SS Disc and Stem , Model 2873.81, NSF 61 Certified
	2.5-4	-		

PIPE SPEC: 1KFD1

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DESCRIPTION:	ABOVE GROUND COMPRESSED AIR
MATERIAL:	Copper
EXAMINATION:	Per ASME B31.1 - 2012
TEMPERATURE LIMIT:	0F to 200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2012
STRESS RELIEF:	Per ASME B31.1 - 2012

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	200
200	200

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 2 COMPONENT RATINGS (FLANGES, FITTINGS, ETC.) SHALL, AT A MINIMUM, MEET THE PRESSURE AND TEMPERATURE LIMITS SHOWN ON THIS PIPE CODE. COMPONENTS (FITTINGS, FLANGES, ETC.) SELECTED SHALL CORRESPOND TO THE PIPING SCHEDULE SHOWN.
- 3 SEALING ELEMENTS AND FLANGE GASKET MATERIAL, AS SHOWN, ARE TO MATCH.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE VIEGA GRADE EPDM

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-4	-	Type K	Pipe , Copper Tubing , Male Solder End , B 88 Cl.C10200, drwn
Large Bore Fittings				
	2.5-4	-	Type K	45 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0926XL
	2.5-4	-	Type K	90 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0916XL
	2.5-4	-	Type K	Cap , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0956XL
	2.5-4	-		Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0915XL, CPLG
	2.5-4	0.75-3	Type K	Red. Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0915.2XL
	2.5-4	-	Type K	Reducing Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0918XL
	2.5-4	-	Type K	Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 0918XL
Small Bore Fittings				
	0.5-2	-	Type K	45 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2926
	0.5-2	-	Type K	90 Deg Elbow , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2916
	0.5-2	-	Type K	Cap , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2956
	0.5-2	-		Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2915, CPLG
	0.5-2	-		Dielectric Union , Viega ProPress , MTE x FMJE , Wrought Copper Alloy , Model 4067
	0.5-2	-	Type K	Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2918
	0.5-2	-		Union , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2960ZL
	0.75-2	-	Type K	Female Adapter , Viega ProPress , FTE x FMJE , Wrought Copper Alloy , Model 2912ZL
	0.75-2	-	Type K	Male Adapter , Viega ProPress , MTE x FMJE , Wrought Copper Alloy , Model 2911ZL
	0.75-2	0.5-1.5	Type K	Red. Coupling , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2915.2
	0.75-2	0.5-1.5	Type K	Reducing Tee , Viega ProPress , FMJE , Wrought Copper Alloy , Model 2918
Bolts				
Gaskets				
Flanges				
	1-2	-		Flg. Adapter , Viega ProPress , CL150 , FFFE x FMJE , Bronze , Model 2959.5ZL
	2.5-4	-		Flg. Adapter , Viega ProPress , CL150 , FFFE x FMJE , Bronze , Model 0959.5XL
Gate Valves				
Globe Valves				
Check Valves				
	0.5-2	-		Pistn Lft Chk Vlv LP , Viega ProPress or eq. , FMJE , BRONZE , Model 2974ZL
Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Viega ProPress or eq. , FMJE , Two piece Fltg. Ball , Lever Operator , BRONZE , SS Ball and Stem , Model 2970.3
Butterfly Valves				
	2.5-4	-		Bfly Vlv Lug Type , Viega ProPress , FFTBE , Lever Operator , Ductile iron , SS Disc and Stem , Model 2873.81

PIPE SPEC: 1LCG1

Date: 8/4/2016 6:27:06 PM



DESCRIPTION:	ABOVE GROUND COMPRESSED AIR
MATERIAL:	Stainless Steel
EXAMINATION:	Per ASME B31.1 - 2012
TEMPERATURE LIMIT:	0F to 140F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2012
STRESS RELIEF:	Per ASME B31.1 - 2012

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	200
140	200

GENERAL NOTES

- 1 PRESSURE RATINGS FOR BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 2 COMPONENT RATINGS (FLANGES, FITTINGS, ETC.) SHALL, AT A MINIMUM, MEET THE PRESSURE AND TEMPERATURE LIMITS SHOWN ON THIS PIPE CODE. COMPONENTS (FITTINGS, FLANGES, ETC.) SELECTED SHALL CORRESPOND TO THE PIPING SCHEDULE SHOWN.
- 3 SEALING ELEMENTS AND FLANGE GASKET MATERIAL, AS SHOWN, ARE TO MATCH.
- 4 GASKETS FOR MECHANICAL COUPLINGS SHALL BE: VIEGA GRADE FKM

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	S-5S	Pipe , Annealed Stainless Tubing , PE , A 312 Gr. TP304 , Model 0103
	2.5-4	-	S-5S	Pipe , Annealed Stainless Tubing , PE , A554 , Model 0107XL
Large Bore Fittings				
	2.5-4	-	S-5S	45 Deg Elbow , Viega ProPress , VPS , A 182 Gr. F304 , Model 6026XL
	2.5-4	-	S-5S	90 Deg Elbow , Viega ProPress , VPS , A 182 Gr. F304 , Model 6016XL
	2.5-4	-	S-5S	Cap , Viega ProPress , VPS , A 182 Gr. F304 , Model 6056.1XL
	2.5-4	2-3		Concentric Reducer , Viega ProPress , VPS , A 182 Gr. F304 , Model 6015.1XL
	2.5-4	-		Coupling , Viega ProPress , VPS , A 182 Gr. F304 , Model 6015XL
	2.5-4	-		Male Adapter , Viega ProPress , MTE x VPS , A 182 Gr. F304 , Model 6011XL
	2.5-4	0.75-1	S-5S	Reducing Tee , Viega ProPress , FTE x VPS , A 182 Grade F304 , Model 6017.2XL
	2.5-4	1.5-3	S-5S	Reducing Tee , Viega ProPress , VPS , A 182 Gr. F304 , Model 6018XL
	2.5-4	-	S-5S	Tee , Viega ProPress , VPS , A 182 Gr. F304 , Model 6018XL
Small Bore Fittings				
	0.5-2	-	S-5S	45 Deg Elbow , Viega ProPress , VPS , A 182 Gr. F304 , Model 6026
	0.5-2	-	S-5S	90 Deg Elbow , Viega ProPress , VPS , A 182 Gr. F304 , Model 6016
	0.5-2	-	S-5S	Cap , Viega ProPress , VPS , A 182 Gr. F304 , Model 6056
	0.5-2	-		Coupling , Viega ProPress , VPS , A 182 Gr. F304 , Model 6015
	0.5-2	-	S-5S	Female Adapter , Viega ProPress , FTE x VPS , A 182 Grade F304 , Model 6012
	0.5-2	-	S-5S	Male Adapter , Viega ProPress , MTE x VPS , A 182 Gr. F304 , Model 6011
				Male Connector , Swagelok or Eq , MNPT x CTBE , A 182 Gr. F316 , 2 Ferrule, Grip
	0.5-0.75	0.125-0.5	S-5S	Type Compression , NPT
	0.5-2	-	S-5S	Tee , Viega ProPress , VPS , A 182 Gr. F304 , Model 6018
	0.5-2	-		Union , Viega ProPress , VPS , A 182 Gr. F304 , Model 6060
	0.75-2	0.5-1.5	S-5S	Concentric Reducer , Viega ProPress , VPS , A 182 Gr. F304 , Model 6015.1
	0.75-2	0.5-1.5	S-5S	Reducing Tee , Viega ProPress , VPS , A 182 Gr. F304 , Model 6018
Bolts				
				Machine Bolt , B18.2.1 , B98 Alloy 651 , Nuts Silicon Bronze ASME 18.2.2 Std,
	0.5-4			Integral thread UN, B98 Alloy 651
Gaskets				
	0.5-4			Non Metal Flat Gskt , B16.21 , CL125 , FF , EPDM , 0.125" non compressed thickness
	0.5-4			Non Metal Flat Gskt , B16.21 , CL150 , FF , EPDM , 0.125" non compressed thickness
	0.5-4			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , furnish with CL150
	0.5-4			PTFE compensation ring , 0.125" non compressed thickness
Flanges				
				Flg. Adapter , Viega ProPress , CL150 , FF x VPS , A 182 Gr. F304 , Model 6059
	0.5-2	-		
	2.5-4	-		Flg. Adapter , Viega ProPress , CL150 , FF x VPS , A 182 Gr. F304 , Model 6059XL
Gate Valves				
Globe Valves				
				Globe Vlv , Cameron or eq. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A
	1.5-2	-		182 Gr. F304
Check Valves				

PIPE SPEC: 1LCG1

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Ball Valves				
	0.5-2	-		Ball Vlv LP FB , Viega ProPress or eq. , VPS , Three Piece Fltg. Ball , Lever Operator , A 182 Gr. F304 , SS Ball and Stem , Model 4370.8
	2.5-4	-		Ball Vlv LP FB , Kuka B16.10 Full Port or eq. , CL150 , RF , Top Entry Trun. Mount. Ball , Lever Operator , A 351 Gr. CF8M
Butterfly Valves				

DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	3700
200	3501
400	2893
600	2549
800	2388
1000	2286

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 4 DO NOT MIX FITTING MANUFACTURERS.
- 5 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP316/TP316L Dual Cert.
	0.375-1	-	0.065" tubing	
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC: 1LCR1

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	0.375-1	-	Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Bulkhead Redng Union , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W	
	0.75-1	0.5-0.5	Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W	
	1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W	
Bolts				
Gaskets				
Flanges				
Gate Valves				
	0.75-1	-	Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F316/316L Dual Cert.	
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1LCR2

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DESCRIPTION:	INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING
MATERIAL:	ASTM A213, TP304L TUBING
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3100
100	3100
200	3100
400	2883
600	2542
800	2356
1000	2139
1200	1184

GENERAL NOTES

- 1 ALL TUBING FITTINGS SHALL BE 316.
- 2 THREAD CONNCECTIONS SHALL BE STRAIGHT THREADED, O-RINGS.
- 3 MINIMUM RADI USED FOR TUBE BEND SHALL BE 1.5IN FOR 0.5" TUBING AND 4 X TUBE OD FOR 0.75" AND GREATER.
- 4 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 5 SEAMLESS SS304L TUBING SHALL BE USED; WELDED TUBING IS NOT PERMIT.
- 6 O-RINGS SHALL BE COMBATIBLE WITH PHOSPHATE ESTER HYDRUALIC FLUID.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-0.75	-	0.065" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1-1	-	0.083" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1.5-1.5	-	0.134" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	2-2	-	0.188" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-0.5	0.25-0.25		Bulkhead Redng Union , Swagelok or Eq , CTBE , A 182 Gr. F316
	0.375-1	-		Bulkhead Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Cross , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Equal Tee , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Female Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Male Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Plug Round Head , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316
	0.375-1	-		Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-1	0.375-0.75		Red. Tee , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-1	0.375-0.75		Reducer Concentric , Swagelok or Eq , SWE X CTBE , A 182 Gr. F316
	0.5-1	0.375-0.75		Reducing Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
Bolts				
Gaskets				
Flanges				
	0.375-1	-		Flg. Adapter , Swagelok or eq. , CL150 , FFFE X TUBE SOCKET WELD , A 182 Gr. F316 -
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1LCR3

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DESCRIPTION:	HYDRAULIC OIL
MATERIAL:	ASTM A213, TP304L TUBING
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	-20F to 1200F
RATING CLASS:	None
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS
SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3100
100	3100
200	3100
400	2883
600	2542
800	2356
1000	2139
1200	1184

GENERAL NOTES

- 1 ALL TUBING FITTINGS SHALL BE 316.
- 2 THREAD CONNCECTIONS SHALL BE STRAIGHT THREADED, O-RINGS.
- 3 MINIMUM RADI USED FOR TUBE BEND SHALL BE 1.5IN FOR 0.5" TUBING AND 4 X TUBE OD FOR 0.75" AND GREATER.
- 4 VERIFY VALVE PRESSURE/TEMPERATURE RATING WITH VALVE MANUFACTURER
- 5 SEAMLESS SS304L TUBING SHALL BE USED; WELDED TUBING IS NOT PERMIT.
- 6 O-RINGS SHALL BE COMBATIBLE WITH PHOSPHATE ESTER HYDRUALIC FLUID.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-0.75	-	0.065" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1-1	-	0.083" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1.5-1.5	-	0.134" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	2-2	-	0.188" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Bulkhead Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Cross , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Equal Tee , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Female Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Male Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Plug Round Head , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-1	-		Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.375-2	-		Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316
	0.375-1	-		Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-2	0.375-0.75		Bulkhead Redng Union , Swagelok or Eq , CTBE , A 182 Gr. F316
	0.5-2	0.375-1.5		Red. Tee , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-2	0.375-1.5		Reducer Concentric , Swagelok or Eq , SWE X CTBE , A 182 Gr. F316
	0.5-1	0.375-0.75		Reducer Concentric , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-1	0.5-0.75		Reducer Eccentric , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-1	0.375-0.75		Reducing Union , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316
	0.5-0.5	-	0.065" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	0.5-0.5	-	0.065" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1-1	-	0.083" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1-1	-	0.083" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1.5-2	-		45 Deg. Elbow , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		90 Deg. Elbow , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Bulkhead Union , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Equal Tee , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Female Connector , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Male Connector , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-1.5	-	0.134" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1.5-1.5	-	0.134" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	1.5-2	-		Union , Swagelok or Eq , CTBE , A 182 Gr. F316
	1.5-2	-		Weld Connector , Swagelok or Eq , CTBE , A 182 Gr. F316
	2-2	-	0.188" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L
	2-2	-	0.188" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP304L

PIPE SPEC:

1LCR3

Date:

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Bolts				
0.375-2				Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
Flanges				
0.375-2 -				Fig. Adapter , Swagelok or eq. , CL150 , FFFE X TUBE SOCKET WELD , A 182 Gr. F316 -
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	2991
100	2991
200	2587
300	2333
400	2139
500	1989
600	1884
650	1839
700	1809
750	1780
800	1765
850	1735
900	1720
950	1705
1000	1690

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 3 DO NOT MIX FITTING MANUFACTURERS.
- 4 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP316/TP316L Dual Cert.
	0.375-1	-	0.049" tubing	
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

0.375-1	-	Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-1	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.75	Bulkhead Redng Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.75	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.75	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
0.75-1	0.5-0.5	Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
0.75-0.75	0.375-0.5	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
1-1	0.375-0.75	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

Bolts				
Gaskets				
Flanges				
Gate Valves				
Globe Valves				
Check Valves				

PIPE SPEC:1LCS1

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Ball Valves				
Butterfly Valves				

DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1200F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	3700
200	3501
400	2893
600	2549
800	2388
1000	2286
1200	1184

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 3 DO NOT MIX FITTING MANUFACTURERS.
- 4 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.375-1	-	0.065" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A269, TP316/TP316L, Dual Cert
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.75	-		Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC:

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	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.75	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-1	0.375-0.75	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-1	0.375-0.75	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-1	0.375-0.75	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-1	0.5-0.5	Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W

Bolts				
Gaskets				
Flanges				
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1200F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	4550
100	4550
200	4550
300	4550
400	4321
500	4043
600	3829
650	3743
700	3678
750	3635
800	3592
850	3549
900	3527
950	3484
1000	3462
1050	3419
1100	2874
1150	2232
1200	1713

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 3 DO NOT MIX FITTING MANUFACTURERS.
- 4 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP316/TP316L Dual Cert.
	0.5-0.5	-	0.065" tubing	
Large Bore Fittings				
Small Bore Fittings				
	0.5-0.5	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.5-0.5	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC: 1LCT2

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0.5-0.5	-	Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.5	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.5	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.5	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W

Bolts				
Gaskets				
Flanges				
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				

PIPE SPEC: 1LCT2

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Butterfly Valves				
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DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1200F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	5526
100	5526
200	4780
300	4310
400	3951
500	3674
600	3481
650	3398
700	3343
750	3287
800	3260
850	3205
900	3177
950	3149
1000	3122
1050	3094
1100	3154
1150	2784
1200	2102

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 3 DO NOT MIX FITTING MANUFACTURERS.
- 4 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP316/TP316L Dual Cert.
	0.375-0.375	-	0.065" tubing	
Large Bore Fittings				
Small Bore Fittings				
	0.375-0.375	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC: 1LCT3

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0.375-0.375	-	Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.375	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.375	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-1	0.375-0.375	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W

Bolts				
Gaskets				
Flanges				
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				

PIPE SPEC: 1LCT3

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Butterfly Valves				
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DESCRIPTION:INSTRUMENT PROCESS SENSING AND CHEMICAL FEED TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:-20F to 1000F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.1 - 2014

PRESSURE - TEMPERATURE RATINGS

SUBJECT TO CHANGE IF SPECIFIED IN NOTES

TEMP. F	PRESS. PSIG
-20	6500
100	6500
200	6296
300	5677
400	5204
500	4740
600	4585
650	4476
700	4403
750	4331
800	4294
850	4221
900	4185
950	4149
1000	4112

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DUAL RATED / CERTIFIED PIPING AND COMPONENTS SHALL BE USED. LOW CARBON STAINLESS STEEL AND CASTINGS COMPLYING WITH CF3 OR CF3M SHALL NOT BE USED OVER 800F. FOR TEMPERATURES EXCEEDING 800F, THE CARBON CONTENT SHALL BE EQUAL TO OR GREATER THAN .04%
- 3 DO NOT MIX FITTING MANUFACTURERS.
- 4 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.375-0.375	-	0.083" tubing	Tube , Annealed Stainless Tubing , CTBE , ASTM A 213, TP316/316L Dual Cert.
Large Bore Fittings				
Small Bore Fittings				
	0.375-0.375	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-0.375	-		Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC: 1LCU1

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0.375-0.375	-	Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.375-0.375	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.5-0.5	0.375-0.375	Bulkhead Redng Union , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W

Bolts				
Gaskets				
Flanges				
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: 1PEA1

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DESCRIPTION:	ABOVE GROUND GENERAL SERVICE WATER
MATERIAL:	Undefined
EXAMINATION:	Per ASME B31.1 - 2014
TEMPERATURE LIMIT:	0F to 212F
RATING CLASS:	250, ASME B16.5 - 2010
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per ASME B31.1 - 2014
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	250
212	250

GENERAL NOTES

- 1 DIELECTRIC FLANGE KITS (WITH GASKET), B16.21, CL150, FF, PER SPECIFICATION 81.33.08, 0.125" THICK SHALL BE USED TO ISOLATE UNDERGROUND POLYETHYLENE WRAPPED PIPING. DIELECTRIC FLANGE KIT SHALL NOT BE USED FOR SERVICE OF 220 DEG F.
- 2 CEMENT MORTAR LINING TO BE SUPPLIED WITHOUT SEAL COAT AND RATED TO NOT LESS THAN 212F.
- 3 BOLTS AND NUTS SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS TO PREVENT DAMAGE TO FITTING.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	3-24	-	CL350	Flgd Pipe , AWWA C115 , AWWA C151 , FFFE x PE , Ductile iron
	3-24	-	CL350	Flgd Pipe , AWWA C115 , AWWA C151 , FF , Ductile iron
	3-24	-	CL350	Bell and Spigot Pipe , AWWA C151 , PE , A536 Gr.60-42-10
	30-48	-	CL250	Flgd Pipe , AWWA C115 , AWWA C151 , FF , Ductile iron
	30-48	-	CL250	Flgd Pipe , AWWA C115 , AWWA C151 , FFFE x PE , Ductile iron
Large Bore Fittings				
	3-24	-		45 Deg. Elbow , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		90 Deg. Elbow , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		Equal Tee , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	3-18	2-16		Red. Tee , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	3-24	2-20		Reducer Concentric , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	3-18	2-16		Reducer Eccentric , AWWA C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
Small Bore Fittings				
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Zinc or Cad Plated
Gaskets				
	3-48			Insulating Gskt Set , B16.21 , CL125 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness
	3-48			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness
	3-48			Non Metal Flat Gskt , AWWA C115 , FF , organic fiber, nitrile binder, ANSI-B16.21, Garlock 3000 , 0.175" non compressed thickness
Flanges				
	3-24	-		Flg. Adapter , AWWA C110 , CL150 , FFFE x PE , A536 Gr.70-50-05 , gland and bolt set
	30-48	-		Flg. Adapter , AWWA C110 , CL150 , FFFE x PE , A536 Gr.70-50-05 , gland and bolt set
Gate Valves				
	2-24	-		Gate Vlv , Mueller B16.10 or eq. , CL150 , FF , Bltd Bonnet , Handwheel Operator , A 126 Gr. B
	4-12	-		Gate Valve Underground , App. Mfg. , CL150 , MJ , Bltd Bonnet , A536 Gr.70-50-05 , Valve Box with a Tee Handle Extension
Globe Valves				
Check Valves				
	2.5-24	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , A 216 Gr. WCB
Ball Valves				
Butterfly Valves				

DESCRIPTION:UNDERGROUND GENERAL SERVICE WATER

MATERIAL:Ductile Iron Cement Lined Pipe & Fittings, Mech Joint

EXAMINATION:Per ASME B31.1 - 2014

TEMPERATURE LIMIT:0F to 212F

RATING CLASS:250, ASME B16.5 - 2010

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	250
212	250

GENERAL NOTES

- 1 DIELECTRIC FLANGE KITS (WITH GASKET), B16.21, CL150, FF, PER SPECIFICATION 81.33.08, 0.125" THICK SHALL BE USED TO ISOLATE UNDERGROUND POLYETHYLENE WRAPPED PIPING. DIELECTRIC FLANGE KIT SHALL NOT BE USED FOR SERVICE OF 220 DEG F.
- 2 PIPE AND FITTINGS SHALL BE WRAPPED WITH 4 MIL THICK CROSS-LAMINATED HIGH DENSITY POLYETHYLENE.
- 3 CEMENT MORTAR LINING TO BE SUPPLIED WITHOUT SEAL COAT AND RATED TO NOT LESS THAN 212F.
- 4 BOLTS AND NUTS SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS TO PREVENT DAMAGE TO FITTING.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	3-24	-	CL350	Flgd Pipe , AWWA C115 , AWWA C151 , FFFE x PE , Ductile iron
	3-24	-	CL350	Flgd Pipe , AWWA C115 , AWWA C151 , FF , Ductile iron
				Bell and Spigot Pipe , AWWA C151 , Mechanical Joint Bell End , A536 Gr.60-42-10
	3-24	-	CL350	
	3-24	-	CL350	Bell and Spigot Pipe , AWWA C151 , PE , A536 Gr.60-42-10
	3-24	-	CL350	Bell and Spigot Pipe , AWWA C151 , MJBE x PE , A536 Gr.60-42-10
	30-48	-	CL250	Bell and Spigot Pipe , AWWA C151 , MJBE x PE , A536 Gr.60-42-10
	30-48	-	CL250	Bell and Spigot Pipe , AWWA C151 , PE , A536 Gr.60-42-10
	30-48	-	CL250	Flgd Pipe , AWWA C115 , AWWA C151 , FF , Ductile iron
				Bell and Spigot Pipe , AWWA C151 , Mechanical Joint Bell End , A536 Gr.60-42-10
	30-48	-	CL250	
	30-48	-	CL250	Flgd Pipe , AWWA C115 , AWWA C151 , FFFE x PE , Ductile iron
Large Bore Fittings				
				22.5 Deg. Elbow , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05
	3-24	-		22.5 Deg. Elbow , AWWA C110 , CL350 , PE x MJBE , A536 Gr.70-50-05
	3-24	-		45 Deg. Elbow , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		45 Deg. Elbow , AWWA C110 , CL350 , MJBE x PE , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		90 Deg. Elbow , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		90 Deg. Elbow , AWWA C110 , CL350 , MJBE x PE , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		Cap , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	3-12	-		Equal Tee , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		Equal Tee , AWWA C110 , CL350 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
	3-24	-		set
	4-12	-		45 Deg. Y , C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	4-12	-		Lateral Wye , US pipe , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	4-24	3-20		Reducer Concentric , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	4-24	3-20		Reducer Concentric , AWWA C110 , CL350 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
	4-24	3-20		Reducer Eccentric , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	4-24	3-20		Reducer Eccentric , AWWA C110 , CL350 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
	4-12	-		Wye , US pipe , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	6-24	4-20		Red. Tee , AWWA C110 , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	6-24	4-20		Red. Tee , AWWA C110 , CL350 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set

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	6-12	4-10	Reducing 45 Deg. Y , C110 , CL350 , FF , A536 Gr.70-50-05 , gland and bolt set
	6-14	4-10	Reducing 45 Deg. Y , US pipe , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	6-16	4-12	Reducing 45 Deg. Y , US pipe , CL350 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	14-48	-	Cap , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	22.5 Deg. Elbow , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05
	30-48	-	22.5 Deg. Elbow , AWWA C110 , CL250 , PE x MJBE , A536 Gr.70-50-05
	30-48	-	45 Deg. Elbow , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	45 Deg. Elbow , AWWA C110 , CL250 , MJBE x PE , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	90 Deg. Elbow , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	90 Deg. Elbow , AWWA C110 , CL250 , MJBE x PE , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	Equal Tee , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	Equal Tee , AWWA C110 , CL250 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	Red. Tee , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	6-42	Red. Tee , AWWA C110 , CL250 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
	30-48	6-42	Reducer Concentric , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	18-42	Reducer Concentric , AWWA C110 , CL250 , MJBE x PE , A536 Gr.70-50-05 , gland and bolt set
	30-48	18-42	Reducer Eccentric , AWWA C110 , CL250 , Mechanical Joint Bell End , A536 Gr.70-50-05 , gland and bolt set
	30-48	18-42	Reducer Eccentric , AWWA C110 , CL250 , PE x MJBE , A536 Gr.70-50-05 , gland and bolt set
Small Bore Fittings			
Bolts			
	3-48		Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 307 B / A 563 A, hvy hex , Zinc or Cad Plated
Gaskets			
	3-30		Dielectric FlangeKit , CL150 , 0.175" non compressed thickness
	3-48		Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness
	3-48		Non Metal Flat Gskt , AWWA C115 , FF , organic fiber, nitrile binder, ANSI-B16.21, Garlock 3000 , 0.175" non compressed thickness
Flanges			
	30-48	-	Flg. Adapter , AWWA C110 , CL150 , FF X MJBE , A536 Gr.70-50-05 , gland and bolt set
	3-24	-	Flg. Adapter , AWWA C110 , CL150 , FFFE x PE , A536 Gr.70-50-05 , gland and bolt set
	3-24	-	Flg. Adapter , AWWA C110 , CL150 , FF X MJBE , A536 Gr.70-50-05 , gland and bolt set
	30-48	-	Flg. Adapter , AWWA C110 , CL150 , FFFE x PE , A536 Gr.70-50-05 , gland and bolt set
Gate Valves			
	3-8	-	Gate Valve Underground , App. Mfg. , CL150 , MJ , Bltd Bonnet , A536 Gr.70-50-05 , Valve Box with a Tee Handle Extension
	3-16	-	Gate Vlv , Mueller B16.10 or eq. , CL125 , MJ , Bltd Bonnet , Wrench Operator , A 126 Gr. B , FM 200 Approved , 2" Nut, Post Indicator Valve
Globe Valves			
Check Valves			
Ball Valves			
Butterfly Valves			

DESCRIPTION:UNDERGROUND GRAVITY DRAINS

MATERIAL:Ductile Iron Cement Lined Pipe & Fittings, Tyton Push-on Unrestrained Joint

EXAMINATION:Per ASME B31.1 - 2010

TEMPERATURE LIMIT:32F to 212F

RATING CLASS:None

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2010

STRESS RELIEF:None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	6
212	6

GENERAL NOTES

- 1 DIELECTRIC FLANGE KITS SHALL BE USED TO ISOLATE UNDERGROUND POLYETHYLENE WRAPPED PIPING. DIELECTRIC FLANGE KIT SHALL NOT BE USED FOR SERVICE OF 220 DEG F.
- 2 PIPE AND FITTINGS SHALL BE WRAPPED WITH 4 MIL THICK CROSS-LAMINATED HIGH DENSITY POLYETHYLENE.
- 3 AWWA C153 INDICATES COMPACT FITTINGS.
- 4 PBLE = PUSH-ON BELL END.
- 5 THE ENGINEER SHALL SPECIFY THE FLANGE GASKET MATERIAL TO BE USED.
- 6 FASTITE PUSH ON JOINTS WITH FASTITE PLAIN SDR RUBBER GASKETS ARE AN ACCEPTABLE ALTERNATE TO TYTON JOINTS IN PIPE ONLY.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	4-24	-	CL350	Pipe , AWWA C151 , PE , A536 Gr.60-42-10
	4-24	-	CL350	Bell and Spigot Pipe , AWWA C151 , MPE x PBLE , A536 Gr.60-42-10
Large Bore Fittings				
	4-24	-		11.25 Deg. Elbow , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		22.5 Deg. Elbow , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		45 Deg. Elbow , AWWA C153 , CL350 , MPE x PBLE , A536 Gr.70-50-05
	4-24	-		45 Deg. Elbow , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		45 Deg. Y , US pipe , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		90 Deg. Elbow , AWWA C153 , CL350 , MPE x PBLE , A536 Gr.70-50-05
	4-24	-		90 Deg. Elbow , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		Cross , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		Equal Tee , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	-		Plug Round Head , AWWA C153 , PBLE , A536 Gr.70-50-05
	4-24	3-20		Red. Tee , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	3-20		Reducer Concentric , AWWA C153 , CL350 , MPE x PBLE , A536 Gr.70-50-05
	4-24	3-20		Reducer Concentric , AWWA C153 , CL350 , PBLE , A536 Gr.70-50-05
	4-24	3-20		Reducer Concentric , AWWA C153 , CL350 , PBLE x MPE , A536 Gr.70-50-05
	4-24	3-20	CL350	Reducing 45 Deg. Y , US pipe , CL350 , PBLE , A536 Gr.70-50-05
Small Bore Fittings				
	0.5-2	-		Plug Square Head , B16.11 , MTE , A 105
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	4-16			Non Metal Flat Gskt , B16.21 , CL125 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges				
	4-16	-		Flg. Adapter , AWWA C110 , CL350 , FF X MJB E , A536 Gr.70-50-05 , gland and bolt set
Gate Valves				
	4-16	-		Gate Vlv , Kennedy AWWA C515 or eq. , CL125 , FF , Bltd Bonnet , Handwheel Operator , A536 Gr.60-42-10
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION:PP PRESSURE PIPE

MATERIAL:AQUATHERM GREEN PIPE S, SDR11

EXAMINATION:Per ASME B31.3 - 2014

TEMPERATURE LIMIT:32F to 140F

RATING CLASS:150, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.3 - 2014

STRESS RELIEF:None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	195
50	195
80	170
100	135
120	110
140	95

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE RATING FOR REDUCING WYE SHALL BE PER MANUFACTURER. PRESSURE RATING FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 3 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 PRESSURE RATING ONLY GOOD FOR PIPE 14" DIAMETER AND SMALLER.
- 6 IN SUN EXPOSED AREA USE UV PROTECTED PIPE (GREEN WITH BLACK EXTERIOR). FITTINGS AND PIPE LARGER THAN 10" MUST BE COATED WITH UV RESISTANT COATING OR INSULATED.
- 7 MINIMUM PIPE WALL THICKNESS SHALL BE SDR 7.4.
- 8 PIPE SADDLES SHALL NOT BE USED AS PIPE PRESSURE RATING IS DERATED TO SDR11.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-10	-	SDR 7.4	Pipe , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , IPS , MF UV, PP-R, Seamless
	1-18	-	SDR 11	Pipe , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , IPS , S, PP-R, Seamless
Large Bore Fittings				
	0.5-4	-	SDR 11	45 Deg Elbow , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-4	-	SDR 11	90 Deg Elbow , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-4	-	SDR 7.4	CAP , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-4	-	SDR 11	Coupling , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-6	-		Diaphragm Vlv , Saunders or eq. , CL150 , FF , Handwheel Operator , A 126 Gr. B Flange Adapter , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-4	-	SDR 11	Tee , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	0.5-4	-	SDR 11	Union , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R, with PP-R Nut
	0.5-2.5	-		
	0.75-4	0.5-3	SDR 11	Reducing Tee , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	1-2.5	-		Union , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R, Brass Nut
	1.25-24	0.5-4	SDR 7.4	Fusion Outlet , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	1.25-4	1-3	SDR 11	Reducing Coupling , Aquatherm Green Pipe or eq. , ASTM F2389 , Socket Fusion , PP-R
	4-10	-	SDR 11	Wye , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
	6-18	-	SDR 11	45 Deg Elbow , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R, 3 Piece Mitered
	6-18	-	SDR 11	90 Deg Elbow , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R, 3 Piece Mitered
	6-18	-	SDR 11	CAP , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R

	6-18	-	SDR 11	Flange Adapter , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
	6-8	3.5-4	SDR 11	Reducing Coupling , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion X
	6-8	4-4	SDR 11	Socket Fusion , PP-R
	6-8	4-4	SDR 11	Reducing Coupling , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion X
	6-18	4-16	SDR 11	Socket Fusion , PP-R
	6-18	-	SDR 11	Reducing Tee , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
	8-18	6-16	SDR 11	Tee , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
	8-20	-	SDR 11	Concentric Reducer , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
	12-24	6-12	SDR 11	R , A 126 Gr. B
	12-24	6-12	SDR 11	Diaphragm Vlv , Saunders or eq. , CL150 , FF , Gear Operator , A 126 Gr. B
	12-24	6-12	SDR 11	Fusion Outlet , Aquatherm Green Pipe or eq. , ASTM F2389 , Butt Fusion , PP-R
Small Bore Fittings				
Bolts				
	0.5-18			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-18			Non Metal Flat Gskt , B16.21 , CL150 , FF , PTFE , 0.175" non compressed thickness
Flanges				
	1-4	-	SDR 11	Backing Ring , Aquatherm Green Pipe , CL150 , FF , Carbon Steel with green epoxy powder coating -
	6-18	-	SDR 11	Backing Ring , Aquatherm Green Pipe , CL150 , FF , Carbon Steel with green epoxy powder coating -
Gate Valves				
Globe Valves				
Check Valves				
	1.5-12	-		Swing Chk Vlv , Williams Valve or eq. , CL150 , FF , Bltd Bonnet , Cast Aluminum , Bronze B62 Seat
	14-14	-		Check Valve Swing LP , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , A 106 Gr. B
Ball Valves				
	0.75-10	-		Ball Vlv SP FB , American Valve B16.10 or eq. , CL150 , FF , Lever Operator , A 126 Teflon Fused
	2-2	-		Ball Vlv FB , PBM or eq. , CL150 , FF , Lever Operator , B61, C92200
Butterfly Valves				
	3-6	-		Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Lever Operator , A536 Gr.65-45-12
	8-18	-		Butterfly Valve Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Gear Operator , A536 Gr.65-45-12

DESCRIPTION:300# REFRIGERATION AND PROCESS, LOW TEMPERATURE

MATERIAL:A312 Gr TP304, Stainless Steel

EXAMINATION:Per ASME B31.3 - 2014

TEMPERATURE LIMIT:-325F to 400F

RATING CLASS:300, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.3 - 2014

STRESS RELIEF:Per ASME B31.3 - 2014, All Welds

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-325	720
100	720
200	600
300	540
400	495

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ONLY ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS SHALL CONFORM TO ASME B18.21.
- 6 REFER TO PURCHASE SPECIFICATION. VALVE MATERIALS SHALL BE COMPATIBLE WITH THE SERVICE.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.25-2	-	S-80S	Pipe , B36.19M , PE , A 312 Gr. TP304 , Welded (E = 0.85)
	2.5-8	-	S-40S	Pipe , B36.19M , BEV x GRV , A 312 Gr. TP304 , Welded (E = 0.85)
	2.5-8	-	S-40S	Pipe , B36.19M , BE , A 312 Gr. TP304 , Welded (E = 0.85)
	10-12	-	S-40	Pipe , B36.10M , BEV x GRV , A 312 Gr. TP304 , Welded (E = 0.85)
	10-20	-	S-40	Pipe , B36.10M , BE , A 312 Gr. TP304 , Welded (E = 0.85)
	22-22	-	S-60	Pipe , B36.10M , BE , A 312 Gr. TP304 , Welded (E = 0.85)
	24-24	-	S-40	Pipe , B36.10M , BE , A 312 Gr. TP304 , Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 9" Long, Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , TBE , A 312 Gr. TP304 , 6" Long, SMLS
	0.5-2	-	MATCH	Nipple , B36.19M , TBE , A 312 Gr. TP304 , 3" Long, SMLS
	0.5-2	-	MATCH	Nipple , B36.19M , TBE , A 312 Gr. TP304 , 9" Long, SMLS
	0.5-2	-	MATCH	Nipple , B36.19M , PBE , A 312 Gr. TP304 , 3" Long, Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , PBE , A 312 Gr. TP304 , 6" Long, Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , PBE , A 312 Gr. TP304 , 9" Long, Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, Welded (E = 0.85)
	0.5-2	-	MATCH	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 6" Long, Welded (E = 0.85)
	2.5-3	-	MATCH	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 312 Gr. TP304 , No. 442 SS, 4" long
	4-8	-	MATCH	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 312 Gr. TP304 , No. 442 SS, 6" long
	10-12	-	MATCH	Adapter Nipple , Victaulic Grooved , GRV x BEV , A 312 Gr. TP304 , No. 442 SS, 8" long
Large Bore Fittings				
	0.75-24	0.5-0.5		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304
	2.5-12	0.75-2		45 Deg Latrolet , Bonney Forge , CL3000 , SWE , A 182 Gr. F304
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 403 Gr. WP304
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 403 Gr. WP304
	2.5-24	-	MATCH	Cap , B16.9 , BE , A 403 Gr. WP304
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304 , Class S
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , BLE/TSE , A 403 Gr. WP304 , Class S
	2.5-6	0.75-2	MATCH	Con. Swage , MSS SP-95 , TBE , A 403 Gr. WP304 , Class S
	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304 , Class S

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	2.5-6	0.75-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/TSE , A 403 Gr. WP304 , Class S
	2.5-24	-	MATCH	Eq. Tee , B16.9 , BE , A 403 Gr. WP304
	2.5-12	-	MATCH	Rigid Coupling , Victaulic Grooved , FGE , A 403 Gr. WP304 , Style 489, Type E
	2.5-24	0.75-2		Gasket
	2.5-24	0.75-2		Sockolet , MSS SP-97 , CL3000 , SWE , A 182 Gr. F304
	3-24	2.5-22	MATCH	Threadolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304
	3-6	2.5-4	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304
	3-24	2.5-22	MATCH	Con. Swage , MSS SP-95 , BBE , A 403 Gr. WP304 , Class S
	3-6	2.5-4	MATCH	Ecc. Reducer , B16.9 , BE , A 403 Gr. WP304
	3-18	2.5-14	MATCH	Ecc. Swage , MSS SP-95 , BBE , A 403 Gr. WP304 , Class S
	3-24	2.5-20	MATCH	Pipet , WFI , BE , A 182 Gr. F304
	4-4	1.5-1.5	MATCH	Red. Tee , B16.9 , BE , A 403 Gr. WP304
	4-4	1.5-1.5	MATCH	Con. Reducer , B16.9 , BE , A 403 Gr. WP304
				Con. Swage , MSS SP-95 , BBE , A 403 Gr. WP304 , Class S
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.5-2	-		Dielectric Union , Manuf. Std , CL3000 , MTE x SWE , A 182 Gr. F304 x A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.5-2	-		Union , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.75-2	-		Cap , B16.11 , CL3000 , SWE , A 182 Gr. F304
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , PBE , A 403 Gr. WP304 , Class S
	0.75-2	0.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , PBE , A 403 Gr. WP304 , Class S
	1-2	0.75-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304
Bolts				
	0.5-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Dielectric FlangeKit , CL300 , 0.175" non compressed thickness
	0.75-24			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
	0.75-24			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, 304 SS CR , 0.175" non compressed thickness
Flanges				
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A 182 Gr. F304
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A 182 Gr. F304
	0.75-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A 182 Gr. F304
	0.75-24	-		Blind Flg. , B16.5 , CL300 , FF , A 182 Gr. F304
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A 182 Gr. F304
Gate Valves				
	0.75-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304
	2.5-6	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	8-24	-	MATCH	Gate Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304 , 316 SS Trim
	0.75-2	-		Globe Valve , Manf. Std. , CL800 , FTE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304
	0.75-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304
	2.5-6	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	2.5-6	-		Globe Valve LP , B16.10 App. Mfg. , CL300 , RF , Bltd Bonnet , Handwheel Operator , A 182 Gr. F304
	8-12	-	MATCH	Globe Valve LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , Gear Operator , A 351 Gr. CF8
Check Valves				
	0.75-2	-		Check Valve Pistn Lft , App. Mfg. , CL800 , SWE , Bltd Bonnet , A 182 Gr. F304
	2.5-24	-	MATCH	Check Valve Swing LP , B16.10 App. Mfg. , CL300 , BE , Bltd Bonnet , A 351 Gr. CF8
Ball Valves				
	0.75-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	0.75-2	-		Ball Valve LP FB , App. Mfg. , CL600 , FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	0.75-2	-		Ball Valve , App. Mfg. , CL300 , RF , Split body Fltg. Ball , Lever Operator , A 182 Gr. F304
	2.5-6	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Split body Fltg. Ball , Lever Operator , A 351 Gr. CF8
	8-12	-		Ball Valve LP FB , B16.10 App. Mfg. , CL300 , RF , Three piece Trun. Mount. Ball , Gear Operator , A 351 Gr. CF8
Butterfly Valves				
	2.5-6	-		Butterfly Valve Lug Type , Bray API 609 Cat. B , CL300 , FF w/Integral Gaskets , Lever Operator , A 351 Gr. CF8
	2.5-6	-		Butterfly Valve Wafer Type , Bray API 609 Cat. B , CL300 , FFTBE w/Integral Gaskets , Lever Operator , A 351 Gr. CF8

PIPE SPEC:

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8-24

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Butterfly Valve , Bray , CL300 , FF w/Integral Gaskets , Gear Operator , A 351 Gr.
CF8

DESCRIPTION:REFRIGERATION AND PROCESS TUBING

MATERIAL:ASTM A213, TP316 TUBING

EXAMINATION:Per ASME B31.3 - 2014

TEMPERATURE LIMIT:-325F to 400F

RATING CLASS:300, ASME B16.5 - 2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per ASME B31.1 - 2014

STRESS RELIEF:Per ASME B31.3 - 2014, All Welds

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-325	3700
100	3700
200	3700
300	3700
400	3552

GENERAL NOTES

- 1 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE SPEC FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE SPEC MUST BE ENGINEER APPROVED.
- 2 DO NOT MIX FITTING MANUFACTURERS.
- 3 TUBE MATERIAL HARDNESS SHALL NOT EXCEED HRB80.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				Tube , Annealed Stainless Tubing , CTBE , ASTM A269, TP316/TP316L, Dual Cert
	0.375-1	-	0.049" tubing	
Large Bore Fittings				
Small Bore Fittings				
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		45 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , MALE POSITIONABLE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		90 Deg. Elbow , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Bulkhead Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cap , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Cross , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE BRANCH, NPT (TTF) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , FEMALE RUN, NPT (TFT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , MALE BRANCH, NPT (TTM) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, ISO/BSP PARALLEL THREAD (TTR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression
	0.375-1	-		Equal Tee , Swagelok or Eq , MALE POSITIONABLE BRANCH, SAE/MS STRAIGHT THREAD (TTS) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression

PIPE SPEC:

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	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, ISO/BSP PARALLEL THREAD (TRT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE POSITIONABLE RUN, SAE/MS STRAIGHT THREAD (TST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , MALE RUN, NPT (TMT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Equal Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , FEMALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Parallel Thread (RJ) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Female Connector , Swagelok or Eq , ISO/BSP Tapered Thread (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , BULKEAD NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE ISO/BSP TAPERED THREAD (RT) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE NPT , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE POSITIONABLE ISO/BSP PARALLEL THREAD (PR) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , MALE SAE/MS STRAIGHT THREAD (ST) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Male Connector , Swagelok or Eq , O-Seal (SAE/MS Straight Thread) , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Plug Round Head , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Weld Connector , Swagelok or Eq , MALE PIPE WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.375-1	-	Weld Connector , Swagelok or Eq , TUBE SOCKET WELD , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Bulkhead Redng Union , Swagelok or Eq , CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Red. Tee , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Reducer Concentric , Swagelok or Eq , SWGLK X CTBE , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.5-1	0.375-0.75	Reducing Union , Swagelok or Eq , SWGLK , A 182 Gr. F316/316L Dual Cert. , 2 Ferrule, Grip Type Compression	
	0.75-0.75	-	Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W	
	0.75-1	0.5-0.5	Male Connector , Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W	
	1-1	-	Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W	
Bolts				
Gaskets				
Flanges				
Gate Valves				
	0.75-1	-	Gate Valve , App. Mfg. , CL1500 , SWE , Welded Bonnet , Handwheel Operator , A 182 Gr. F316/316L Dual Cert.	
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: FBAA1

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DESCRIPTION:	ABOVE GRADE FIRE PROTECTION
MATERIAL:	Carbon Steel
EXAMINATION:	Per NFPA 24 - 2013
TEMPERATURE LIMIT:	-20F to 300F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0630 in
DESIGN CODE:	Per NFPA 24 - 2013
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 FIRE PROTECTION SHALL BE SCHEDULE 40.
- 3 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 4 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 5 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 6 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 7 FIRE PROTECTION PIPING AND FITTINGS SHALL MEET STANDARDS IDENTIFIED IN NFPA 24 TABLES 10.1.1 AND 10.2.1(a), RESPECTIVELY.
- 8 FIRE PROTECTION VALVES SHALL BE UL LISTED AND/OR FM APPROVED OS&Y GATE VALVES.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 106 Gr. B , SMLS
	2.5-48	-	Calc	Pipe , B36.10M , BE , A 106 Gr. B , SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PBE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
Large Bore Fittings				
	0.75-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	6-48	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105

	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , Red Rubber or EPDM , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , Red Rubber or EPDM , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC:

FBAB1

Date: 8/4/2016 6:41:59 PM



DESCRIPTION:	ABOVE GRADE FIRE PROTECTION
MATERIAL:	Carbon Steel
EXAMINATION:	Per NFPA 24 - 2013
TEMPERATURE LIMIT:	-20F to 300F
RATING CLASS:	150, ASME B16.5 - 2013
CORROSION ALLOWANCE:	0.0000 in
DESIGN CODE:	Per NFPA 24 - 2013
STRESS RELIEF:	None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
-20	285
100	285
200	260
300	230

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 THREADED COMPONENTS, UNLESS NOTED OTHERWISE ON THE ISOMETRIC, ARE ONLY PERMITTED DOWNSTREAM OF VENT AND DRAIN ISOLATION VALVES. PLUGS OR CAPS MUST BE DRILLED WITH A 1/8" WEEP HOLE
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 7 FIRE PROTECTION PIPING AND FITTINGS SHALL MEET STANDARDS IDENTIFIED IN NFPA 24 TABLES 10.1.1 AND 10.2.1(a), RESPECTIVELY.
- 8 FIRE PROTECTION VALVES SHALL BE UL-LISTED AND/OR FM-APPROVED OS&Y GATE VALVES.
- 9 FIRE PROTECTION SHALL BE SCHEDULE 40.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-48	-	Calc	Pipe , B36.10M , BE , A 53 Gr. B , ERW
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , PE/TE , A 106 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.10M , TBE , A 106 Gr. B , 6" Long, SMLS
Large Bore Fittings				
	0.75-12	0.5-2		45 Deg Latrolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A105
	1-24	0.5-2		Thredolet , MSS SP-97 , CL6000 , FTE , A105
	2.5-48	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-48	2-42	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL3000 , SWE , A105
	2.5-24	0.5-2		Sockolet , MSS SP-97 , CL6000 , SWE , A105
	6-48	2.5-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		45 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A105
	0.5-2	-		90 Deg. Elbow , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , FTE , A105
	0.5-2	-		Cap , B16.11 , CL6000 , SWE , A105

PIPE SPEC:

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	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Cplg. , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A105
	0.5-2	-		Equal Tee , B16.11 , CL6000 , SWE , A105
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A105
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A105
	0.5-2	-		Union , MSS SP-83 , CL6000 , SWE , A105
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A105 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A105
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL6000 , SWE , A105
Bolts				
	0.5-48			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H
Gaskets				
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.125" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , FF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
Flanges				
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , FF , A105
	0.5-24	-		Blind Flg. , B16.5 , CL300 , RF , A105
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL300 , RF , A105
	26-48	-		Blind Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL150 , RF , A105/A105N
	26-48	-	MATCH	WN Flg. , B16.47 Sr. A , CL300 , RF , A105/A105N
	0.5-24	-		Blind Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , FF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A105
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL300 , RF , A105
Gate Valves				
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 105
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION: FIRE PROTECTION PIPING

MATERIAL: Ductile Iron, Cement Lined Pipe, Mechanical Joint

EXAMINATION: Per NFPA 24 - 2013

TEMPERATURE LIMIT: 0F to 120F

RATING CLASS: 125, ASME B16.5 - 2013

CORROSION ALLOWANCE: 0.0000 in

DESIGN CODE: Per NFPA 24 - 2013

STRESS RELIEF: None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
0	250
120	250

GENERAL NOTES

- 1 ALL PIPING USED IN PRESSURIZED SYSTEMS SHALL UTILIZE RESTRAINED JOINT SYSTEMS. INSTALLATION METHODS FOR RESTRAINED JOINT SYSTEMS SHALL STRICTLY FOLLOW MANUFACTURER'S INSTRUCTIONS. END PREP AS "RJBLE" = "Restrained Joint On Bell End"
- 2 GASKET MATERIAL INDICATED INCLUDES FLANGED AND BELL AND SPIGOT JOINTS. DIMENSIONS AND RATING ARE PER THE TYPE OF GASKET SELECTED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 PIPE FITTINGS AND VALVES MUST BE UL AND/OR FM APPROVED.
- 5 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 6 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 7 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 8 THE INTERIOR SURFACES OF DUCTILE IRON PIPE SHALL BE CEMENT LINED ACCORDING TO AWWA C104/21.4. UNLESS OTHERWISE REQUIRED, EXTERIOR SURFACES OF DUCTILE IRON PIPE SHALL BE COATED BEFORE SHIPMENT WITH A BITUMINOUS MATERIAL IN ACCORDANCE WITH AWWA C153/A21.53.
- 9 UNDERGROUND VALVES SHALL BE PROVIDED WITH A VALVE BOX AS A MINIMUM.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	4-24	-	CL350	Flgd Pipe , CL125 , ASME B16.1 , TR Flex, AWWA C115/A21.15 , FFFE x PE , Ductile iron , FM APPROVED
	4-24	-	CL350	Flgd Pipe , CL125 , ASME B16.1 , TR Flex, AWWA C115/A21.15 , FFFE x RJBLE , Ductile iron , FM APPROVED
	4-24	-	CL350	Pipe , TR Flex, AWWA C151/A21.51 , PE , Ductile iron , FM APPROVED
	4-24	-	CL350	Bell and Spigot Pipe , TR Flex, AWWA C151/A21.51 , RJBLE x SPE , Ductile iron , FM APPROVED
Large Bore Fittings				
	4-24	-		22.5 Deg. Elbow , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	4-24	-		45 Deg. Elbow , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	4-24	-		90 Deg. Elbow , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	4-24	-		Cap , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	4-24	-		Equal Tee , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	4-24	-		Plug Round Head , TR Flex, AWWA C153/A21.53 , RJSPE , FM Approved
	4-24	-		Wye , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	6-24	4-20		Red. Tee , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	6-24	4-20	CL350	Reducing WYE , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	10-24	4-20		Reducer Concentric , TR Flex, AWWA C153/A21.53 , CL350 , RJBLE , FM Approved
	10-24	8-20		Reducer Eccentric , TR Flex, AWWA C153/A21.53 , RJBLE , FM Approved
Small Bore Fittings				
Bolts				
	4-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	4-24			Non Metal Flat Gskt , B16.21 , CL125 , FF , Full Face Flange-Tyte , Neoprene , 0.125" non compressed thickness

Flanges				
	4-24	-		Thd. Flg. , AWWA C115 , CL125 , FF , Ductile Iron , Srrted Finish
	4-24	-		Flange Connecting Pc , TR Flex, AWWA C153/A21.53 , CL125 , FFFE x RJBLE , FM Approved
Gate Valves				
	6-10	-		Gate Vlv , B16.10 App. Mfg. , CL125 , FF , Bltd Bonnet , Wrench Operator , A 216 Gr. WCB , UL LISTED, FM APPROVED , Underground
	6-10	-		Gate Valve Underground , B16.10 App. Mfg. , CL150 , FF , Bltd Bonnet , Post Indicator , A 126 Gr. B , UL LISTED, FM APPROVED
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION: FIRE WATER FM CLASS 250

MATERIAL: HDPE, PE 4710 RESIN

EXAMINATION: Per NFPA 24-2013 ASTM F2164-2013

TEMPERATURE LIMIT: 32F to 120F

RATING CLASS: 250, AWWA C906-15 ASTM D3035-2014, Cell Class 445574C

CORROSION ALLOWANCE: 0.0000 in

DESIGN CODE: Per NFPA 24 - 2013

STRESS RELIEF: None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	250
80	250
90	225
100	195
105	186
110	177
120	157

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 FINAL LEAK TESTING SHALL BE HYDROSTATIC IN ACCORDANCE WITH ASTM F2164 AND NFPA 24.
- 3 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 4 ALL PIPE SHALL BE CONTINUOUSLY MARKED WITH DURABLE PRINTING, INCLUDING THE FOLLOWING INFORMATION: DIMENSION RATIO, MANUFACTURER'S NAME, CELL CLASS, ASTM BASIS, LOT NUMBER, AND FM DIAMOND LOGO MARKING.
- 5 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 6 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 7 TEMP LIMIT 40-120 PER NFPA FOR FIRE WATER SERVICE.
- 8 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 9 PIPE FITTINGS AND VALVES MUST BE UL AND/OR FM APPROVED.
- 10 HDPE PIPING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND ASTM D2774.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	2-24	-	SDR 9	Pipe , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	2-6	-	SDR 9	45 Deg Elbow , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-6	-	SDR 9	90 Deg Elbow , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-8	-	SDR 9	CAP , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	-	SDR 9	Flange Adapter , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS -
	2-24	-	SDR 9	MJ Adapter , ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion x MJPE , IPS , gland and bolt set
	2-6	-	SDR 9	Tee , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	3-24	2-22	SDR 9	Concentric Reducer , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-22	SDR 7	Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-12	SDR 7	Reducing Tee , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Branch Saddle
	8-24	-	SDR 7	45 Deg Elbow , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabbed
	8-24	-	SDR 7	90 Deg Elbow , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , 5 Piece Fabbed

	8-24	-	SDR 7	Tee , FM Approved ISCO or eq. , ASTM D3350, PE4710 , Butt Fusion , IPS , Fabbbed
Small Bore Fittings				
Bolts				
	2-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	2-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Synthetic Fiber, Rubber Binder, Garlock 3760 , 0.125" non compressed thickness
Flanges				
	2-24	-	CL200	Backing Ring , FM Approved, ISCO or eq. , CL125 , FF Lap Flgd , Ductile Iron -
	2-24	-		Blind Flg. , B16.5 , CL150 , FF , Ductile Iron
Gate Valves				
	3-16	-		Gate Vlv , Mueller B16.10 or eq. , CL125 , MJ , Bltd Bonnet , Wrench Operator , A 126 Gr. B , FM 200 Approved , 2" Nut
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

DESCRIPTION: FIRE PROTECTION PIPING

MATERIAL: PVC

EXAMINATION: Per NFPA 24-2013 ASTM F2164-2013 & Factory Mutual (For Mech Joints w/Flgs)

TEMPERATURE LIMIT: 40F to 120F

RATING CLASS: 200, FM/ ASTM D3035-2014, Cell Class 445574C

CORROSION ALLOWANCE: 0.0000 in

DESIGN CODE: Per NFPA 24 - 2013

STRESS RELIEF: None Required

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
40	305
73	305
80	269
90	229
100	190
110	153
120	122

GENERAL NOTES

- 1 REFER TO THE DESIGN DOCUMENT (PID, ISOMETRIC AND LINE LIST) FOR ACTUAL COMPONENT SELECTION, PLACEMENT, AND INSTALLATION DETAILS
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 ALL PIPE SHALL BE CONTINUOUSLY MARKED WITH DURABLE PRINTING, INCLUDING THE FOLLOWING INFORMATION: DIMENSION RATIO, MANUFACTURER'S NAME, CELL CLASS, ASTM BASIS, LOT NUMBER, AND FM DIAMOND LOGO MARKING.
- 4 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED
- 5 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 6 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08
- 7 FINAL LEAK TESTING SHALL BE HYDROSTATIC IN ACCORDANCE WITH ASTM F2164 AND NFPA 24.
- 8 TEMP LIMIT 40-120 PER NFPA FOR FIRE WATER SERVICE.
- 9 PIPE FITTINGS AND VALVES MUST BE UL AND/OR FM APPROVED.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	2-24	-	CL200	Pipe , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS
Large Bore Fittings				
	2-6	-	CL200	45 Deg Elbow , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-6	-	CL200	90 Deg Elbow , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	2-8	-	CL200	CAP , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS
	2-24	-	CL200	Flange Adapter , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS -
	2-6	-	CL200	Tee , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , Molded
	3-24	2-22	CL200	Concentric Reducer , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-22	CL200	Eccentric Reducer , Industrial Pipe Fittings , ASTM D3350, PE4710 , Butt Fusion , IPS
	3-24	2-12	CL200	Reducing Tee , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , Branch Saddle
	8-24	-	CL200	45 Deg Elbow , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabled
	8-24	-	CL200	90 Deg Elbow , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , 3 Piece Fabled
	8-24	-	CL200	Tee , FM Approved ISCO or eq. , CL200 , ASTM D3350, PE4710 , Butt Fusion , IPS , Fabled
Small Bore Fittings				

PIPE SPEC:

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Bolts				
	2-24			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	2-24			Non Metal Flat Gskt , B16.21 , CL125 , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	2-24			Non Metal Flat Gskt , B16.21 , CL125 , FF , NM Comp. Gskt. , 0.175" non compressed thickness
	2-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , Neoprene Rubber , 0.125" non compressed thickness
Flanges				
	2-24	-	CL200	Backing Ring , FM Approved, ISCO or eq. , CL125 , FF Lap Flgd , Ductile Iron -
	2-24	-		Blind Flg. , B16.5 , CL150 , FF , Ductile Iron
Gate Valves				
Globe Valves				
Check Valves				
Ball Valves				
Butterfly Valves				

PIPE SPEC: WMAJ1

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DESCRIPTION:	CIRCULATING WATER
MATERIAL:	Carbon Steel
EXAMINATION:	Per AWWA C200 - 2012
TEMPERATURE LIMIT:	32F to 150F
RATING CLASS:	CL.D, PER AWWA C207-2013
CORROSION ALLOWANCE:	0.0625 in
DESIGN CODE:	Per AWWA C200 - 2012
STRESS RELIEF:	NOT APPLICABLE

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	150
150	150

GENERAL NOTES

- 1 PIPE SEAM WELDING SHALL MEET THE REQUIREMENTS OF AWWA C200
- 2 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 3 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, NON-METALLIC GASKETS SHALL NOT BE FIBER-REINFORCED.
- 4 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 5 CAP SCREWS ARE ACCEPTABLE FOR USE ON LUGGED AND TAPPED BUTTERFLY VALVES. SCREWS MUST CONFORM TO ASME B18.2.1.
- 6 PRESSURE RATINGS FOR BUTTERFLY AND BALL VALVES ARE DEPENDENT ON MANUFACTURER'S SEAT RATINGS AT VARIOUS TEMPERATURES.
- 7 INTERIOR OF PIPE IS LINED. LINING MATERIAL SHALL BE PER SPECIFICATION 70.12.4 REQUIREMENTS.
- 8 GASKETS SHALL MEET OR EXCEED THE REQUIREMENTS OF AWWA C200 AND C207
- 9 THE LISTED MATERIALS ARE THE MINIMUM REQUIREMENTS AND MAY BE SUBSTITUTED WITH ENGINEER REVIEW AND APPROVAL. WHERE NOT LISTED, MATERIALS LISTED AS "AWWA C200 CS" SHALL BE SUBMITTED FOR ENGINEER REVIEW AND APPROVAL

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	0.5-2	-	Calc	Pipe , B36.19M , PE , A 312 Gr. TP304L , SMLS
	0.5-2	-	Calc	Pipe , B36.10M , PE , A 53 Gr. B , SMLS
	2.5-24	-	Calc	Pipe , B36.10M , BE , A 53 Gr. B , ERW
	30-84	-		Pipe , AWWA C200 , BE , AWWA C200 CS
	0.25-2	-	Calc	Nipple , B36.10M , PBE , A 53 Gr. B , 6" Long, SMLS
	0.25-2	-	Calc	Nipple , B36.10M , PBE , A 53 Gr. B , 6" Long, SMLS
	0.25-2	-	Calc	Nipple , B36.10M , PBE , A 53 Gr. B , 3" Long, SMLS
	0.25-2	-	Calc	Nipple , B36.10M , PE/TE , A 53 Gr. B , 3" Long, SMLS
	0.25-2	-	Calc	Nipple , B36.10M , TBE , A 53 Gr. B , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 9" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 6" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PBE , A 312 Gr. TP304L , 3" Long, SMLS
	0.5-2	-	Calc	Nipple , B36.19M , PE/TE , A 312 Gr. TP304 , 3" Long, SMLS
	6-6	-	Calc	Nipple , B36.19M , PE x MTE , A 106 Gr. B , 3" Long, SMLS
Large Bore Fittings				
	2.5-24	-	MATCH	45 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. LR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	-	MATCH	90 Deg. SR Elbow , B16.9 , BE , A 234 Gr. WPB , SMLS
	2.5-24	0.5-2		Thredolet , MSS SP-97 , CL3000 , FTE , A 182 Gr. F304L
	3-3	1.5-1.5	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	3-3	1.5-1.5	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	4-4	2-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 234 Gr. WPB
	4-4	2-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	4-4	2-2	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	4-4	2-2	MATCH	Ecc. Swage , MSS SP-95 , BLE/PSE , A 403 Gr. WP304L , SMLS
	4-24	-	MATCH	Eq. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS
	4-84	3-18	MATCH	Weldolet , MSS SP-97 , BE , A105 , SMLS
	6-24	-	MATCH	Cap , B16.9 , BE , A 234 Gr. WPB , SMLS
	6-6	1-1	MATCH	Con. Swage , MSS SP-95 , TLE/PSE , A 403 Gr. WP304/304L Dual Cert. , SMLS
	6-24	3-22	MATCH	Red. Tee , B16.9 , BE , A 234 Gr. WPB , SMLS

	8-24	6-22	MATCH	Con. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	8-24	6-22	MATCH	Ecc. Reducer , B16.9 , BE , A 234 Gr. WPB , SMLS
	26-84	-	MATCH	45 Deg Eq Lat Tee , AWWA C208 , BE , AWWA C200 CS
	26-84	-	MATCH	90 Deg. Y , AWWA C208 , BE , AWWA C200 CS
	26-84	-	MATCH	Eq. Cross , AWWA C208 , BE , AWWA C200 CS
	30-84	-	MATCH	45 Dg Mitr 2 Ct 2.5D , AWWA C208 , BE , AWWA C200 CS
	30-84	-	MATCH	90 Dg 5pc Elbow 1.0D , AWWA C208 , BE , AWWA C200 CS
	30-84	-	MATCH	90 Dg 5pc Elbow 1.5D , AWWA C208 , BE , AWWA C200 CS
	30-84	-	MATCH	90 Dg 5pc Elbow 2.5D , AWWA C208 , BE , AWWA C200 CS
	30-84	-	MATCH	Eq. Tee , AWWA C208 , BE , AWWA C200 CS
	36-84	30-72	MATCH	Con. Reducer , AWWA C208 , BE , AWWA C200 CS
	36-84	30-72	MATCH	Ecc. Reducer , AWWA C208 , BE , AWWA C200 CS
Small Bore Fittings				
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		45 Deg. Elbow , B16.11 , CL3000 , SWE , A 53 Gr. B
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		90 Deg. Elbow , B16.11 , CL3000 , SWE , A 53 Gr. B
	0.5-2	-		Cplg. , B16.11 , CL3000 , SWE , A 182 Gr. F304/304L Dual Cert.
	0.5-2	-		Equal Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.5-2	-		Plug Hex Head , B16.11 , MTE , A 182 Gr. F304L
	0.5-2	-		Union , MSS SP-83 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	-		Cap , B16.11 , CL3000 , FTE , A 182 Gr. F304L
	0.75-2	0.5-1.5	MATCH	Con. Swage , MSS SP-95 , BLE/PSE , A 182 Gr. F304L
	0.75-0.75	-		Male Connector , 0.75 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-12W
	0.75-2	0.5-1.5		Red. Tee , B16.11 , CL3000 , SWE , A 182 Gr. F304L
	0.75-2	0.5-1.5		Reducing Insert , MSS SP-79 , CL3000 , PE x SWE , A 182 Gr. F304L
	1-1	-		Male Connector , 1 x 0.5in Swagelok or Eq , PE x CTBE , A 182 Gr. F316 , SS-810-1-16W
Bolts				
	0.5-84			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B7 / A 194 2H , Zinc or Cad Plated
Gaskets				
	0.5-24			Dielectric FlangeKit , CL150 , 0.175" non compressed thickness, Non Fiber Reinforced
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , FF , NM Comp. Gskt. , 0.175" non compressed thickness, Non Fiber Reinforced
	0.5-24			Non Metal Flat Gskt , B16.21 , CL150 , RF , NM Comp. Gskt. , 0.175" non compressed thickness, Non Fiber Reinforced
	0.5-48			Sp. Wound Gskt , B16.20 , CL150 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.5-48			Sp. Wound Gskt , B16.20 , CL300 , RF , 304 SS, Graphite Fill, CS CR , 0.175" non compressed thickness
	0.75-24			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.175" non compressed thickness, Non Fiber Reinforced
	0.75-24			Insulating Gskt Set , B16.21 , CL150 , RF , Per Specification 81.33.08 , 0.175" non compressed thickness, Non Fiber Reinforced
	26-84			Non Metal Flat Gskt , AWWA C207 , CL D , Ring , Neoprene Rubber , 0.175" non compressed thickness, Non Fiber Reinforced
Flanges				
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	0.5-2	-		Blind Flg. , B16.5 , CL150 , RF , A 182 Gr. F304L
	2.5-24	-		Blind Flg. , B16.5 , CL150 , FF , A 53 Gr. B
	0.5-2	-	MATCH	SW Flg. , B16.5 , CL150 , FF , A 182 Gr. F304L
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , RF , A105
	30-72	-		Blind Flg. , AWWA C207 , CL D , FF , AWWA C207 CS
	30-84	-		SO Flg. - Ring Type , AWWA C207 , CL D , FF , AWWA C207 CS
	2.5-24	-	MATCH	WN Flg. , B16.5 , CL150 , FF , A105
Gate Valves				
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	0.5-2	-		Gate Valve , App. Mfg. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
	2.5-6	-		Gate Valve LP , B16.10 App. Mfg. , CL150 , RF , Bltd Bonnet , Handwheel Operator , A 216 Gr. WCB
Globe Valves				
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE x FTE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF8
	0.5-2	-		Globe Valve , Manf. Std. , CL800 , SWE , Bltd Bonnet , Handwheel Operator , A 351 Gr. CF3
Check Valves				
Ball Valves				
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE x FTE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF8
	0.5-2	-		Ball Valve LP FB , App. Mfg. , CL600 , SWE , Three Piece Fltg. Ball , Lever Operator , A 351 Gr. CF3
Butterfly Valves				
	3-6	-		Bfly Vlv Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Lever Operator , A536 Gr.65-45-12

PIPE SPEC:

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8-24	-	Bfly Vlv Lug Type , Bray API 609 Cat. B , CL150 , FF w/Integral Gaskets , Gear Operator , A536 Gr.65-45-12
30-48	-	Bfly DbIFlg Short Pt , Milliken AWWA C504 , CL D , FF , Gear Operator , A 126 Gr. B
54-54	-	Butterfly Valve DbIFlg Short Pt , Bray Controls or eq. , 150PSIG , Lugged FF , Gear Operator , A 126 Gr. B
54-84	-	Bfly Vlv Lug Type , Bray API 609 Cat. B , CL150 , Lugged FF w/ Integral Gaskets , Gear Operator , A 126 Gr. B , EPDM Seat, 316 Disc
66-66	-	Butterfly Valve DbIFlg Short Pt , Bray Controls or eq. , 150PSIG , Lugged FF , Gear Operator , A 126 Gr. B
78-78	-	Butterfly Valve DbIFlg Short Pt , Bray Controls or eq. , 75PSIG , Lugged FF , Gear Operator , A 126 Gr. B
84-84	-	Butterfly Valve DbIFlg Short Pt , Bray Controls or eq. , 150PSIG , Lugged FF , Gear Operator , A 126 Gr. B

DESCRIPTION:UNDERGROUND CIRCULATING WATER

MATERIAL:Prestressed Concrete

EXAMINATION:Per AWWA C304 - 2007

TEMPERATURE LIMIT:32F to 200F

RATING CLASS:CL.D, PER AWWA C207-2013

CORROSION ALLOWANCE:0.0000 in

DESIGN CODE:Per AWWA C304 - 2007

STRESS RELIEF:Per AWWA C301-2014, C304 - 2007

PRESSURE - TEMPERATURE RATINGS	
SUBJECT TO CHANGE IF SPECIFIED IN NOTES	
TEMP. F	PRESS. PSIG
32	150
100	150
200	115

GENERAL NOTES

- 1 ALL JOINTS SHALL BE FIELD TESTABLE. JOINTS SHALL BE AIR TESTED PER MFR PROCEDURE.
- 2 GASKET SELECTION SHALL BE BASED ON THE ISOMETRIC AND MECHANICAL PIPING SPECIFICATION. METALLIC GASKETS ARE GENERALLY SPIRAL WOUND 304SS/GRAPHITE FILL WITH CENTERING RING AND INNER RING AS LISTED IN THIS PIPE CODE. NON-METALLIC GASKETS SHALL BE SELECTED FOR THE RATING AND SERVICE CONDITIONS, GARLOCK (E.G. SERIES 3000, GYLON, ETC) OR ENGINEER APPROVED EQUAL SHALL BE USED.
- 3 GASKET THICKNESS AFTER COMPRESSION IS APPROXIMATELY 1/8".
- 4 PIPE SHALL BE WRAPPED AND/OR CATHODICALLY PROTECTED ACCORDING TO SPEC 81.33.08.
- 5 PRESSURE-TEMPERATURE RATINGS ARE DEPENDENT ON SELECTION OF MATERIALS WHICH MEET OR EXCEED THE PRESSURE-TEMPERATURE RATING OF THIS PIPE CODE FOR THE SPECIFIC FLUID. ANY DEVIATIONS OR SELECTION OF MATERIALS, INCLUDING GASKETS, VALVES, OR TRIM, WHICH IMPACTS THE RATING OF THIS PIPE CODE MUST BE ENGINEER APPROVED.
- 6 REFER TO THE DESIGN DOCUMENT; PID, ISOMETRIC AND LINE LIST; FOR ACTUAL COMPONENT SELECTION, PLACEMENT AND INSTALLATION DETAILS.
- 7 STEEL CYLINDER WALL LINING THICKNESS SHALL BE VERIFIED BY SUPPLIER TO MEET THE PRESSURE AND TEMPERATURE REQUIREMENTS SPECIFIED.
- 8 UNDERGROUND JOINTS TO BE CEMENT MORTAR COVERED PER MANUFACTURER'S INSTRUCTIONS.

	NPS 1	NPS2	SCH	Description:
Pipes & Nipples				
	16-144	-	HOLD	Pipe , AWWA C301 , Bell/Spigot End , AWWA C301 CS
	16-144	-	HOLD	Pipe , AWWA C301 , PE x SPE , AWWA C301 CS
Large Bore Fittings				
	16-144	-	HOLD	45 Deg. 3D Elbow , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	45 Deg. Eq Lat Tee , AWWA C301 , Bell/Spigot Run, Bell Branch , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	45 Deg. Eq Lat Tee , AWWA C301 , Bell/Spigot Run, Spigot Branch , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	45 Deg. LR Elbow , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	45 Deg. SR Elbow , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	90 Deg. 3D Elbow , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	90 Deg. Elbow Asym , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	90 Deg. LR Elbow , AWWA C301 , BLE x SPIGOT , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	Adapter Female , AWWA C301 , BLE , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	Adapter Flange Fem. , AWWA C301 , FF x BLE , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	Adapter Flange Male , AWWA C301 , FF x SPIGOT , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	Adapter Male , AWWA C301 , SPIGOT , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	Cap , AWWA C301 , BLE , AWWA C301 CS , Lay Length Per Kiewit Estimate
	16-144	-	HOLD	Equal Tee , AWWA C301 , Bell/Spigot Run, Bell Branch , AWWA C301 CS , Lay Length Per Price Brothers

	16-144	-	HOLD	Equal Tee , AWWA C301 , Bell/Spigot Run, FFFE Branch , AWWA C301 CS , Lay Length Per Price Brothers
	16-144	-	HOLD	Equal Tee , AWWA C301 , Bell/Spigot Run, Spigot Branch , AWWA C301 CS , Lay Length Per Price Brothers
	18-144	16-102	HOLD	Concentric Reducer , AWWA C301 , BL LE x SPIGOT SE , AWWA C301 CS , Lay Length Per Price Brothers
	18-144	16-102	HOLD	Eccentric Reducer , AWWA C301 , BL LE x SPIGOT SE , AWWA C301 CS , Lay Length Per Price Brothers
	30-108	18-78	HOLD	Reducing Tee , Hanson , Bell/Spigot Run, Spigot Branch , AWWA C301 CS , Lay Length Hanson

Small Bore Fittings				
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Bolts				
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	16-144			Std Blt & 2HvyHex Nt , ASME B18.31.2 / B18.2.2 , A 193 B8M / A 194 B8M
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Gaskets				
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	16-24			Non Metal Flat Gskt , AWWA C207 , CL D , FF , NM Comp. Gskt. , 0.125" non compressed thickness
	16-108			Insulating Gskt Set , B16.21 , CL150 , FF , Per Specification 81.33.08 , 0.125" non compressed thickness
	26-144			Non Metal Flat Gskt , AWWA C207 , CL D , Ring , NM Comp. Gskt. , 0.125" non compressed thickness

Flanges				
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	16-144	-		SO Flg. - Ring Type , AWWA C207 , CL D , FF , AWWA C207 CS
	16-108	-		Blind Flg. , AWWA C207 , CL D , FF , AWWA C207 CS

Gate Valves				
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Globe Valves				
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Check Valves				
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Ball Valves				
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Butterfly Valves				
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