



CODE: P1B388
 Issued: 6-15-2021
 Revised:

CORPORATE PIPE CODE

CATEGORY D

304/304L

Code P1B388*

Design pressure, psig	150	150
Design temperature, F	-20	250
C	-29	121

Basis for stresses: ASME B31.3

Maximum hydrostatic test pressure, 225 psig. For intermediate test pressures, see Product and Service Index in Plant piping specification. For test procedure, see [SP1B](#) or ASME B31.3.

FABRICATION, ERECTION, TESTING, AND EXAMINATION

Fabrication, erection, testing, and examination shall be in accordance with the latest edition of ASME B31.3 for Category D Service.

Pipe sizes less than NPS 2 shall use the gas tungsten arc (GTAW) welding process.

Use only low carbon "L" grade weld consumables as follows: E308L, E308/E308L dual certified.

The root pass for all pipe sizes shall be GTAW.

Inert gas or nitrogen backup is required.

Backing rings are not permitted.

BOLTING/GASKETS REFERENCE STANDARDS

Mat'l: [U2A](#), [SU2A](#)
Sizes: ASME B16.20
ASME B16.21

* One of the following suffixes shall be added to the pipe code number to show the proper gasket and bolting materials (e.g., P1B388A).

Suffix	Code	Thick(in.)	Bolts/Studs(1) ASTM	Nuts(2) ASTM	Max. Temp.
A	G81	1/16	A307 GR B	A563 GR A	250°F
B	G50	1/16	A307 GR B	A563 GR A	250°F
C	G62G66	0.175	A193 GR B7	A194 GR 2H	250°F
D	G921G6	1/16	A193 GR B7	A194 GR 2H	250°F



Suffix	Code	Thick(in.)	Bolts/Studs(1) ASTM	Nuts(2) ASTM	Max. Temp.
E	G80	1/16	A193 GR B7	A194 GR 2H	250°F
F	G50G	1/16	A193 GR B7(3)	A194 GR 2H(3)	250°F
G	G50	1/16	A193 GR B7	A194 GR 2H	250°F
H	G49H	1/16	A193 GR B7(3)	A194 GR 2H(3)	250°F
I	Not used				
J	G50B	1/16	A193 GR B7(3)	A194 GR 2H(3)	250°F
K	G62S6ZA	0.175	A193 GR B7	A194 GR 2H	250°F

QUALIFICATIONS

Refer to the tables in [PP25](#) for appropriate torque values. Note that torque values listed in the tables will require adjustments based on the amount of lubrication used or if bolts are fluoropolymer coated.

Thread lubricant: Any commercial antiseize. Do not use lubricant with fluoropolymer coated bolting. If using A307 bolts, galvanizing is acceptable.

- (1) Bolts shall be heavy hexagon heads, ASME B18.2.1. Studs shall be threaded full length.
- (2) Heavy hexagon, ASME B18.2.2.
- (3) Fluoropolymer coated bolting per [SP11C](#).

PIPE

NPS	SCHED	SPECIFICATIONS
1/4 thru 3/8	80S	Grade TP304/304L "Dual Marked" welded stainless steel to SW41M or ASTM A312.
1/2 thru 2	40S(1)	

QUALIFICATIONS

- (1) Schedule 80S is also acceptable.

For Pipe to be cold bent to 1.5 pipe diameters, only [SW41M](#) material shall be used.

ASTM A312 seamless, same grades as above, may be substituted in all sizes.

In locations where "Dual Marked" material is not available, Grade 304 pipe, fittings, and flanges may be substituted for process streams in which low carbon content stainless steel is not required. If this cannot be determined, contact Materials Engineering. Low carbon Grade 304L shall not be substituted.



FITTINGS

NPS	WEIGHT	SPECIFICATIONS
1/4 thru 2	2000 lb or 3000 lb	Threaded, forged stainless steel, ASTM A182 Grade F304/304L, ASME B16.11.
1/4 thru 2	3000 lb	Socket-welding, forged stainless steel, ASTM A182 Grade F304/304L, ASME B16.11.

QUALIFICATIONS

Cast fittings **are not permitted**.

Cold bends are acceptable, provided they meet the requirements of ASME B31.3 (1.5/3D 18% max. thinning) or [P36E](#) with minimum bending radius in accordance with the following table.

MATERIAL	NPS 1/4	3/8	1/2	3/4	1	1 1/2	2
A312W	3D	3D	3D	3D	3D	3D	3D
SW41M	3D	3D	3D	1.5D	1.5D	1.5D	1.5D

JOINTS

RUNS	NPS	SPECIFICATIONS
Couplings	1/4 -2	2000 or 3000 lb stainless steel threaded or socket weld couplings, ASTM A182 Grade F304/304L, ASME B16.11.
MAINTENANCE (Alternate)		
Unions	1/2 -2	Nicholson (SUA) Uniflex forged stainless steel pipe union with Type 304 stainless steel and graphite spiral wound retained gasket and threaded or socket-welded ends; or stainless steel union as specified under fittings, threaded or socket-welded ends.
MAINTENANCE AND FIT-UP TO FLANGES		
Threaded flanges	1/2 -2	Class 150, stainless steel threaded flanges, ASTM A182 Grade F304/304L. ASME B16.5.
Slip-on flanges	1/2 -2	Double-welded, Class 150 stainless steel, ASTM A182 Grade F304/304L, ASME B16.5.



VALVES **REFERENCE STANDARDS** [P1V](#), [P2V](#), [P4V](#), [P5V](#), [SP5V](#)

Valves if listed below are satisfactory for most fluid services where this pipe code is listed in the Product and Service index. For proper selection of valves for a specific project or when valves are not listed below, refer to piping diagrams, drawings, or Product and Service Index.

NPS	ENDS	CHECK	GATE	GLOBE	BALL	PLUG
1/4 thru 2	SW				B87U(5)	
1/2 thru 2	SW	C87S(2)	G87P	T87X		
1/4 thru 2	TH	C11B (1)	G12A	T82G	B85A	P82D
1/4 thru 2	TH	C12A (1)	G13N	T85F	B85AU	
1/4 thru 2	TH	C82A (2)	G83A	T82C	B85BC(4)	
1/4 thru 2	TH	C82AZ (3)	G82A			
1/2 thru 2	FL	C82H(1)	G82K	T82L	B82AA(4,5)	
1/2 thru 2	FL				B82N	

QUALIFICATIONS

- (1) Swing check.
- (2) Horizontal lift.
- (3) Ball check, in-line, spring loaded.
- (4) Reduced port.
- (5) Fire safe to API 607.

STRESS RELIEVE Not required

HYDROSTATIC LEAK TEST Use clean water (less than 50 ppm chlorides) such as steam condensate or demineralized water. Drain and thoroughly dry lines within 24 hours of the test. Refer to [SG20T](#).

CLEANING Clean piping system per the appropriate procedure in [SP2M](#), unless indicated otherwise in the Product and Service Index.

REVISIONS