

COMPLETE REVISION April 2022

Piping

PIP PN03SA0B03 Piping Material Specification 3SA0B03 Class 300, 304/304L Stainless Steel, Butt Weld, C.A. - None, Process

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

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Use of trade names should not be viewed as an expression of preference. Other brands having the same specifications are equally correct and may be substituted for those named.

This Practice is subject to revision at any time. For more information refer to PIP ADG001, *Specification for Developing Practices*.

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Complete Revision

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SERVICE:	Process	MATERIAL:	304/304L Dual Marked
RATING CLASS:	300, ASME B16.5-2020	DESIGN CODE:	ASME B31.3-2020
TEMPERATURE LIMIT:	-29°C to 425°C (-20°F to 800°F) (Note 09)	STRESS RELIEF:	PIP PNSC0001
NOMINAL CORROSION ALLOWANCE:	None	EXAMINATION:	PIP PNSC0001

PRESSURE - TEMPERATURE RATINGS – METRIC UNITS

For NPS 1/2 through NPS 14 (Full flange rating per ASME B16.5, Table 2-2.1 and ASME B16.47, Table 17).

For NPS 16 through NPS 48 see Note 01. Pressure rated components are based on US customary units.												
TEMP °C	-29 to 38	50	100	150	200	250	300	325	350	375	400	425
BAR	49.6	47.8	40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0

PRESSURE - TEMPERATURE RATINGS – US CUSTOMARY UNITS

For NPS 1/2 through NPS 14 (Full flange rating per ASME B16.5, Table 2-2.1C and ASME B16.47, Table 17C). For NPS 16 through NPS 48 see Note 01. Pressure rated components are based on US customary units. TEMP °F -20 to 100 200 400 500 600 650 700 300 750 800 PSIG 720 600 540 495 465 440 430 420 415 405

ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION	USER CODES	s
PIPE	01, 188						
	,	1/2 – 1-1/2	40S		SS, SMLS, ASTM A312-TP 304/304L		
		2	40S		SS, EFW, ASTM A312-TP 304/304L (Ej=0.80)		
		3 – 4	10S		SS, EFW, ASTM A312-TP 304/304L (Ej=0.80)		
		6 – 14	40S		SS, EFW, ASTM A312-TP 304/304L (Ej=0.80)		
		16 – 24	Calc		SS, EFW, ASTM A312-TP 304/304L (Ej=0.80)		
		30 – 48	Calc		SS, EFW, ASTM A358-304/304L CL2 (Ej=0.85)		
NIPPLES							
Branch		1/2 – 1-1/2	40S		SS, SMLS, ASTM A312-TP 304/304L		
Swage (CONC)	194	1/2 – 1-1/2			SS, ASTM A403-WP 304/304L-S MSS SP-95		
Swage (ECC)	194	1/2 – 1-1/2			SS, ASTM A403-WP 304/304L-S MSS SP-95		
FITTINGS	02						
Reducer (CONC)		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
Reducer (CONC)		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
Reducer (ECC)		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
Reducer (ECC)		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
BW Pipet	170	1/2 – 20	Light Wt	Weld	SS, ASTM A182-F304/304L		
BW Lateral Pipet	170	1/2 – 2	Light Wt	Weld	SS, ASTM A182-F304/304L		
BW Elbow Pipet	170	1/2 – 2	Light Wt	Weld	SS, ASTM A182-F304/304L		
90 LR ELL		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
90 LR ELL		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
45 LR ELL		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
45 LR ELL		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
Tee		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
Tee		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
Tee (RED)		1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
Tee (RED)		2 – 48		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9		
Plug	53	1/2		PE	SS, ASTM A182-F304/304L, round head, ASME B16.	11	
Сар		1/2 – 48		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9		
Stub End LJ	22	1/2 – 1-1/2		Weld	SS, ASTM A403-WP 304/304L-S, ASME B16.9, short	pattern	
Stub End LJ	22	2 – 16		Weld	SS, ASTM A403-WP 304/304L-W, ASME B16.9, shor	t pattern	
VALVES							
Gate		1/2 – 8	Class 300	RF	316 SS body, trim 12, BB, OS&Y, FP	GA03ST501	
Gate		10 – 24	Class 300	RF	316 SS body, trim 12, BB, OS&Y, FP, GO	GA03ST504	
Gate	204	30 – 48	Class 300	RF	316 SS body, trim 12, BB, OS&Y, FP, GO, Series B	GA03ST515	
Gate	204	30 – 48	Class 300	RF	316 SS body, trim 12, BB, OS&Y, FP, GO, Series A	GA03ST516	
Globe		1/2 – 4	Class 300	RF	316 SS body, trim 12, BB, OS&Y	GL03ST500	
Globe		6 – 12	Class 300	RF	316 SS body, trim 12, BB, OS&Y, GO	GL03ST503	
Swing Check	62	1/2 – 24	Class 300	RF	316 SS body, trim 10, BC	CS03ST501	
Wafer Dual PLT	07, 26,	3 – 24	Class 300	RF	316 SS body, trim 10	CD03ST700	
Check	63, 160						
Lug Dual PLT Check	07, 26, 63	3 – 10	Class 300	RF	316 SS body, trim 10	CD03ST702	
Double FLG Dual PLT Check	26, 63	12 – 24	Class 300	RF	316 SS body, trim 10	CD03ST512	

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ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION		USER CODES
VALVES							
(continued)							
Double FLG Dual PLT Check	26, 63, 204	30 – 48	Class 300	RF	316 SS body, trim 10, Series B	CD03ST514	
Double FLG Dual PLT Check	26, 63, 204	30 – 48	Class 300	RF	316 SS body, trim 10, Series A	CD03ST515	
Ball	09	1/2 – 4	Class 300	RF	316 SS body, 316 SS trim, RPTFE ST, FT	BA03ST503	
Ball	08.09	1/2 – 4	Class 300	RF	316 SS body, 316 SS trim, RPTFE ST, FP, FT	BA03ST502	
Ball	09	6 – 10	Class 300	RF	316 SS body, 316 SS trim, RPTFE ST, GO, FT	BA03ST505	
Ball	08.09	6 – 10	Class 300	RF	316 SS body, 316 SS trim, RPTFE ST, FP, GO, FT	BA03ST504	
Ball	09	12 – 24	Class 300	RF	316 SS body, 316 SS trim, RPTFE ST, GO, FT	BA03ST500	
Ball	08 09	12 - 24	Class 300	RF	316 SS body, 316 SS trim RPTEE ST EP GO ET	BA03ST501	
Wafer Butterfly	07 09	3 - 24	Class 300	RF	316 SS body, 316 SS trim, 316 SS/RPTFF ST	BF03ST701	
Waler Batteriny	160, 178, 190	0 24			Category B, GO, FT	Brooorron	
Lug Butterfly	09, 26, 178	3 – 24	Class 300	RF	316 SS body, 316 SS trim, 316 SS/RPTFE ST, Category B, GO, FT	BF03ST703	
Lug Butterfly	09, 26, 178, 204	30 – 48	Class 300	RF	316 SS body, 316 SS trim, 316 SS/RPTFE ST, Category B, GO, Series B, FT	BF03ST704	
Lug Butterfly	09, 26, 178, 204	30 – 48	Class 300	RF	316 SS body, 316 SS trim, 316 SS/RPTFE ST, Category B, GO, Series A, FT	BF03ST711	
Plug	09, 178, 190	1/2 – 3	Class 300	RF	316 SS body, 316 SS trim, PTFE sleeve-lined, FT	PL03ST500	
Plug	09, 178, 190	4 – 20	Class 300	RF	316 SS body, 316 SS trim, PTFE sleeve-lined, GO, FT	PL03ST501	
FLANGES	02, 193						
Blind	- ,	1/2 – 24	Class 300	RF	SS. ASTM A182-F304/304L. ASME B16.5		
Blind		30 – 48	Class 300	RF	SS, ASTM A182-F304/304L, ASME B16.47, Series B		
Blind		30 – 48	Class 300	RF	SS, ASTM A182-F304/304L, ASME B16.47, Series A		
Lap Joint	22, 189	1/2 – 16	Class 300	FF	CS. ASTM A105N. ASME B16.5		
Weld Neck	22	1/2 – 16	Class 300	RF	SS. ASTM A182-F304/304L. ASME B16.5		
Weld Neck		18 – 24	Class 300	RF	SS_ASTM A182-F304/304L_ASMF B16.5		
Weld Neck		30 - 48	Class 300	RF	SS ASTM A182-F304/304L ASMF B16 47 Series B		
Weld Neck		30 - 48	Class 300	RF	SS ASTM A182-F304/304L ASMF B16 47 Series A		
Pair WN Orifice		1 – 24	Class 300	RF	SS ASTM A182-F304/304L ASME B16.36 SW taps		
LINE BLANKS	192				,		
Figure-8		1/2 – 10	Class 300	FF	SS. ASTM A240-TYPE 304 ASMF B16 48		
Paddle Blank		1/2 - 24	Class 300	FF	SS_ASTM A240-TYPE 304_ASME B16 48		
Paddle Spacer		1/2 – 24	Class 300	FF	SS, ASTM A240-TYPE 304, ASME B16.48		
GASKETS	193				,		
		1/2 – 24	Class 300		Spiral wound type, 304 SS winding, w/ flexible graphit SS inner ring and CS outer ring, ASME B16.20	e filler, w/ 304	
		30 – 48	Class 300		Spiral wound type, 304 SS winding, w/ flexible graphit SS inner ring and CS outer ring, ASME B16.20, ASME Series B	e filler, w/ 304 E B16.47	
		30 – 48	Class 300		Spiral wound type, 304 SS winding, w/ flexible graphit SS inner ring and CS outer ring, ASME B16.20, ASME Series A	e filler, w/ 304 E B16.47	
BOLTING							
Stud Bolts					ASTM A193, Gr B7, w/ 2 heavy hex nuts, ASTM A194	l, Gr 2H	
Cap Screw	178				ASTM A193, Gr. B7 heavy hex		

90° BRANCH CONNECTION

Legend and Chart



- E Reducing Tee
- T Tee W BW Pipet

NOTES:

- 01 If a pipe schedule is shown under "SCH/RAT," it shall be adequate for the full flange rating. If "CALC" is shown, the pressure limit may be lower than full flange rating.
- 02 All butt-welded component thicknesses shall match the pipe thickness.
- 07 These valves have no flanges but are installed between line flanges with extra-length bolts.
- 08 Full-port valves shall be used if indicated on the P&ID.
- 09 Pressure and temperature rating can be limited by certain components permitted by this Practice. Manufacturer's recommended pressuretemperature restrictions shall be consulted.
- 22 Stub ends with lap-joint back-up flanges may be used for temperatures up to 260°C (500°F). For higher temperatures, weld-neck flanges shall be used.
- 26 To be used only if indicated on the P&ID.
- 53 To be used where required for pipe supports, dummy legs and unused socket weld taps.
- 62 These check valves shall be installed in a horizontal position with cover up or in a vertical position with upward flow.
- 63 These check valves shall be installed in a horizontal position with hinge pin vertical or in a vertical position with upward flow.
- 160 Wafer-type valves are not recommended for hazardous, combustible, or flammable service, or for temperatures greater than 260°C (500°F).
- 170 These items shall be qualified for use in this specification in accordance with ASME B31.3, Paragraph 304.7.2.
- 178 Use cap screws for valves or flanges containing threaded holes. It is recommended that cap screws be supplied by valve
- supplier/manufacturer to ensure proper length for all threaded holes.
- 188 Wall thickness calculations in this specification are based on values in US customary units.
- 189 Carbon steel lap joint flanges should be coated prior to installation.
- 190 These valves may contain tapped holes.
- 192 Paddle blanks or paddle spacers shall be used in place of figure 8 type blanks for cold-insulated piping less than 21°C (70°F).
- 193 For NPS 1/2 6 spiral wound gaskets, the inner ring protrudes into the bore of the pipe. If this presents a process concern, an alternate gasket type or special inner ring size may be specified.
- 194 Swage size range listed is for the small end. Large end greater than NPS 1-1/2 shall be beveled up to NPS 6. Wall thickness shall match pipe.
- 204 Both Series A and Series B valves are listed for the convenience of users. Note that (a) API 594, Check Valves, 8th Edition, lists only Series A valves.
- (a) API 594, Uneck Valves, 8th Edition, lists only Series A valves,
 - (b) API 6D, Specification for Pipeline and Piping Valves, 24th Edition, lists Series A valves but allows the use of other flange types, and (c) all other API valve standards do not list a preference.
 - (c) all other APT valve standards do not list a pl

REFERENCES:

Process Industry Practices (PIP)

- PIP PNC00005 Design of ASME B31.3 Metallic Piping Systems
- PIP PNF0200 Vents, Drains, and Instrument Connection Details
- PIP PNSC0001 ASME B31.3 Metallic Piping Fabrication and Examination Specification
- PIP PNSMV023 Stainless Steel Gate Valve Descriptions
- PIP PNSMV024 Stainless Steel Globe Valve Descriptions
- PIP PNSMV025 Stainless Steel Check Valve Descriptions
- PIP PNSMV026 Stainless Steel Ball Valve Descriptions
- PIP PNSMV027 Stainless Steel Butterfly Valve Descriptions
- PIP PNSMV028 Stainless Steel Plug Valve Descriptions