

Technical Information

Weld-in adapter, process adapter and flanges

Level, pressure, temperature



Application

The adapters and the flanges are used to connect level, pressure or temperature measuring instruments to a vessel or a pipe.

Advantages

- High-quality, corrosion resistant materials for use in aggressive media
- Versions without crevices and dead space of the weld-in adapters and process adapters according to international hygiene regulations
- Weld-in adapters with a variety of seals for use in diverse processes

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General information

NOTICE

Maximum temperature and pressure values of the sensor can reduce the specified limit values.

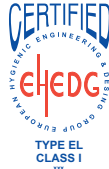
- Observe the maximum temperature and pressure limits of the sensor used!

Pressure Equipment Directive 2014/68/EU

The adapters listed here do not fall within the scope of the Pressure Equipment Directive, irrespective of the maximum working pressure as they do not have a pressure-bearing volume.

Suitability for hygienic processes

3-A and EHEDG



The connections listed in this documentation have EHEDG and 3-A approval. Suitable for hygienic applications, see also "Hygienic certificates" documentation, SD02503F. All seals that are FDA-compliant are permitted for 3-A applications.

Material compliance



The information on suitability for hygienic processes is listed under the version in question. The weld-in adapters have been manufactured in accordance with the material specifications to the latest standard. Particular versions of weld-in adapters, e.g. an older material batch, must be requested and ordered via the TSP workflow.

Seals:

Comply with FDA 21 CFR (Code of Federal Regulations)

PART 177 - Indirect food additives: Polymers

- Part 177.1550: Perfluorocarbon resins (PTFE)
- Part 177.2600: Rubber articles (EPDM, silicone (VMQ), Viton (FKM))

Comply with regulation (EC) No. 1935/2004 on materials and articles intended to come into contact with food (Europe)

- BfR (Federal Institute for Risk Assessment) Recommendation XV. Commodities based on silicones: Silicone (VMQ)
- BfR (Federal Institute for Risk Assessment) Recommendation XXI. Commodities based on natural and synthetic rubber: EPDM, Viton (FKM)
- PTFE conform to regulation (EU) No. 10/2011

Metals:

Metals meet at least the voluntary standard of the Council of Europe - EDQM Guide "metals and alloys used in food contact materials and articles 2013 (1st edition)".

CRN approval

Device versions with a CRN approval (Canadian Registration Number) are listed in the corresponding registration documents. CRN-approved devices are marked with a registration number.

Any restrictions regarding the maximum process pressure values are listed on the CRN certificate. CRN approvals for adapters are available in the Downloads area of the product pages: www.endress.com → Downloads.

Ordering information



Product Configurator: www.endress.com

Product Configurator - the tool for individual product configuration

- Up-to-the-minute configuration
- Depending on the device: direct input of information specific to the measuring point, such as the measuring range or operating language
- Automatic verification of exclusion criteria
- Automatic creation of the order code and its breakdown in PDF or Excel output format
- Ability to order directly in the Endress+Hauser Online Shop

Symbols

Safety icons



This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.



This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.



This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.



This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

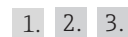
Symbols for certain types of Information



Additional information

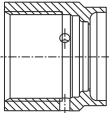
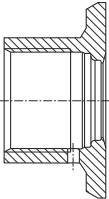
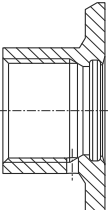
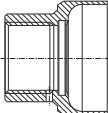
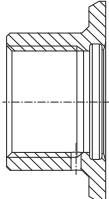
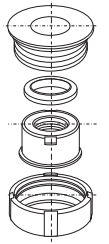


Please recycle component or device.



Series of steps

Weld-in adapter - Temperature overview

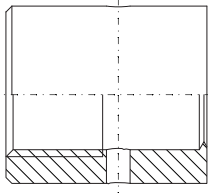
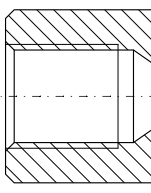
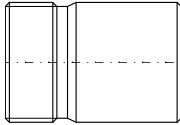
	A	B	C	D	E	F
[Part 1] Weld-in adapter Temperature overview	 A0008246	 A0008251	 A0008256	 A0011924	 A0008248	 A0008253
	G ¾, d=29 pipe-mounting	G ¾, d=50 vessel- mounting	G ¾, d=55 with flange	G 1, d=53 pipe-mounting	G 1, d=60 with flange	G 1 adjustable
Material	316L (1.4435)	316L (1.4435)	316L (1.4435)	316L (1.4435)	316L (1.4435)	316L (1.4435)
Roughness µm (µin) process side	≤ 1.5 (59.1)	≤ 0.8 (31.5)	≤ 0.76 (29.9)	≤ 0.76 (29.9)	≤ 0.76 (29.9)	≤ 0.8 (31.5)
Order number weld-in adapter	71258357	71258355	52001052	71258358	52001051	52001221
Order number weld-in adapter with inspection certificate ¹⁾	52028295	52018765	52011897	71093129	52011896	52011898
Order number replacement seal (5 pieces)	Silicone O-ring 52021717 ²⁾	Silicone O-ring 52021717 ²⁾	Silicone O-ring 52014473 ²⁾	Silicone O-ring 52014472 ²⁾	Silicone O-ring 52014472 ²⁾	Silicone profile gasket 52014424 ³⁾
Order number welding dummy	71174959	71174959	71168889	71166879	71166879	71181945
Order number blind plug	71167850	71167850	71177193	71173810	71173810	71166366
Order number blind plug with inspection certificate ¹⁾	–	–	71190074	71167291	71167291	71196853
Measuring instrument	Suitable for process connection Option ⁴⁾					
Compact thermometer						
TMR35	AC	AC	AB	AD	AD	AD
TM311	J1	J1	J2	J3	J3	J3
Hygienic thermometer						
TM371	J1	J1	J2	J3	J3	J3
TM372	J1	J1	J2	J3	J3	J3
TM411	J1	J1	J2	J3	J3	J3
Thermowell						
TT411	J1	J1	J2	J3	J3	J3

1) Inspection certificate according to EN10204-3.1 Material; AD2000: The material 316L (in contact with process) corresponds to AD2000 – W0/W2/W10.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

3) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal

4) The option can be selected in the Product Configurator via the appropriate order feature.

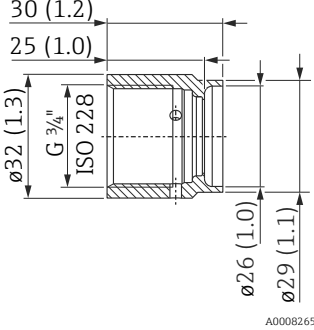
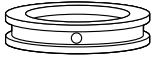
	G	H	I
[Part 2] Weld-in adapter Temperature overview			
	A0045815	A0045834	A0045836
	Weld-in adapter with sealing taper for G ½	Weld-in adapter with sealing taper for M12x1.5	G 1¼ for Ingold process connection
Material	316L (1.4435)	316L (1.4435)	316L (1.4435)
Order number weld-in adapter	71424800	71405560	71531585
Order number replacement seal (5 pieces) ¹⁾	–	–	Silicone O-ring 60018911
Order number blind plug	60022519	71535692	–
Measuring instrument	Suitable for process connection Option²⁾		
Compact thermometer			
TMR31	–	–	–
TMR35	MB	–	–
TM311	H2	H1	–
Hygienic thermometer			
TM371	H2	H1	M1/M3
TM372	–	–	–
TM401	H2	H1	–
TM411	H2	H1	M1/M3
Thermowell			
TT411	H2	H1	M1/M3
Temperature switch			
TTR31	–	–	–
TTR35	MB	–	–
Flow switch			
DTT31	–	–	–
DTT35	MB	–	–

1) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal.

2) The option can be selected in the Product Configurator via the appropriate order feature.

Weld-in adapter and accessories - Temperature

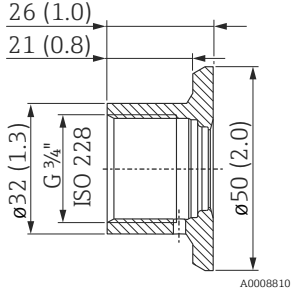
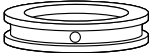
G 3/4, d=29 pipe-mounting

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F)	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 1.5 µm (59.1 µin) Certified according to CRN	71258357 52028295
	Welding dummy for welding the weld-in adapter Material: Brass	71174959 ¹⁾
	Blind plug for sealing the weld-in adapter Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 3.2 µm (126 µin)	71167850 ¹⁾
Seals, pressure ring		Order number
	Standard seal	
	Silicone O-ring, ø 14.9 x 2.7 mm (0.59 x 0.11 in) Material: VMQ 70 FDA-compliant	52021717 ²⁾ (5 pieces)
	The seal can be easily replaced with this version.	
	Alternative seals	
	ø 15.08 x 2.62 mm (0.59 x 0.10 in) Material: EPDM Complies with FDA, USP Class VI, EC1935 EHEDG certified	71529759 ²⁾ (5 pieces)
	ø 15.08 x 2.62 mm (0.59 x 0.10 in) Material: FKM Complies with FDA, USP Class VI, EC1935 EHEDG certified	71167890 ¹⁾ (5 pieces)
	ø 14.9 x 2.7 mm (0.59 x 0.11 in) Material: Silicone VMQ 80 Complies with FDA, USP Class VI	71086117 (3 pieces)
	Pressure ring Material: 316L (1.4435) The seal with pressure ring enables easy exchange of defective sealing rings.	52027421

1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

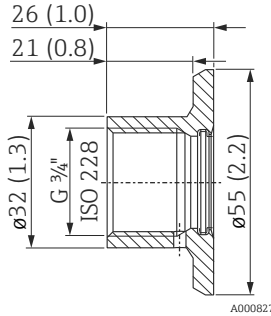
G ¾, d=50 vessel-mounting

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F)	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 0.8 µm (31.5 µin) Certified according to CRN	71258355 52018765
	Welding dummy for welding the weld-in adapter Material: Brass	71174959 ¹⁾
	Blind plug for sealing the weld-in adapter Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 3.2 µm (126 µin)	71167850 ¹⁾
Seals, pressure ring		Order number
	Standard seal	
	Silicone O-ring, ø 14.9 x 2.7 mm (0.59 x 0.11 in) Material: VMQ 70 FDA-compliant The seal can be easily replaced with this version.	52021717 ²⁾ (5 pieces)
	Alternative seals	
	ø 15.08 x 2.62 mm (0.59 x 0.10 in) Material: EPDM Complies with FDA, USP Class VI, EC1935 EHEDG certified	71529759 ²⁾ (5 pieces)
	ø 15.08 x 2.62 mm (0.59 x 0.10 in) Material: FKM Complies with FDA, USP Class VI, EC1935 EHEDG certified	71167890 ¹⁾ (5 pieces)
	Pressure ring Material: 316L (1.4435) The seal with pressure ring enables easy exchange of defective sealing rings.	71086117 (3 pieces)
		52027421

1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

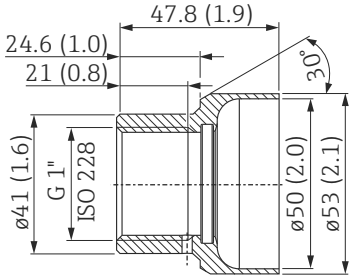
G 3/4, d=55 with flange for flush mounting

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F)	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 0.8 µm (31.5 µin)	52001052 52011897
	Welding dummy for welding the weld-in adapter Material: Brass	71168889 ¹⁾
	Blind plug for sealing the weld-in adapter - Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 0.76 µm (29.9 µin)	71177193 ¹⁾ 71190074 ¹⁾
Seals, ø 21.89 x 2.62 mm (0.86 x 0.10 in)		Order number
	Standard seal	
	Silicone O-ring Material: VMQ 70 Complies with FDA, EC1935, GB4806	52014473 ²⁾ (5 pieces)
	Alternative seals	
	Material: EPDM 70 Complies with FDA, USP Class VI, EC1935, GB4806 EHEDG certified	71140670 ²⁾ (3 pieces)
	Material: FFKM Kalrez 6221 Complies with FDA, USP Class VI	71167883 ¹⁾
	Material: FKM Complies with FDA, USP Class VI, EC1935	71172153 ¹⁾ (5 pieces)
	Material: FKM FEP coated Complies with FDA, USP Class VI, EC1935	71167747 ¹⁾
	Material: Silicone VMQ 3-80 Complies with FDA, USP Class VI, EC1935, GB4806	71086100 (3 pieces)

1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

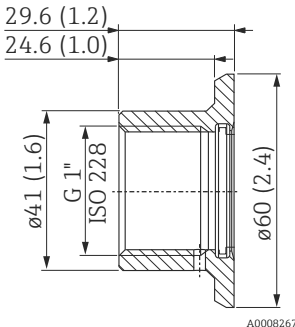
G 1, d=53 pipe-mounting

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F)	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): $R_a \leq 0.76 \mu\text{m}$ (29.9 μin) Certified according to CRN	71258358 71093129
	Welding dummy for welding the weld-in adapter Material: Brass	71166879 ¹⁾
	Blind plug for sealing the weld-in adapter - Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): $R_a \leq 0.76 \mu\text{m}$ (29.9 μin)	71173810 71167291¹⁾
Seals, $\varnothing 28.17 \times 3.53 \text{ mm}$ (1.11 x 0.14 in)		Order number
	Standard seal	
	Silicone O-ring Material: VMQ 70 Complies with FDA, EC1935, GB4806	52014472 ²⁾ (5 pieces)
	Alternative seals	
	Material: EPDM 70 Complies with FDA, USP Class VI, EC1935 EHEDG certified	71140668 ²⁾ (3 pieces)
	Material: FKM 75	71182264 ¹⁾ (5 pieces)
	Material: FFKM Kalrez 4079	71166292 ¹⁾
	Material: Silicone VMQ 3-80 Complies with FDA, USP Class VI, EC1935	71086102 (3 pieces)

1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

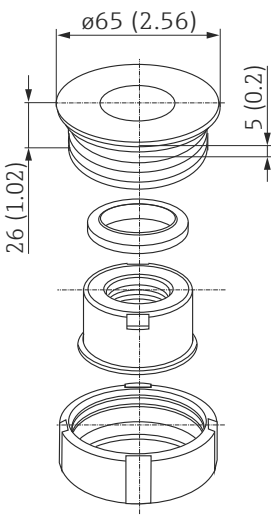
G 1, d=60 with flange for flush mounting

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F)	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 0.76 µm (29.9 µin) Certified according to CRN	52001051 52011896
	Welding dummy for welding the weld-in adapter Material: Brass	71166879 ¹⁾
	Blind plug for sealing the weld-in adapter - Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): Ra ≤ 0.76 µm (29.9 µin)	71173810 71167291 ¹⁾
Seals, ø 28.17 x 3.53 mm (1.11 x 0.14 in)		Order number
	Standard seal	
	Silicone O-ring Material: VMQ 70 Complies with FDA, EC1935, GB4806	52014472 ²⁾ (5 pieces)
	Alternative seals	
	Material: EPDM 70 Complies with FDA, USP Class VI, EC1935 EHEDG certified	71140668 ²⁾ (3 pieces)
	Material: FKM 75	71182264 ¹⁾ (5 pieces)
	Material: FFKM Kalrez 4079	71166292 ¹⁾
	Material: Silicone VMQ 3-80 Complies with FDA, USP Class VI, EC1935	71086102 (3 pieces)

1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal, 1 x EPDM seal (EHEDG)

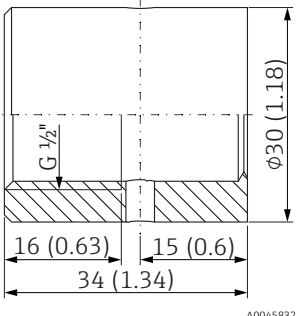
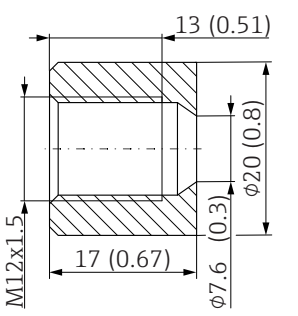
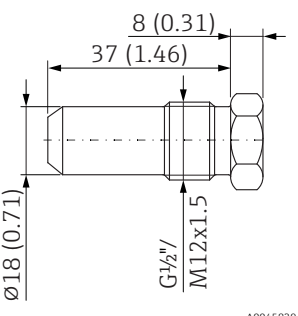
G1 sensor adjustable

Dimensions in mm (in)	Version	Order number
 Pressure and temperature range of the adapter - max. 25 bar (362 psi) / max. 150 °C (302 °F) - max. 40 bar (580 psi) / max. 100 °C (212 °F) A0008272	- Without inspection certificate - With inspection certificate EN10204-3.1 material Material: AISI 316L (1.4435) Roughness (process side): $R_a \leq 0.8 \mu\text{m}$ (31.5 μin) Certified according to CRN	52001221 52011898
	Welding dummy for welding the weld-in adapter Material: Brass	71181945 ¹⁾
	Blind plug for sealing the weld-in adapter Material: AISI 316L (1.4435) Roughness (process side): $R_a \leq 0.76 \mu\text{m}$ (29.9 μin)	71166366 ¹⁾
Seals, ø 29 x 36 x 3.7 mm (1.14 x 1.42 x 0.15 in)		Order number
 A0021901	Standard seal	
	Silicone profile gasket Material: VMQ 60 Complies with FDA, EC1935	52014424 ²⁾ (5 pieces)
	Alternative seals	
	Material: EPDM 70	71168375 ¹⁾ (5 pieces)
	Material: VMQ 60 Complies with FDA, USP Class VI, EC1935	71075662 (5 pieces)

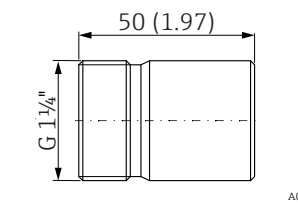
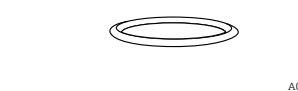
1) TSP modification number. Can only be ordered via FTSP, PTSP or NTSP.

2) Already included in the scope of delivery for the weld-in adapter: 1 x standard seal

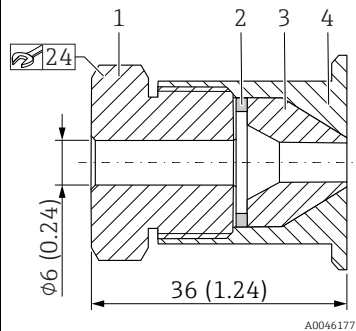
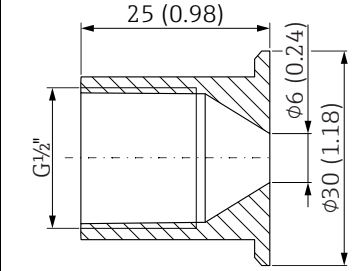
Weld-in adapter with sealing taper for G ½ or M12x1.5 thread

Dimensions in mm (in)	Version	Order number
 A0045832	Weld-in adapter for G ½ or M12x1.5 thread, metal sealing; conical Material: Parts in contact with the process AISI 316L (1.4435)	71424800 (G ½)
 A0045833		71405560 (M12x1.5)
Process pressure max. 16 bar (232 psi)		
 A0045839	Blind plug for G ½ or M12x1.5 conical metal-sealing weld-in adapter Material: AISI 316L (1.4435)	60022519 (G ½) 71535692 (M12x1.5)

Weld-in adapter for Ingold process connection

Dimensions in mm (in)	Version	Order number
 A0045835	G 1 ¼ x 50 mm (1.97 in) Material: AISI 316L (1.4435)	71531585
Seal		Order number
 A0021901	O-ring seal set	
	Silicone O-ring FDA-compliant Maximum temperature: 230 °C (446 °F)	60018911

Weld-in adapter with sealing taper with/without pressure screw

Dimensions in mm (in)	Version	Order number
 1 Pressure screw, 303/304 2 Washer, 303/304 3 Sealing taper, PEEK 4 Collar welding boss, 316L Process pressure Max. 10 bar (145 psi)	Collar welding boss movable with sealing taper, washer and pressure screw G ½ Material of parts in contact with the process: 316L, PEEK	71535690 (with pressure screw)
 Process pressure Max. 10 bar (145 psi)	Collar welding boss Material: Parts in contact with the process AISI 316L (1.4435)	71535691 (without pressure screw)

Pressure-temperature dependency

EN flanges¹⁾

Temperature range	Nominal pressure bar (psi)				
	PN16	PN25	PN40	PN63	PN100
–10 °C to +50 °C (+14 °F to +122 °F)	16.0 (232)	25.0 (362)	40.0 (580)	63.0 (913)	100.0 (1450)
50 °C (122 °F)	15.5 (225)	24.3 (352)	38.9 (564)	61.3 (889)	97.3 (1411)
100 °C (212 °F)	15.1 (219)	23.6 (342)	37.9 (550)	59.7 (866)	94.7 (1373)
150 °C (302 °F)	13.7 (199)	21.5 (312)	34.4 (499)	54.3 (787)	86.1 (1248)
200 °C (392 °F)	12.7 (184)	19.8 (287)	31.8 (461)	50.1 (726)	79.5 (1153)
250 °C (482 °F)	11.9 (173)	18.6 (270)	29.9 (434)	47.1 (683)	74.7 (1083)
300 °C (572 °F)	11.0 (159)	17.2 (249)	27.6 (400)	43.5 (631)	69.0 (1000)
350 °C (662 °F)	10.5 (152)	16.5 (239)	26.4 (383)	41.7 (605)	66.1 (958)
400 °C (752 °F)	10.2 (148)	16.0 (232)	25.7 (373)	40.1 (580)	64.2 (931)

ASME flanges¹⁾

Temperature range	Nominal pressure bar (psi)				
	Class 150	Class 300	Class 600	Class 900	Class 1500
–29 °C to +38 °C (–20 °F to +100 °F)	19.0 (275)	49.6 (719)	99.3 (1440)	148.9 (2159)	248.2 (3599)
50 °C (122 °F)	18.4 (267)	48.1 (697)	96.2 (1395)	144.3 (2092)	240.6 (3489)
100 °C (212 °F)	16.2 (235)	42.2 (612)	84.4 (1224)	126.6 (1836)	211.0 (3059)
150 °C (302 °F)	14.8 (215)	38.5 (558)	77.0 (1116)	115.5 (1675)	192.5 (2791)
200 °C (392 °F)	13.7 (199)	35.7 (518)	71.3 (1034)	107.0 (1551)	178.3 (2588)
250 °C (482 °F)	12.1 (175)	33.4 (484)	66.8 (969)	100.1 (1451)	166.9 (2420)
300 °C (572 °F)	10.2 (148)	31.6 (458)	63.2 (916)	94.9 (1376)	158.1 (2292)
325 °C (617 °F)	9.3 (135)	30.9 (448)	61.8 (896)	92.7 (1344)	154.4 (2239)
350 °C (662 °F)	8.4 (122)	30.3 (439)	60.7 (880)	91.0 (1319)	151.6 (2189)
375 °C (707 °F)	7.4 (107)	29.9 (434)	59.8 (867)	89.6 (1299)	149.4 (2166)
400 °C (752 °F)	6.5 (94)	29.4 (426)	58.9 (854)	88.3 (1280)	147.2 (2134)

JIS flanges¹⁾

Temperature range	Nominal pressure bar (psi)			
	10 K	20 K		
	for all flanges	to DN 125	from DN 150 to DN 250	DN 300
up to 120 °C (248 °F)	14 (203.0)	34 (493.0)	20 (290.0)	20 (290.0)
220 °C (428 °F)	12 (174.0)	31 (449.5)	20 (290.0)	-
300 °C (572 °F)	10 (145.0)	29 (420.5)	19 (275.5)	-
350 °C (662 °F)	-	26 (377.0)	17 (246.5)	-
400 °C (752 °F)	-	23 (333.5)	17 (246.5)	-
425 °C (797 °F)	-	20 (290.0)	17 (246.5)	-

1) With regard to their stability-temperature property, the materials 1.4404 and 1.4435 are grouped together under 13E0 in DIN EN 1092-1 Tab.18 and under 023b in JIS B2220:Tab. 5. The ASME flanges are dual rated flanges (316/316L) and classified under Tab. 2-2.2 in ASME B16.5.