

Twin Ferrule Series Tube Fittings

Twin ferrule fittings provide metal-to-metal seal connections, non-elastomeric seals for leak-free connections. CIR-LOK twin ferrule fittings is designed to have a maximum allowable working pressure that is higher than that of any tubing. Industry standard design for all instrumentation grade tubing. Stainless steel tube hardness: the hardness of the tube shall be not greater than 85 HRB. Available in sizes from 1/16 to 2 in and 2 mm to 50 mm. CIR-LOK fittings materials include 316 stainless steel, steel, brass, aluminum, nickel-copper, Hastelloy C, 6Mo, Incoloy 625 and 825. CIR-LOK special treated Back ferrule is to provide secure. Silver coated threads to reduce galling. leak-proof joints capable of satisfying high pressure vacuum and vibration applications.

Performance

Hydraulic proof pressure test (1.5 times the maximum permissible working pressure): no leakage.
 Dismantling and reassembly test (dismantle ten times): no leakage.
 Minimum hydrostatic pressure test (four times the maximum permissible ambient pressure rating): no leakage.
 Vacuum test (1×10^{-4} mbar or greater): the leak rate less than 1×10^{-8} mbar l/s .
 Maximum static gas pressure test (with nitrogen gas to 150% of pressure rating): no visible bubbles.
 Hydraulic impulse and vibration test (the pressure impulses at between 0.5 Hz and 1.7 Hz and the vibration at between 23 Hz and 47 Hz): no leakage.
 Thermal cycle test (ambient to +80 °C and then to -25 °C with a hydrostatic pressure): no evidence of leakage.
 Pneumatic pressure vibration test (The frequency of vibration shall be set at 45 Hz and complete 20×10^6 cycles): without failure.
 Fire test (in accordance with BS ISO 19921): no leakage.
 Corrosion resistance test (the duration of exposure at least 168 h): no visible evidence of corrosion.
 Deep water submersion test (equivalent to 3048 m of sea water): no helium detected.

Materials Standards

Material	Bar Stock	Forgings
316 stainless steel	ASTM A276, ASME SA479, EN 1.4401	ASTM A182, ASME SA182, EN 1.4401
Alloy 20	ASTM B473	ASTM B462
Alloy 400/R-405	ASTM B164, ASME SB164	ASTM B564, ASME SB564
Alloy 600	ASTM B166, ASME SB166	ASTM B564, ASME SB564
Alloy 625	ASTM B446	ASTM B564, ASME SB564
Alloy 825	ASTM B425	ASTM B564, ASME SB564
Alloy C-276	ASTM B574	ASTM B564
Aluminum	ASTM B211	ASTM B247
Brass	ASTM B16, ASTM B453	ASTM B283
Carbon steel	ASTM A108	—
Duplex 2507	ASTM A479	ASTM A182
Titanium (grade 4)	ASTM B348	ASTM B381
PFA	—	ASTM D3307 Type I
PTFE	ASTM D1710	ASTM D3294

Thread Specifications

Thread Type (End Connection)	Reference Specification
NPT	ASME B1.20.1, SAE AS71051
ISO/BSP (parallel) (Based on DIN 3852) (CIR-LOK PPT, BP, and BS fittings)	ISO 228, JIS B0202
ISO/BSP (tapered) (Based on DIN 3852) (CIR-LOK BT fittings)	ISO 7, BS EN 10226-1, JIS B0203
ISO/BSP (gauge) (Based on EN 837-1 and 837-3) (CIR-LOK BG)	ISO 228, JIS B0202
Unified (SAE) (CIR-LOK SA fittings)	ASME B1.1

Pressure Ratings

Ratings are based on ASME Code for Pressure Piping B31.3, Process Piping, at ambient temperature.

NPT/ ISO Pipe Size	316 SS and Carbon Steel				Brass			
	Male		Female		Male		Female	
	psig	bar	psig	bar	psig	bar	psig	bar
1/16	11000	760	6700	460	5500	380	3300	230
1/8	10000	690	6500	440	5000	340	3200	220
1/4	8000	550	6600	450	4000	270	3300	220
3/8	7800	540	5300	360	3900	270	2600	180
1/2	7700	530	4900	330	3800	260	2400	160
3/4	7300	500	4600	320	3600	250	2300	160
1	5300	370	4400	300	2600	180	2200	150
1 1/4	6000	410	5000	350	3000	200	2500	170
1 1/2	5000	340	4600	310	2500	170	2300	150
2	3900	270	3900	270	1900	130	1900	130

To determine pressure ratings in accordance with ASME B31.1, Power Piping:
 stainless steel material—multiply by 0.94
 carbon steel material—multiply by 0.85.
 Brass material ratings remain the same.

SAE/MS Fittings Pressure Ratings

Pressure ratings are based on SAE J1926/3 at ambient temperature.

SAE/MS Thread Size	316 SS and Carbon Steel			
	Nonpositionable		Positionable	
	psig	bar	psig	bar
5/16-24	4568	315	4568	315
7/16-20			3626	250
1/2-20				
9/16-18			3626	250
3/4-16				
7/8-14	3626	250	2900	200
1 1/16-12	2900	200	2320	160
1 3/16-12				
1 5/16-12				
1 5/8-12	2320	160	1813	125
1 7/8-12				
2 1/2-12				

Some fittings with O-seal, and SAE/MS ends may have lower ratings.

Positionable, ISO/BSP Parallel Thread (PPT) Pressure Ratings

Pressure ratings are at ambient temperature.

ISO/BSP Male Pipe Size in.	316 SS and Carbon Steel	
	psig	bar
1/8	4568	315
1/4		
3/8		
1/2	2320	160
3/4		
1		

Configuration

			
Union	Bulkhead Union	Union Elbow	Union Tee
			
Union Cross	Male Connector	Bulkhead Male Connector	Thermocouple Connector
			
Female Connector	Bulkhead Female Connector	Male Elbow	Positionable Male Elbow
			
Female Elbow	Male Run Tee	Male Branch Tee	Positionable Male Run Tee
			
Positionable Male Branch Tee	Female Run Tee	Female Branch Tee	Cap
			
Plug	Reducer	Port Connector	Male Adapter
			
Female Adapter	Weld Connector	Weld Elbow	Flange Adapter

How to Order

F8

MC

NPT8

Port 3 and Port 4 — 316

Port 1 Type	Port 1 Size	Configuration Designator	Port 2 Type	Port 2 Size	Port 3 and Port 4	Material
M Metric Ferrule F Fractional Ferrule	1 1/16 in. 2 1/8 in. or 2 mm 3 3/16 in. or 3 mm 4 1/4 in. or 4 mm 5 5/16 in. 6 3/8 in. or 6 mm 8 1/2 in. or 8 mm 10 5/8 in. or 10 mm 12 3/4 in. or 12 mm 14 7/8 in. or 14 mm 16 1 in. or 16 mm 15 15 mm 18 1 1/8 in. or 18 mm 20 1 1/4 in. or 20 mm 22 22 mm 24 1 1/2 in. or 24 mm 25 25 mm 28 28 mm 30 30 mm 32 2 in. or 32 mm 38 38 mm 50 50 mm	MC Male Connector BMC Bulkhead Male Connector TC Thermocouple Connector FC Female Connector BFC Bulkhead Female Connector U Union BU Bulkhead Union ME Male Elbow 45MC 45° Male Elbow PME Positionable Male Elbow FE Female Elbow UE Union Elbow MRT Male Run Tee MBT Male Branch Tee PMRT Positionable Male Run Tee PMBT Positionable Male Branch Tee FRT Female Run Tee FBT Female Branch Tee UT Union Tee UC Union Cross CA Cap PL Plug R Reducer PC Port Connector MA Male Adapter FA Female Adapter WC Weld Connector WE Weld Elbow	Same as the Port 1 or as follow: FNPT Female NPT NPT Male NPT ONPT O-ring with Male NPT FBT Female BSPT MBT Male BSPT OMBT O-ring with Male BSPT FBP Female BSPP (for BP, BS) FBPG Female BSPP (for BG) MBP Male BSPP (for BP) MBS Male BSPP (for BS) MBG Male BSPP (for BG) FMS Female ISO (for BP, BS) FMSG Female ISO (for BG) MS Male ISO (for BG) MSP Male ISO (for BP) MSS Male ISO (for BS) MSO O-ring with Male ISO FSA Female SAE (for BP, BS) FSAG Female SAE (for BG) MSA Male SAE (for BG) MSAP Male SAE (for BP) MSAS Male SAE (for BS) MSAO O-ring with Male SAE PPT Positionable BSP Parallel Thread PST Positionable ISO Parallel Thread PAT Positionable SAE Parallel Thread FSW Fractional Tube Socket Weld FBW Fractional Tube Butt Weld MSW Metric Tube Socket Weld MBW Metric Tube Butt Weld	Same as the Port 1 or as follow: 5 M5 x 0.8 or 5/16-24 6 M6 x 1 or 3/8-24 7 7/16-20 8 M8 x 1 or 1/2-20 9 9/16-18 10 M10 x 1 12 M12 x 1.5 or 3/4-16 14 M14 x 1.5 or 7/8-14 16 M16 x 1.5 17 1 1/16-12 18 M18 x 1.5 19 1 3/16-12 20 M20 x 1.5 21 1 5/16-12 22 M22 x 1.5 24 M24 x 1.5 26 1 5/8-12 27 M27 x 2 30 1 7/8-12	Same as the Port 1	316 304 Alloy 20 Alloy 400 Alloy 600 Alloy 625 Alloy C-276 Aluminum Brass Steel Duplex 2507 Titanium

