Tubing

TMP, TCT, TBA, TEP, PEP, TCA, T15A, T20D, T20M, T60H, TJT, TIT, TST and TET Series

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Content

General Information

Types of Tubing

Instrumentation Tubing

Available in TMP series and TCT series.
TMP series seamless straight-length tubing, internal surface pickled, bright annealed, external surface machined finished.
TCT series seamless coiled tubing, internal surface bright annealed, external surface machined finished.
Materials: stainless steel, duplex stainless steel or nickel-based alloy. Enhanced-316/316L available: within the range as defined by ASTM A269, Ni, Cr and Mo contents are controlled closer to the maximum value and Nieq≥28.5%.
Sizes: TMP series: 1/16" to 2", 2 mm to 50 mm. TCT series: 1/32" to 1/2", 0.8 mm to 12 mm.
Standard length: TMP series: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m. TCT series: 180 ft to 7218 ft, 60 m to 2108 m.
Customized length as per customer requirement is also available

High Purity Tubing

Available in TBA, TEP, PEP and TCA series.
TBA series seamless straight-length tubing, bright annealed, internal surface roughness of Ra 20 μin. (0.51 μm) max.; ultrasonically cleaned, then purged and dried with high purity nitrogen in a cleanroom; suitable for high purity gas systems.
TEP and PEP series seamless straight-length tubing, electropolished internal surface roughness of Ra 10 μin. (0.25 μm) max.; ultrasonically cleaned, then purged and dried with Ultra High Purity (UHP) hot nitrogen in a cleanroom; suitable for ultra high purity systems.
TCA series coaxial tubing and fittings, electropolished internal surface of inner tube with roughness of Ra 10 μin. (0.25 μm) max; ultrasonically cleaned, then purged and dried with Ultra High Purity (UHP) hot nitrogen and assembled in a cleanroom.
Materials: TBA, PEP Series: 316L. TEP Series: 316L, 316L VAR, 316L VIM-VAR
TCA Series: inner tube: 316L, 316L VAR, 316L VIM-VAR, outer tube: 316L, 304L
Sizes: TBA, TEP, PEP Series: 1/8" to 2 1/2 ", 6A to 50A. TCA Series: inner tube: 1/4"-2", outer tube: 1/2"-2 1/2"
Standard length: 20 ft, 2 m, 3 m, 4 m and 6 m.

Medium and High Pressure Tubing

Available in T15A, T20D, T20M and T60H series.
T15A series tubing, seamless in straight lengths, annealed, with working pressure up to 15,000 psig (1034 bar).
T20D series tubing, seamless in straight lengths, 1/8-hard, with working pressure up to 20,000 psig (1379 bar).
T20M series medium pressure tubing, seamless, cold-drawn and full hard, with working pressure up to 20,000 psig (1379 bar), for coned and threaded connections.
T60H series high pressure tubing, seamless in straight lengths, cold-drawn and full hard, with working pressure up to 60,000 psig (4137 bar), for coned and threaded connections.
Materials: 316/316L stainless steel, enhanced-316/316L.
Sizes: T15A series: 1/8", 1/4", 3/8", 1/2", 3/4" and 1"
T20D series: 1/4", 3/8", 1/2", 3/4" and 1"
T20M series: 1/4", 3/8", 9/16", 3/4", 1" and 1 1/2"
T60H series: 1/4", 3/8"and 9/16"
Standard length:
T15A, T20D series: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m, customized length as per customer requirement is also available.
T20M series: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m, straight-length tubing and coned and threaded nipples in custom length are also available. The T20M series in 1/4" size is additionally available in coiled form.
T60H series: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m, straight-length tubing and coned and threaded nipples in custom length are also available.

Jacketed Tubing

TJT series jacketed tubing, seamless, corrosion and abrasion resistant, available in straight lengths or coils.
Materials: stainless steel or copper.
Tubing sizes: 1/4" to 1 1/4", 6 mm to 32 mm.
For working pressure, refer to the TMP Series straight tubing and TCT Series coiled tubing.
Standard length: 20 ft and 6 m in straight lengths, 130 ft to 6560 ft or 40 m to 1600 m in coils.

Insulated Tubing

TIT series insulated tubing, seamless, thermal insulating, corrosion and abrasion resistant, supplied in coils.
Materials: stainless steel or copper.
Tubing sizes: 1/4" to 1 1/4", 6 mm to 32 mm.
For working pressure, refer to the TMP Series straight tubing and TCT Series coiled tubing.
Standard length: 20 ft and 6 m in straight lengths, 130 ft to 1640 ft or 40 m to 500 m in coils.

Heat Trace Tubing

TST Series Steam Heat Traced Tubing integrates process tubes and tracer tubes, which are available in seamless straight tubing or coiled tubing. It is offered in light or heavy trace configurations, with temperature maintenance ranges of 50°F–200°F (10°C–93°C) and 200°F–355°F (93°C–179°C) respectively.
Materials: stainless steel or copper
Inner Tube O.D.: 6-12 mm, 1/4"-1/2"
For working pressure, refer to the TMP Series straight tubing and TCT Series coiled tubing.
Standard length: 20 ft and 6 m in straight lengths, 130 ft to 1312 ft or 40 m to 400 m in coils.
Standard Supply Length:
Straight tubing: 6 m, 20 ft
Coiled tubing: 40-400 m/coil or 130-1,312 ft/coil

Electrical Heat Traced Tubing

TET Series Electrical Heat Traced Tubing integrates inner tubes with heating cables. The inner tubes are available in seamless straight tubing or coiled tubing. Heating cables are offered in low, medium, and high temperature types, with maximum continuous exposure temperatures of 149°F (65°C), 230°F (110°C), and 500°F (260°C) respectively.
Materials: stainless steel or copper
Inner Tube O.D.: 6-12 mm, 1/4"-1/2"
For working pressure, refer to the TMP Series straight tubing and TCT Series coiled tubing.
Standard Supply Length: Straight tubing: 6 m, 20 ft
Coiled tubing:
Low and medium temperature types: 40–305 m/coil or 130–1,000 ft/coil
High temperature type: 40–230 m/coil or 130–755 ft/coil

Materials

Materials \ Series		TMP	TCT	TBA	TEP	PEP	TCA	T15A	T20D	T20M	T60H	TJT	TIT	TST	TET
Stainless Steel	316/316L	√	√					√	√	√	√	√	√	√	
	Enhanced-316/316L (higher Cr, Ni and Mo content)	√	√					√	√	√	√				
	316L			√	√	√	√								
	316L (JIS standard)					√									
	316L VAR				√		√								
	316L VIM-VAR				√		√								
	304/304L	√	√												
	6Mo (S31254)	√													
Duplex Stainless Steel	2205	√													
	2507	√													
Nickel -Based Alloy	400	√													
	20	√													
	600	√													
	625	√													
	825	√													
	C-276	√													
Copper	C12200	√	√									√	√	√	√

Notes: 1. √ means materials are provided as standard.
2. Materials not marked with standard comply with ASTM standard.
3. Other materials are available subject to confirmation from FITOK.

Match of Tubing and Fittings

√ Recommended application ○ Applicable but not optimal □ Limited application subject to confirmation from FITOK × Not applicable

Series / Heat Treatment / Hardness / Connection	TMP	TCT	TBA	TEP	PEP	TCA	T15A	T20D	T20M	T60H	TJT	TIT	TST	TET
	Annealed							1/8-Hard	Hard		Annealed			
	⩽ 80 HRB			⩽ 90 HRB				⩽ 26 HRC	⩾ 98 HRB	-	⩽ 80 HRB			
6D Series Tube Fittings	√	√	○	○	×	×	□	×	×	×	√	√	√	√
6S Series Single-Ferrule Tube Fittings	√	√	○	○	×	×	□	×	×	×	√	√	√	√
37° Flared Fittings	○	○	○	○	×	×	×	×	×	×	○	○	○	○
Orbital Welding	○	○	√	√	√	√	□	×	×	×	○	○	○	○
15S Series Single-Ferrule Tube Fittings	□	□	□	□	×	×	√	×	×	×	□	□	□	□
20D Series Tube Fittings	□	□	□	□	×	×	√	√	○①	×	□	□	□	□
20M Series Medium Pressure Fittings	×	×	×	×	×	×	×	×	√	□	×	×	×	×
60H Series High Pressure Fittings	×	×	×	×	×	×	×	×	×	√	×	×	×	×

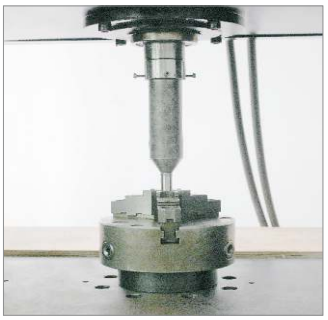
① Contact FITOK Group for installation methods of 20D series tube fittings with 20M series tubing.

Working Pressure

Working pressures are calculated based on ASME B31.3. To determine working pressures at elevated temperatures, multiply the working pressures at ambient temperature by the elevated temperature factors.
For more details, refer to applicable sections below.

Inspection Items

- ◎ Composition Analysis
- ◎ Metallographic Examination
- ◎ Hardness Test
- ◎ Tensile Test
- ◎ Flaring Test
- ◎ Intergranular Corrosion Test
- ◎ Surface Roughness Measurement
- ◎ Hydrostatic Test
- ◎ Eddy Current Test
- ◎ Ultrasonic Test
- ◎ Particle Test
- ◎ Dew Point Test
- ◎ Oil Content Test
- ◎ Scanning Electron Microscope (SEM)
- ◎ Auger Electron Spectroscopy (AES)
- ◎ X-Ray Photoelectron Spectroscopy (ESCA or XPS)


Packaging

Seamless Straight-Length Tubing

Tubing ends polyethylene capped; tubing bulk packed in cardboard box, cardboard tubes or crates.
However, in between the two processes, TBA series tubing should be additionally packed in a single polyethylene bag, and TEP series tubing in double polyethylene bags, with tubing ends fitted with anti-static film and caps

Seamless Coiled Tubing

Two kinds of packaging methods:
Tubing ends polyethylene capped; tubing packed in coils and wrapped with a polyethylene film.
Tubing ends polyethylene capped; tubing packed in coils on wooden reel and firmly anchored by a polyethylene plate.
The first packaging method is standard, if packaging with wooden reel is needed, please contact FITOK Group or our authorized distributors.

Instrumentation Tubing

TMP Series

Features

- ◎ Materials: stainless steel, duplex stainless steel or nickel-based alloy
- ◎ Sizes: 1/16" to 2" and 2 mm to 50 mm
- ◎ Working temperature: -325°F to 1000°F (-198°C to 537°C)
- ◎ Pickled, or bright annealed or cold worked followed by bright annealing, machined finished external surface
- ◎ For use with FITOK 6D series tube fittings, 4:1 safety factor for the tubing and connection part of fitting and tubing
- ◎ Marked with brand, material grade, standard, specification and heat number
- ◎ Standard length: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
  Customized length as per customer requirement is also available

Materials

UNS	Grade	ASTM Standard	FITOK Designator	Composition %					Mechanical Properties			
				C	Cr	Ni	Mo	Others	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness
S31600/ S31603①	316/316L	A269	SS	⩽0.035③	16-18	10-14	2.0-3.0	-	⩾205	⩾515	⩾35	⩽80 HRB
Enhanced-S31600/S31603①	Enhanced-316/316L②		SH	⩽0.03	17-18	12-14	2.6-3.0					
S30400/ S30403①	304/304L		S4	⩽0.035③	18-20	8-11	-					
N08904	904L	A269	904L	⩽0.02	19-23	23-28	4.0-5.0	Cu, N	⩾490	⩾215	⩾35	⩽80 HRB
S31254	6Mo	A269	S12	⩽0.02	19.5-20.5	17.5-18.5	6.0-6.5		⩾310	⩾675	⩾35	⩽96 HRB
S31803	2205	A789	D5	⩽0.03	21-23	4.5-6.5	2.5-3.5		⩾450	⩾620	⩾25	⩽30 HRC
S32750①	2507	A789	D7	⩽0.03	24-26	6-8	3.0-5.0	Cu, N	⩾550	⩾800	⩾15	⩽32 HRC
N04400①	Alloy 400	B165	M	⩽0.30	-	⩾63	-	Cu 28-34	⩾195	⩾480	⩾35	⩽75 HRB
N08020	Alloy 20	B729	A20	⩽0.07	19-21	32-38	2.0-3.0	Cu, Nb, Ta	⩾240	⩾550	⩾30	⩽95 HRB
N06600	Alloy 600	B167	INC	⩽0.15	14-17	⩾72	-	Cu	⩾205	⩾550	⩾35	⩽92 HRB
N06625	Alloy 625	B444	A65	⩽0.10	20-23	⩾58	8.0-10.0	Cb, Ta	⩾276	⩾690	⩾30	⩽25 HRC
N08825	Alloy 825	B423	A85	⩽0.05	19.5-23.5	38-46	2.5-3.5	Cu, Ti	⩾241	⩾586	⩾30	⩽201 HV
N10276①	Alloy C-276	B622	HC	⩽0.01	14.5-16.5	BAL	15.0-17.0	W	⩾283	⩾690	⩾40	⩽100 HRB

① Materials are compliant with NACE MR0175 by default. For additional requirements, please contact FITOK.
② Enhanced-316/316L complying with GB50516-2021 Technical Code for Hydrogen Fuelling Station is available, in which Ni_{eq} is not less than 28.5%. Contact FITOK Group for more information.
③ The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

Dimensional Tolerance

Materials	Tube O.D. (D) in. (mm)	O.D. Tolerance in. (mm)	Wall Thickness Tolerance %
316/316L Enhanced-316/316L 304/304L 6Mo 904L	D＜3/32 (2.38)	+0.002 (0.05)/-0	+/-10
	3/32 (2.38)≤D＜3/16 (4.76)	+0.003 (0.08)/-0	
	3/16 (4.76)≤D≤1 (25.4)	+/-0.004 (0.10)	
	1 (25.4)＜D≤1 1/2 (38.1)	+/-0.005 (0.13)	
	1 1/2 (38.1)＜D＜2 (50.8)	+/-0.008 (0.2)	
	D≥2 (50.8)	+/-0.010 (0.25)	
2205 2507	D＜1/2 (12.7)	+/-0.005 (0.13)	+/-15
	1/2 (12.7)≤D≤3/4 (19.05)		+/-10
Alloy 400 Alloy 20	D＜5/8 (16)	+/-0.005 (0.13)	+/-15
	5/8 (16)≤D＜1 (25)		+/-10
Alloy 600	D＜5/8 (16)	+/-0.005 (0.13)	+/-12.5
Alloy 625	3/16 (4.8)≤D＜1/2 (12.7)	+0.004 (0.10)/-0	+/-10
	D≥1/2 (12.7)	+0.005 (0.13)/-0	
Alloy 825	D≤2/5 (10)	+/-0.004 (0.10)	+/-15
	2/5 (10)＜D＜5/8 (16)	+/-0.005 (0.13)	
Alloy C-276	D≤2/5 (10)	+/-0.004 (0.10)	
	2/5 (10)＜D＜5/8 (16)	+/-0.005 (0.13)	

Working Pressure at Ambient Temperature

Figures and tables are for reference only. No implication is made that these values can be used for design work. Applicable codes and practices in industry should be considered. ASME Codes are the successor to and replacement of ASA Piping Codes.

◎ All pressures are calculated from equations in ASME B31.3, Process Piping. See factors for calculating working pressures in accordance with ASME B31.1, Power Piping.

◎ Calculations are based on maximum O.D. and minimum wall thickness, except as noted in individual tables.
Example: ″ in. O.D.×0.035 in. wall thickness stainless steel tubing according to ASTM A269:
O.D. Tolerance ±0.005 in. / Wall Thickness Tolerance ±10%
Calculations are based on 0.505 in.O.D.×0.0315 in. wall thickness tubing.

◎ No allowance is made for corrosion or erosion.

Enhanced-316/316L, 316/316L and 304/304L Stainless Steel Tubing

Table 1 — Fractional Seamless Tubing

Allowable working pressures are calculated from an S value of 20 000 psig (137.8 MPa) for ASTM A269 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

For Welded Tubing

For welded and drawn tubing, a derating factor must be applied for weld integrity:

- For double-welded tubing, multiply working pressure by 0.85.
- For single-welded tubing, multiply working pressure by 0.80.

Tube O.D. (in.)	Tube Wall Thickness, in.															
	0.010	0.012	0.014	0.016	0.020	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
	Working Pressure, psig															
1/16	5600	6800	8100	9400	12000											
1/8						8500	10900									
3/16						5400	7000	10200								
1/4						4000	5100	7500	10200							
5/16							4000	5800	8000							
3/8							3300	4800	6500	7500						
1/2							2600	3700	5100	6700						
5/8								2900	4000	5200	6000					
3/4								2400	3300	4200	4900	5800				
7/8								2000	2800	3600	4200	4800				
1									2400	3100	3600	4200	4700			
1 1/4										2400	2800	3300	3600	4100	4900	
1 1/2											2300	2700	3000	3400	4000	4900
2												2000	2200	2500	2900	3600

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 2—Metric Seamless Tubing

Tube O.D. (mm)	Tube Wall Thickness, mm													
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.5	4.0	4.5	5.0
	Working Pressure, bar													
3	670													
6	310	420	540	710										
8		310	390	520										
10		240	300	400	510	580								
12		200	250	330	410	470								
14		160	200	270	340	380	430							
15		150	190	250	310	360	400							
16			170	230	290	330	370	400						
18			150	200	260	290	320	370						
20			140	180	230	260	290	330	380					
22			140	160	200	230	260	300	340					
25					180	200	230	260	290	320				
28						180	200	230	260	280	330			
30						170	180	210	240	260	310			
32						160	170	200	220	240	290	330		
38							140	160	190	200	240	270	310	
50										150	180	210	240	270

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed (Type 304/304L, 316/316L, Enhanced-316/316L) (seamless or welded and drawn) stainless steel hydraulic tubing, ASTM A269 or A213, or equivalent. Hardness not to exceed 80 HRB. Tubing to be free of scratches, suitable for bending and flaring.

Note: Certain austenitic stainless tubing has an allowable ovality tolerance double the O.D. tolerance and may not fit into FITOK precision tube fittings.

904L Tubing

Allowable working pressures are calculated from an S value of 20,700 psi (143 MPa) for ASTM A269 annealed seamless tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 3 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.035	0.049	0.065	0.083
	Working Pressure, psig			
1/4	5200	7600	10500	
3/8		4800	6600	
1/2		3700	5100	6700

Table 4 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm		
	1.0	1.2	1.5
	Working Pressure, bar		
10	250	300	380
12	200	240	310

Suggested Ordering Information

ASTM A269–compliant, fully annealed 904L stainless steel tubing or an equivalent alternative with a maximum hardness of 80 HRB. The tubing must be free of scratches and suitable for bending and flaring.

6 Mo Tubing

Allowable working pressures are calculated from an S value of 27100 psig (186.8 MPa) for ASTM A269 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B 31.3 and ASME B31.1.

Table 5 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.028	0.035	0.049	0.065
	Working Pressure, psig			
1/4	5400	6900	10100	13900
3/8		4500	6500	8900
1/2		3500	5000	6900

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 6 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm				
	0.8	1	1.2	1.5	1.8
	Working Pressure, bar				
6	430	580	740	980	
8		420	530	710	
10		330	420	550	700
12		270	340	450	570

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed S31254 tubing, ASTM A269 or equivalent. Hardness not to exceed 96 HRB. Tubing to be free of scratches, suitable for bending and flaring. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Super Duplex 2507 Tubing

Allowable working pressures are calculated from an S value of 38 700 psig (266.8 MPa) for ASTM A789 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3.

Table 7 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.				
	0.035	0.049	0.065	0.083	0.095
	Working Pressure, psig				
1/4	10000	15000			
3/8	6500	10100	12700		
1/2	5000	7200	10100	12900	
5/8		5800	7600	10100	
3/4		4700	6300	8500	10000

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed super duplex 2507 tubing, ASTM A789 or equivalent. Hardness not to exceed 32 HRC. Tubing to be free of scratches, suitable for bending and flaring.

Alloy 400 Tubing

Allowable working pressures are calculated from an S value of 18 700 psig (128.9 MPa) for ASTM B165 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 8 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.							
	0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120
	Working Pressure, psig							
1/8	7900	10100						
1/4	3700	4800	7000	9500				
5/16		3700	5400	7300				
3/8		3100	4400	6100				
1/2		2300	3200	4400				
3/4			2200	3000	4000	4600		
1				2200	2900	3400	3900	4300

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 9 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm									
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0
	Working Pressure, bar									
6	310	390	490	620						
8		290	350	450						
10		220	280	350						
12		180	230	290						
14		160	190	240	270					
18			150	200	240	270	300			
20				180	210	240	270	290		
25					170	190	210	240	270	290

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed seamless alloy 400 hydraulic tubing, ASTM B165 or equivalent. Hardness not to exceed 75 HRB. Tubing to be free of scratches, suitable for bending and flaring. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Alloy 20 Tubing

Allowable working pressures are calculated from an S value of 20 000 psi (137.8 MPa) for ASTM B729 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 10 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.028	0.035	0.049	0.065
	Working Pressure, psig			
1/4	4000	5100	7500	10200
3/8		3300	4800	6500
1/2		2600	3700	5100

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 11 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm			
	0.8	1.0	1.2	1.5
	Working Pressure, bar			
6	310	420	520	670
10		240	300	380
12		200	240	310

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed seamless or welded and drawn alloy 20 tubing, ASTM B729, B468 or equivalent. Hardness not to exceed 95 HRB. Tubing to be free of scratches, suitable for bending and flaring. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Alloy 600 Tubing

Allowable working pressures are calculated from an S value of 20 000 psi (137.8 MPa) for ASTM B167 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 12 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.028	0.035	0.049	0.065
	Working Pressure, psig			
1/4	4000	5100	7500	10200
3/8		3300	4800	6500
1/2		2600	3700	5100

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 13 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm			
	0.8	1.0	1.2	1.5
	Working Pressure, bar			
6	310	420	520	670
10		240	300	380
12		200	240	310

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed, cold drawn #1 temper alloy 600 seamless alloy tubing, ASTM B167 or equivalent. Hardness not to exceed 92 HRB. Tubing to be free of scratches, suitable for bending and flaring. Order to outside diameter and wall thickness only, not to inside diameter, average wall specification. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Alloy 625 Tubing

Allowable working pressures are calculated from an S value of 26 700 psig (184.1 MPa) for ASTM B444 Grade 2 tubing at -20 to 100°F (-28 to 37°C) in accordance with ASME BPV 2007 Section II, Part D, Table 1B, tubing outside diameter and wall thickness tolerances from ASTM B444 for small-diameter tube.

Table 14 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.		
	0.035	0.049	0.065
	Working Pressure, psig		
1/4	7300	10700	14600
3/8	4700	6800	9400
1/2	3500	5000	6800

Table 15 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm				
	0.8	1.0	1.2	1.5	1.8
	Working Pressure, bar				
6	470	610	750		
10		350	430	550	
12		290	350	450	550

Suggested Ordering Information

High-quality, fully annealed seamless alloy 625 tubing, ASTM B444, Grade 2 or equivalent. Hardness not to exceed 25 HRC. Tubing to be free of scratches, suitable for bending and flaring.

Note: For sizes not listed in the tables above, we recommend that a sample of the tubing and all pertinent information relating to system parameters be provided for evaluation before installation. Give tubing sample and system information to any of authorized FITOK distributors to forward to the factory.

Alloy 825 Tubing

Allowable working pressures are calculated from an S value of 23 300 psi (160.6 MPa) for ASTM B704 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 or ASME BPV 2007 Section II, Part D, Table 1B.

Table 16 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.		
	0.035	0.049	0.065
	Working Pressure, psig		
1/4	6400	9300	11600
3/8	4100	5900	8200
1/2	3000	4300	5900

Table 17 — Metric

Tube O.D. (in.)	Tube Wall Thickness, mm				
	0.8	1.0	1.2	1.5	1.8
	Working Pressure, bar				
6	410	530	660		
10		300	370	480	
12		250	300	390	480

Suggested Ordering Information

High-quality, fully annealed seamless alloy 825 tubing, ASTM B163, or equivalent. Fully annealed welded alloy 825 tubing, ASTM B704, class 1 or equivalent. Hardness not to exceed 90 HRB. Tubing to be free of scratches, suitable for bending and flaring. Wall thickness tolerances not to exceed ±10%.

Alloy C-276 Tubing

Allowable working pressures are calculated from an S value of 20 000 psi (137.8 MPa) for ASTM B622 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 18 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.028	0.035	0.049	0.065
	Working Pressure, psig			
1/4	4000	5100	7500	10200
5/16		4000	5800	7800
3/8		3300	4800	6500
1/2		2600	3700	5100

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 19 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm			
	0.8	1.0	1.2	1.5
	Working Pressure, bar			
6	310	420	520	670
8		310	390	500
10		240	300	380
12		200	240	310

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed alloy C-276 tubing, ASTM B622 or equivalent. Hardness not to exceed 100 HRB. Tubing to be free of scratches, suitable for bending and flaring. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Copper Tubing

Allowable working pressures are calculated from an S value of 6000 psi (41.3 MPa) for ASTM B75 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

Table 20 —Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.									
	0.028	0.030	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134
	Working Pressure, psig									
1/8	2700	3000	3600							
3/16	1800	1900	2300	3400						
1/4	1300	1400	1600	2500	3500					
5/16			1300	1900	2700					
3/8			1000	1600	2200					
1/2			800	1100	1600	2100				
5/8				900	1200	1600	1900			
3/4				700	1000	1300	1500	1800		
7/8				600	800	1100	1300	1500		
1				500	700	900	1100	1300	1500	
1 1/8					600	800	1000	1100	1300	1400

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 21 —Metric

Tube O.D. (mm)	Tube Wall Thickness, mm									
	0.8	1.0	1.2	1.5	1.8	2.0	2.2	2.5	2.8	3.0
	Working Pressure, bar									
6	110	140	170	220						
8		100	120	160						
10		80	100	130						
12		60	80	100	130	140				
14		50	60	90	110	120	130			
15			60	80	100	110	120			
16				70	90	100	110	120		
18				60	80	90	100	110		
20				60	70	80	90	100	110	
22				50	60	70	80	90	100	
25				40	50	60	70	80	90	100
28					40	50	60	70	80	90

Note: For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, soft annealed seamless copper tubing, ASTM B75 (B75M) or equivalent. Also soft annealed (Temper O) copper water tube, type K or type L to ASTM B88.

Grade 2 Titanium Tubing

Allowable working pressures are calculated from an S value of 16 700 psi (115.1 MPa) for ASTM B338 tubing at 20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1. For working pressure in accordance with ASME B31.1, multiply by 0.85.

Table 22 — Fractional

Tube O.D. (in.)	Tube Wall Thickness, in.			
	0.028	0.035	0.049	0.065
	Working Pressure, psig			
1/4	3500	4500	6700	9100
3/8		2900	4200	5800
1/2		2100	3100	4200

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Table 23 — Metric

Tube O.D. (mm)	Tube Wall Thickness, mm			
	0.8	1.0	1.2	1.5
	Working Pressure, bar			
6	290	380	470	600
10		210	260	340
12		180	220	280

Note:For gas service, select tubing with a wall thickness corresponding to a working pressure outside the shaded area.

Suggested Ordering Information

High-quality, fully annealed seamless or welded and drawn grade 2 titanium tubing, ASTM B338 or equivalent. Tubing to be free of scratches, suitable for bending. O.D. tolerances not to exceed ±0.005 in (±0.13 mm).

Pressure Ratings at Elevated Temperatures

Table 24 — Elevated Temperature Factors

Temperature		Tubing Materials												
°F	°C	316/316L①	304/304L①	904L	6 Mo	Super Duplex 2507	Alloy 400	Alloy 20②	Alloy 600②	Alloy 625	Alloy 825	Alloy C-276②	Copper	Ti
200	93	1.00	1.00	1.00	0.90	0.99	0.87	1.00	1.00	0.93	1.00	1.00	0.80	0.86
400	204	0.96	0.93	0.91	0.74	0.91	0.79	0.96	0.96	0.85	0.90	0.96	0.50	0.61
600	315	0.85	0.82		0.67	0.89③	0.79	0.85	0.85	0.79	0.84	0.85		0.45
800	426	0.79	0.76				0.75	0.79	0.79	0.75	0.81	0.79		
1000	537	0.76	0.69						0.35	0.73		0.76		

① Dual-certified grades such as 304/304L and 316/316L meet the minimum chemistry and the mechanical properties of both alloy grades.
② Based on the lower derating factor for stainless steel, in accordance with ASME B31.3.
③ Using 2507 duplex stainless steel at temperatures above 482°F (250°C) may cause microstructural changes, resulting in embrittlement and reduced corrosion resistance. At 482°F (250°C), the rating reduction factor is 0.90.

To determine allowable working pressure at elevated temperatures, multiply allowable working pressures from Tables 1 through 21 by a factor shown in Table 22.

Example: Type 316/316L stainless steel 1/2 in. O.D.×0.035 in. wall at 1000°F

1. The allowable working pressure at -20 to 100°F (-28 to 37°C) is 2600 psig (Table 1, page F-07).
2. The elevated temperature factor for 1000°F (537°C) is 0.76 (Table 22, above):
   2600 psig×0.76 = 1976 psig

The allowable working pressure for 316/316L 1/2 in. O.D.×0.035 in. wall tubing at 1000°F (537°C) is 1976 psig.

TCT Series

Features

◎ Materials: 316/316L, enhanced-316/316L or 304/304L
◎ Sizes: 1/32" to 1/2" and 0.8 mm to 12 mm
◎ Working temperature: -325°F to 1000°F (-198°C to 537°C)
◎ Bright annealed with machined finished external surface
◎ For use with FITOK 6D series tube fittings, 4:1 safety factor for the tubing and connection part of fitting and tubing
◎ Marked with brand, material grade, standard, specification and heat number

Materials

UNS	Grade	ASTM Standard	FITOK Designator	Composition %				Mechanical Properties			
				C	Cr	Ni	Mo	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness
S31600/S31603	316/316L	A269	SS	≤0.035②	16-18	10-14	2.0-3.0	≥205	≥515	≥35	≤80 HRB
Enhanced-S31600/31603	Enhanced-316/316L①		SH	≤0.030	17-18	12-14	2.6-3.0				
S30400/S30403	304/304L		S4	≤0.035②	18-20	8-11	-				

① Enhanced-316/316L complying with GB50516-2021 Technical Code for Hydrogen Fuelling Station is available, in which Ni_{eq} is not less than 28.5%. Contact FITOK Group for more information.
② The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

Working Pressure and Elevated Temperature Factors

Refer to the working pressure of TMP series tubing.

Ordering Information and Dimensions

Random length example
Customer requirement: coiled tubing, 316/316L stainless steel , 12 mm O. D. x 1.5 mm wall thickness, about 150 m/coil length, total length 1500 m.
Recommended ordering number: SS-TCT-12MM-1.5-CL21M
Actual supply length is 135-166 m/coil, about 10 coils, total 1500 m.

Random Length Grade Table

Fractional

FITOK P/N	Tube O.D. in.	Wall① Thickness in.	Random Length Grade②				Cut Length③ Tolerance ft, (m)
			CL11F (CL11M)	CL21F (CL21M)	CL31F (CL31M)	CL41F (CL41M)	
			Length Range/ft, (m)				
-TCT-1-014-	1/16	0.014	1341-1714 (408-522)	2683-3280 (818-999)	4026-4921 (1226-1499)	5368-6561④ (1636-1999)	+1.640 (+0.50)
-TCT-1-016-		0.016	1230-1572 (374-478)	2460-3007 (749-916)	3690-4511 (1125-1375)	4921-6014④ (1499-1832)	
-TCT-1-020-		0.020	1077-1376 (327-418)	2154-2633 (656-801)	3232-3951 (984-1203)	4310-5267④ (1313-1604)	
-TCT-1.5-014-	3/32	0.014	815-1041 (248-317)	1630-1993 (496-607)	2447-2990 (745-910)	3262-3987④ (993-1214)	
-TCT-1.5-020-		0.020	617-788 (188-240)	1234-1509 (376-459)	1853-2264 (564-689)	2470-3019④ (752-919)	
-TCT-1.5-028-		0.028	495-632 (150-192)	990-1211 (301-368)	1485-1816 (452-553)	1981-2422④ (603-738)	
-TCT-2-016-	1/8	0.016	522-668 (159-203)	1046-1279 (318-389)	1570-1919 (477-584)	2093-2558④ (638-779)	
-TCT-2-020		0.020	433-554 (132-169)	868-1061 (264-323)	1302-1591 (396-485)	1737-2123④ (529-646)	
-TCT-2-028-		0.028	335-428 (101-129)	672-821 (204-249)	1008-1233 (306-375)	1344-1643④ (409-500)	
-TCT-2-035-		0.035	288-369 (88-112)	578-707 (176-215)	868-1061 (264-323)	1157-1414④ (352-431)	
-TCT-3-020-	3/16	0.020	271-347 (82-105)	544-665 (165-202)	817-998 (248-303)	1089-1331④ (332-405)	
-TCT-3-028-		0.028	204-261 (62-79)	408-499 (124-151)	612-749 (186-227)	817-998④ (249-304)	
-TCT-3-035-		0.035	171-218 (51-65)	342-418 (103-126)	513-627 (155-190)	684-836④ (207-254)	
-TCT-4-028-	1/4	0.028	738-943 (225-287)	1476-1804 (450-550)	2952-3609 (900-1100)	5905-7218 (1800-2200)	
-TCT-4-035-		0.035	605-773 (184-235)	1212-1481 (369-451)	2425-2964 (738-903)	4851-5930 (1478-1807)	
-TCT-4-049-		0.049	500-639 (152-194)	926-1131 (281-344)	1853-2264 (564-689)	3707-4530 (1129-1380)	
-TCT-4-065-		0.065	469-600 (143-182)	910-1113 (277-338)	1517-1854 (462-565)	3035-3710 (925-1130)	
-TCT-6-035-	3/8	0.035	382-488 (116-148)	765-936 (233-284)	1532-1873 (467-570)	3066-3747 (934-1141)	
-TCT-6-049-		0.049	307-393 (93-119)	570-697 (173-212)	1142-1395 (347-424)	2284-2791 (695-850)	
-TCT-6-065-		0.065	279-357 (85-109)	542-663 (164-201)	905-1106 (275-336)	1810-2213 (551-674)	
-TCT-8-035-	1/2	0.035	279-357 (84-108)	560-685 (170-207)	1121-1370 (341-416)	2243-2742 (683-834)	
-TCT-8-049-		0.049	222-284 (67-86)	413-504 (125-152)	826-1009 (251-306)	1652-2019 (503-614)	
-TCT-8-065-		0.065	199-255 (60-77)	387-473 (117-144)	645-788 (196-239)	1290-1577 (393-480)	
-TCT-8-083-		0.083	162-208 (49-63)	315-386 (96-117)	527-644 (160-195)	1054-1289 (321-392)	

Metric

FITOK P/N	Tube O.D. mm	Wall① Thickness mm	Random Length Grade②				Cut Length③ Tolerance m
			CL11M	CL21M	CL31M	CL41M	
			Length Range/m				
-TCT-3MM-0.5-	3	0.5	143-182	287-350	431-526	574-701④	+0.50
-TCT-3MM-0.8-		0.8	101-129	203-248	306-374	407-498④	
-TCT-6MM-0.8-	6	0.8	215-274	431-526	862-1053	1725-2108	
-TCT-6MM-1.0-		1.0	180-230	360-440	720-880	1440-1760	
-TCT-6MM-1.2-		1.2	167-213	311-380	622-761	1246-1523	
-TCT-6MM-1.5-		1.5	164-210	319-390	531-650	1064-1301	
-TCT-8MM-1.0-	8	1.0	127-163	256-313	513-628	1027-1256	
-TCT-8MM-1.2-		1.2	117-150	219-268	439-536	879-1074	
-TCT-8MM-1.5-		1.5	114-146	220-269	368-449	737-900	
-TCT-10MM-1.0-	10	1.0	99-126	198-243	398-487	797-974	
-TCT-10MM-1.2-		1.2	91-117	169-206	339-414	679-830	
-TCT-10MM-1.5-		1.5	86-110	168-205	280-343	562-687	
-TCT-12MM-1.0-	12	1.0	81-103	162-199	325-398	652-797	
-TCT-12MM-1.2-		1.2	74-95	137-168	276-337	553-676	
-TCT-12MM-1.5-		1.5	70-89	135-166	227-278	455-556	
-TCT-12MM-2.0-		2.0	54-70	107-130	179-218	358-437	

Notes: ① Other wall thicknesses available subject to confirmation from FITOK.
② Custom length outside the Random Length Grade Table and within the max. length range available subject to confirmation from FITOK.
③ Custom shorter cut length available.
④ Custom longer length available subject to confirmation from FITOK.

Cut Length Example
Customer requirement: coiled tubing, 304/304L stainless steel, 8 mm O. D. x 1.2 mm wall thickness, 400 m/coil length, total length 2000 m.
Recommended ordering number: S4-TCT-8MM-1.2-400M
Actual supply length is 400-400.5 m, 5 coils, total 2000 m.

Ordering Number Description

SS - TMP - 6 - 049 - 20F - BA - F2

Material

SS	316/316L
SH	Enhanced-316/316L
S4	304/304L
S12	6Mo
D5	2205 Duplex
D7	2507 Duplex
M	Alloy 400
A20	Alloy 20
INC	Alloy 600
A65	Alloy 625
A85	Alloy 825
HC	Alloy C-276

Series

TMP
TCT

Tube O.D.

Fractional		Metric	
0.5	1/32"	0.8MM	0.8 mm
1	1/16"	1.5MM	1.5 mm
2	1/8"	3MM	3 mm
3	3/16"	6MM	6 mm
4	1/4"	8MM	8 mm
5	5/16"	10MM	10 mm
6	3/8"	12MM	12 mm
8	1/2"	14MM	14 mm
10	5/8"	15MM	15 mm
12	3/4"	16MM	16 mm
14	7/8"	18MM	18 mm
16	1"	20MM	20 mm
20	1 1/4"	22MM	22 mm
24	1 1/2"	25MM	25 mm
32	2"	28MM	28 mm
		30MM	30 mm
		32MM	32 mm
		38MM	38 mm
		50MM	50 mm

Wall Thickness

Fractional		Metric	
010	0.010"	0.3	0.3 mm
012	0.012"	0.4	0.4 mm
014	0.014"	0.5	0.5 mm
016	0.016"	0.8	0.8 mm
020	0.020"	1.0	1.0 mm
028	0.028"	1.2	1.2 mm
035	0.035"	1.5	1.5 mm
049	0.049"	1.8	1.8 mm
065	0.065"	2.0	2.0 mm
083	0.083"	2.2	2.2 mm
095	0.095"	2.5	2.5 mm
109	0.109"	2.8	2.8 mm
120	0.120"	3.0	3.0 mm
134	0.134"	3.5	3.5 mm
156	0.156"	4.0	4.0 mm
188	0.188"	4.5	4.5 mm
		5.0	5.0 mm

Length

40N	Length 40 in. (For Straight-Length Tubing Only)
80N	Length 80 in. (For Straight-Length Tubing Only)
xxM	Length xx m (Except For Random Length Coiled Tubing)
xxF	Length xx ft (Except For Random Length Coiled Tubing)
CL11F	Random Length Grade CL11F (For Coiled Tubing Only)
CL11M	Random Length Grade CL11M (For Coiled Tubing Only)
CL21F	Random Length Grade CL21F (For Coiled Tubing Only)
CL21M	Random Length Grade CL21M (For Coiled Tubing Only)
CL31F	Random Length Grade CL31F (For Coiled Tubing Only)
CL31M	Random Length Grade CL31M (For Coiled Tubing Only)
CL41F	Random Length Grade CL41F (For Coiled Tubing Only)
CL41M	Random Length Grade CL41M (For Coiled Tubing Only)

Internal Surface Condition

	Pickling
BA	Bright Annealing
CRBA	Cold Working Followed by Bright Annealing

CRBA Process Description: precision cold worked, degreased with special cleaning agent, and bright annealed. Internal surface roughness to Ra 0.8 μm Max.

Cleaning and Packaging

	FC-01
F2	FC-02

Note: "Ordering Number Description" is a referenc to understand the combination rules of FITOK product part number. Not all combinations aere available. For any questions, please contact FITOK group or our authorized distributors.

High Purity Tubing

TBA Series

Introduction

TBA series are suitable for high purity and ultra high purity fluid systems such as in the semiconductor industry. FITOK adopts strict specifications for materials and machining processes, etc., as well as eliminates undesired contaminant residues through high standard cleaning and packaging process to meet high cleanliness and high performance requirements of valves, fittings and tubing in the semiconductor manufacturing industry.

Features

◎ Material: 316L

◎ Standards: ASTM A269/A632

◎ Sizes: 1/8"-2 1/2"

◎ Process: internal surface cold worked followed by bright annealing to roughness of Ra≤20 μin (0.51 μm)

◎ Inspection:

FC-01: visual inspection, surface roughness measurement

FC-02: visual inspection, surface roughness measurement, particle testing, dew point testing, oil content testing

◎ Cleaning:

FC-01: immersion rinsing, air purging

FC-02: ultrasonic cleaning and rinsing, then purging and drying with high purity nitrogen in ISO 4 cleanroom

◎ Packaging: in ISO 4 cleanroom, after cleaning with 99.999% nitrogen, both tubing ends are capped and tubing is packed in individual polyethylene bag

◎ Marking: tubing is marked with brand, material grade, specification and heat number

◎ Standard length: 20 ft, 2 m, 3 m, 4 m and 6 m

Materials

Grade	Standard	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Ni	Cr	Mo
316L	ASTM	6L	≤0.035①	≤2.00	≤0.045	≤0.03	≤1.00	10.0-15.0	16.0-18.0	2.0-3.0

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

Surface Roughness

Tube O.D. (D) mm	External Surface μin. (μm)	Internal Surface μin. (μm)
3.18≤D≤48.6	Ra≤63 (1.6)	Ra≤15 (0.38)
48.6<D≤63.5		Ra≤20 (0.51)

Dimensional Tolerance and Scope of Supply

Tube O.D.	Wall Thickness	O.D. Tolerance	Wall Thickness Tolerance	Tubing Length		Process	
in.	in.	in. (mm)	%	m	ft	Seamless	Welded
1/8	0.028	0/+0.003 (0.08)	+/-10	2 or 3	-	√	-
1/4	0.035	+/-0.004 (0.10)		4 or 6	20		√
	0.039						
3/8	0.035						
	0.039						
	0.049						
1/2	0.035						
	0.039						
	0.049						
3/4	0.049						
	0.065						
1	0.049						
	0.065						
1 1/2	0.065	+/-0.008 (0.20)					
2	0.065	+/-0.010 (0.25)					
2 1/2	0.065						

Working Pressure at Ambient Temperature

For seamless tubing, working pressures are calculated in accordance with ASME B31.3: for single butt weld tubing, multiply the pressure rating by 0.8.

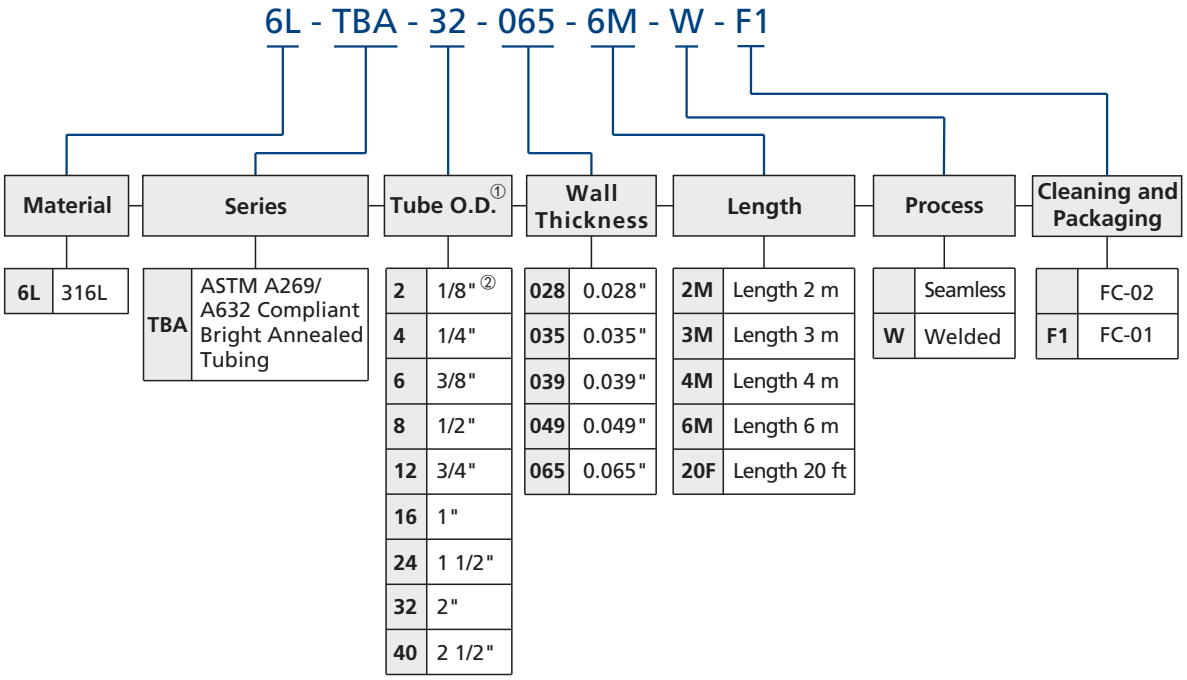
Tube O.D. in.	Wall Thickness in.				
	0.028	0.035	0.039	0.049	0.065
	Working Pressure psig				
1/8	8500	-	-	-	-
1/4	-	5100	5700	-	-
3/8	-	3300	3700	4800	-
1/2	-	2600	3000	3700	-
3/4	-	-	-	2400	3300
1	-	-	-	1800	2400
1 1/2	-	-	-	-	1600
2	-	-	-	-	1200
2 1/2	-	-	-	-	950

Elevated Temperature Factors

Temperature		Factor
°F	°C	316L
200	93	1.00
400	204	0.96
600	315	0.85
800	426	0.79
1000	537	0.76

Example:
1/2 in. O.D. × 0.035 in. wall thickness TBA series tubing at 600 °F (315 °C):
1. Working pressure is 2600 psig at -20 °F to 100 °F (-28 °C to 37 °C);
2. Elevated temperature factor is 0.85 at 600 °F (315 °C);
2600 psig × 0.85 = 2210 psig
conclude the working pressure of 1/2 in. O.D. × 0.035 in. wall thickness TBA series tubing at 600 °F (315 °C) is 2210 psig.

Ordering Number Description



① To order metric sizes, please contact FITOK Group.
② Maximum length: 3 meters.
Notes:
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Purity test reports are available. Please contact FITOK Group for more information.

TEP and PEP Series

Introduction

TEP/PEP series are suitable for high purity and ultra high purity fluid systems such as in the semiconductor industry. FITOK adopts strict specifications for materials, machining and electropolishing processes, etc., as well as eliminates undesired contaminant residues through high standard cleaning and packaging process to meet high cleanliness and high performance requirements of valves, fittings and tubing in the semiconductor manufacturing industry.

Features

◎ Materials: TEP series: 316L, 316L VAR, 316L VIM-VAR
PEP series: 316L

◎ Standards: ASTM A269, A632, A312 or JIS G3459

◎ Sizes: TEP series ASTM A269/A632: 1/8"-2 1/2"
PEP series JIS G3459: 6A-50A
PEP series ASTM A312: NPS 1/8-NPS 2

◎ Process: internal surface electropolished to roughness of Ra≤15 μin (0.38 μm), Ra≤10 μin (0.25 μm), Ra≤7 μin (0.18 μm), Ra≤5 μin (0.13 μm); external surface roughness of Ra≤40 μin (1 μm)

◎ Inspection: visual inspection, surface roughness measurement, particle test, dew point testing, oil content testing, scanning electron microscopy (SEM), Auger electron spectroscopy (AES), X-ray photoelectron spectroscopy (ESCA or XPS)

◎ Cleaning: ultrasonically cleaned and rinsed, then washed, and purged and dried with UHP hot nitrogen in ISO 4 cleanroom

◎ Packaging: packaged in ISO 4 cleanroom, cleaned with ultra high pressure nitrogen, tubing ends are fitted with anti-static film and caps and tubing is packed in double polyethylene bags with inner bag filled with 99.99999% nitrogen

◎ Marking: tubing bodies are marked with brand, material grade, specification and heat number

◎ Standard length: 20 ft, 2 m, 3 m, 4 m and 6 m

Materials

Grade	Standard	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Ni	Cr	Mo
316L	ASTM	6L	≤0.035①	≤2.00	≤0.045	≤0.03	≤1.00	10.0-15.0	16.0-18.0	2.0-3.0
	JIS G3459		≤0.03					12.0-16.0		
316L VAR	ASTM	6LV		≤1.50	≤0.045	≤0.01		10.0-15.0		
316L VIM-VAR		6LW								

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

Surface Roughness

Tube O.D. (D) mm	External Surface μin. (μm)	Internal Surface μin. (μm)		
	TEP/PEP	TEP/PEP		
		A	B	C
3.18	Ra≤40 (1.0)	-	-	Ra≤15 (0.38)
6.35≤D≤63.5		Ra≤5 (0.13)	Ra≤7 (0.18)	Ra≤10 (0.25)

Tubing

Dimensional Tolerance and Scope of Supply

ASTM A269/A632 Compliant TEP Series							
Tube O.D.	Wall Thickness	O.D. Tolerance	Wall Thickness Tolerance	Tubing Length		Process	
in.	in.	in. (mm)	%	m	ft	Seamless	Welded
1/8	0.028	0/+0.003 (0.08)	+/-10	2 or 3	-	√	-
1/4	0.035	+/-0.004 (0.10)		4 or 6	20		√
	0.039						
3/8	0.035						
	0.039						
	0.049						
1/2	0.035						
	0.039						
	0.049						
3/4	0.049						
	0.065						
1	0.049						
	0.065						
1 1/2	0.065	+/-0.008 (0.20)					
2	0.065	+/-0.010 (0.25)					
2 1/2	0.065						

Working Pressure at Ambient Temperature

For seamless tubing, working pressures are calculated in accordance with ASME B31.3: for single butt weld tubing, multiply the pressure rating by 0.8.

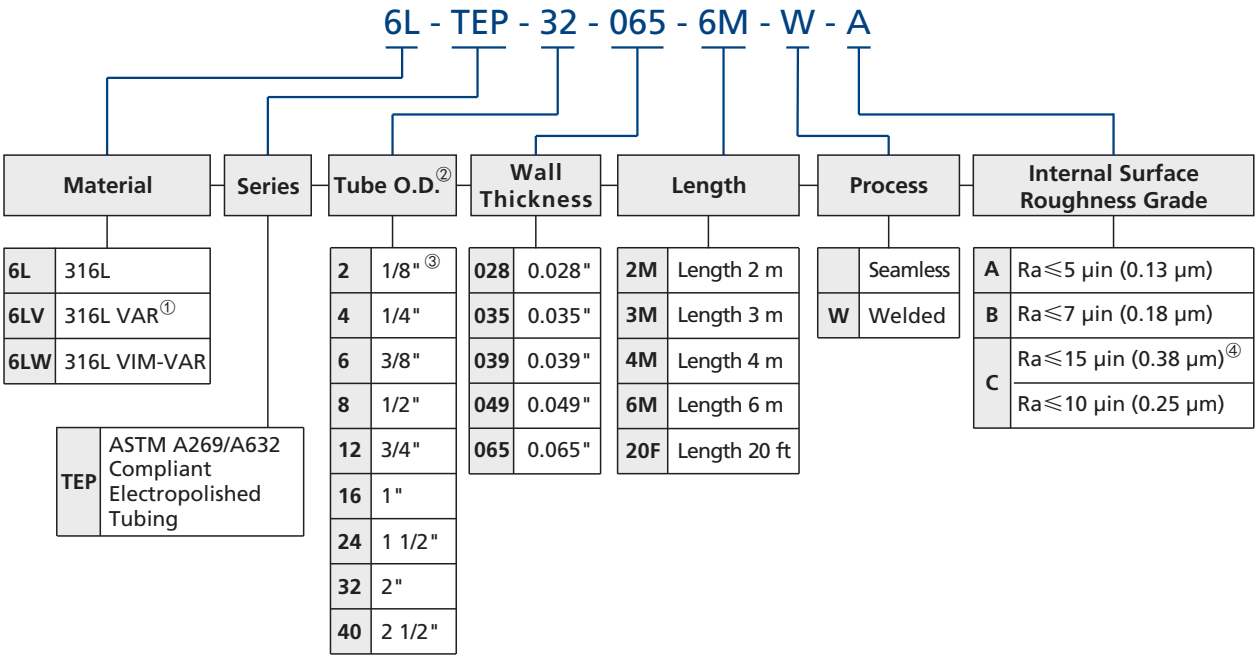
ASTM A269/A632 Compliant TEP Series					
Tube O.D. in.	Wall Thickness in.				
	0.028	0.035	0.039	0.049	0.065
	Working Pressure psig				
1/8	8500	-	-	-	-
1/4	-	5100	5700	-	-
3/8	-	3300	3700	4800	-
1/2	-	2600	3000	3700	-
3/4	-	-	-	2400	3300
1	-	-	-	1800	2400
1 1/2	-	-	-	-	1600
2	-	-	-	-	1200
2 1/2	-	-	-	-	950

Elevated Temperature Factors

Temperature		Factor
°F	°C	316L
200	93	1.00
400	204	0.96
600	315	0.85
800	426	0.79
1000	537	0.76

Example:
1/2 in. O.D. × 0.035 in. wall thickness EP tubing at 600 °F (315 °C):
1. Working pressure is 2600 psig at -20 °F to 100 °F (-28 °C to 37 °C);
2. Elevated temperature factor is 0.85 at 600 °F (315 °C);
2600 psig × 0.85 = 2210 psig
conclude the working pressure of 1/2 in. O.D. × 0.035 in. wall thickness EP tubing at 600 °F (315 °C) is 2210 psig.

Ordering Number Description



① For ordering, please contact FITOK.
② To order metric sizes, please contact FITOK Group.
③ Maximum length: 3 meters.
④ Applicable only to tubing with a diameter of 1/8".

Notes:
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Purity test reports are available. Please contact FITOK Group for more information.

Pipes

Dimensional Tolerance and Scope of Supply

JIS G3459 Compliant PEP Series

Nominal O.D.	Pipe O.D.	Nominal Wall Thickness		O.D. Tolerance	Wall Thickness Tolerance	Pipe Length		Process	
		SCH5S	SCH10S						
A Size	mm	Wall Thickness, mm		in. (mm)	%	m	ft	Seamless	Welded
6A	10.5	1. 0	1.2	+/-0.004 (0.10)	+/-10	4 or 6	-	√	√
8A	13.8	1. 2	1.65						
10A	17.3	1. 2	1.65						
15A	21.7	1. 65	2.1						
20A	27.2	1.65	2.1						
25A	34.0	1.65	2.8						
32A	42.7	1.65	2.8	+/-0.012 (0.30)					
40A	48.6	1.65	2.8						
50A	60.5	1.65	2.8	+/-0.020 (0.50)					

ASTM A312 Compliant PEP Series

Nominal O.D.	Pipe O.D.	Nominal Wall Thickness				O.D. Tolerance	Wall Thickness Tolerance	Pipe Length		Process	
		B36.19M		B36.10M							
		SCH5S	SCH10S	SCH5	SCH10						
NPS	mm	Wall Thickness, mm				in. (mm)	%	m	ft	Seamless	Welded
1/8	10.3	-	1.24	-	1.24	+0.016 (0.40)/ -0.031 (0.80)	+20/ -12.5	4 or 6	20	√	√
1/4	13.7	-	1.65	-	1.65						
3/8	17.1	-	1.65	-	1.65						
1/2	21.3	1. 65	2.11	1. 65	2.11						
3/4	26.7	1.65	2.11	1.65	2.11						
1	33.4	1.65	2.77	1.65	2.77						
1 1/4	42.2	1.65	2.77	1.65	2.77						
1 1/2	48.3	1.65	2.77	1.65	2.77						
2	60.3	1.65	2.77	1.65	2.77	+/-0.031 (0.80)					

Working Pressure at Ambient Temperature

For seamless pipes, working pressures are calculated in accordance with ASME B31.3: for single butt weld pipes, multiply the pressure rating by 0.8.

JIS G3459 Compliant PEP Series

Nominal Diameter A Size	Pipe O.D. mm	Wall Thickness	
		SCH5S	SCH10S
		Working Pressure psig	
6A	10.5	3300	4000
8A	13.8	3000	4300
10A	17.3	2400	3300
15A	21.7	2600	3400
20A	27.2	2100	2700
25A	34.0	1600	2900
32A	42.7	1300	2200
40A	48.6	1100	2000
50A	60.5	910	1600

ASTM A312 Compliant PEP Series

Nominal Diameter NPS	Wall Thickness			
	B36.19M		B36.10M	
	SCH5S	SCH10S	SCH5	SCH10
	Working Pressure psig			
1/8	-	4600	-	4600
1/4	-	4600	-	4600
3/8	-	3600	-	3600
1/2	2800	3700	2800	3700
3/4	2300	2900	2300	2900
1	1800	3100	1800	3100
1 1/4	1400	2400	1400	2400
1 1/2	1200	2100	1200	2100
2	970	1700	970	1700

Elevated Temperature Factors

Temperature		Factor
°F	°C	316L
200	93	1.00
400	204	0.96
600	315	0.85
800	426	0.79
1000	537	0.76

Example:
10A O.D. × SCH55 wall thickness EP pipes at 600 °F (315 °C):
1. Working pressure is 2400 psig at -20 °F to 100 °F (-28 °C to 37 °C);
2. Elevated temperature factor is 0.85 at 600 °F (315 °C);
2400 psig × 0.85 = 2040 psig
conclude the working pressure of 10A O.D. × SCH55 wall thickness EP pipes at 600 °F (315 °C) is 2040 psig.

Ordering Number Description

6L - PEP - 40A - 5S - 6M - W - A

Material	Series	Pipe O.D.	Wall Thickness	Length	Process	Internal Surface Roughness Grade

Material	
6L	316L

Series	
PEP	JIS G3459 or ASTM A312 Compliant Electropolished Pipes

Pipe O.D.			
JIS G3459		ASTM A312	
6A	10.5 mm	2	NPS 1/8 (DN6)
8A	13.8 mm	4	NPS 1/4 (DN8)
10A	17.3 mm	6	NPS 3/8 (DN10)
15A	21.7 mm	8	NPS 1/2 (DN15)
20A	27.2 mm	12	NPS 3/4 (DN20)
25A	34.0 mm	16	NPS 1 (DN25)
32A	42.7 mm	20	NPS 1 1/4 (DN32)
40A	48.6 mm	24	NPS 1 1/2 (DN40)
50A	60.5 mm	32	NPS 2 (DN50)

Wall Thickness			
JIS G3459		ASTM① A312	
5S	SCH5S	5S	SCH5S
10S	SCH10S	10S	SCH10S

Length	
4M	Length 4 m
6M	Length 6 m
20F	Length 20 ft

Process	
	Seamless
W	Welded

Internal Surface Roughness Grade	
A	Ra≤5 μin (0.13 μm)
B	Ra≤7 μin (0.18 μm)
C	Ra≤10 μin (0.25 μm)

① Wall thickness complies with ASME B36.19M. For ASME B36.10M compliant wall thickness, please contact FITOK Group.

Notes:
1. "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.
2. Purity test reports are available. Please contact FITOK Group for more information.

Ordering Information

To order, add material designator, series, length, process, internal surface roughness grade and report to get a complete ordering number.

Examples:

1. Seamless tubing, 316L stainless steel, ASTM A269 compliant, TBA series, 1/4" O.D. x 0.035" wall thickness, 6 m length, standard report, the ordering number is 6L-TBA-4-035-6M.

1. Seamless tubing, 316L stainless steel, ASTM A269 compliant, TEP series, 1/4" O.D. x 0.035" wall thickness, 6 m length, internal surface roughness of Ra≤0.25 μm, standard report, the ordering number is 6L-TEP-4-035-6M-C.

2. Seamless pipe, 316L stainless steel, JIS G3459 compliant, PEP series, 8A O.D. x SCH105 wall thickness, 6 m length, internal surface roughness of Ra≤0.13 μm, the ordering number is 6L-PEP-8A-10S-6M-A.

ASTM A269/A632 Compliant TBA/TEP Series			
Tube O.D. in.	Wall Thickness in.	Basic Ordering Number	
1/8	0.028	□□-TBA-2-028-□□-□	□□-TEP-2-028-□□-□-□
1/4	0.035	□□-TBA-4-035-□□-□	□□-TEP-4-035-□□-□-□
	0.039	□□-TBA-4-039-□□-□	□□-TEP-4-039-□□-□-□
3/8	0.035	□□-TBA-6-035-□□-□	□□-TEP-6-035-□□-□-□
	0.039	□□-TBA-6-039-□□-□	□□-TEP-6-039-□□-□-□
	0.049	□□-TBA-6-049-□□-□	□□-TEP-6-049-□□-□-□
1/2	0.035	□□-TBA-8-035-□□-□	□□-TEP-8-035-□□-□-□
	0.039	□□-TBA-8-039-□□-□	□□-TEP-8-039-□□-□-□
	0.049	□□-TBA-8-049-□□-□	□□-TEP-8-049-□□-□-□
3/4	0.049	□□-TBA-12-049-□□-□	□□-TEP-12-049-□□-□-□
	0.065	□□-TBA-12-065-□□-□	□□-TEP-12-065-□□-□-□
1	0.049	□□-TBA-16-049-□□-□	□□-TEP-16-049-□□-□-□
	0.065	□□-TBA-16-065-□□-□	□□-TEP-16-065-□□-□-□
1 1/2	0.065	□□-TBA-24-065-□□-□	□□-TEP-24-065-□□-□-□
2	0.065	□□-TBA-32-065-□□-□	□□-TEP-32-065-□□-□-□
2 1/2	0.065	□□-TBA-40-065-□□-□	□□-TEP-40-065-□□-□-□

JIS G3459 Compliant PEP Series

Nominal Diameter A Size	Nominal Wall Thickness	
	SCH5S	SCH10S
	Basic Ordering Number	
6A	□□-PEP-6A-5S-□□-□-□	□□-PEP-6A-10S-□□-□-□
8A	□□-PEP-8A-5S-□□-□-□	□□-PEP-8A-10S-□□-□-□
10A	□□-PEP-10A-5S-□□-□-□	□□-PEP-10A-10S-□□-□-□
15A	□□-PEP-15A-5S-□□-□-□	□□-PEP-15A-10S-□□-□-□
20A	□□-PEP-20A-5S-□□-□-□	□□-PEP-20A-10S-□□-□-□
25A	□□-PEP-25A-5S-□□-□-□	□□-PEP-25A-10S-□□-□-□
32A	□□-PEP-32A-5S-□□-□-□	□□-PEP-32A-10S-□□-□-□
40A	□□-PEP-40A-5S-□□-□-□	□□-PEP-40A-10S-□□-□-□
50A	□□-PEP-50A-5S-□□-□-□	□□-PEP-50A-10S-□□-□-□

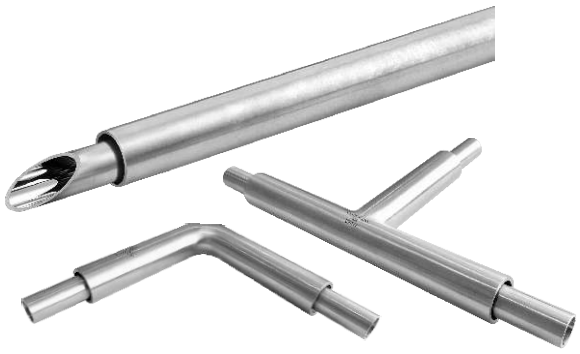
ASTM A312 Compliant PEP Series

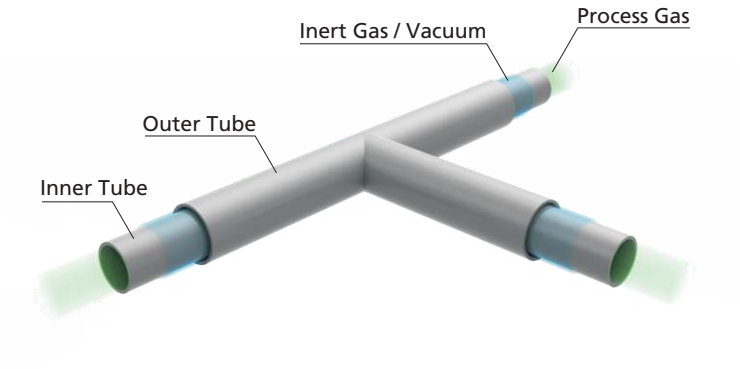
Nominal Diameter NPS	Nominal Wall Thickness	
	SCH5S	SCH10S
	Basic Ordering Number	
1/8	-	□□-PEP-2-10S-□□-□-□
1/4	-	□□-PEP-4-10S-□□-□-□
3/8	-	□□-PEP-6-10S-□□-□-□
1/2	□□-PEP-8-5S-□□-□-□	□□-PEP-8-10S-□□-□-□
3/4	□□-PEP-12-5S-□□-□-□	□□-PEP-12-10S-□□-□-□
1	□□-PEP-16-5S-□□-□-□	□□-PEP-16-10S-□□-□-□
1 1/4	□□-PEP-20-5S-□□-□-□	□□-PEP-20-10S-□□-□-□
1 1/2	□□-PEP-24-5S-□□-□-□	□□-PEP-24-10S-□□-□-□
2	□□-PEP-32-5S-□□-□-□	□□-PEP-32-10S-□□-□-□

TCA Series Coaxial Tubing and Fittings

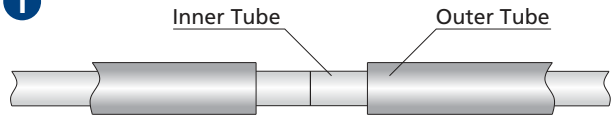
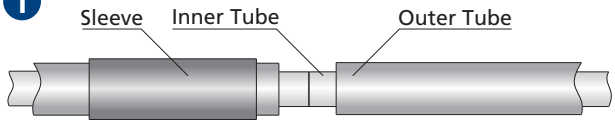
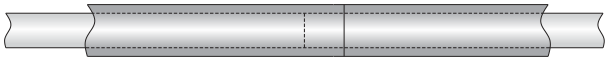
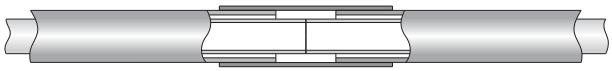
Introduction

The inner process tube meets the high cleanliness and high performance requirements of ultra high purity fluid systems through strict specifications for raw materials, electropolishing, cleaning and packaging. The outer safety tube provides safe distribution of the overflow fluid in the unlikely event of a leak in the process tube. The double tube system is simple and easy to install with only orbital welding and can be integrated into existing systems and facilities.



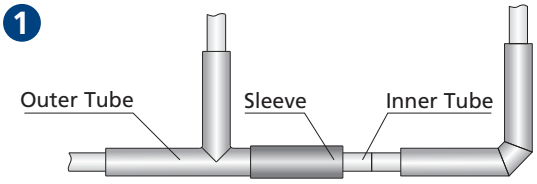


Connection Method

Tube to tube or tube to fitting connection method 1	Tube to tube or tube to fitting connection method 2
1  Orbital weld the inner tubes together, then conduct helium leak test.	1  Install the sleeve on the outer tubes and orbital weld the inner tubes together, then conduct helium leak test.
2  Move the outer tubes to cover the inner tubes completely and connect them by orbital welding, then conduct helium leak test.	2  Move the sleeve to cover the gap between the two outer tubes completely and weld the sleeve to the outer tubes, then conduct helium leak test.

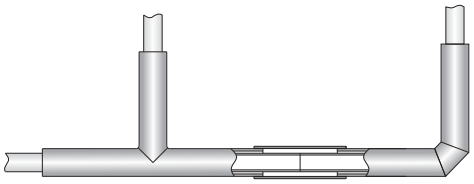
Fitting to fitting connection

1



Install the sleeve on the outer tube of one fitting and connect the inner tubes together by orbital welding, then conduct helium leak test.

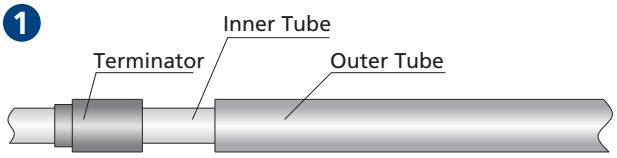
2



Move the sleeve to cover the gap between the two outer tubes completely and weld the sleeve to the outer tubes, then conduct helium leak test.

Seal the outer tubes

1



Install the terminator to the inner tubes.

2

Weld one end of the terminator to the outer tube and the other end to the outer wall of the inner tube, then conduct helium leak test.

Coaxial Tubing

Features

◎ Materials:

Inner tube：316L, 316L VAR, 316L VIM-VAR

Outer tube: 316L, 304L

◎ Outside diameters:

Inner tube: 1/4" ~ 2"

Outer tube: 1/2" ~ 2 1/2"

◎ Process:

Inner tube: internal surface electropolished to roughness of Ra≤5 μin (0.13 μm), Ra≤7 μin (0.18 μm), Ra≤10 μin (0.25 μm)

Outer tube: internal surface bright annealed or bright annealed after precision cold working to roughness of 15 μin (0.38 μm), Ra≤20 μin (0.51 μm), Ra≤32 μin (0.8 μm), Ra≤63 μin (1.6 μm); external surface machine finished to roughness of Ra≤63 μin (1.6 μm)

◎ Cleaning: ultrasonically cleaned and rinsed, then washed, and purged and dried with UHP hot nitrogen in ISO 4 cleanroom

◎ Packaging: assembled in ISO 4 cleanroom, tubing ends are capped and tubing is packed in double polyethylene bags with inner bag filled with 99.99999% nitrogen

◎ Marked with brand, inner tube grade, inner tube specification, inner tube heat number, outer tube grade, outer tube specification, outer tube heat number

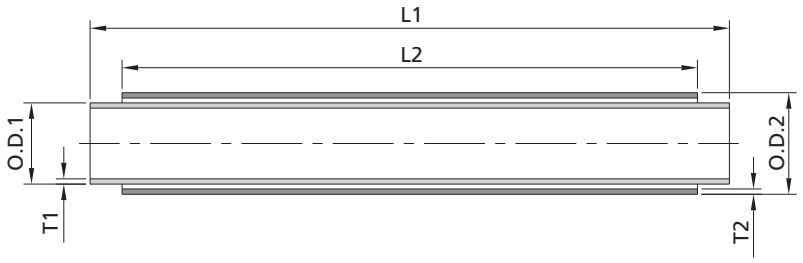
◎ Standard length: 20 ft and 6 m

Materials

Grade	Standard	FITOK Designator	Composition/%							
			C	Mn	P	S	Si	Ni	Cr	Mo
316L	ASTM	6L	≤0. 035①	≤2. 00	≤0. 045	≤0.03	≤1.00	10.0~15.0	16.0~18.0	2.0~3.0
316L VAR		6LV	≤0. 03	≤1.50		≤0.01				
316L VIM-VAR		6LW								

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%

Ordering Information



Basic Ordering Number	Inner Tube O.D.1	Inner Tube Wall Thickness T1	Outer Tube O.D.2	Outer Tube Wall Thickness T2	Metric/m (recommended)		Fractional/ft		Inner Tube Working Pressure (-18~99 °F) psig
					Inner Tube Length L1	Outer Tube Length L2	Inner Tube Length L1	Outer Tube Length L2	
□□-CEP-TB4-TB8-□□-□□	1/4"	0.035"	1/2"	0.049"	6	5.95	20	19.83	5100
□□-CEP-TB6-TB10-□□-□□	3/8"	0.035"	5/8"	0.049"	6	5.95	20	19.83	3300
□□-CEP-TB8-TB12-□□-□□	1/2"	0.049"	3/4"	0.065"	6	5.95	20	19.83	3700
□□-CEP-TB12-TB16-□□-□□	3/4"	0.065"	1"	0.065"	6	5.91	20	19.71	3300
□□-CEP-TB16-TB20-□□-□□	1"	0.065"	1 1/4"	0.065"	6	5.91	20	19.71	2400
□□-CEP-TB24-TB32-□□-□□	1 1/2"	0.065"	2"	0.065"	6	5.9	20	19.67	1600
□□-CEP-TB32-TB40-□□-□□	2"	0.065"	2 1/2"	0.065"	6	5.9	20	19.67	1200

Ordering Number Description

6L - CEP - TB4 - 4L - TB8 - 6M - A A

Inner Tube Material	
6L	316L
6LV	316L VAR①
6LW	316L VIM-VAR

Type	
CEP	Coaxial Tubing

Inner Tube Size	
TB4	1/4" x 0.035"
TB6	3/8" x 0.035"
TB8	1/2" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB24	1 1/2" x 0.065"
TB32	2" x 0.065"

Outer Tube Material	
None	316L
4L	304L

Outer Tube Size	
TB8	1/2" x 0.049"
TB10	5/8" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB20	1 1/4" x 0.065"
TB32	2" x 0.065"
TB40	2 1/2" x 0.065"

Length	
6M	6 m
20F	20 ft

Inner Tube Grade	
A	Internal Surface Ra≤0.13 μm (EP Condition)
B	Internal Surface Ra≤0.18 μm (EP Condition)
C	Internal Surface Ra≤0.25 μm (EP Condition)

Outer Tube Grade	
A	6.35≤O.D.≤48.6 Internal Surface Ra≤0.38 μm (BA Condition)
	48.6<O. D. ≤63.5 Internal Surface Ra≤0.51 μm (BA Condition)
B	Internal Surface Ra≤0.8 μm (BA Condition)
C	Internal Surface Ra≤1.6 μm (BA Condition)

① For ordering, please contact FITOK.

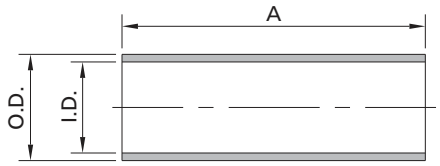
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combination are available.

Coaxial Sleeve

Features

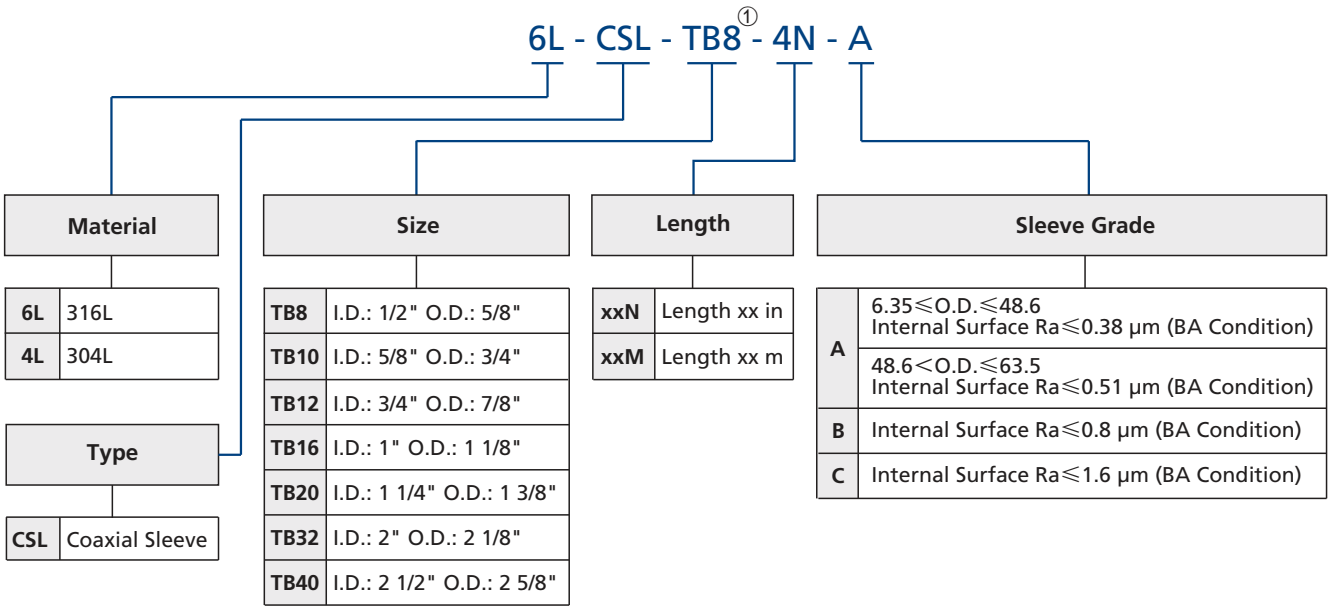
- ◎ Materials: 316L, 304L
- ◎ Inside diameter: 1/2" ~ 2 1/2"
- ◎ Process: internal surface bright annealed or bright annealed after precision cold working to roughness of 15 μin (0.38 μm), Ra≤20 μin (0.51 μm), Ra≤32 μin (0.8 μm), Ra≤63 μin (1.6 μm); external surface mechine finished to roughness of Ra≤63 μin (1.6 μm)
- ◎ Cleaning: ultrasonically cleaned, purged and dried
- ◎ Packaging: tubing ends are capped and tubing is packed in individual polyethylene bag
- ◎ Marked with brand, material grade and trace number
- ◎ Standard length: 2.5 in, 4 in, 4.5 in, customized lengths are available upon request

Ordering Information



Part Number	I.D.	O.D.	Length A
6L-CSL-TB8-□□-□	1/2"	5/8"	2.5"
6L-CSL-TB10-□□-□	5/8"	3/4"	2.5"
6L-CSL-TB12-□□-□	3/4"	7/8"	2.5"
6L-CSL-TB16-□□-□	1"	1 1/8"	4"
6L-CSL-TB20-□□-□	1 1/4"	1 3/8"	4"
6L-CSL-TB32-□□-□	2"	2 1/8"	4.5"
6L-CSL-TB40-□□-□	2 1/2"	2 5/8"	4.5"

Ordering Number Description



① Refer to outer tube outside diameter for sleeve part number selection.

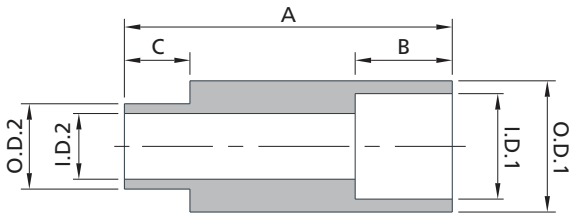
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Coaxial Terminator

Features

- Materials: 316L, 304L
- Big end: O.D. 1/2" ~ 2 1/2"
- Small end: I.D. 1/4" ~ 2"
- Marked with brand, material grade and trace number
- Standard length: 1.25 in, 2 in, 2.25 in

Ordering Information



Part Number	O.D.1	I.D.1	O.D.2	I.D.2	A	B	C
6L-CTE-TB8-TB4	1/2"	0.402"	0.325"	1/4"	1.25"	0.37"	0.25"
6L-CTE-TB10-TB6	5/8"	0.527"	0.450"	3/8"	1.25"	0.37"	0.25"
6L-CTE-TB12-TB8	3/4"	0.620"	0.603"	1/2"	1.25"	0.37"	0.25"
6L-CTE-TB16-TB12	1"	0.870"	0.885"	3/4"	2"	0.5"	0.25"
6L-CTE-TB20-TB16	1 1/4"	1.120"	1.135"	1"	2"	0.5"	0.25"
6L-CTE-TB32-TB24	2"	1.870"	1.635"	1 1/2"	2.25"	0.75"	0.25"
6L-CTE-TB40-TB32	2 1/2"	2.360"	2.135"	2"	2.25"	0.75"	0.25"

Ordering Number Description

6L - CTE - TB8 - TB4

Material	
6L	316L
4L	304L

Type	
CTE	Coaxial Terminator

Big End Size	
TB8	1/2" x 0.049"
TB10	5/8" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB20	1 1/4" x 0.065"
TB32	2" x 0.065"
TB40	2 1/2" x 0.065"

Small End Size	
TB4	I.D.: 1/4"
TB6	I.D.: 3/8"
TB8	I.D.: 1/2"
TB12	I.D.: 3/4"
TB16	I.D.: 1"
TB24	I.D.: 1 1/2"
TB32	I.D.: 2"

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Coaxial Elbow

Features

◎ Materials:
Inner tube: 316L, 316L VAR, 316L VIM-VAR
Outer tube: 316L, 304L

◎ Outside diameter:
Inner tube: 1/4" ~ 2"
Outer tube: 1/2" ~ 2 1/2"

◎ Inner tube process: internal surface electropolished to roughness of Ra≤5 μin (0.13 μm), Ra≤7 μin (0.18 μm), Ra≤10 μin (0.25 μm)

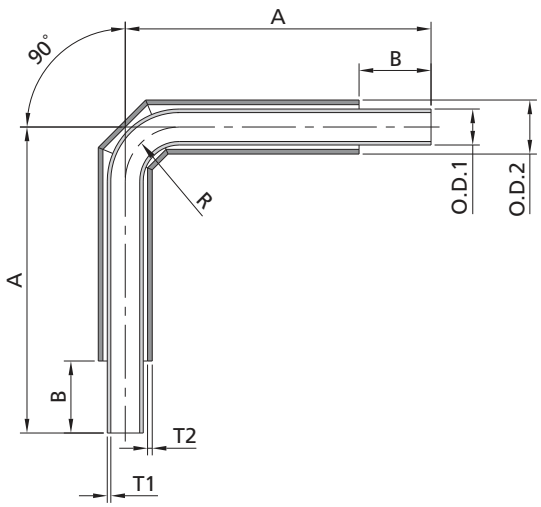
◎ Cleaning: ultrasonically cleaned and rinsed, then washed, and purged and dried with UHP hot nitrogen in ISO 4 cleanroom

◎ Packaging: packaged in ISO 4 cleanroom, tubing ends are capped and tubing is packed in double polyethylene bags with inner bag filled with 99.99999% nitrogen

◎ Marked with brand, material grade and trace number

Ordering Information

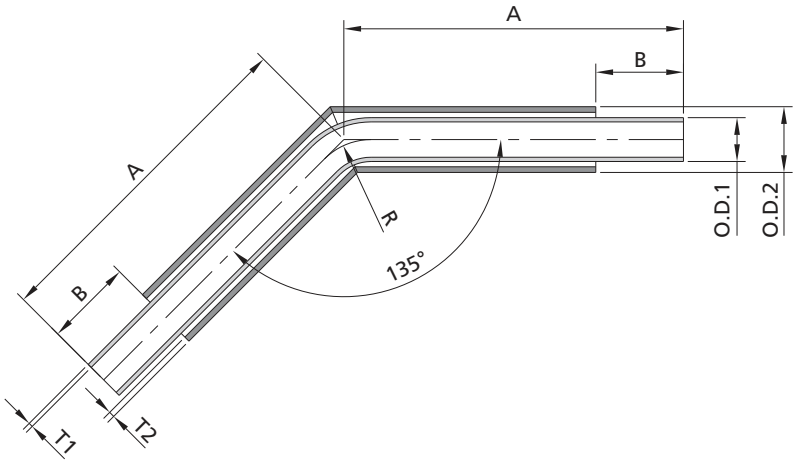
Coaxial 90° Elbow



Part Number	Inner Tube O.D.1	Inner Tube Wall Thickness T1	Outer Tube O.D.2	Outer Tube Wall Thickness T2	Bending Radius R	A	B
6L-CEL-TB4-TB8	0.25"	0.035"	0.5"	0.049"	0.56"	4.375"	1"
6L-CEL-TB6-TB10	0.375"	0.035"	0.625"	0.049"	0.56"	4.125"	1"
6L-CEL-TB8-TB12	0.5"	0.049"	0.75"	0.065"	0.75"	4.25"	1"
6L-CEL-TB12-TB16	0.75"	0.065"	1"	0.065"	1"	6.75"	1.75"
6L-CEL-TB16-TB20	1"	0.065"	1.25"	0.065"	1.18"	7.125"	1.75"
6L-CEL-TB24-TB32	1.5"	0.065"	2"	0.065"	2.25"	8.375"	2"
6L-CEL-TB32-TB40	2"	0.065"	2.5"	0.065"	3"	9"	2"

Ordering Information

Coaxial 45° Elbow



Part Number	Inner Tube O.D.1	Inner Tube Wall Thickness T1	Outer Tube O.D.2	Outer Tube Wall Thickness T2	Bending Radius R	A	B
6L-CEV-TB4-TB8	0.25"	0.035"	0.5"	0.049"	0.56"	4"	1"
6L-CEV-TB6-TB10	0.375"	0.035"	0.625"	0.049"	0.56"	3.875"	1"
6L-CEV-TB8-TB12	0.5"	0.049"	0.75"	0.065"	0.75"	3.875"	1"
6L-CEV-TB12-TB16	0.75"	0.065"	1"	0.065"	1"	6.125"	1.75"
6L-CEV-TB16-TB20	1"	0.065"	1.25"	0.065"	1.18"	6.25"	1.75"
6L-CEV-TB24-TB32	1.5"	0.065"	2"	0.065"	2.25"	7.12"	2"
6L-CEV-TB32-TB40	2"	0.065"	2.5"	0.065"	3"	8"	2"

Ordering Number Description

6L - CEL - TB4 - 4L - TB8 - A A

Inner Tube Material

6L	316L
6LV	316L VAR①
6LW	316L VIM-VAR

Type

CEL	Coaxial 90° Elbow
CEV	Coaxial 45° Elbow

Inner Tube Size

TB4	1/4" x 0.035"
TB6	3/8" x 0.035"
TB8	1/2" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB24	1 1/2" x 0.065"
TB32	2" x 0.065"

Outer Tube Material

None	316L
4L	304L

Outer Tube Size

TB8	1/2" x 0.049"
TB10	5/8" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB20	1 1/4" x 0.065"
TB32	2" x 0.065"
TB40	2 1/2" x 0.065"

Inner Tube Grade②

A	Internal Surface Ra≤0.13 μm (EP Condition)
B	Internal Surface Ra≤0.18 μm (EP Condition)
C	Internal Surface Ra≤0.25 μm (EP Condition)

Outer Tube Grade②

A	6.35≤O.D.≤48.6 Internal Surface Ra≤0.38 μm (BA Condition)
	48.6<O.D.≤63.5 Internal Surface Ra≤0.51 μm (BA Condition)
B	Internal Surface Ra≤0.8 μm (BA Condition)
C	Internal Surface Ra≤1.6 μm (BA Condition)

① For ordering, please contact FITOK.
② Ra values for the internal and external surfaces of the cold working area of the fittings are not defined.
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Coaxial Equal Tee

Features

◎ Materials:
Inner tube: 316L, 316L VAR, 316L VIM-VAR
Outer tube: 316L, 304L

◎ Outside diameter:
Inner tube: 1/4" ~ 2"
Outer tube: 1/2" ~ 2 1/2"

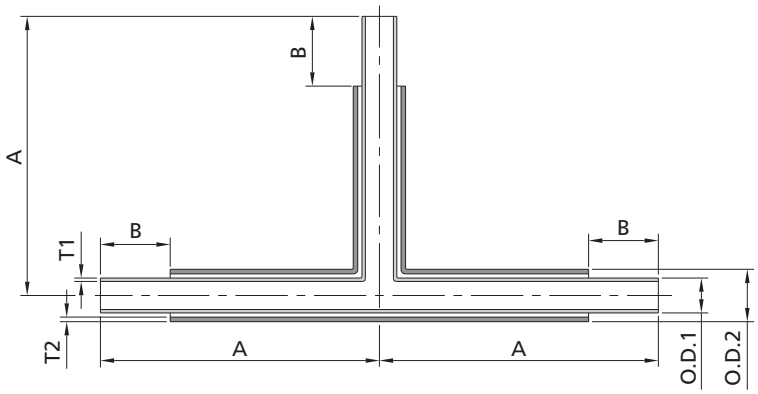
◎ Inner tube process: internal surface electropolished to roughness of Ra≤5 μin (0.13 μm), Ra≤7 μin (0.18 μm), Ra≤10 μin (0.25 μm)

◎ Cleaning: ultrasonically cleaned and rinsed, then washed, and purged and dried with UHP hot nitrogen in ISO 4 cleanroom

◎ Packaging: packaged in ISO 4 cleanroom, tubing ends are capped and tubing is packed in double polyethylene bags with inner bag filled with 99.99999% nitrogen

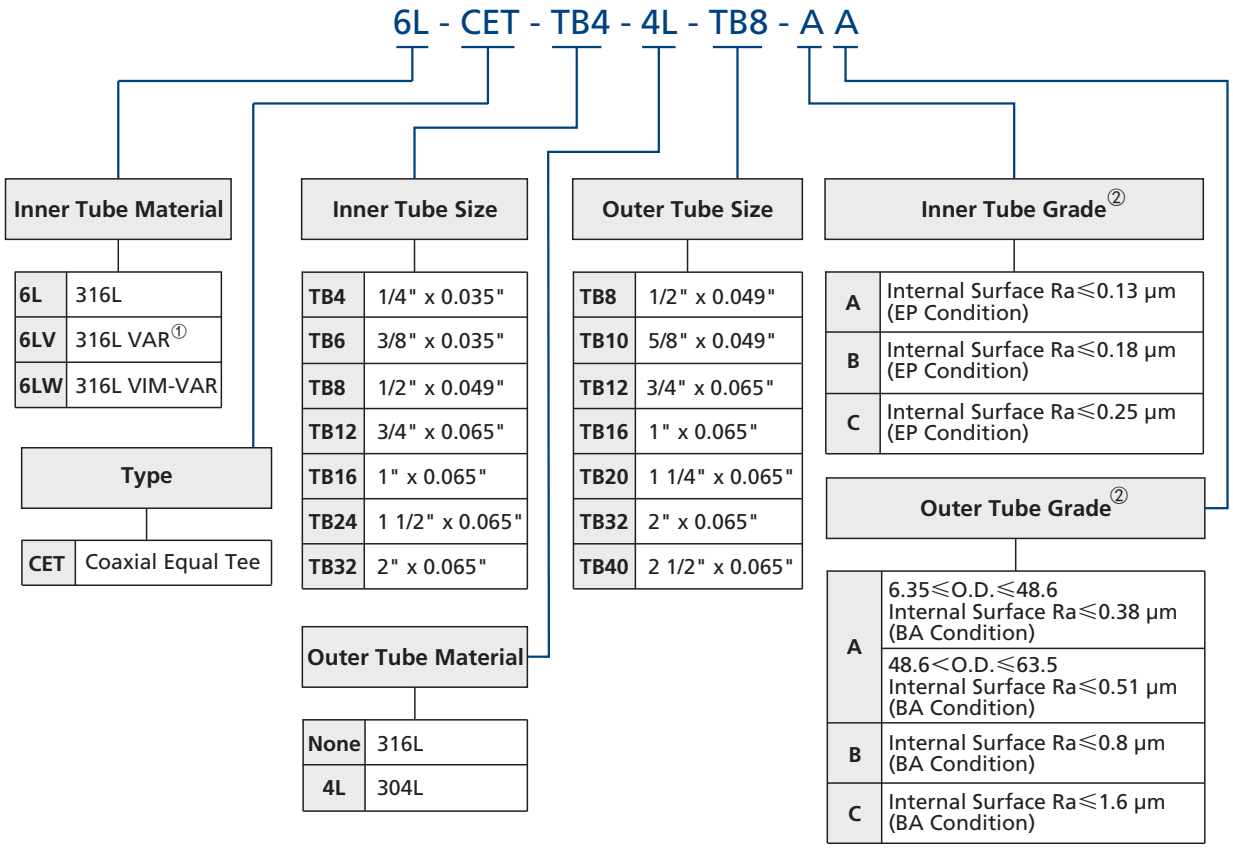
◎ Marked with brand, material grade and trace number

Ordering Information



Part Number	Inner Tube O.D.1	Inner Tube Wall Thickness T1	Outer Tube O.D.2	Outer Tube Wall Thickness T2	A	B
6L-CET-TB4-TB8	0.25"	0.035"	0.5"	0.049"	3.875"	1"
6L-CET-TB6-TB10	0.375"	0.035"	0.625"	0.049"	4"	1"
6L-CET-TB8-TB12	0.5"	0.049"	0.75"	0.065"	4"	1"
6L-CET-TB12-TB16	0.75"	0.065"	1"	0.065"	6.375"	1.75"
6L-CET-TB16-TB20	1"	0.065"	1.25"	0.065"	6.5"	1.75"
6L-CET-TB24-TB32	1.5"	0.065"	2"	0.065"	7.625"	2"
6L-CET-TB32-TB40	2"	0.065"	2.5"	0.065"	8"	2"

Ordering Number Description



① For ordering, please contact FITOK.
② Ra values of the internal and external surfaces at tube circumferential weld area is undefined.
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

Coaxial Reducing Tee

Features

◎ Materials:

Inner tube: 316L, 316L VAR, 316L VIM-VAR

Outer tube: 316L, 304L

◎ Outside diameter:

Inner tube: main inner tube O.D. 3/8" ~ 2", branch inner tube O.D. 1/4" ~ 1"

Outer tube: main outer tube O.D. 5/8" ~ 2 1/2", branch outer tube O.D. 1/2" ~ 1 1/4"

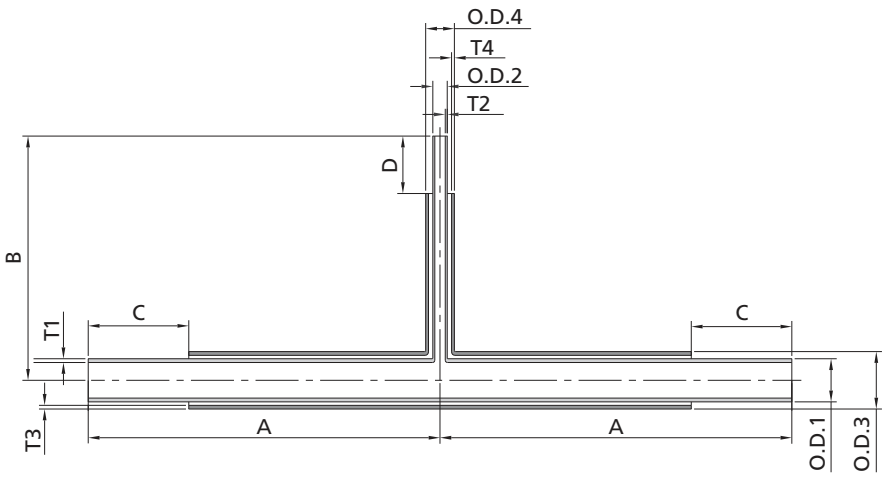
◎ Inner tube process: internal surface electropolished to roughness of Ra≤5 μin (0.13 μm), Ra≤7 μin (0.18 μm), Ra≤10 μin (0.25 μm)

◎ Cleaning: ultrasonically cleaned and rinsed, then washed, and purged and dried with UHP hot nitrogen in ISO 4 cleanroom

◎ Packaging: packaged in ISO 4 cleanroom, tubing ends are capped and tubing is packed in double polyethylene bags with inner bag filled with 99.99999% nitrogen

◎ Marked with brand, material grade and trace number

Ordering Information



Part Number	Inner Tube O.D.1	Inner Tube Wall Thickness T1	Inner Tube O.D.2	Inner Tube Wall Thickness T2	Outer Tube O.D.3	Outer Tube Wall Thickness T3	Outer Tube O.D.4	Outer Tube Wall Thickness T4	A	B	C	D
6L-CRT-TB6-TB4-TB10-TB8	0.375"	0.035"	0.25"	0.035"	0.625"	0.049"	0.5"	0.049"	3.875"	4.125"	1"	1"
6L-CRT-TB8-TB4-TB12-TB8	0.5"	0.049"	0.25"	0.035"	0.75"	0.065"	0.5"	0.049"	3.875"	4.125"	1"	1"
6L-CRT-TB8-TB6-TB12-TB10	0.5"	0.049"	0.375"	0.035"	0.75"	0.065"	0.625"	0.049"	4"	4.125"	1"	1"
6L-CRT-TB12-TB4-TB16-TB8	0.75"	0.065"	0.25"	0.035"	1"	0.065"	0.5"	0.049"	6.125"	4.25"	1.75"	1"
6L-CRT-TB12-TB6-TB16-TB10	0.75"	0.065"	0.375"	0.035"	1"	0.065"	0.625"	0.049"	6.25"	4.25"	1.75"	1"
6L-CRT-TB12-TB8-TB16-TB12	0.75"	0.065"	0.5"	0.049"	1"	0.065"	0.75"	0.065"	6.25"	4.25"	1.75"	1"
6L-CRT-TB16-TB4-TB20-TB8	1"	0.065"	0.25"	0.035"	1.25"	0.065"	0.5"	0.049"	6.125"	4.375"	1.75"	1"
6L-CRT-TB16-TB6-TB20-TB10	1"	0.065"	0.375"	0.035"	1.25"	0.065"	0.625"	0.049"	6.25"	4.375"	1.75"	1"
6L-CRT-TB16-TB8-TB20-TB12	1"	0.065"	0.5"	0.049"	1.25"	0.065"	0.75"	0.065"	6.25"	4.375"	1.75"	1"
6L-CRT-TB16-TB12-TB20-TB16	1"	0.065"	0.75"	0.065"	1.25"	0.065"	1"	0.065"	6.375"	6.625"	1.75"	1.75"
6L-CRT-TB24-TB8-TB32-TB12	1.5"	0.065"	0.5"	0.049"	2"	0.065"	0.75"	0.065"	7"	7"	2"	1.75"
6L-CRT-TB24-TB12-TB32-TB16	1.5"	0.065"	0.75"	0.065"	2"	0.065"	1"	0.065"	7.125"	7"	2"	1.75"
6L-CRT-TB24-TB16-TB32-TB20	1.5"	0.065"	1"	0.065"	2"	0.065"	1.25"	0.065"	7.25"	7"	2"	1.75"
6L-CRT-TB32-TB8-TB40-TB12	2"	0.065"	0.5"	0.049"	2.5"	0.065"	0.75"	0.065"	7.75"	9"	2"	1.75"
6L-CRT-TB32-TB16-TB40-TB20	2"	0.065"	1"	0.065"	2.5"	0.065"	1.25"	0.065"	8"	7.25"	2"	1.75"

Ordering Number Description

6L - CRT - TB6 - TB4 - 4L - TB10 - TB8 - A A

Inner Tube Material

6L	316L
6LV	316L VAR①
6LW	316L VIM-VAR

Type

CRT	Coaxial Reducing Tee

Main Inner Tube Size

TB6	3/8" x 0.035"
TB8	1/2" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB24	1 1/2" x 0.065"
TB32	2" x 0.065"

Branch Inner Tube Size

TB4	1/4" x 0.035"
TB6	3/8" x 0.035"
TB8	1/2" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"

Outer Tube Material

None	316L
4L	304L

Main Outer Tube Size

TB10	5/8" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB20	1 1/4" x 0.065"
TB32	2" x 0.065"
TB40	2 1/2" x 0.065"

Branch Outer Tube Size

TB8	1/2" x 0.049"
TB10	5/8" x 0.049"
TB12	3/4" x 0.065"
TB16	1" x 0.065"
TB20	1 1/4" x 0.065"

Inner Tube Grade②

A	Internal Surface Ra≤0.13 μm (EP Condition)
B	Internal Surface Ra≤0.18 μm (EP Condition)
C	Internal Surface Ra≤0.25 μm (EP Condition)

Outer Tube Grade②

A	6.35≤O.D.≤48.6 Internal Surface Ra≤0.38 μm (BA Condition)
	48.6<O.D.≤63.5 Internal Surface Ra≤0.51 μm (BA Condition)
B	Internal Surface Ra≤0.8 μm (BA Condition)
C	Internal Surface Ra≤1.6 μm (BA Condition)

① For ordering, please contact FITOK.

② Ra values of the internal and external surfaces at tube circumferential weld area is undefined.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.
Not all combinations are available.

Coaxial Seal Fittings

Introduction

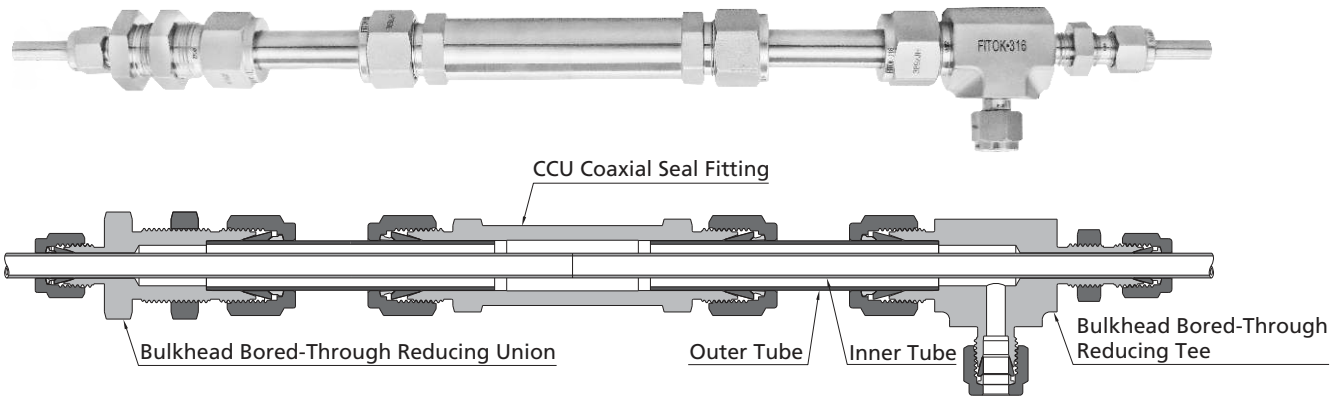
Coaxial Seal Fittings feature a double ferrule design that significantly reduces installation costs when using coaxial tubing in semiconductor manufacturing, as well as in toxic or hazardous gas applications. Unlike traditional welding methods used to seal the outer tube, these fittings eliminate the challenges, time consumption, and high costs associated with welding. They also mitigate the risk of damaging the inner tubes during the welding process. They are easy to install, highly reliable, and safe. Additionally, gap gauges can be used to verify proper end connection assembly before system pressurization.

Features

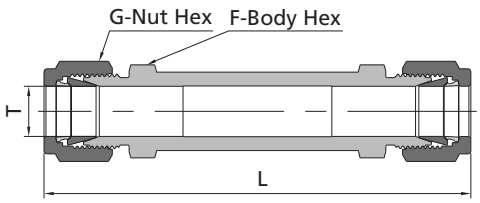
- ◎ Sizes range from 1/2" to 1" or 12 mm to 25 mm
- ◎ Same installation method as 6D Series Tube Fittings
- ◎ Available with metal and non-metal ferrules
- ◎ The working pressure of metal coaxial tube fittings is determined by multiplying the outer tube's working pressure by corresponding coefficients

Size, in.	Size, mm	Coefficient
O.D.≤1/2	O.D.≤12	0.75
1/2<O.D.≤3/4	12<O.D.≤18	0.50
O.D.>3/4	O.D.>18	0.25

Connection Diagram



Dimensions of Coaxial Seal Fittings



Fractional Tube				
T-Tube O.D. in.	Basic Ordering Number	Dimensions, in. (mm)		
		L	G	F
1/2	-CCU-FL8-5.3	5.30 (135)	0.87 (22.2)	0.81 (20.6)
	-CCU-FL8-4.3	4.30 (109)		
5/8	-CCU-FL10-4.42	4.42 (112)	1.00 (25.4)	0.94 (23.8)
	-CCU-FL10-5.3	5.30 (135)		
3/4	-CCU-FL12-6.55	6.55 (166)	1.13 (28.6)	1.06 (27.0)
	-CCU-FL12-4.3	4.30 (109)		
1	-CCU-FL16-3.5	3.50 (90)	1.50 (38.1)	1.37 (34.9)
	-CCU-FL16-4.3	4.30 (109)		
	-CCU-FL16-6.5	6.50 (165)		

Dimensions are for reference only and are subject to change;
Dimensions are shown with FITOK nuts finger-tight.

Ordering Number Description

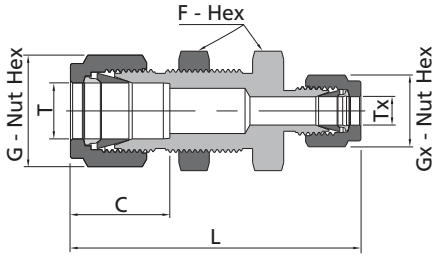
SS - CCU - FL16TF - 6.5 - F2

Body Material		Fitting Type	Fitting Type		Port Size		Ferrule Material		Length		Cleaning and Packaging	
SS	316 SS	CCU Coaxial Seal Fitting	FL	Fractional Tube Fitting	8	1/2"		Same Material as Body	xx	xx in.		FC-01
S4	304 SS		ML	Metric Tube Fitting	10	5/8"	TF	PTFE			F2	FC-02
					12	3/4" or 12 mm						
					16	1" or 16 mm						

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

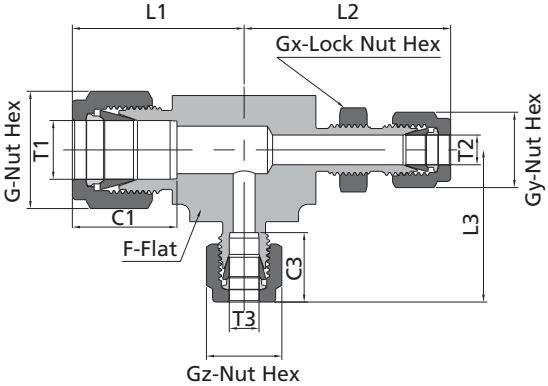
Other Fittings Used in Connection

Bulkhead Bored-Through Reducing Unions



Fractional Tube									
T-Tube O.D. in.	Tx-Tube O.D. in.	Basic Ordering Number	Dimensions, in. (mm)					Panel Hole Size in. (mm)	Max. Panel Thickness in. (mm)
			L	C	G	F	Gx		
1/2	1/4	-TU-FL4-BFL8	2.63 (66.8)	0.90 (22.9)	0.87 (22.2)	0.94 (23.8)	0.56 (14.3)	0.76 (19.4)	0.50 (12.7)

Bulkhead Bored-Through Reducing Tees

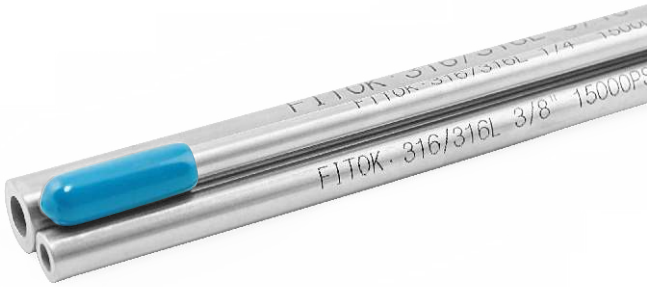


Fractional Tube													
T1-Tube O.D. in.	T2-Tube O.D. in.	T3-Tube O.D. in.	Basic Ordering Number	Dimensions, in. (mm)										Panel Hole Size in. (mm)	Max. Panel Thickness in. (mm)
				G	C1	F	Gx	Gy	Gz	C3	L1	L2	L3		
1/2	1/4	1/4	-TTT-FL8-TBFL4-FL4	0.87 (22.2)	0.90 (22.9)	0.94 (23.8)	0.63 (15.9)	0.56 (14.3)	0.56 (14.3)	0.60 (15.2)	1.49 (37.9)	1.96 (49.7)	1.33 (33.7)	0.45 (11.5)	0.40 (10.2)

Medium and High Pressure Tubing

T15A Series

Features



- ◎ Materials: 316/316L, enhanced-316/316L
- ◎ Working pressures: up to 15,000 psig (1034 bar)
- ◎ Working temperature: -325°F to 1000°F (-198°C to 537°C)
- ◎ Supply conditions: annealed seamless tubing
- ◎ For use with FITOK 20D series tube fittings
- ◎ Marked with brand, material grade, specification, pressure, annealing designator and heat number
- ◎ Standard length: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
  Customized length as per customer requirement is also available

Materials

UNS	Grade	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Cr	Ni	Mo
S31600/S31603	316/316L	SS	≤0.035	≤2.00	≤0.045	≤0.03	≤1.00	16-18	10-14	2.0-3.0
Enhanced-S31600/S31603	Enhanced-316/316L ①	SH	≤0.03					17-18	12-14	2.6-3.0

① Enhanced-316/316L complying with GB50516-2021 Technical Code for Hydrogen Fuelling Station is available, in which Ni_{eq} is not less than 28.5%. Contact FITOK Group for more information.

Mechanical Properties

UNS	Grade	Yield Strength ksi	Tensile Strength ksi	Elongation %	Hardness
S31600/S31603	316/316L	≥30	≥75	≥30	≤90 HRB
Enhanced-S31600/S31603	Enhanced-316/316L				

Dimensional Tolerance

Tube O.D. in.	O.D. Tolerance in.	Wall Thickness Tolerance %
1/8	+/-0.003	+/-10
1/4	+/-0.005	
3/8		
1/2		
3/4		
1		

Working Pressure at Ambient Temperature

Working pressures are calculated in accordance with ASME B31.3.

Tube O.D. in.	Wall Thickness in.	Working Pressure psig (bar)
1/8	0.037	15,000 (1,034)
1/4	0.083	15,000 (1,034)
	0.065	10,300 (710)
3/8	0.118	15,000 (1,034)
	0.095	10,000 (690)
1/2	0.156	15,000 (1,034)
	0.134	11,200 (772)
3/4	0.240	15,000 (1,034)
	0.188	10,000 (690)
1	0.220	10,000 (690)

Elevated Temperature Factors

Temperature		Factor
°F	°C	
100	38	1.00
200	93	
300	149	
400	204	0.96
500	260	0.89
600	316	0.85
700	371	0.81
800	427	0.79
1000	537	0.76

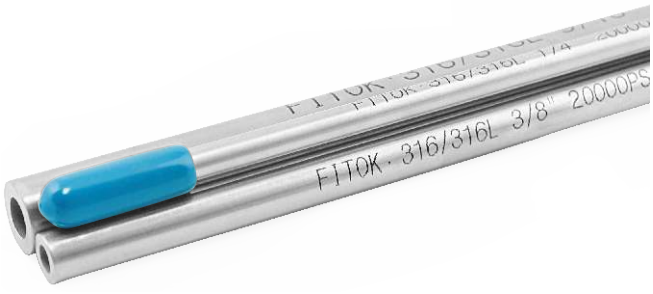
Ordering Information

Tube O.D. in.	Wall Thickness in.	Ordering Number ①②	
1/8	0.037	□□-T15A-2-037-6M	□□-T15A-2-037-20F
1/4	0.083	□□-T15A-4-083-6M	□□-T15A-4-083-20F
	0.065	□□-T15A-4-065-6M	□□-T15A-4-065-20F
3/8	0.118	□□-T15A-6-118-6M	□□-T15A-6-118-20F
	0.095	□□-T15A-6-095-6M	□□-T15A-6-095-20F
1/2	0.156	□□-T15A-8-156-6M	□□-T15A-8-156-20F
	0.134	□□-T15A-8-134-6M	□□-T15A-8-134-20F
3/4	0.240	□□-T15A-12-240-6M	□□-T15A-12-240-20F
	0.188	□□-T15A-12-188-6M	□□-T15A-12-188-20F
1	0.220	□□-T15A-16-220-6M	□□-T15A-16-220-20F

① In the ordering number, "6M"designator refers to 6 m tubing length and "20F" designator refers to 20 ft tubing length.
② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

T20D Series

Features



◎ Materials: 316/316L, enhanced-316/316L
◎ Working pressures: up to 20,000 psig (1379 bar)
◎ Working temperature: -325°F to 800°F (-198°C to 427°C)
◎ Supply conditions: cold-drawn 1/8-hard seamless tubing
◎ For use with FITOK 20D series tube fittings
◎ Marked with brand, material grade, specification, pressure and heat number
◎ Standard length: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m
Customized length as per customer requirement is also available

Materials

UNS	Grade	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Cr	Ni	Mo
S31600/S31603	316/316L	SS	≤0.035	≤2.00	≤0.045	≤0.03	≤1.00	16-18	10-14	2.0-3.0
Enhanced-S31600/S31603	Enhanced-316/316L ①	SH	≤0.03					17-18	12-14	2.6-3.0

① Enhanced-316/316L complying with GB50516-2021 Technical Code for Hydrogen Fuelling Station is available, in which Ni_{eq} is not less than 28.5%. Contact FITOK Group for more information.

Mechanical Properties

UNS	Grade	Yield Strength ksi	Tensile Strength ksi	Elongation %	Hardness
S31600/S31603	316/316L	75 to 110	105 to 140	≥25	≤26 HRC
Enhanced-S31600/S31603	Enhanced-316/316L				

Dimensional Tolerance

Tube O.D. in.	O.D. Tolerance in.	Wall Thickness Tolerance %
1/4	+/-0.005	+/-10
3/8		
1/2		
3/4		
1		

Working Pressure at Ambient Temperature

Working pressures are calculated in accordance with ASME B31.3 Chapter IX High Pressure Piping.

Tube O.D. in.	Wall Thickness in.	Working Pressure psig (bar)
1/4	0.065	20,000 (1,379)
3/8	0.083	
1/2	0.109	
3/4	0.165	
1	0.172	15,000 (1,034)

Elevated Temperature Factors

Temperature		Factor
°F	°C	
100	38	1.00
200	93	
300	149	
400	204	0.96
500	260	0.89
600	316	0.85
700	371	0.81
800	427	0.79

Ordering Information

Tube O.D. in.	Wall Thickness in.	Ordering Number ①②③	
1/4	0.065	☐☐-T20D-4-065-6M	☐☐-T20D-4-065-20F
3/8	0.083	☐☐-T20D-6-083-6M	☐☐-T20D-6-083-20F
1/2	0.109	☐☐-T20D-8-109-6M	☐☐-T20D-8-109-20F
3/4	0.165	☐☐-T20D-12-165-6M	☐☐-T20D-12-165-20F
1	0.172	☐☐-T20D-16-172-6M	☐☐-T20D-16-172-20F

① In the ordering number, "6M"designator refers to 6 m tubing length and "20F" designator refers to 20 ft tubing length.
② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.
③ Cold-drawn 1/8-hard seamless tubing is not used with 15S series single-ferrule tube fittings.

T20M Series

Features

- ◎ Materials: 316/316L, enhanced-316/316L
- ◎ Working pressure up to 20,000 psig (1379 bar)
- ◎ Working temperature: -325°F to 800°F (-198°C to 427°C)
- ◎ Cold-drawn seamless tubing
- ◎ For use with FITOK 20M series medium pressure fittings
- ◎ Marked with brand, material grade, specification, pressure, and heat number
- ◎ Standard length: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m, straight-length tubing and coned and threaded nipples in custom length are also available.

Materials

UNS	Grade	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Cr	Ni	Mo
S31600/S31603	316/316L	SS	≤0.035	≤2.00	≤0.045	≤0.03	≤1.00	16-18	10-14	2.0-3.0
Enhanced-S31600/S31603	Enhanced-316/316L ①	SH	≤0.03					17-18	12-14	2.6-3.0

① Enhanced-316/316L complying with GB50516-2021 Technical Code for Hydrogen Fuelling Station is available, in which Ni_{eq} is not less than 28.5%. Contact FITOK Group for more information.

Dimensional Tolerance

Tube O.D. in.	O.D. Tolerance in.	Tube I.D. in.	I.D. Tolerance in.
1/4	-0.002/-0.007	0.109	0/-0.005
3/8	-0.005/-0.01	0.203	
9/16		0.312	
3/4		0.438	+/-0.005
1		0.562	
1 1/2		0.937	

Working Pressure at Ambient Temperature

Working pressures are calculated in accordance with ASME B31.3 Chapter IX High Pressure Piping.

Tube O.D. in.	Tube I.D. in.	Working Pressure psig (bar)
1/4	0.109	20,000 (1,379)
3/8	0.203	
9/16	0.312	
3/4	0.438	
1	0.562	
1 1/2	0.937	15,000 (1,034)

Pressure-Temperature Ratings

Working Pressure psig (bar)				
-423 to 100°F (-252 to 37.8°C)	200°F (93°C)	400°F (204°C)	600°F (316°C)	800°F (427°C)
20,000 (1379)	20,000 (1379)	19,000 (1310)	18,000 (1241)	16,800 (1158)
15,000 (1034)	15,000 (1034)	14,200 (979)	13,500 (931)	12,600 (869)

Ordering Information

Cold-Drawn Seamless Tubing

Tube O.D. in.	Tube I.D. in.	Ordering Number①②	
1/4	0.109	□□-T20M-4-6M	□□-T20M-4-20F
3/8	0.203	□□-T20M-6-6M	□□-T20M-6-20F
9/16	0.312	□□-T20M-9-6M	□□-T20M-9-20F
3/4	0.438	□□-T20M-12-6M	□□-T20M-12-20F
1	0.562	□□-T20M-16-6M	□□-T20M-16-20F
1 1/2	0.937	□□-T20M-24-6M	□□-T20M-24-20F

① In the ordering number, "6M"designator refers to 6 m tubing length and "20F" designator refers to 20 ft tubing length. Nipples in custom length available upon request.

② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

Cold-Drawn Seamless Coiled Tubing

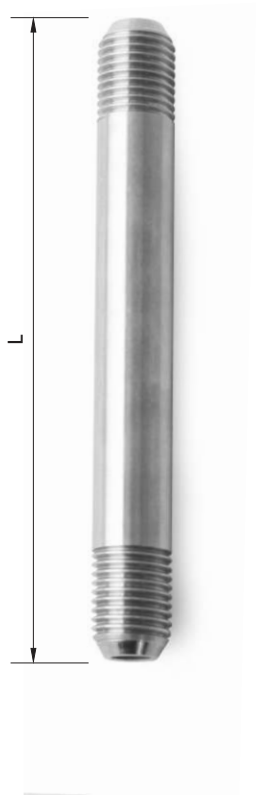
Tube O.D. in.	Tube I.D. in.	Ordering Number①②③	
1/4	0.109	□□-T20MC-4-CL11M	□□-T20MC-4-CL11F

① Random-length coiled tubing applies only to Grades CL11M/CL11F and is available in lengths ranging from 354 ft to 456 ft (108 m to 139 m).

② Cut-to-length service is available for lengths up to a maximum of 120 m.

③ To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

Coned and Threaded Nipples



Tube O.D. in.	Tube I.D. in.	Length L ① in. (mm)	Ordering Number ②
1/4	0.109	3.00 (76.2)	☐☐-T20M-4CT-3N
		4.00 (101.6)	☐☐-T20M-4CT-4N
		6.00 (152.4)	☐☐-T20M-4CT-6N
		8.00 (203.2)	☐☐-T20M-4CT-8N
		10.0 (254.0)	☐☐-T20M-4CT-10N
		12.0 (304.8)	☐☐-T20M-4CT-12N
3/8	0.203	3.00 (76.2)	☐☐-T20M-6CT-3N
		4.00 (101.6)	☐☐-T20M-6CT-4N
		6.00 (152.4)	☐☐-T20M-6CT-6N
		8.00 (203.2)	☐☐-T20M-6CT-8N
		10.0 (254.0)	☐☐-T20M-6CT-10N
		12.0 (304.8)	☐☐-T20M-6CT-12N
9/16	0.312	4.00 (101.6)	☐☐-T20M-9CT-4N
		6.00 (152.4)	☐☐-T20M-9CT-6N
		8.00 (203.2)	☐☐-T20M-9CT-8N
		10.0 (254.0)	☐☐-T20M-9CT-10N
		12.00 (304.8)	☐☐-T20M-9CT-12N
3/4	0.438	4.00 (101.6)	☐☐-T20M-12CT-4N
		6.00 (152.4)	☐☐-T20M-12CT-6N
		8.00 (203.2)	☐☐-T20M-12CT-8N
		10.0 (254.0)	☐☐-T20M-12CT-10N
		12.0 (304.8)	☐☐-T20M-12CT-12N
1	0.562	6.00 (152.4)	☐☐-T20M-16CT-6N
		8.00 (203.2)	☐☐-T20M-16CT-8N
		10.0 (254.0)	☐☐-T20M-16CT-10N
		12.0 (304.8)	☐☐-T20M-16CT-12N
1 1/2	0.937	6.00 (152.4)	☐☐-T20M-24CT-6N
		8.00 (203.2)	☐☐-T20M-24CT-8N
		10.0 (254.0)	☐☐-T20M-24CT-10N
		12.0 (304.8)	☐☐-T20M-24CT-12N

① Nipples in customized length available upon request.
② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

T60H Series

Features

- Materials: 316/316L, enhanced-316/316L
- Working pressure up to 60,000 psig (4137 bar)
- Working temperature: -423°F to 1200°F (-252°C to 649°C)
- Cold-drawn seamless tubing
- For use with FITOK 60H series high pressure fittings
- Marked with brand, material grade, specification, pressure, and heat number
- Standard length: 40 in, 80 in, 10 ft, 20 ft, 1 m, 2 m, 3 m and 6 m, straight-length tubing and coned and threaded nipples in custom length are also available.

Materials

UNS	Grade	FITOK Designator	Composition %							
			C	Mn	P	S	Si	Cr	Ni	Mo
S31600/S31603	316/316L	SS	≤0.035	≤2.00	≤0.045	≤0.03	≤1.00	16-18	10-14	2.0-3.0
Enhanced-S31600/S31603	Enhanced-316/316L	SH	≤0.03					17-18	12-14	2.6-3.0

Dimensional Tolerance

Tube O.D. in.	O.D. Tolerance in.	Tube I.D. in.	I.D. Tolerance in.
1/4	-0.002/-0.007	0.083	0/-0.005
3/8	-0.005/-0.01	0.125	
9/16		0.188	

Pressure-Temperature Ratings

Working Pressure psig (bar)				
-423 to 100°F (-252 to 37.8°C)	200°F (93°C)	400°F (204°C)	600°F (316°C)	800°F (427°C)
60,000 (4137)	60,000 (4137)	57,750 (3982)	54,250 (3740)	50,700 (3496)

If tubing is used at temperatures above 800°F (427°C) or reused thereafter, working pressures for tubing in the following table shall apply.

Working Pressure psig (bar)					
-423 to 200°F (-252 to 93°C)	400°F (204°C)	600°F (316°C)	800°F (427°C)	1000°F (538°C)	1200°F (649°C)
24,200 (1669)	22,200 (1531)	20,500 (1413)	18,850 (1300)	18,600 (1282)	8,750 (603)

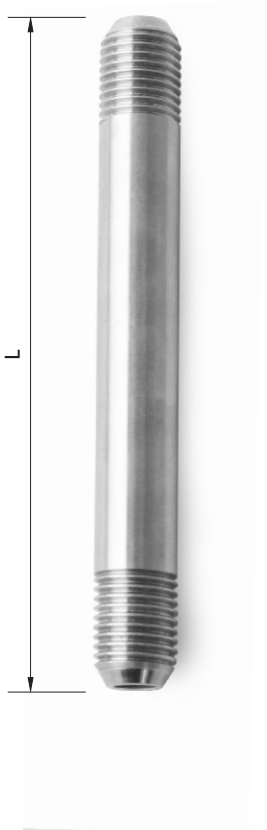
Ordering Information

Cold-Drawn Seamless Tubing

Tube O.D. in.	Tube I.D. in.	Ordering Number ①②	
1/4	0.083	□□-T60H-4-6M	□□-T60H-4-20F
3/8	0.125	□□-T60H-6-6M	□□-T60H-6-20F
9/16	0.188	□□-T60H-9-6M	□□-T60H-9-20F

① In the ordering number, "6M"designator refers to 6 m tubing length and "20F" designator refers to 20 ft tubing length. Nipples in custom length available upon request.
② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

Coned and Threaded Nipples



Tube O.D. in.	Tube I.D. in.	Length L ① in. (mm)	Ordering Number②
1/4	0.083	2.75 (69.9)	□□-T60H-4CT-2.75N
		3.00 (76.2)	□□-T60H-4CT-3N
		4.00 (101.6)	□□-T60H-4CT-4N
		6.00 (152.4)	□□-T60H-4CT-6N
		8.00 (203.2)	□□-T60H-4CT-8N
		10.0 (254.0)	□□-T60H-4CT-10N
		12.0 (304.8)	□□-T60H-4CT-12N
3/8	0.125	3.00 (76.2)	□□-T60H-6CT-3N
		4.00 (101.6)	□□-T60H-6CT-4N
		6.00 (152.4)	□□-T60H-6CT-6N
		8.00 (203.2)	□□-T60H-6CT-8N
		10.0 (254.0)	□□-T60H-6CT-10N
		12.0 (304.8)	□□-T60H-6CT-12N
9/16	0.188	4.00 (101.6)	□□-T60H-9CT-4N
		6.00 (152.4)	□□-T60H-9CT-6N
		8.00 (203.2)	□□-T60H-9CT-8N
		10.0 (254.0)	□□-T60H-9CT-10N
		12.0 (304.8)	□□-T60H-9CT-12N

① Nipples in custom length available upon request.
② To order, add the material designator as prefix: SS for 316/316L and SH for enhanced-316/316L.

Jacketed Tubing

TJT Series

Features

◎ Materials: stainless steel or copper tubing, PVC or TPU jacket
◎ Sizes: 1/4" to 1 1/4", 6 mm to 32 mm
◎ Working temperature: -31°F to 194°F (-35°C to 90°C)
◎ Stainless steel tubing bright annealed with machined finished external surface
◎ For use with FITOK 6D series tube fittings, 4:1 safety factor for the tubing and connection part of fitting and tubing
◎ Marked with brand, tubing material grade, standard, specification, heat number

Materials

Tubing

UNS	Grade	ASTM Standard	FITOK Designator	Composition %					Mechanical Properties			
				C	Cr	Ni	Mo	Cu	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness
S31600/ S31603	316/ 316L	A269	SS	≤0.035①	16-18	10-14	2.0-3.0	-	≥205	≥515	≥35	≤80 HRB
C12200	-	B75	CU	-	-	-	-	99.9	≥62	≥205	-	-

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

PVC Jacket

Min. Tensile Strength	1530 psig (105 bar)
Min. Elongation	300%
Shore Hardness	80 HA
Max. Working Temperature	194°F (90°C)
Min. Installation Temperature	-31°F (-35°C)
Min. Working Temperature	-31°F (-35°C)
Resistance to Chloride	Yes
Max. Water Absorption	0.06%

Technical Data

Fractional

Material Designator	UNS	Tube O.D. in.	Wall Thickness in. ①	Max. Working Temperature °F (°C)	Min. Working Temperature °F (°C)	Working Pressure psig	Min. Bend Radius in.	Jacket O.D. in. ±0.016 in.	Max. Coil Length ft	Straight-Length Tubing ft
SS	S31600/ S31603	1/4	0.028	194 (90)	-31 (-35)	4000	8	0.407	6560	20
		5/16	0.035			4000		0.471	4170	
		3/8	0.049			4800		0.533	2530	
		1/2	0.065			5100		0.657	1430	
		5/8	0.083			5200		0.783	900	
		3/4	0.095			4900	/	0.907	/	
		7/8	0.095			4200		1.033		
		1	0.109			4200		1.157		
		1 1/4	0.120			3600		1.407		
CU	C12200	1/4	0.035			1600	8	0.407	4800	
		3/8	0.035			1000		0.533	3050	
		1/2	0.035 ②			800		0.657	2200	
			0.049			1100		0.657	1650	

Metric

Material Designator	UNS	Tube O.D. mm	Wall ① Thickness mm	Max. Working Temperature °C (°F)	Min. Working Temperature °C (°F)	Working Pressure bar	Min. Bend Radius cm	Jacket O.D. mm ±0.4 mm	Max. Coil Length m	Straight-Length Tubing m
SS	S31600/ S31603	6	1.0	204 (400)	-29 (-20)	420	20.3	10	1600	6
		8	1.0			310		12	1140	
		10	1.2			300		14	750	
		12	1.5			330		16	500	
		14	2.0			380		18	330	
		15	2.0			360		19	300	
		16	2.0			330		20	280	
		18	2.0			290	/	22	/	
		20	2.0			260		24		
		22	2.0			230		26		
		25	3.0			320		29		
		28	3.0			280		32		
		30	3.0			260		34		
		32	3.0			240		36		
CU	C12200	6	1.0			140	20.3	10	1400	
		10	1.0			80		14	750	
		12	1.0②			60		16	650	
			1.5			100		16	450	

① Refer to TMP series tubing for other wall thicknesses of S31600/S31603.

② Not recommended for use with 6D series tube fittings in gas service.

Ordering Information

1. Standard length: 20 ft and 6 m
2. S31600/S31603 material jacketed tubing is ordered in the same way as TCT series coiled tubing, for different lengths see Ordering information of TCT series.

Ordering Number Description

SS - TJT - 6 - 035 - U - H - 6M

Material	
SS	316/316L
CU	12200

Series
TJT

Tube O.D.			
Fractional		Metric	
4	1/4"	6MM	6 mm
6	3/8"	8MM	8 mm
8	1/2"	10MM	10 mm
10	5/8"	12MM	12 mm
12	3/4"	14MM	14 mm
14	7/8"	16MM	16 mm
16	1"	18MM	18 mm
20	1 1/4"	20MM	20 mm
		22MM	22 mm
		25MM	25 mm
		28MM	28 mm
		30MM	30 mm
		32MM	32 mm

Wall Thickness			
Fractional		Metric	
028	0.028"	0.8	0.8 mm
035	0.035"	1.0	1.0 mm
049	0.049"	1.2	1.2 mm
065	0.065"	1.5	1.5 mm
083	0.083"	1.8	1.8 mm
095	0.095"	2.0	2.0 mm
109	0.109"	2.2	2.2 mm
120	0.120"	2.5	2.5 mm
134	0.134"	2.8	2.8 mm
156	0.156"	3.0	3.0 mm
		3.5	3.5 mm
		4.0	4.0 mm

Jacket Material	
	PVC
U	TPU

Jacket Color	
	Black
H	White

Length	
xxM	Length xx m (Except For Random Length Coiled Tubing)
xxF	Length xx ft (Except For Random Length Coiled Tubing)
CL11F	Random Length Grade CL11F (For Coiled Tubing Only)
CL11M	Random Length Grade CL11M (For Coiled Tubing Only)
CL21F	Random Length Grade CL21F (For Coiled Tubing Only)
CL21M	Random Length Grade CL21M (For Coiled Tubing Only)
CL31F	Random Length Grade CL31F (For Coiled Tubing Only)
CL31M	Random Length Grade CL31M (For Coiled Tubing Only)
CL41F	Random Length Grade CL41F (For Coiled Tubing Only)
CL41M	Random Length Grade CL41M (For Coiled Tubing Only)

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. For any questions, please contact FITOK Group or our authorized distributors.

Insulated Tubing

TIT Series

Features

◎ Materials: stainless steel or copper tubing, fibrous glass insulation, PVC or TPU jacket
◎ Sizes: 1/4" to 1 1/4", 6 mm to 32 mm
◎ Maintains temperature from -20°F to 400°F (-29°C to 204°C)
◎ Stainless steel tubing bright annealed with machined finished external surface
◎ For use with FITOK 6D series tube fittings, 4:1 safety factor for the tubing and connection part of fitting and tubing
◎ Marked with brand, tubing material grade, standard, specification, heat number

Materials

Tubing

UNS	Grade	ASTM Standard	FITOK Designator	Composition %					Mechanical Properties			
				C	Cr	Ni	Mo	Cu	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness
S31600/ S31603	316/ 316L	A269	SS	≤0.035①	16-18	10-14	2.0-3.0	-	≥205	≥515	≥35	≤80 HRB
C12200	-	B75	CU	-	-	-	-	99.9	≥62	≥205	-	-

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

PVC Jacket

Min. Tensile Strength	1530 psig (105 bar)
Min. Elongation	300%
Shore Hardness	80 HA
Max. Working Temperature	194°F (90°C)
Min. Installation Temperature	-31°F (-35°C)
Min. Working Temperature	-31°F (-35°C)
Resistance to Chloride	Yes
Max. Water Absorption	0.06%

Technical Data

Fractional

Material Designator	UNS	Tube O.D. in.	Wall Thickness in.	Max. Working Temperature °F (°C)	Min. Working Temperature °F (°C)	Working Pressure psig	Min. Bend Radius in.	Jacket O.D. in. ±0.157 in.	Max. Coil Length ft	Straight-Length Tubing ft
SS	S31600/ S31603	1/4	0.028	400 (204)	-20 (-29)	4000	13.8	1.27	1640	20
		5/16	0.035			4000		1.34		
		3/8	0.049			4800		1.40		
		1/2	0.065			5100		1.68		
		5/8	0.083			5200		1.80	984	
		3/4	0.095			4900	/	1.93	/	
		7/8	0.095			4200		2.06		
		1	0.109			4200		2.18		
		1 1/4	0.120			3600		2.43		
CU	C12200	1/4	0.035			1600	9.84	1.27	1640	
		3/8	0.035			1000		1.40		
		1/2	0.035②			800		1.68		
			0.049			1100		1.68		

Metric

Material Designator	UNS	Tube O.D. mm	Wall ① Thickness mm	Max. Working Temperature °C (°F)	Min. Working Temperature °C (°F)	Working Pressure bar	Min. Bend Radius mm	Jacket O.D. mm ±4 mm	Max. Coil Length m	Straight-Length Tubing m
SS	S31600/ S31603	6	1.0	204 (400)	-29 (-20)	420	350	32	500	6
		8	1.0			310		34		
		10	1.2			300		36		
		12	1.5			330		42		
		14	2.0			380		44	400	
		15	2.0			360		45	300	
		16	2.0			330		46		
		18	2.0			290	/	48	/	
		20	2.0			260		50		
		22	2.0			230		52		
		25	3.0			320		55		
		28	3.0			280		58		
		30	3.0			260		60		
		32	3.0			240		62		
CU	C12200	6	1.0			140	250	32	500	
		10	1.0			80		36		
		12	1.0 ②			60		42		
			1.5			100		42		

① Refer to TMP series tubing for other wall thicknesses of S31600/S31603.

② Not recommended for use with 6D series tube fittings in gas service.

Ordering Information

1. Standard length: 20 ft and 6 m
2. S31600/S31603 material jacketed tubing is ordered in the same way as TCT series coiled tubing, for different lengths see Ordering Information of TCT series.

Ordering Number Description

SS - TIT - 6 - 035 - U - H - 6M

Material		Series	Tube O.D.				Wall Thickness				Jacket Material		Jacket Color		Length	
SS	316/316L	TIT	Fractional		Metric		Fractional		Metric			PVC		Black	xxM	Length xx m (Except For Random Length Coiled Tubing)
CU	12200		4	1/4"	6MM	6 mm	028	0.028"	0.8	0.8 mm	U	TPU	H	White	xxF	Length xx ft (Except For Random Length Coiled Tubing)
			5	5/16"	8MM	8 mm	035	0.035"	1.0	1.0 mm					CL11F	Random Length Grade CL11F (For Coiled Tubing Only)
			6	3/8"	10MM	10 mm	049	0.049"	1.2	1.2 mm					CL11M	Random Length Grade CL11M (For Coiled Tubing Only)
			8	1/2"	12MM	12 mm	065	0.065"	1.5	1.5 mm					CL21F	Random Length Grade CL21F (For Coiled Tubing Only)
			10	5/8"	14MM	14 mm	083	0.083"	1.8	1.8 mm					CL21M	Random Length Grade CL21M (For Coiled Tubing Only)
			12	3/4"	16MM	16 mm	095	0.095"	2.0	2.0 mm					CL31F	Random Length Grade CL31F (For Coiled Tubing Only)
			14	7/8"	18MM	18 mm	109	0.109"	2.2	2.2 mm					CL31M	Random Length Grade CL31M (For Coiled Tubing Only)
			16	1"	20MM	20 mm	120	0.120"	2.5	2.5 mm					CL41F	Random Length Grade CL41F (For Coiled Tubing Only)
			20	1 1/4"	22MM	22 mm	134	0.134"	2.8	2.8 mm					CL41M	Random Length Grade CL41M (For Coiled Tubing Only)
					25MM	25 mm	156	0.156"	3.0	3.0 mm						
					28MM	28 mm			3.5	3.5 mm						
					30MM	30 mm			4.0	4.0 mm						
					32MM	32 mm										

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. For any questions, please contact FITOK Group or our authorized distributors.

Steam Heat Traced Tubing

TST Series

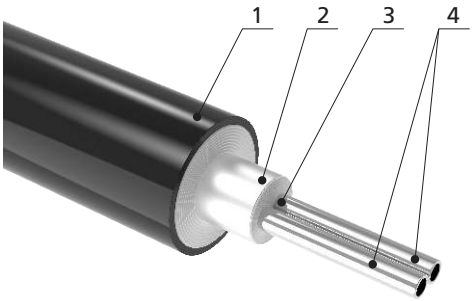
Introduction

TST Series Steam Heat Traced Tubing is a pre-insulated tubing bundle that integrates one or more process tubes with one or more tracer tubes. It maintains the desired media temperature during transport by using steam, making it ideal for applications such as temperature maintenance and viscosity control.

Features

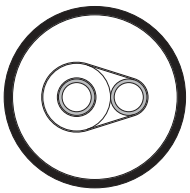
- Identical tubing material for both process and tracer tubes - one for media transport and the other for steam supply
- Materials: 316/316L stainless steel or copper process and tracer tubes, with PVC or TPU outer jacket
- Process and Tracer Tube O.D.: 1/4"-1/2", 6-14 mm
- Available in light and heavy heat tracing configurations
- Optional quantity of tracer and process tubes
- Compatible with FITOK 6D Series tube fittings

Standard Materials of Construction

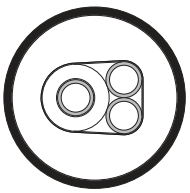


Item	Component	Material
1	Outer Jacket	PVC or TPU
2	Thermal Insulation	Fibre Glass
3	Wrap	Aluminum Foil
4	Tracer Tube and Process Tube	Stainless Steel or Copper

Light Heat Trace

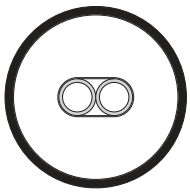


One Process Tube

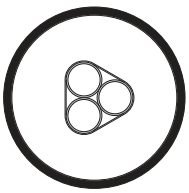


Two Process Tubes

Heavy Heat Trace



One Process Tube



Two Process Tubes

Outer Jacket

Outer Jacket Material	PVC	TPU
Min. Tensile Strength	16.5 MPa	24.9 MPa
Max. Elongation	250%	660%
Shore Hardness	85 HA	85 HA
Working Temperature Range	-40 °F to 194 °F (-40 °C to 90 °C)	-58 °F to 194 °F (-50 °C to 90 °C)

Technical Data of Process Tube and Tracer Tube

Temperature Maintenance Range

Temperature Maintenance Range	
Light Heat Trace	Heavy Heat Trace
50 °F - 200 °F (10 °C - 93 °C)	200 °F - 355 °F (93 °C - 179 °C)

Material

UNS	Grade	ASTM Standard	FITOK Designator	Composition %					Mechanical Properties			
				C	Cr	Ni	Mo	Cu	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness HRB
S31600/ S31603	316/ 316L	A269	SS	⩽0.035①	16-18	10-14	2.0-3.0	-	⩾205	⩾515	⩾35	⩽80
C12200	-	B75	CU	-	-	-	-	99.9	⩾62	⩾205	-	-

① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%.

Working Pressure

For tubing working pressure, refer to the TMP series tubing.
When use with FITOK 6D series tube fittings, it provides a safety factor of 4:1 for the connection between the fitting and tubing.

Dimensions of Process Tube and Tracer Tube

Fractional

Process Tube Tube O.D. x Wall Thickness, in.	Tracer Tube Tube O.D. x Wall Thickness, in.	Product O.D. in. ±0.157 in.	Min. Bend Radius in.	Max. Coil Length ① ft	Straight-Length Tubing ft
Process Tube and Tracer Tube					
1/4×0.035	1/4×0.035	1.65	13.8	1312	20
3/8×0.049	3/8×0.049	1.89			
1/2×0.065	1/2×0.065	2.32			
Two Process Tubes and Tracer Tube					
1/4×0.035	1/4×0.035	1.65	13.8	984	20
3/8×0.049	3/8×0.049	1.89			
1/2×0.065	1/2×0.065	2.32			

① Contact FITOK Group for more information.

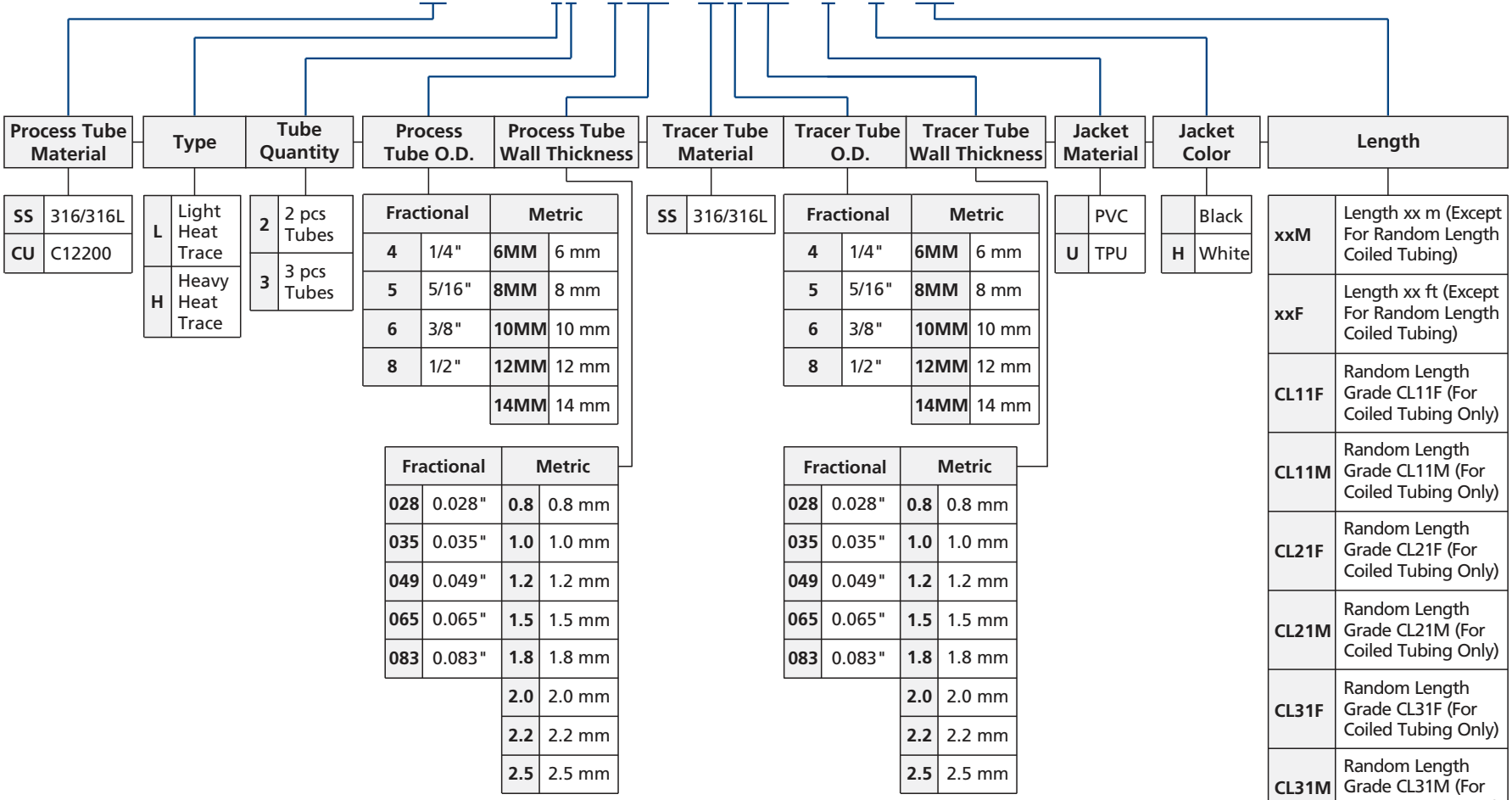
Metric

Process Tube Tube O.D. x Wall Thickness, mm	Tracer Tube Tube O.D. x Wall Thickness, mm	Product O.D. mm ±4 mm	Min. Bend Radius mm	Max. Coil Length ① m	Straight-Length Tubing m
Process Tube and Tracer Tube					
6×1	6×1	41	350	400	6
8×1	8×1	45			
10×1	10×1	49			
12×1	12×1	57			
14×2	14×2	61	/	/	
Two Process Tubes and Tracer Tube					
6×1	6×1	41	350	300	6
8×1	8×1	45			
10×1	10×1	49			
12×1	12×1	57			
14×2	14×2	61	/	/	

① Contact FITOK Group for more information.

Ordering Number Description

SS - TST - L2 - 6035 - SS6035 - U - H - 6M



Process Tube Material	
SS	316/316L
CU	C12200

Type	
L	Light Heat Trace
H	Heavy Heat Trace

Tube Quantity	
2	2 pcs Tubes
3	3 pcs Tubes

Process Tube O.D.			
Fractional		Metric	
4	1/4"	6MM	6 mm
5	5/16"	8MM	8 mm
6	3/8"	10MM	10 mm
8	1/2"	12MM	12 mm
		14MM	14 mm

Process Tube Wall Thickness			
Fractional		Metric	
028	0.028"	0.8	0.8 mm
035	0.035"	1.0	1.0 mm
049	0.049"	1.2	1.2 mm
065	0.065"	1.5	1.5 mm
083	0.083"	1.8	1.8 mm
		2.0	2.0 mm
		2.2	2.2 mm
		2.5	2.5 mm

Tracer Tube Material	
SS	316/316L

Tracer Tube O.D.			
Fractional		Metric	
4	1/4"	6MM	6 mm
5	5/16"	8MM	8 mm
6	3/8"	10MM	10 mm
8	1/2"	12MM	12 mm
		14MM	14 mm

Tracer Tube Wall Thickness			
Fractional		Metric	
028	0.028"	0.8	0.8 mm
035	0.035"	1.0	1.0 mm
049	0.049"	1.2	1.2 mm
065	0.065"	1.5	1.5 mm
083	0.083"	1.8	1.8 mm
		2.0	2.0 mm
		2.2	2.2 mm
		2.5	2.5 mm

Jacket Material	
	PVC
U	TPU

Jacket Color	
	Black
H	White

Length	
xxM	Length xx m (Except For Random Length Coiled Tubing)
xxF	Length xx ft (Except For Random Length Coiled Tubing)
CL11F	Random Length Grade CL11F (For Coiled Tubing Only)
CL11M	Random Length Grade CL11M (For Coiled Tubing Only)
CL21F	Random Length Grade CL21F (For Coiled Tubing Only)
CL21M	Random Length Grade CL21M (For Coiled Tubing Only)
CL31F	Random Length Grade CL31F (For Coiled Tubing Only)
CL31M	Random Length Grade CL31M (For Coiled Tubing Only)
CL41F	Random Length Grade CL41F (For Coiled Tubing Only)
CL41M	Random Length Grade CL41M (For Coiled Tubing Only)

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. For any questions, please contact FITOK Group or our authorized distributors.

Electrical Heat Traced Tubing

TET Series

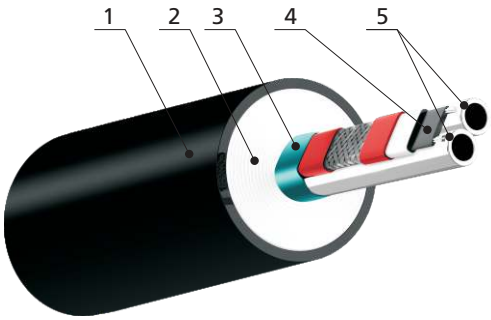
Introduction

TET Series Electrical Heat Traced Tubing is a pre-insulated tubing bundle that integrates an electric heating cable with one or more process tubes. It maintains the desired media temperature during transport using electric power, making it ideal for applications such as temperature maintenance and viscosity control.

Features

◎ Materials: 316/316L SS or copper process tube with PVC or TPU outer jacket
◎ Process Tube O.D.: 6~12 mm, 1/4"~1/2"
◎ Available in low, medium, or high temperature heating cable types, capable of maintaining temperature up to 446 °F (230 °C)
◎ One or two process tubes available as standard
◎ Raychem® heating cables and electrical accessories

Standard Materials of Construction



Item	Component	Material
1	Outer Jacket	PVC or TPU
2	Thermal Insulation	Fibre Glass
3	Wrap	Aluminum Foil
4	Heating Cable	-
5	Process Tube	316/316L SS or Copper

Material Specification

Process Tube

The process tube is used for the transport of process media and for withstanding the pressure of that media. 6D series tube fittings are used to connect process tubes.

UNS	Grade	Standard ASTM	FITOK Designator	Composition %					Mechanical Properties			
				C	Cr	Ni	Mo	Cu	Yield Strength MPa	Tensile Strength MPa	Elongation %	Hardness HRB
S31600/ S31603	316/ 316L SS	A269	SS	⩽0.035①	16-18	10-14	2.0-3.0	-	⩾205	⩾515	⩾35	⩽80
C12200	-	B75	CU	-	-	-	-	99.9	⩾62	⩾205	-	-

Note: ① The carbon content of tubing with outside diameter < 1/2" or wall thickness < 0.049" is allowed be ⩽ 0.04%.
Other materials are available upon request. Contact FITOK for details.

Outer Jacket

The outer jacket provides effective corrosion resistance and mechanical protection. PVC is an economical choice that still offers reliable protection. TPU is suitable for applications requiring lower temperature flexibility and higher mechanical strength.

Outer Jacket Material	PVC	TPU
Min. Tensile Strength	16.5 MPa	24.9 MPa
Max. Elongation	250%	660%
Shore Hardness	85 HA	85 HA
Working Temperature Range	-40 °F ~ 194 °F (-40 °C ~ 90 °C)	-58 °F ~ 194 °F (-50 °C ~ 90 °C)

Heating Cable

Both self-regulating and power-limiting heating cables reduce their power output as temperature rises. However, due to differences in configuration, power-limiting heating cables are more suitable for high-temperature applications. In the table below, low and medium temperature heating cable types are self-regulating, while high temperature heating cable type is power-limiting.

Maximum continuous exposure temperature refers to the recommended maximum temperature as the power is on/off during freeze protection or viscosity control applications.

Maximum intermittent exposure temperature refers to the acceptable temporary peak temperature, such as during steam cleaning of process tubes.

Heating Cable Type	Heating Cable Code	Voltage V (ac)	Power W/ft (W/m)	Max. Continuous Exposure Temp.		Max. Intermittent Exposure Temp.		Max. Length, m	Temp. Rating	Approvals
				Power-on °F (°C)	Power-off °F (°C)	Power-on °F (°C)	Power-off °F (°C)			
Low Temp.	L	120/240	3 (10) 5 (16) 8 (26) 10 (32)	149 (65)	149 (65)	185 ① (85)		305	T6	**IECEx:** Ex 60079-30-1 eb IIC T6 Gb Ex 60079-30-1 eb mb IIC T6 Gb Ex 60079-30-1 tb IIIC T80°C Db Ex 60079-30-1 mb tb IIIC T80°C Db **FM:** Class I, Zone 1, Group IIC Class I, Division 2, Groups A, B, C, D Class II, Division 2, Groups F, G Class III, Division 1 **EAC:** 1Ex e IIC T6 Gb X 1Ex e mb IIC T6 Gb X Ex tb IIIC T80°C Db X Ex tb mb IIIC T80°C Db X
Medium Temp.	M	120/240	10 (32) 15 (49) 20 (65)	230 (110)	230 (110)	230 (110)		305	T4	**IECEx:** Ex 60079-30-1 eb IIC T4 Gb Ex 60079-30-1 eb mb IIC T4 Gb Ex 60079-30-1 tb IIIC T130°C Db Ex 60079-30-1 mb tb IIIC T130°C Db **FM:** Class I, Zone 1, AEx e II 120°C (T4) Class I, Division 2, Groups A, B, C and D T4A Class II, Division 2, Groups E, F and G T4A Class III, Division 1 Type 4X **EAC:** 1Ex e IIC T4 Gb X 1Ex e mb IIC T4 Gb X Ex tb IIIC T130°C Db X Ex tb mb IIIC T130°C Db X

Heating Cable Type	Heating Cable Code	Voltage V (ac)	Power W/ft (W/m)	Max. Continuous Exposure Temp.		Max. Intermittent Exposure Temp.		Max. Length, m	Temp. Rating	Approvals
				Power-on °F (°C)	Power-off °F (°C)	Power-on °F (°C)	Power-off °F (°C)			
High Temp.	H	240	5 (16)	446 (230)	500 (260)	500 (260)		230	T2-T6	**IECEx:** Ex e IIC T* Gb Ex td A21 IP66 T**°C Ex e mb IIC T* Gb Ex td mbD A21 IP66 T**°C **FM:** Class I, Division 2, Group B, C and D T* Class II, Division 2, Groups E, F and G T* Class III, Division 1 Type 4X **EAC:** 1Ex e IIC T* Gb X 1Ex e mb IIC T* Gb X Ex tb IIIC T* Db X Ex tb mb IIIC T* Db X
			10 (32)	410 (210)						
			15 (49)	356 (180)						
			20 (65)	302 (150)						
		400	5 (16)	446 (230)						
			10 (32)	419 (215)						
			15 (49)	383 (195)						
			20 (65)	302 (150)						

Maximum circuit length based on type "C" circuit breakers according to IEC 60898

The circuit breaker is an electrical protection device designed to protect a circuit from damage caused by overcurrent or short circuit. The following table lists maximum circuit lengths for different breaker sizes.

Example: In a circuit with a rated voltage of 240 V and a breaker size of 15 A, the maximum safe length for a low-temperature heating cable with a rated output of 5 W/ft (16 W/m) at a startup temperature of 50°F (10°C) is 460 ft (140 m).

Heating Cable Type	Nominal Power Output W/ft (W/m)	Startup Temp. °F (°C)	Circuit Breaker Voltage V				Circuit Breaker Voltage V			
			120				240			
			Circuit Breaker Size A				Circuit Breaker Size A			
			15	20	30	40	15	20	30	40
			Maximum Circuit Length ft (m)				Maximum Circuit Length ft (m)			
Low Temp.	3 (10)	50 (10)	330 (101)	330 (101)	330 (101)	330 (101)	660 (201)	660 (201)	660 (201)	660 (201)
		0 (-18)	200 (61)	265 (81)	330 (101)	330 (101)	395 (120)	530 (162)	660 (201)	660 (201)
		-20 (-29)	175 (53)	235 (72)	330 (101)	330 (101)	350 (107)	465 (142)	660 (201)	660 (201)
		-40 (-40)	155 (47)	205 (62)	310 (94)	330 (101)	310 (94)	410 (125)	620 (189)	660 (201)
	5 (16)	50 (10)	230 (70)	270 (82)	270 (82)	270 (82)	460 (140)	540 (165)	540 (165)	540 (165)
		0 (-18)	140 (43)	190 (58)	270 (82)	270 (82)	285 (87)	380 (116)	540 (165)	540 (165)
		-20 (-29)	125 (38)	165 (50)	250 (76)	270 (82)	250 (76)	330 (101)	500 (152)	540 (165)
		-40 (-40)	110 (34)	145 (44)	220 (67)	270 (82)	220 (67)	295 (90)	440 (134)	540 (165)
	8 (26)	50 (10)	150 (46)	200 (61)	210 (64)	210 (64)	300 (91)	400 (122)	420 (128)	420 (128)
		0 (-18)	100 (30)	130 (40)	200 (61)	210 (64)	200 (61)	265 (81)	400 (122)	420 (128)
		-20 (-29)	85 (26)	115 (35)	175 (53)	210 (64)	175 (53)	235 (72)	350 (107)	420 (128)
		-40 (-40)	80 (24)	105 (32)	155 (47)	210 (64)	155 (47)	210 (64)	315 (96)	420 (128)
	10 (32)	50 (10)	120 (37)	160 (49)	180 (55)	180 (55)	240 (73)	315 (96)	360 (110)	360 (110)
		0 (-18)	80 (24)	110 (34)	160 (49)	180 (55)	160 (49)	215 (66)	325 (99)	360 (110)
		-20 (-29)	70 (21)	95 (29)	140 (43)	180 (55)	145 (44)	190 (58)	285 (87)	360 (110)
		-40 (-40)	65 (20)	85 (26)	125 (38)	170 (52)	125 (38)	170 (52)	255 (78)	340 (104)
Medium Temp.	10 (32)	50 (10)	100 (30)	130 (40)	195 (59)	195 (59)	200 (61)	265 (81)	390 (119)	390 (119)
		0 (-18)	80 (24)	105 (32)	160 (49)	195 (59)	160 (49)	210 (64)	320 (98)	390 (119)
		-20 (-29)	70 (21)	95 (29)	145 (44)	195 (59)	145 (44)	195 (59)	295 (90)	390 (119)
		-40 (-40)	65 (20)	90 (27)	135 (41)	180 (55)	135 (41)	180 (55)	275 (84)	365 (111)
	15 (49)	50 (10)	75 (23)	100 (30)	150 (46)	200 (61)	160 (49)	210 (64)	320 (98)	340 (104)
		0 (-18)	60 (18)	80 (24)	120 (37)	160 (49)	125 (38)	170 (52)	255 (78)	340 (104)
		-20 (-29)	55 (17)	70 (21)	110 (34)	145 (44)	115 (35)	155 (47)	235 (72)	315 (96)
		-40 (-40)	50 (15)	65 (20)	100 (30)	135 (41)	110 (34)	145 (44)	220 (67)	290 (88)
	20 (65)	50 (10)	60 (18)	80 (24)	120 (37)	160 (49)	120 (37)	160 (49)	240 (73)	320 (98)
		0 (-18)	45 (14)	60 (18)	95 (29)	125 (38)	95 (29)	125 (38)	190 (58)	255 (78)
		-20 (-29)	40 (12)	55 (17)	85 (26)	115 (35)	85 (26)	115 (35)	175 (53)	235 (72)
		-40 (-40)	40 (12)	55 (17)	80 (24)	110 (34)	80 (24)	110 (34)	165 (50)	220 (67)

Heating Cable Type	Nominal Power Output W/ft (W/m)	Startup Temp. °F (°C)	Circuit Breaker Voltage V				Circuit Breaker Voltage V			
			240				400			
			Circuit Breaker Size A				Circuit Breaker Size A			
			16	25	32	40	16	25	32	40
			Maximum Circuit Length ft (m)				Maximum Circuit Length ft (m)			
High Temp.	5 (16)	50 (10)	705 (215)	725 (220)	725 (220)	725 (220)	1200 (365)	1480 (450)	1480 (450)	1480 (450)
		0 (-18)	640 (195)	725 (220)	725 (220)	725 (220)	1100 (335)	1480 (450)	1480 (450)	1480 (450)
	10 (32)	50 (10)	361 (110)	510 (155)	510 (155)	510 (155)	610 (185)	950 (290)	1050 (320)	1050 (320)
		0 (-18)	328 (100)	510 (155)	510 (155)	510 (155)	560 (170)	870 (265)	1050 (320)	1050 (320)
	15 (49)	50 (10)	246 (75)	380 (115)	430 (130)	430 (130)	410 (125)	640 (195)	820 (250)	855 (260)
		0 (-18)	230 (70)	345 (105)	430 (130)	430 (130)	375 (115)	610 (185)	770 (235)	855 (260)
	20 (65)	50 (10)	180 (55)	280 (85)	360 (110)	360 (110)	310 (95)	490 (150)	625 (190)	740 (225)
		0 (-18)	164 (50)	260 (80)	330 (100)	360 (110)	295 (90)	460 (140)	590 (180)	740 (225)

Notes:

1. The table above is for theoretical estimation only. Actual system design must be based on specific application conditions.
2. For circuit safety, a properly rated breaker must be used along with a ground fault circuit interrupter (GFCI) rated at 30 mA or higher. In applications with high leakage current risk, a GFCI with an appropriate protective current rating must be used.

Dimensions and Bend Radii

The process tubes are used for the transport of process media and for withstanding its pressure.
The finished tubes refer to electric traced tubing as delivered.

Fractional

Process Tube		Finished Tube			
Material	O.D. in. O.D. Tolerance ± 0.004 in.	O.D. in., O.D. Tolerance ± 0.157 in.			Min. Bend Radius in.
		Low Temp. Tracing	Medium Temp. Tracing	High Temp. Tracing	
316/316L SS or C12200	1/4	1.98	1.78	2.18	11.81
	3/8	2.11	1.91	2.30	
	1/2	2.23	2.04	2.43	

Metric

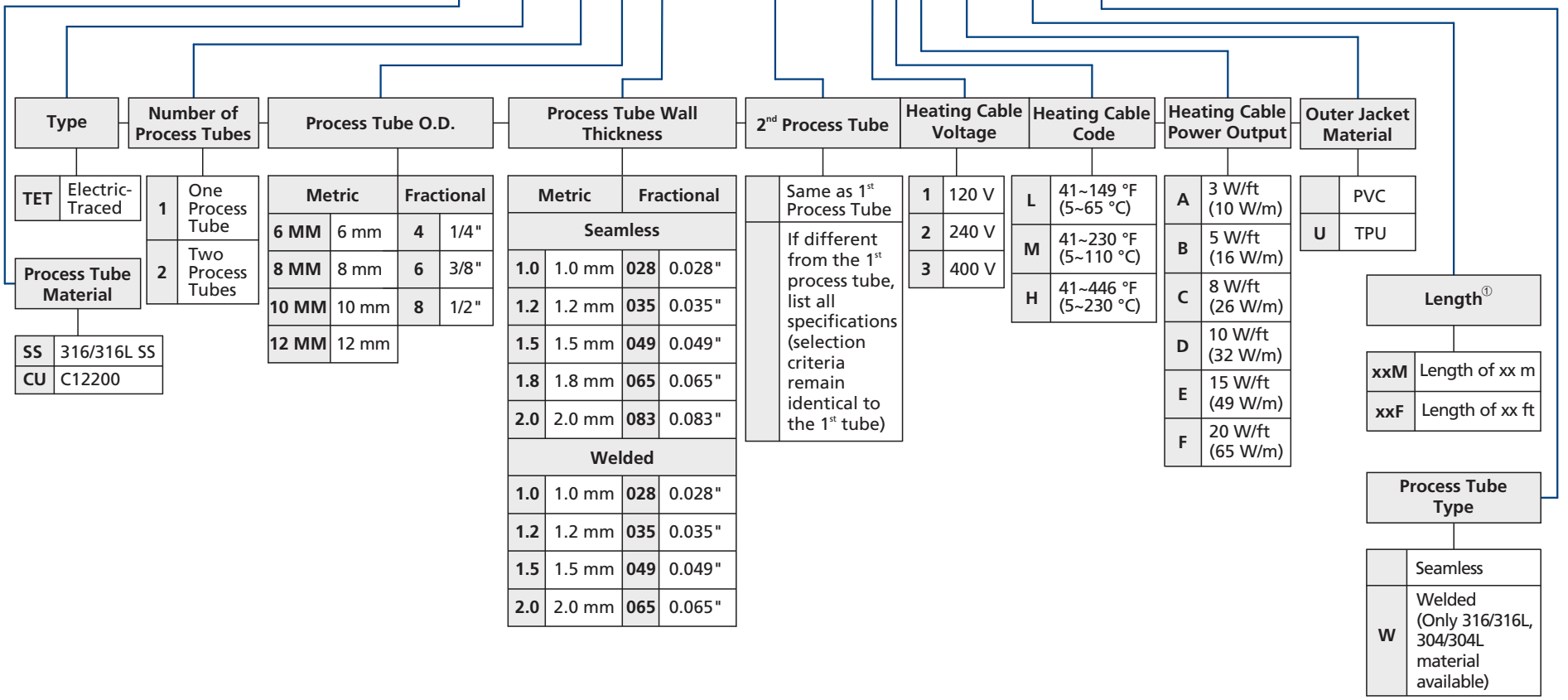
Process Tube		Finished Tube			
Material	O.D. mm O.D. Tolerance ± 0.004 mm	O.D. mm, O.D. Tolerance ± 4.0 mm			Min. Bend Radius mm
		Low Temp. Tracing	Medium Temp. Tracing	High Temp. Tracing	
316/316L SS or C12200	6	50	45	55	300
	8	52	47	57	
	10	54	49	59	
	12	56	51	61	

Working Pressure

For the working pressure of the process tube, refer to the TMP series tubing.
When use with FITOK 6D series tube fittings, it provides a safety factor of 4:1 for the connection between the fitting and tubing.

Ordering Number Description

SS - TET - 1 - 4 035 - (SS 4 028) - 2 L A - U - 50M - W



Type	
TET	Electric-Traced

Process Tube Material	
SS	316/316L SS
CU	C12200

Number of Process Tubes	
1	One Process Tube
2	Two Process Tubes

Process Tube O.D.			
Metric		Fractional	
6 MM	6 mm	4	1/4"
8 MM	8 mm	6	3/8"
10 MM	10 mm	8	1/2"
12 MM	12 mm		

Process Tube Wall Thickness			
Metric		Fractional	
Seamless			
1.0	1.0 mm	028	0.028"
1.2	1.2 mm	035	0.035"
1.5	1.5 mm	049	0.049"
1.8	1.8 mm	065	0.065"
2.0	2.0 mm	083	0.083"
Welded			
1.0	1.0 mm	028	0.028"
1.2	1.2 mm	035	0.035"
1.5	1.5 mm	049	0.049"
2.0	2.0 mm	065	0.065"

2nd Process Tube	
	Same as 1st Process Tube
	If different from the 1st process tube, list all specifications (selection criteria remain identical to the 1st tube)

Heating Cable Voltage	
1	120 V
2	240 V
3	400 V

Heating Cable Code	
L	41~149 °F (5~65 °C)
M	41~230 °F (5~110 °C)
H	41~446 °F (5~230 °C)

Heating Cable Power Output	
A	3 W/ft (10 W/m)
B	5 W/ft (16 W/m)
C	8 W/ft (26 W/m)
D	10 W/ft (32 W/m)
E	15 W/ft (49 W/m)
F	20 W/ft (65 W/m)

Outer Jacket Material	
	PVC
U	TPU

Length①	
xxM	Length of xx m
xxF	Length of xx ft

Process Tube Type	
	Seamless
W	Welded (Only 316/316L, 304/304L material available)

① Default supply: coiled tubing for lengths > 6 m; straight tubing for lengths ≤ 6 m.

Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available. For any questions, please contact FITOK or our authorized distributors.

Accessories

FITOK offers a full range of power connection components, including junction boxes and end seals. These components must be used to ensure proper system function and compliance with electrical requirements.

Single Entry Power Connectionwith Junction Box

The single-circuit power supply junction box connects a heating cable to a power source. The kit is selectable based on local installation practices and working conditions. All versions are also available in a lighted version to show operating status.

Model	JBS-100-A, JBS-100-L-A	JBS-100-E, JBS-100-L-E	JBS-100-EP, JBS-100-L-EP
Applicable Regions	North America only	Europe and Asia only	Europe and Asia only
Description	This kit has one through-hole for use with 3/4" conduit.	This kit provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This kit provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.
Kit Contents	1 junction box with terminals	1 junction box with terminals	1 junction box with terminals, earthing plate, and stud
	1 indicator light module (for -L model only)		
	1 stand		
	1 core sealer		
	1 yellow/green earthing sleeve		
	1 cable tie		
	1 polywater sachet		
	-	1 M25 stopping plug	1 M25 stopping plug
	-	1 M25 gland for power cable 8~17 mm in diameter	-
Specifications			
Applicable Heating Cable	Low temp., medium temp., high temp.		
Ingress Protection	NEMA 4X	IP66	IP66
Entries	1 × 3/4"	2 × M25	2 × M25
Ambient Temp. Range	JBS-100-A: -67 °F to 133 °F (-55 °C to 56 °C) JBS-100-L-A: -40 °F to 104 °F (-40 °C to 40 °C)	JBS-100-E: -67 °F to 133 °F (-55 °C to 56 °C) JBS-100-L-E: -40 °F to 104 °F (-40 °C to 40 °C)	JBS-100-EP: -67 °F to 133 °F (-55 °C to 56 °C) JBS-100-L-EP: -40 °F to 104 °F (-40 °C to 40 °C)
	For ambient temperature > 104 °F (40 °C), additional conditions are required for safe use. High temperature power cables and metallic glands must be used.		
Min. Installation Temp.	-67 °F (-55 °C)		
Max. Pipe Temp.	Refer to heating cable specification		
Terminals	Spring clamp (Ex e) 2 line, 1 earth	Spring clamp (Ex e) 1 phase, 1 neutral, 1 earth	Spring clamp (Ex e) 1 phase, 1 neutral, 1 earth
Max. Conductor Size	8 AWG stranded	10 mm^2 stranded,10 mm^2 solid	10 mm^2 stranded,10 mm^2 solid
Max. Operating Voltage	480 Vac. JBS-100-L-A, JBS-100-L-E, JBS-100-L-EP for 254 Vac only. For voltages > 254 Vac, additional conditions are required for safe use.		
Max. Continuous Operating Current	50 A	40 A	40 A
	When 302 °F (150 °C) < pipe temperature < 500 °F (260 °C), reduce the maximum operating current to ≤ 20A.		
Materials of Construction			
Enclosure, Lid, and Stand	Electrostatic charge-resistant glass-filled engineered polymer, black		
Lid Screws	Stainless steel		
Lid Gasket	Silicone rubber		
Earth Continuity Plate	-	-	Steel, zinc plated, and blue chromated
LED Indicator Light Optional (For -L model only)			
Color	Red	Green	Green
Voltage Rating	100 to 277 Vac	100 to 254 Vac	100 to 254 Vac
Power Consumption	<1 W		

Multiple Entry Power Connection with Junction Box

The multi-circuit power supply three-way junction box is designed to connect power to up to three heating cables. The kit is selectable based on local installation practices and working conditions. All versions are also available in a lighted version to show operating status.

Model	JBM-100-A, JBM-100-L-A	JBM-100-E, JBM-100-L-E	JBM-100-EP, JBM-100-L-EP
Applicable Regions	North America only	Europe and Asia only	Europe and Asia only
Description	This kit has two 3/4" through holes for use with 3/4" conduit. One stopping plug is supplied in the kit.	This kit provides two M25 threaded entries, one stopping plug, and one plastic power cable gland.	This kit provides two M25 threaded entries, an earthing plate, and an external earthing stud. It is designed for use with armoured cables.
Kit Contents	1 junction box with terminals	1 junction box with terminals	1 junction box with terminals, earth continuity plate, and stud
	1 light module (for -L model only)		
	1 stand		
	1 polywater sachet		
	3 core sealers		
	3 yellow/green earthing sleeve		
	1 3/4" stopping plug	1 M25 stopping plug	2 M25 stopping plug
	1 spanner		
	1 strain relief assembly		
	2 grommet plugs		
	-	1 M25 gland for power cable 8-17 mm in diameter (Temperature range: -67°F to 158°F (-55°C to 70°C))	-
Specifications			
Applicable Heating Cable	Low temp., medium temp., high temp		
Ingress Protection	IP66		
Entries	1 × 3/4"	2 × M25	2 × M25
Ambient Temp. Range	JBM-100-A: -67 °F to 133 °F (-55 °C to 56 °C) JBM-100-L-A: -58 °F to 104 °F (-40 °C to 40 °C)	JBM-100-E: -67 °F to 133 °F (-55 °C to 56 °C) JBM-100-L-E: -40 °F to 104 °F (-40 °C to 40 °C)	JBM-100-EP: -67 °F to 133 °F (-55 °C to 56 °C) JBM-100-L-EP: -40 °F to 104 °F (-40 °C to 40 °C)
	For ambient temperature > 104 °F (40 °C), additional conditions are required for safe use. High temperature power cables and metallic glands must be used.		
Min. Installation Temp.	-67 °F (-55 °C)		
Max. Pipe Temp.	Refer to heating cable specification		
Terminals	Spring clamp (Ex e) 4 line, 2 earth	Spring clamp (Ex e) 2 phase, 2 neutral, 2 earth	Spring clamp (Ex e) 2 phase, 2 neutral, 2 earth
Max. Conductor Size	8 AWG stranded	10 mm^2 stranded,10 mm^2 solid	10 mm^2 stranded,10 mm^2 solid
Max. Operating Voltage	480 Vac. JBM-100-L-A, JBM-100-L-E, JBM-100-L-EP for 254 Vac only. For voltages > 254 Vac, additional conditions are required for safe use.		
Max. Continuous Operating Current	53 A		
	When 302 °F (150 °C) < pipe temperature < 500 °F (260 °C), reduce the maximum operating current to ⩽ 20A.		
Materials of Construction			
Enclosure, Lid, and Stand	Electrostatic charge-resistant glass-filled engineered polymer, black		
Lid Screws	Stainless steel		
Lid Gasket	Silicone rubber		
Earth Continuity Plate	-	-	Steel, zinc plated, and blue chromated
LED Indicator Light Optional (For -L model only)			
Color	Red	Green	Green
Voltage Rating	100 to 277 Vac	100 to 254 Vac	100 to 254 Vac
Power Consumption	<1 W		

End Seal and End Seal with Indicator Light

The end seal is designed to seal the end of the heating cable.
Lighted versions are available to provide easy visual confirmation that the heating cable is functioning properly.

Model	E-100-E	E-100-L-E
Kit Contents	1 end seal	1 end seal with indicator light
	1 cable tie	
	1 polywater sachet	
	-	2 insulated parallel crimps
		1 core sealer
Specifications		
Applicable Heating Cable	Low temp., medium temp., high temp.	
Max. Pipe Temp.	Refer to heating cable specification, maximum is 500 °F (260 °C)	
Max. Operating Voltage	277V (480V for high temperature electric heating cables only.)	277 V
	For voltages ＞ 277 V, additional conditions are required for safe use.	
Ambient Temp. Range	-67 °F to 133 °F (-55 °C to 56 °C)	-40 °F to 104 °F (-40 °C to 40° C)
Min. Installation Temp.	-67 °F (-55 °C)	-40 °F (-40 °C)
Overall Height	171 mm approx.	197 mm approx.
Outer Diameter	46 mm approx. Usable with up to 100 mm thermal insulation	66 mm approx.
Ingress Protection	IP66, Type 4X	
Impact Resistance	EN 60079-30-1, ≥7 joules	
UV Stability	No degradation after 1000 hours	
Solvent Resistance	Excellent	
Strain Relief	＞250 N	
LED Indicator Light		
Color	-	Green
Voltage Rating Range		110 to 277 Vac, 50/60 Hz
Power Consumption		＜2 W
Electromagnetic Immunity/Emissions		Complies with IEC 61000-6 IEC 61000-4
Installation Tools		
Tools Required	Cable knife, wire cutters, screwdriver	Cable knife, wire cutters, screwdriver, crimp tool, long nose pliers

Heat-Shrink End Seal

E-20

E-40

Model	E-20	E-40
Max. Expose Temp. °F (°C)	230 (110)	500 (260)
Dielectric Strength (MV/m)	2.2	＞40
Volume Resistivity (MΩ·m)	10^{7}	10^{12}
Final Length in. (mm)	4.72 (120)	4.72 (120)
Min. Ambient Temp. °F (°C)	-76 (-60)	-76 (-60)
Installation Details		
Hot Air Gun (W)	＞1460	＞3000
Min. Installation Temp. °F (°C)	-4 (-20)	-4 (-20)

Splice or Tee Connection Kit

This kit is used to make splice or tee connections for the heating cable.

Model	T-100
Description	Above-insulation splice / tee kit
Kit Contents	1 splice/tee enclosure and lid
	1 stand assembly
	3 core sealers
	3 yellow/green earthing sleeves
	3 compression crimps
	3 crimping insulating tubes
	1 spanner
	1 strain relief assembly
	2 grommet plugs
Applicable Heating Cable	Low temp., medium temp., high temp.
Ingress Protection	NEMA Type 4X IP66
Min. Installation Temp.	-67 °F (-55 °C)
Max. Pipe Temp.	Refer to heating cable specification
Ambient Temp. Range	-67 °F to 133 °F (-55 °C to 56 °C)
Max. Operating Voltage	277 Vac for FM, CSA, 480 Vac for PTB
Max. Continuous Operating Current	50 A heating cable circuit for FM, CSA, 40 A heating cable circuit for PTB
Materials of Construction	
Enclosure, Lid, and Stand	Electrostatic charge-resistant glass-filled engineered polymer, black
Lid Screws	Stainless steel
Lid Gasket	Silicone rubber

Cold Applied Power Connection Kit

This kit is used to terminate the heating cable to a junction box.

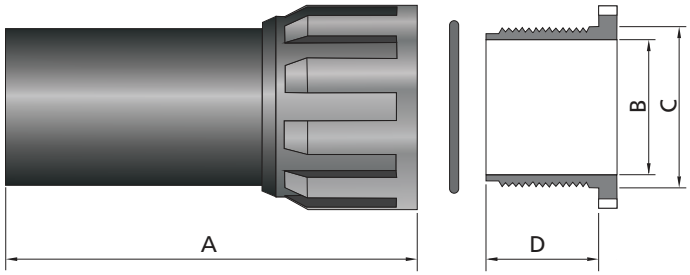
Model	C25-100
Kit Contents	1 gland
	2 grommets
	1 locknut
	1 core sealer
	1 yellow/green tube
Specifications	
Type	Cold Applied
Thread Size	M25 × 1.5
Min. Ambient Temp.	-67 °F (-55 °C)
Max. Exposure Temp.	230 °F (110 °C)

Electronic Thermostat

Model 1 (without earthing plate)	ETS-05-L2-E	ETS-05-H2-E
Model 2 (with earthing plate)	ETS-05-L2-EP	ETS-05-H2-EP
Application	Surface sensing	
Temperature Setpoint Range	32 °F to 390 °F (0 to 199 °C)	32 °F to 930 °F (0 to 499 °C)
Temperature Measurement Range	-67 °F to 500 °F (-55 °C to 260 °C)	-67 °F to 1085 °F (-55 °C to 585 °C)
Max. Sensor Lead Resistance	20 Ohm	
Ingress Protection	IP66	
Switching Accuracy	±1.8 °F (1 °C) at 41 °F (5 °C)	± 1.8 °F (1 °C) at 41 °F (5 °C), ± 3.6 °F (2 °C) at 930 °F (499 °C)
Switching Differential (Hysteresis)	≈ 5 °F (3 °C)	
Output Relay	Single Pole change over type (SPST)	
Switching Capacity	32A resistive load	
Anbient Temperature Range	-40 °F to 140 °F (-40 °C to 60 °C)	
Supply Voltage	230V +10%/-15% 50/60 Hz	
Internal Power Consumption	3 VA	
Terminal Size	Max. 6 mm^2	
Cable Entries	2 × M25	
	1 × M25 gland for power cable in	
	2 × M25 rain plug for heating cable out	
Sensor Type	M16 gland with a three wire PT100 flexible sensor, 2 meters long	M16 gland with a three wire PT100 stainless steel sensor, 2 meters long
LED Status Indications		
Green	ETS-05 powered on, heating cable off	
Yellow	ETS-05 powered on, heating cable on	
Red	Sensor failure - controller in fail safe mode	

Heat-Shrink Entry Seals

The heat-shrink entry seals provide waterproofing and mechanical protection where the electric-traced tubing passes through a wall or panel.

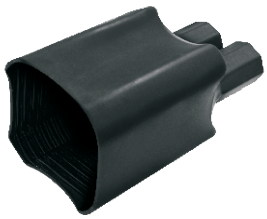


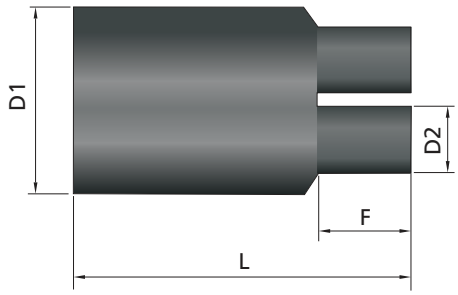
Model	Dimensions, mm				Tightening Tool (Hook Spanner)
	A	B①	C	D	
BET-60MM	250	35-60	73	40	78-85
BET-70MM	260	42-70	86	35	85-105

Note: ① The heat-shrink entry seals' heat-shrinking dimensional range.

Heat-Shrink Boots

The heat-shrink boots provide a waterproof end seal for the electric-traced tubing. Use a 2-way boot for one process tube, and a 3-way boot for two process tubes.





Model		State	Dimensions, mm			
			L	F	D1①	D2②
2-Way Boots	HSB-2-6023	Before heat-shrinking	95	21	60	25
		After heat-shrinking	105	25	23	8
	HSB-2-9060	Before heat-shrinking	165	45	90	30
		After heat-shrinking	170	48	60	8
3-Way Boots	HSB-3-6025	Before heat-shrinking	170	40	60	26
		After heat-shrinking	175	45	25	8
	HSB-3-7028	Before heat-shrinking	175	45	70	32
		After heat-shrinking	180	45	28	10

Note: ①② Minimum inside diameter after heat-shrinking.

FITOK

Working Condition Questionnaire

Customer Name			End User	
Project Name			Project Location	
Process Tube Parameters	Number of Process Tubes	◯ 1	◯ 2	
	◯ Process Tube #1	O.D.	◯ in. ◯ mm	
		Wall Thk.	◯ in. ◯ mm	
		Material	◯ 316/316L SS	◯ C12200
		Process Tube Type	◯ Seamless	◯ Welded
	◯ Process Tube #2	O.D.	◯ in. ◯ mm	
		Wall Thk.	◯ in. ◯ mm	
		Material	◯ 316/316L SS	◯ C12200
		Process Tube Type	◯ Seamless	◯ Welded
Medium Parameters	Medium Name			
	Initial Medium Temp.	◯ °F ◯ °C		
	Target Maintenance Temp.	◯ °F ◯ °C		
	Flow Rate	_____ kg/h		
	Medium Pressure	◯ psig ◯ bar		
Site Conditions	Installation Environment	◯ Indoor	◯ Outdoor	
	Min. Ambient Temp.	◯ °F ◯ °C		
	Max. Ambient Temp.	◯ °F ◯ °C		
	Avg. Ambient Temp.	◯ °F ◯ °C		
	Wind Speed	_____ km/h		
Heat Tracing Type	◯ Electric-traced	Voltage	_____ Vac	
		Hazardous Area		
		Explosion-Proof Rating		
		Steam Purging	◯ Yes	◯ No
		Max. Purge Temp.	◯ °F ◯ °C	
	◯ Steam-traced	Steam Pressure	◯ psig ◯ bar	
		Temp.	◯ °F ◯ °C	
		Max. Purge Temp.	◯ °F ◯ °C	
		Traced Tubing Material		
		Traced Tubing O.D.	◯ in. ◯ mm	
		Traced Tubing Wall Thk.	◯ in. ◯ mm	
Traced Tubing Parameters	Outer Jacket Material	◯ PVC	◯ TPU	
	Outer Jacket Color	◯ Black	◯ White	
	Total Length	◯ ft ◯ m		
	Supply Form	◯ Fixed Length	◯ Random Length	
	Single Coil Length (Fixed Length)	◯ ft ◯ m		

Accessories	◯ Single Circuit Power Supply Junction Box _____ pc(s). ◯ Multi-Circuit Power Supply Three-Way Junction Box _____ pc(s). ◯ End Seal _____ pc(s). ◯ Splice or Tee Connection Kit _____ pc(s). ◯ Thermostat _____ pc(s). ◯ Cold Applied Power Connection Kit _____ pc(s). ◯ Heat-Shrink Entry Seal _____ pc(s). ◯ Heat-Shrink Boot _____ pc(s). ◯ Heat-Shrink End Seal _____ pc(s).
Other Information	

Other Tubing Products

Inert Silicon Coated Tubing

Introduction

Oil & gas, petrochemical, chemical, and analytical industries frequently involve diverse active chemical compounds, such as sulfur compounds (especially H_2S), mercury, and ammonia. While stainless steel is widely used in analytical sampling systems for its corrosion resistance, its tendency to adsorb these compounds hinders accurate determination when used untreated. The inert silicon coating is an effective solution. It provides a chemically protective barrier of amorphous silicon on the surface of the stainless steel, preventing adsorption of active chemical compounds and enabling low detection limits for trace-level analysis. Typical applications include analytical process, environment detection, downhole sampling from petroleum and natural gas wells, as well as monitoring and control of oil refining and petroleum processes.

FITOK uses top notch inert silicon coating techniques including SilcoNert® 2000 to coat our products. The coated product's maximum working pressure and temperature remain unchanged in typical applications mentioned.

Note：① SilcoNert® 2000 (Sulfinert®) is registered trademark of SilcoTek Corporation.

TMP Series Silicon Coated Tubing

TCT Series Silicon Coated Tubing

Features

◎ Coating by chemical vapor deposition (CVD) process
◎ Typical thickness: 100-500 nm
◎ Enables ppm-level trace analysis of active compounds
◎ Durable with long service life
◎ Internal surfaces of the tubing is inert silicon coated
◎ Polished external surface to ensure reliable seal
◎ Match with inert silicon coated tube fittings
◎ Straight and coiled tubing are optional

Ordering Information

Inert Silicon Coated ，Add "-SI" as a suffix to the standard ordering number.
For example:
1. To order 316 tubing, ASTM A269 compliant, TMP series, 1/4" O.D. x 0.035" wall thickness, 6 m length,Inert Silicon Coated ，the ordering number is SS-TMP-4-035-6M-SI.
2. To order 316 tubing, ASTM A269 compliant, TCT series, 1/4" O.D. x 0.035" wall thickness, cut length 100 m, Inert Silicon Coated ，the ordering number is SS-TCT-4-035-100M-SI.

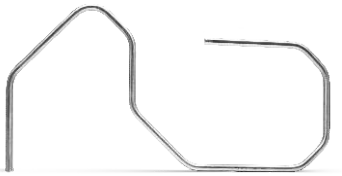
Custom Bent Tubing

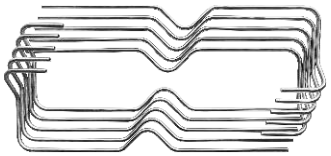
Introduction

FITOK offers custom bent tubing in various angles and sizes designed and manufactured to customer drawings or technical requirements. Utilizing CNC bending machines, stainless steel tubing is formed in the cold state, suitable for complex piping system layout. Suitable for varied pressure and temperature conditions, FITOK bent tubing ensures high accuracy, superior sealing, and improved installation efficiency across a wide range of industrial applications.

Products





Standard Packaging for Seamless Straight-Length Tubing

Table 1 shows the standard packaging comparison for TMP series seamless straight-length tubing
Table 2 shows the standard packaging comparison for TBA series seamless straight-length tubing
Table 3 shows the standard packaging comparison for TEP series seamless straight-length tubing
Table 4 shows the standard packaging comparison for T15A, T20D, T20M and T60H series seamless straight-length tubing (fractional)

Table 1

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1/16	0.02	300	6000	3000
1/8	0.028	140	2660	1540
	0.035	120	2280	1440
3/16	0.035	50	1500	500
1/4	0.035	40	800	400
	0.049	35	805	385
	0.065	30	660	390
5/16	0.035	30	600	300
3/8	0.035	25	500	250
	0.049	22	484	242
	0.065	18	396	252
1/2	0.035	17	340	170
	0.049	17	340	170
	0.065	13	260	169
	0.083	11	220	165
5/8	0.049	11	220	110
	0.065	10	200	120
3/4	0.049	8	160	80
	0.065	8	160	80
	0.083	7	140	77
	0.095	6	120	78
	0.109	5	110	80
7/8	0.049	5	100	50

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1	0.065	4	80	40
	0.083	4	80	40
	0.095	4	80	40
	0.109	4	76	40
	0.12	4	76	40
1 1/4	0.083	2	60	30
	0.095	2	60	30
	0.109	2	58	30
	0.12	2	54	30
	0.134	2	48	30
	0.156	2	42	30
1 1/2	0.095	1	40	20
	0.109	1	40	20
	0.12	1	40	20
	0.134	1	40	20
	0.156	1	35	20
	0.188	1	30	20

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
2	0.5	200	①	2000
3	0.5	150	3000	1500
	0.8	135	2970	1485
6	1	40	800	400
	1.5	35	770	350
8	1	30	600	300
	1.5	25	500	300
	2	20	440	300
10	1	25	500	250
	1.5	19	399	247
	2	15	315	240
	2.5	13	273	234
12	1	17	340	170
	1.5	15	330	165
	2	12	264	168
14	1	14	280	140
	1.5	12	276	132
	2	10	220	140
	2.5	8	184	136
	3	8	160	136
15	1	12	240	120
16	1	10	230	100
	1.5	10	230	100
	2	8	184	96
	2.5	7	154	98
	3	7	133	98

① Available subject to confirmation from FITOK.

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
18	1	8	160	80
	1.5	8	160	80
	2	8	160	80
	2.5	6	132	78
	3	5	110	80
	4	5	90	80
	5	4	80	72
20	1.5	8	160	80
	2	7	140	77
	2.5	5	110	80
22	2	5	100	50
	2.5	5	100	50
	3	4	88	48
25	2	4	80	40
	2.5	4	80	40
28	2.5	4	76	40
30	3	3	60	30
32	3.5	2	40	20
38	4	1	35	20

Table 2

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1/8	0.028	140	2660	1540
1/4	0.035	40	800	400
	0.049	35	805	385
	0.065	30	660	390
5/16	0.035	30	600	300
3/8	0.035	25	500	250
	0.049	22	484	242
	0.065	18	396	252
1/2	0.035	17	340	170
	0.049	17	340	170
	0.065	13	260	169
	0.083	11	220	165
5/8	0.049	10	200	100
	0.065	10	200	120
3/4	0.049	8	160	80
	0.065	8	160	80
	0.083	7	140	77
	0.095	6	120	78
	0.109	5	110	80
7/8	0.049	5	100	50
1	0.065	4	80	40
	0.083	4	80	40
	0.095	4	80	40
	0.109	4	76	40
	0.12	4	76	40
1 1/4	0.083	2	60	30
	0.095	2	60	30
	0.109	2	58	30
	0.12	2	54	30
	0.134	2	48	30
	0.156	2	42	30

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1 1/2	0.095	1	40	20
	0.109	1	40	20
	0.12	1	40	20
	0.134	1	40	20
	0.156	1	35	20
	0.188	1	30	20

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
8	1	30	600	300
	1.5	25	500	300
	2	20	440	300
10	1	25	500	250
	1.5	19	399	247
	2	15	315	240
	2.5	13	273	234
12	1	17	340	170
	1.5	15	330	165
	2	12	264	168
14	1	14	280	140
	1.5	12	276	132
	2	10	220	140
	2.5	8	184	136
	3	8	160	136
15	1	12	240	120
16	1	10	230	100
	1.5	10	230	100
	2	8	184	96
	2.5	7	154	98
	3	7	133	98

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
18	1	8	160	80
	1.5	8	160	80
	2	8	160	80
	2.5	6	132	78
	3	5	110	80
	4	5	90	80
	5	4	80	72
20	1.5	8	160	80
	2	7	140	77
	2.5	5	110	80
22	2	5	100	50
	2.5	5	100	50
	3	4	88	48
25	2	4	80	40
	2.5	4	80	40
28	2.5	4	76	40
30	3	3	60	30
32	3.5	2	40	20
38	4	1	35	20

Contact FITOK Group for more information.

Table 3

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1/8	0.028	98	1862	1078
1/4	0.035	28	560	280
	0.049	24	563	269
	0.065	21	462	273
5/16	0.035	21	420	210
3/8	0.035	17	350	175
	0.049	15	338	169
	0.065	12	277	176
1/2	0.035	11	238	119
	0.049	11	238	119
	0.065	9	182	118
	0.083	7	154	115
5/8	0.049	7	140	70
	0.065	7	140	84
3/4	0.049	5	112	56
	0.065	5	112	56
	0.083	4	98	53
	0.095	4	84	54
	0.109	3	77	56
7/8	0.049	3	70	35
1	0.065	2	56	28
	0.083	2	56	28
	0.095	2	56	28
	0.109	2	53	28
	0.12	2	53	28
1 1/4	0.083	1	42	21
	0.095	1	42	21
	0.109	1	40	21
	0.12	1	37	21
	0.134	1	33	21
	0.156	1	29	21

Tube O.D. in	Wall Thickness in	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
1 1/2	0.095	1	28	14
	0.109	1	28	14
	0.12	1	28	14
	0.134	1	28	14
	0.156	1	24	14
	0.188	1	21	14

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
8	1	21	420	210
	1.5	17	350	210
	2	14	308	210
10	1	17	350	175
	1.5	13	279	172
	2	10	220	168
	2.5	9	191	163
12	1	11	238	119
	1.5	10	231	115
	2	8	184	117
14	1	9	196	98
	1.5	8	193	92
	2	7	154	98
	2.5	5	128	95
	3	5	112	95
15	1	8	168	84
16	1	7	161	70
	1.5	7	161	70
	2	5	128	67
	2.5	4	107	68
	3	4	93	68

Tube O.D. mm	Wall Thickness mm	Pcs/Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
18	1	5	112	56
	1.5	5	112	56
	2	5	112	56
	2.5	4	92	54
	3	3	77	56
	4	3	63	56
	5	2	56	50
20	1.5	5	112	56
	2	4	98	53
	2.5	3	77	56
22	2	3	70	35
	2.5	3	70	35
	3	2	61	33
25	2	2	56	28
	2.5	2	56	28
28	2.5	2	53	28
30	3	2	42	21
32	3.5	1	28	14
38	4	1	24	14

Contact FITOK Group for more information.

Table 4

Part Number	Tube O.D. in	Wall Thickness in	Pcs/ Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
T15A-2-037	1/8	0.037	110	2530	1540
T15A-4-083	1/4	0.083	25	600	400
T15A-4-065		0.065	30	690	390
T15A-6-118	3/8	0.118	12	264	240
T15A-6-095		0.095	14	308	252
T15A-8-156	1/2	0.156	7	154	154
T15A-8-134		0.134	7	168	168
T15A-12-240	3/4	0.24	3	66	66
T15A-12-188		0.188	3	78	72
T20D-4-065	1/4	0.065	30	660	390
T20D-6-083	3/8	0.083	14	336	252
T20D-8-109	1/2	0.109	8	192	160
T20D-12-165	3/4	0.165	4	88	80
T20D-16-172	1	0.172	2	48	40
T20M-4	1/4	0.071	30	660	390
T20M-6	3/8	0.086	14	336	252

Part Number	Tube O.D. in	Wall Thickness in	Pcs/ Cardboard Tube	Pcs/Crate 1 (L*W*H=626*41*46 cm)	Pcs/Crate 2 (L*W*H=626*31*36 cm)
T20M-9	9/16	0.125	7	154	126
T20M-12	3/4	0.156	4	88	80
T20M-16	1	0.219	2	48	40
T20M-24	1 1/2	0.282	1	24	20
T20M-4-S	1/4	0.071	30	660	390
T20M-6-S	3/8	0.086	14	336	252
T20M-9-S	9/16	0.125	7	154	126
T20M-12-S	3/4	0.156	4	88	80
T20M-16-S	1	0.219	2	48	40
T20M-24-S	1 1/2	0.282	1	24	20
T60H-4	1/4	0.083	25	600	400
T60H-6	3/8	0.125	12	264	240
T60H-9	9/16	0.188	5	115	110
T60H-4-S	1/4	0.083	25	600	400
T60H-6-S	3/8	0.125	12	264	240
T60H-9-S	9/16	0.188	5	115	110

Contact FITOK Group for more information.

Related Products

Integrated Systems

◎ **Custom Integration**
Applicable to the stable application analysis of various gases

Bottle Configuration Sampling Systems

◎ **BLE3 - Back Purge Type with Venturi Unit**
Applicable to sampling from zero or negative pressure pipelines

Tube Clamps

Hand Tube Benders

◎ **HTB Series**

Tube Cutters

◎ **FTC Series**

Tube Deburring Tools

◎ **TDT Series**

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 FK-FC-T-01-EN-26V1