

Tubing

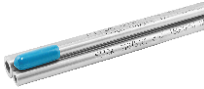



T15, T20D, T20M, T60 Series

Fittings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Tools and Installation Instructions
Technical Information
Part Number Crossover Charts



Contents

Connections

		B-04
T15 Series Tubing		B-05
T20D Series Tubing		B-08
T20M Series Tubing		B-10
T60 Series Tubing		B-13

Fittings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Tools and Installation Instructions
Technical Information
Part Number Crossover Charts

Connections

- ✓ Recommended application
- Applicable but not optimal
- Limited application subject to confirmation from FITOK
- × Not applicable

Connection	Series	T15	T20D	T20M	T60
15S Series Single Ferrule Tube Fittings		✓ ^①	×	×	×
20D Series Tube Fittings		✓	✓	×	×
20M Series Medium Pressure Fittings		×	×	✓	□
60 Series High Pressure Fittings		×	×	×	✓

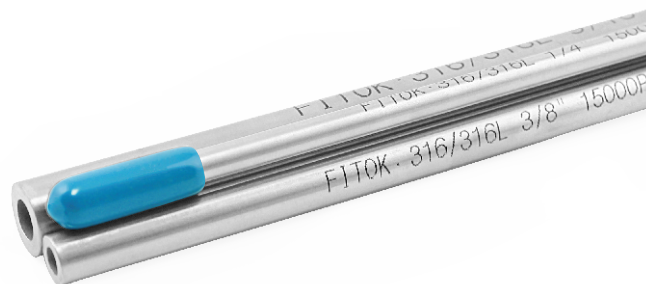
① Only T15 series annealed tubing is for use with 15S Series Single Ferrule Tube Fittings.
 15S Series Single Ferrule Tube Fittings catalog is individually available in soft copy.

Fittings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Tools and Installation Instructions
Technical Information
Part Number Crossover Charts

T15 Series Tubing

Features

- Material: 316/316L, enhanced-316/316L
- Working pressure up to 15,000 psig (1034 bar)
- Working temperature: -325°F to 800°F (-198°C to 427°C)
- Annealed seamless or cold-drawn 1/8-hard seamless tubing
- For use with FITOK 20D series (formerly DHL series) tube fittings
- Marked with brand, material grade, specification, pressure, annealing code and heat number
- Standard length: 20 ft and 6 m



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	0.030					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%. Leave a note for your requirements when placing order.

Mechanical Properties

Cold-drawn 1/8-hard Seamless Tubing

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				

Annealed Seamless Tubing

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				

Fittings

Tubing

Quick Couplings

Line Filters

Valves

Sour Service Products

Subsea Valves

Tools and Installation Instructions

Technical Information

Part Number Crossover Charts

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		
9/16		
3/4		
1		

Working Pressure at Ambient Temperature

Cold-drawn 1/8-hard Seamless Tubing

Tube O.D. in.	Wall Thickness in.	Working Pressure ^① psig (bar)
1/4	0.065	15,000 (1034)
3/8	0.083	
1/2	0.109	
9/16	0.125	
3/4	0.165	12,500 (862)
1	0.172	

Annealed Seamless Tubing

Tube O.D. in.	Wall Thickness in.	Working Pressure ^① psig (bar)
1/8	0.037	15,000 (1034)
1/4	0.083	15,000 (1034)
	0.065	10,300 (710)
3/8	0.118	15,000 (1034)
	0.095	10,000 (690)
1/2	0.156	15,000 (1034)
	0.134	11,200 (772)
9/16	0.188	15,000 (1034)
3/4	0.240	15,000 (1034)
	0.188	10,000 (690)
1	0.220	10,000 (690)

① Working pressures are calculated from an S value of 35,000 psi (241 MPa) at -20 to 100°F (-28 to 38°C) for ASME B31.3.

① Working pressures are calculated from an S value of 20,000 psi (138 MPa) at -20 to 100°F (-28 to 38°C) for ASME B31.3.

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

Fittings

Tubing

Quick Couplings

Line Filters

Valves

Sour Service Products

Subsea Valves

Tools and Installation Instructions

Technical Information

Part Number Crossover Charts

Ordering Information

Cold-drawn 1/8-hard Seamless Tubing

Tube O.D. in.	Wall Thickness in.	Ordering Number ^{①②}	
1/4	0.065	□□-T15-4-065-6M	□□-T15-4-065-20
3/8	0.083	□□-T15-6-083-6M	□□-T15-6-083-20
1/2	0.109	□□-T15-8-109-6M	□□-T15-8-109-20
9/16	0.125	□□-T15-9-125-6M	□□-T15-9-125-20
3/4	0.165	□□-T15-12-165-6M	□□-T15-12-165-20
1	0.172	□□-T15-16-172-6M	□□-T15-16-172-20

① In the ordering number, "6M" designates tubing length of 6 meters; "20" designates tubing length of 20 feet.

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

Annealed Seamless Tubing

Tube O.D. in.	Wall Thickness in.	Ordering Number ^{①②}	
1/8	0.037	□□-T15-A-2-037-6M	□□-T15-A-2-037-20
1/4	0.083	□□-T15-A-4-083-6M	□□-T15-A-4-083-20
	0.065	□□-T15-A-4-065-6M	□□-T15-A-4-065-20
3/8	0.118	□□-T15-A-6-118-6M	□□-T15-A-6-118-20
	0.095	□□-T15-A-6-095-6M	□□-T15-A-6-095-20
1/2	0.156	□□-T15-A-8-156-6M	□□-T15-A-8-156-20
	0.134	□□-T15-A-8-134-6M	□□-T15-A-8-134-20
9/16	0.188	□□-T15-A-9-188-6M	□□-T15-A-9-188-20
3/4	0.240	□□-T15-A-12-240-6M	□□-T15-A-12-240-20
	0.188	□□-T15-A-12-188-6M	□□-T15-A-12-188-20
1	0.220	□□-T15-A-16-220-6M	□□-T15-A-16-220-20

① In the ordering number, "6M" designates tubing length of 6 meters; "20" designates tubing length of 20 feet.

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

Fittings

Tubing

Quick Couplings

Line Filters

Valves

Sour Service Products

Subsea Valves

Tools and Installation Instructions

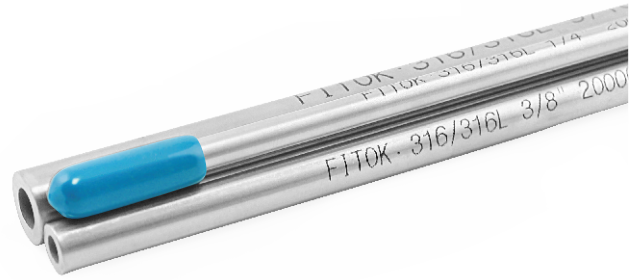
Technical Information

Part Number Crossover Charts

T20D Series Tubing

Features

- Material: 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 1/8-hard seamless tubing
- For use with FITOK 20D series (formerly DHL series) tube fittings
- Marked with brand, material grade, specification, pressure and heat number
- Standard length: 20 ft and 6 m



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	0.030					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%. Leave a note for your requirements when placing order.

Mechanical Properties

UNS	Grade	Yield Strength ksi	Tensile Strength ksi	Elongation %	Hardness
S31600/S31603	316/316L	87 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		
9/16		
3/4		

Working Pressure at Ambient Temperature

Tube O.D. in.	Wall Thickness Tolerance in.	Working Pressure ^① psig (bar)
1/4	0.065	20,000 (1379)
3/8	0.083	
1/2	0.109	
9/16	0.125	
3/4	0.165	

① Working pressures are calculated from an S value of 50,000 psi (344 MPa) at -20 to 100°F (-28 to 38°C) for ASME B31.3 Chapter IX High Pressure Piping.

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 ^{①②}	
1/4	0.065	□□-T20D-4-065-6M	□□-T20D-4-065-20
3/8	0.083	□□-T20D-6-083-6M	□□-T20D-6-083-20
1/2	0.109	□□-T20D-8-109-6M	□□-T20D-8-109-20
9/16	0.125	□□-T20D-9-125-6M	□□-T20D-9-125-20
3/4	0.165	□□-T20D-12-165-6M	□□-T20D-12-165-20

① In the ordering number, "6M" designates tubing length of 6 meters; "20" designates tubing length of 20 feet.

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

Fittings

Tubing

Quick Couplings

Line Filters

Valves

Sour Service Products

Subsea Valves

Tools and Installation Instructions

Technical Information

Part Number Crossover Charts

T20M Series Tubing

Features

- Material: 316/316L, enhanced-316/316L
- Working pressure up to 20,000 psig (1379 bar)
- Working temperature: -423°F to 1200°F (-252°C to 649°C)
- Cold-drawn seamless tubing
- For use with FITOK 20M series (formerly 20 series) medium pressure fittings
- Marked with brand, material grade, specification, pressure, and heat number
- Supplied in fractional sizes up to 20 ft and metric sizes up to 6 m. Nipples in customized length 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	0.030					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%. Leave a note for your requirements when placing order.

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		0.203	
9/16		0.312	
3/4	-0.005/-0.01	0.438	+/-0.005
1		0.562	

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)	19,250 (1327)	18,050 (1244)	16,800 (1158)

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)
8,050 (555)	7,400 (510)	6,800 (469)	6,300 (434)	6,200 (427)	2,900 (200)

Ordering Information

Cold-drawn Seamless Tubing

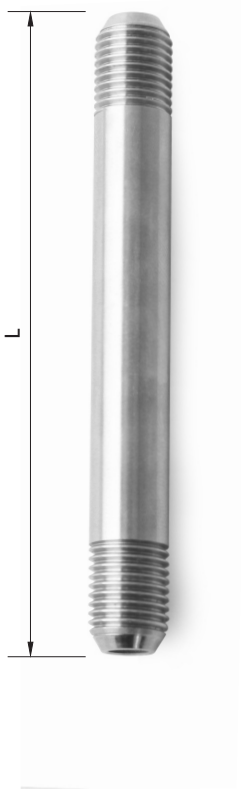
Tube O.D. in.	Tube I.D. in.	Ordering Number ^{①②}	
1/4	0.109	<input type="checkbox"/> <input type="checkbox"/> -T20M-4-6M	<input type="checkbox"/> <input type="checkbox"/> -T20M-4-20
3/8	0.203	<input type="checkbox"/> <input type="checkbox"/> -T20M-6-6M	<input type="checkbox"/> <input type="checkbox"/> -T20M-6-20
9/16	0.312	<input type="checkbox"/> <input type="checkbox"/> -T20M-9-6M	<input type="checkbox"/> <input type="checkbox"/> -T20M-9-20
3/4	0.438	<input type="checkbox"/> <input type="checkbox"/> -T20M-12-6M	<input type="checkbox"/> <input type="checkbox"/> -T20M-12-20
1	0.562	<input type="checkbox"/> <input type="checkbox"/> -T20M-16-6M	<input type="checkbox"/> <input type="checkbox"/> -T20M-16-20

① In the ordering number, "6M" designates tubing length of 6 meters; "20" designates tubing length of 20 feet. Customized length up to 20ft/6m is available upon request.

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

Fitings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Tools and Installation Instructions
Technical Information
Part Number Crossover Charts

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-3
		4.00 (101.6)	□□-T20M-4CT-4
		6.00 (152.4)	□□-T20M-4CT-6
		8.00 (203.2)	□□-T20M-4CT-8
		10.0 (254.0)	□□-T20M-4CT-10
		12.0 (304.8)	□□-T20M-4CT-12
3/8	0.203	3.00 (76.2)	□□-T20M-6CT-3
		4.00 (101.6)	□□-T20M-6CT-4
		6.00 (152.4)	□□-T20M-6CT-6
		8.00 (203.2)	□□-T20M-6CT-8
		10.0 (254.0)	□□-T20M-6CT-10
		12.0 (304.8)	□□-T20M-6CT-12
9/16	0.312	4.00 (101.6)	□□-T20M-9CT-4
		6.00 (152.4)	□□-T20M-9CT-6
		8.00 (203.2)	□□-T20M-9CT-8
		10.0 (254.0)	□□-T20M-9CT-10
		12.00 (304.8)	□□-T20M-9CT-12
3/4	0.438	4.00 (101.6)	□□-T20M-12CT-4
		6.00 (152.4)	□□-T20M-12CT-6
		8.00 (203.2)	□□-T20M-12CT-8
		10.0 (254.0)	□□-T20M-12CT-10
		12.0 (304.8)	□□-T20M-12CT-12
1	0.562	6.00 (152.4)	□□-T20M-16CT-6
		8.00 (203.2)	□□-T20M-16CT-8
		10.0 (254.0)	□□-T20M-16CT-10
		12.0 (304.8)	□□-T20M-16CT-12

① Nipples in customized length available upon request.

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

Fittings
Tubing
Quick Couplings
Line Filters
Valves
Sour Service Products
Subsea Valves
Tools and Installation Instructions
Technical Information
Part Number Crossover Charts

T60 Series Tubing

Features

- Material: 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 60 series high pressure fittings
- Marked with brand, material grade, specification, pressure, and heat number
- Supplied in fractional sizes up to 20 ft and metric sizes up to 6 m. Nipples in customized length 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	0.030					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)

- Fittings
- Tubing
- Quick Couplings
- Line Filters
- Valves
- Sour Service Products
- Subsea Valves
- Tools and Installation Instructions
- Technical Information
- Part Number Crossover Charts

Ordering Information

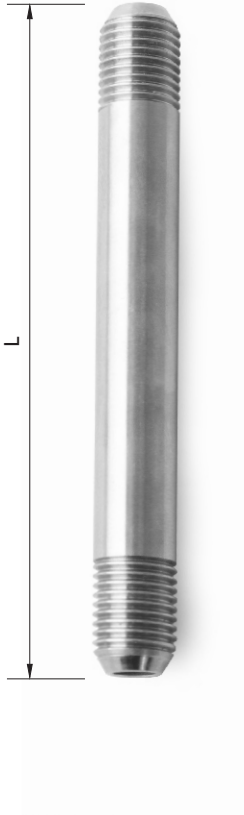
Cold-drawn Seamless Tubing

Tube O.D. in.	Tube I.D. in.	Ordering Number ^{①②}	
1/4	0.083	□□-T60-4-6M	□□-T60-4-20
3/8	0.125	□□-T60-6-6M	□□-T60-6-20
9/16	0.188	□□-T60-9-6M	□□-T60-9-20

① In the ordering number, "6M" designates tubing length of 6 meters; "20" designates tubing length of 20 feet. Customized length up to 20ft/6m is available upon request.

② To order, add the appropriate 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	0.083	2.75 (69.9)	□□-T60-4CT-2.75
		3.00 (76.2)	□□-T60-4CT-3
		4.00 (101.6)	□□-T60-4CT-4
		6.00 (152.4)	□□-T60-4CT-6
		8.00 (203.2)	□□-T60-4CT-8
		10.0 (254.0)	□□-T60-4CT-10
		12.0 (304.8)	□□-T60-4CT-12
3/8	0.125	3.00 (76.2)	□□-T60-6CT-3
		4.00 (101.6)	□□-T60-6CT-4
		6.00 (152.4)	□□-T60-6CT-6
		8.00 (203.2)	□□-T60-6CT-8
		10.0 (254.0)	□□-T60-6CT-10
		12.0 (304.8)	□□-T60-6CT-12
9/16	0.188	4.00 (101.6)	□□-T60-9CT-4
		6.00 (152.4)	□□-T60-9CT-6
		8.00 (203.2)	□□-T60-9CT-8
		10.0 (254.0)	□□-T60-9CT-10
		12.0 (304.8)	□□-T60-9CT-12

① Nipples in customized length available upon request.

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