

# TCA Series Coaxial Tubing and Fittings



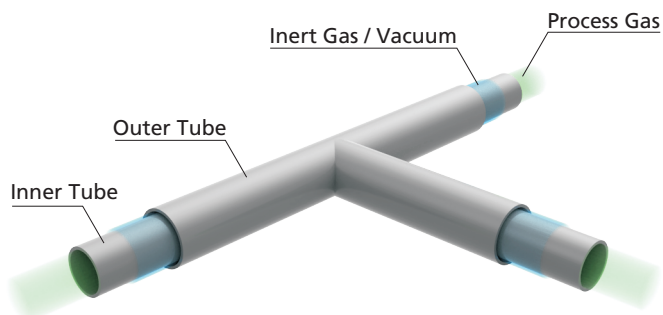
**FITOK**

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# TCA Series Coaxial Tubing and Fittings

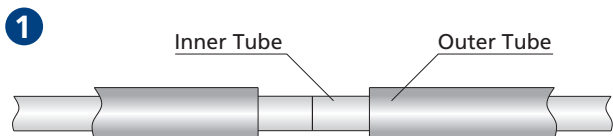
## Introduction

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.

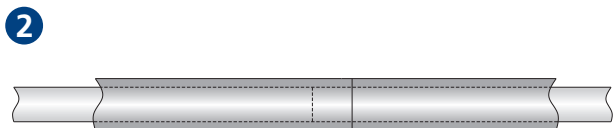


## Connection Method

### Tube to tube or tube to fitting connection method 1

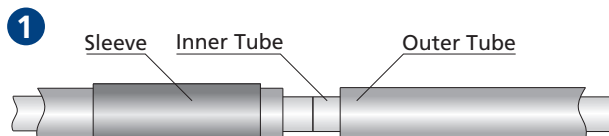


Orbital weld the inner tubes together, then conduct helium leak test.



Move the outer tubes to cover the inner tubes completely and connect them by orbital welding, then conduct helium leak test.

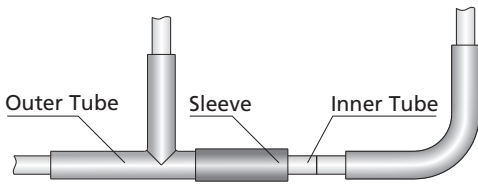
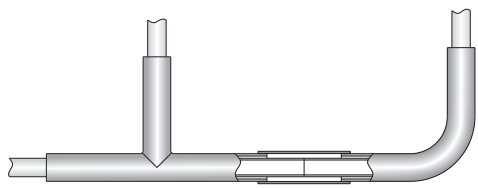
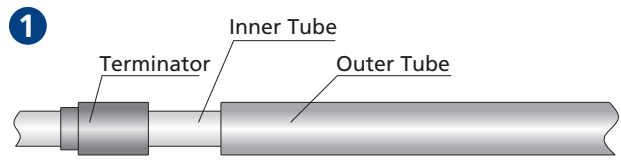

### Tube to tube or tube to fitting connection method 2



Install the sleeve on the outer tubes and orbital weld the inner tubes together, then conduct helium leak test.



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	Seal the outer tubes
<p><b>1</b></p>  <p>Outer Tube Sleeve Inner Tube</p> <p>Install the sleeve on the outer tube of one fitting and connect the inner tubes together by orbital welding, then conduct helium leak test.</p> <p><b>2</b></p>  <p>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.</p>	<p><b>1</b></p>  <p>Terminator Inner Tube Outer Tube</p> <p>Install the terminator to the inner tubes.</p> <p><b>2</b></p>  <p>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.</p>

## Coaxial Tubing

### Features

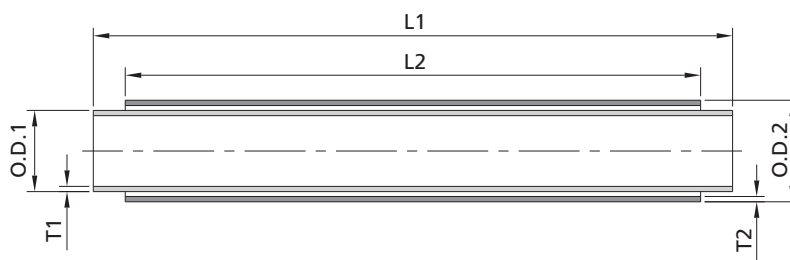
- ⦿ Materials:
  - Inner tube: 316L, 316L VAR, 316L VIM-VAR
  - Outer tube: 316L, 304L
- ⦿ Outside diameters:
  - Inner tube: 1/4" ~ 2"
  - Outer tube: 1/2" ~ 2 1/2"
- ⦿ Process:
  - Inner tube: internal surface electropolished to roughness of  $Ra \leq 5 \mu\text{in}$  (0.13  $\mu\text{m}$ ),  $Ra \leq 7 \mu\text{in}$  (0.18  $\mu\text{m}$ ),  $Ra \leq 10 \mu\text{in}$  (0.25  $\mu\text{m}$ ); external surface machine finished to roughness of  $Ra \leq 15 \mu\text{in}$  (0.38  $\mu\text{m}$ )
  - Outer tube: internal surface bright annealed or bright annealed after precision cold working to roughness of 15  $\mu\text{in}$  (0.38  $\mu\text{m}$ ),  $Ra \leq 20 \mu\text{in}$  (0.51  $\mu\text{m}$ ),  $Ra \leq 32 \mu\text{in}$  (0.8  $\mu\text{m}$ ),  $Ra \leq 63 \mu\text{in}$  (1.6  $\mu\text{m}$ ); external surface machine finished to roughness of  $Ra \leq 63 \mu\text{in}$  (1.6  $\mu\text{m}$ )
- ⦿ Cleaning: ultrasonically cleaned, washed, rinsed, and purged and dried with high purity hot nitrogen in ISO Class 6 cleanroom
- ⦿ Packaging: assembled in ISO Class 4 cleanroom, tubing ends are capped and tubing is packed in double polyethylene bags with inner bag filled with 99.999% nitrogen
- ⦿ Marked with brand, ordering number, inner tube grade, specification, heat number; outer tube grade, specification and 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	≤0.035 <sup>①</sup>	≤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								

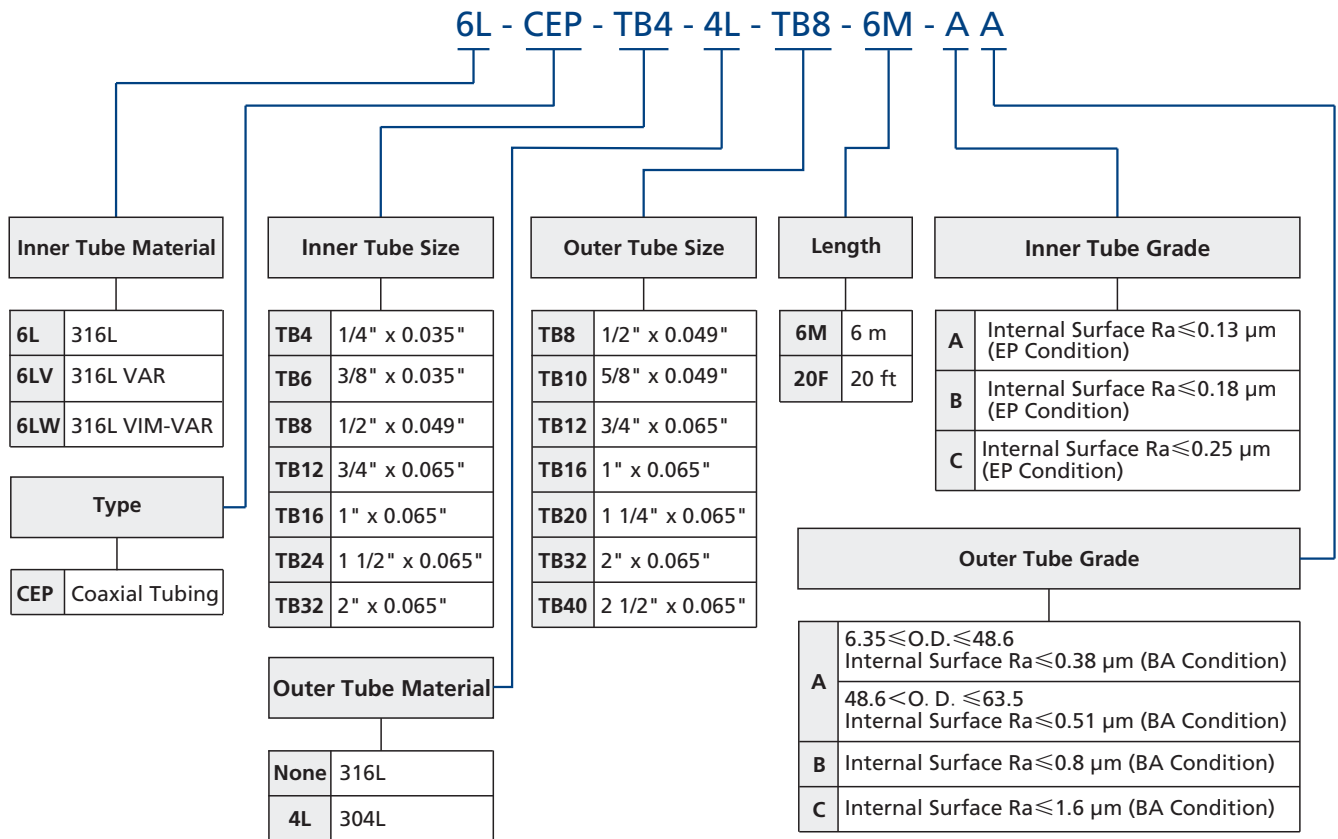
① The carbon content of tubing with outside diameter smaller than 1/2" or wall thickness smaller than 0.049" is allowed up to 0.04%

## 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



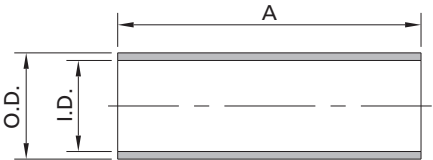
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.  
Not all combination are available.

# Coaxial Tubing Sleeve

## Features

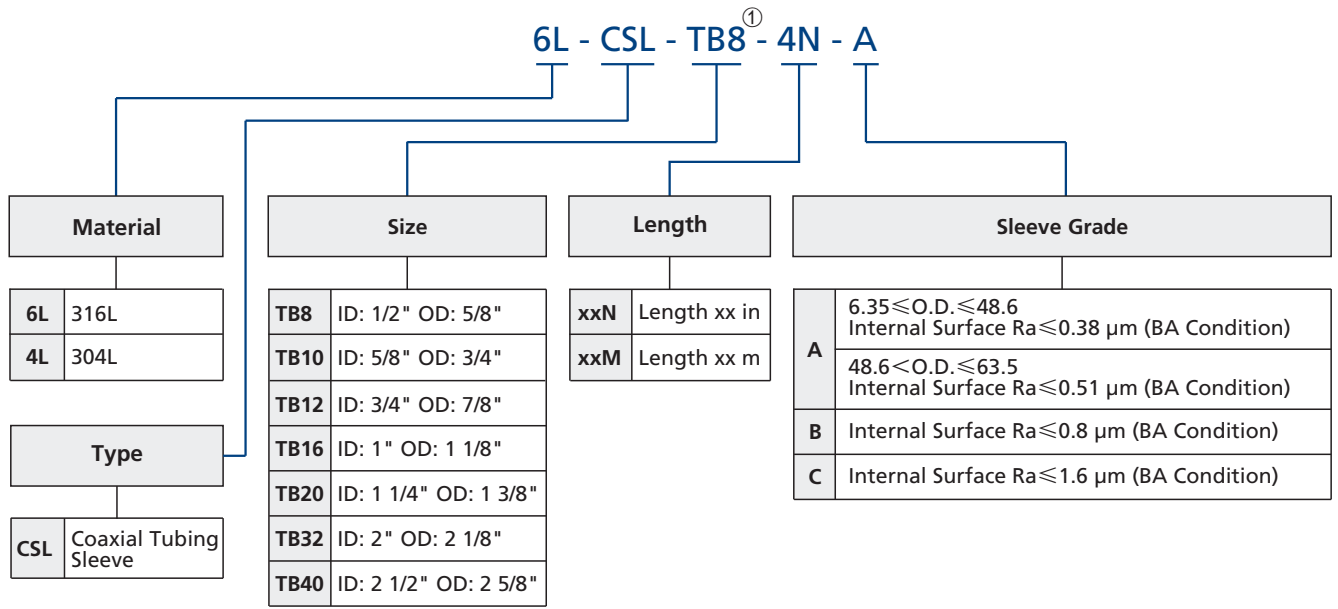
- ⦿ Materials: 316L, 304L
- ⦿ Inside diameter: 1/2" ~ 2 1/2"
- ⦿ Process: internal surface bright annealed or bright annealed after precision cold working to roughness of 15 μin (0.38 μm), Ra≤20 μin (0.51 μm), Ra≤32 μin (0.8 μm), Ra≤63 μin (1.6 μm); external surface machine finished to roughness of Ra≤63 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.

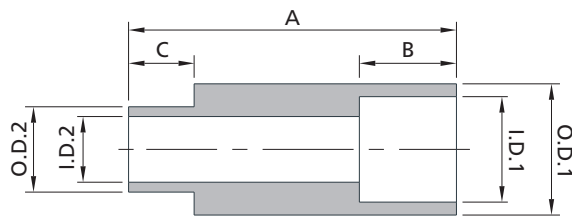
Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number.  
Not all combinations are available.

# Coaxial Tubing Terminator

## Features

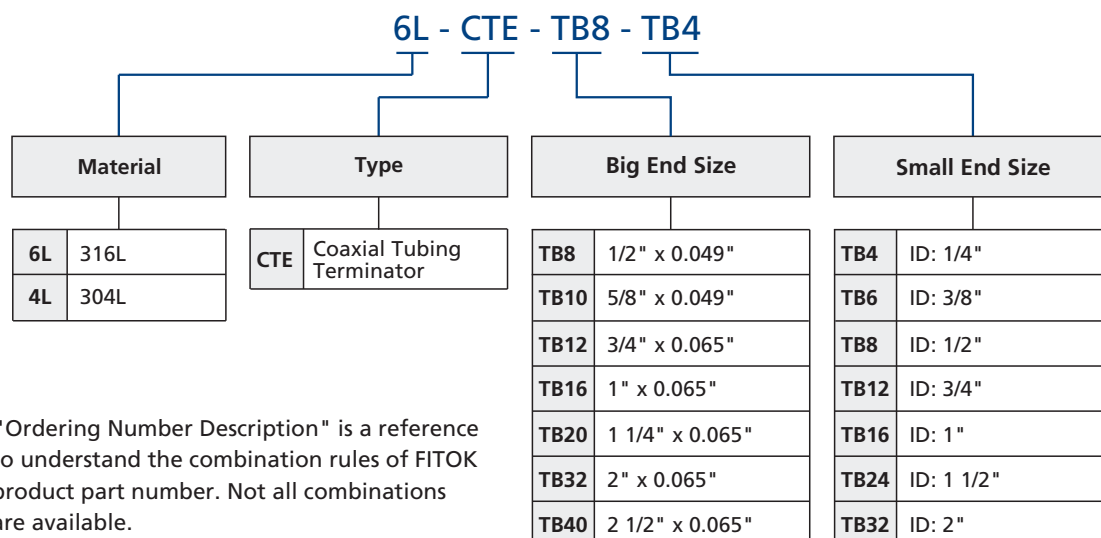
- Materials: 316L, 304L
- Big end: O.D. 1/2" ~ 2 1/2"
- Small end: I.D. 1/4" ~ 2"
- Marked with brand, material grade and trace number
- Standard length: 1.25 in, 2 in, 2.25 in

## 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



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



# Coaxial Fittings



## Coaxial Elbow

- ◎ Type: Coaxial 90° Elbow, Coaxial 45° Elbow
- ◎ 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  $Ra \leq 5 \mu\text{in}$  (0.13  $\mu\text{m}$ ),  
external surface mechanical polished to roughness of  $Ra \leq 15 \mu\text{in}$  (0.38  $\mu\text{m}$ )
- ◎ Cleaning and packaging: ultrasonically cleaned in ISO Class 6 cleanroom, packaged in ISO Class 4 cleanroom

## Coaxial Tee

- ◎ Type: Coaxial Equal Tee, Coaxial Reducing Tee
- ◎ Materials: inner tube: 316L, 316L VAR, 316L VIM-VAR  
outer tube: 316L, 304L
- ◎ Outside diameter:  
Coaxial Equal Tee: inner tube: 1/4" ~ 2", outer tube: 1/2" ~ 2 1/2"  
Coaxial Reducing Tee: inner tube 3/8" ~ 2", inner tube branch 1/4" ~ 1"  
outer tube 5/8" ~ 2 1/2", outer tube branch 1/2" ~ 1 1/4"
- ◎ Inner tube process: internal surface electropolished to roughness of  $Ra \leq 5 \mu\text{in}$  (0.13  $\mu\text{m}$ ),  
external surface mechanical polished to roughness of  $Ra \leq 15 \mu\text{in}$  (0.38  $\mu\text{m}$ )
- ◎ Cleaning and packaging: ultrasonically cleaned in ISO Class 6 cleanroom, packaged in ISO Class 4 cleanroom