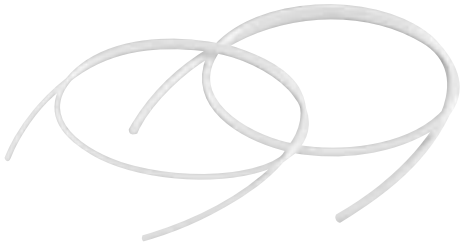
Soft Fluoropolymer Tubing
Metric Size
Series TD



Flexibility: Improved by approx. 20%

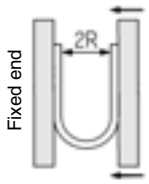
* SMC comparison (Fluoropolymer tubing, Series TL/TIL)

Applications: Food, semiconductor, medical, automobile and machine tools fields

Compatible with the Food Sanitation Law

- Compatible with the test conforming to the Food Sanitation Law based on the 370th notice given by the Ministry of Health and Welfare in 1959.
- Compatible with the §177-1550 dissolution test approved by FDA (Food and Drug Administration).

How to measure the minimum bending radius



Bend the tube into the U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the deformed ratio of the tube diameter at bending reaches 5%.

Model/Specifications

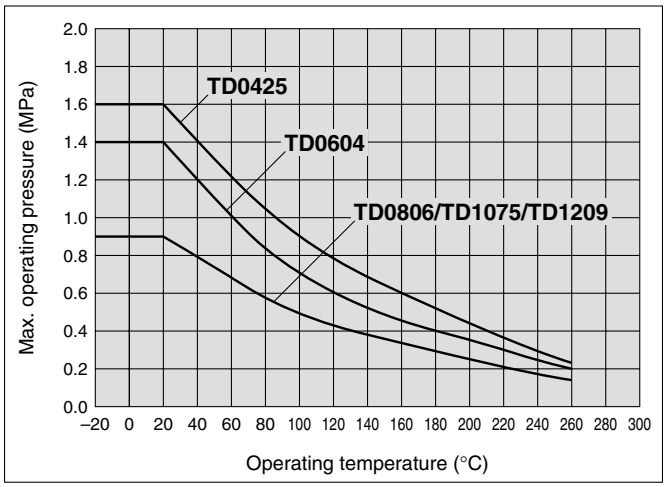
Size		Metric size				
Model		TD0425	TD0604	TD0806	TD1075	TD1209
Tubing O.D. (mm)		4	6	8	10	12
Tubing I.D. (mm)		2.5	4	6	7.5	9
Roll	10 m	●	●	●	●	●
	20 m	●	●	●	●	●
Color		Translucent (material color)				
Fluid Note 1)		Air, Water, Inert gas				
Applicable fittings Note 2)		Insert fitting Miniature fittings M, MS series (Hose nipple type) Fluoropolymer fitting LQ1 series				
Max. operating pressure (MPa)	20°C	1.6	1.4	0.9	0.9	0.9
	100°C	0.9	0.7	0.5	0.5	0.5
	200°C	0.45	0.35	0.25	0.25	0.25
	260°C	0.23	0.2	0.15	0.15	0.15
Min. bending radius (mm) Note 3)	Recommended radius	15	25	45	55	75
	Refraction value	8	16	31	35	41
Max. operating temperature (fixed usage)		260°C				
Material		Modified PTFE (Polytetrafluoroethylene resin)				

Note 1) When using a liquid fluid, the surge pressure must be under the maximum operating pressure. If the surge pressure exceeds the maximum operating pressure, it will result in damage to fittings and tubes. Furthermore, abnormal temperature rise caused by adiabatic compression may result in the tube bursting.

Note 2) Do not use this product in a manner in which the tube is not fixed.
Observe the lesser value of the maximum operating pressure between the tube and fitting.
A material change over a long duration or due to high-temperature may cause leakage. Perform periodic maintenance and replace with a new product immediately when abnormalities are detected.
(Refer to Maintenance in the Series TD/TID Precautions on page 396.)

Note 3) The minimum bending radius is the representative value measured as shown in the left figure.
- Use a tube above the recommended minimum bending radius.
- The tube may be bent if used under the recommended minimum bending radius. Therefore, refer to the refraction value and make sure that the tube is not bent or flattened.
- Please note that the refraction value is not warranted because of the value when 2R is measured by the method in the left figure if the tube is bent or flattened, etc.

Maximum Operating Pressure



How to Order

Metric size

TD0425 – **10**

- **Tubing model**
- **Length per roll**

Symbol	Length
10	10 m roll
20	20 m roll

Fluorine ion elution Note 4)

(μg/g)

Kind	Fluorine ion
Amount of elution	0.7

Cut the fluoropolymer tube into 15 g and clean it with pure water. After letting the 15 mℓ of 25% methyl alcohol elute for 24 hours at the room temperature, dilute the elute with ultrapure water. In accordance with the dissolution method, carry out the quantitative study of fluorine ions.

Metal ion elution Note 4)

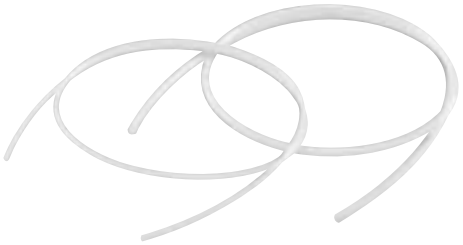
(ng/cm²)

Kind	Al	Fe	Ni	Na	Ca
Amount of elution	0.1 or less	0.1 or less	0.1 or less	0.1	0.1 or less

Clean the inside of fluoropolymer tube with ultrapure water. Weight out about 20 g of ultrapure hydrofluoric acid (48%) and pull in the tube, and then cover both sides of the tube for a week at the room temperature. Dilute the elute with ultrapure water. In accordance with the dissolution method, carry out the quantitative study of Al, Fe, Ni, Na and Ca.

Note 4) The values in the table are not warranted, but the measured values.

Soft Fluoropolymer Tubing
Inch Size
Series TID



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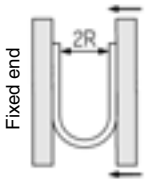
How to measure the minimum bending radius



Bend the tube into the U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the deformed ratio of the tube diameter at bending reaches 5%.

Model/Specifications

Size		Inch size				
Model		TID01	TID05	TID07	TID11	TID13
Tubing O.D.	inch	1/8"	3/16"	1/4"	3/8"	1/2"
	mm	3.18	4.75	6.35	9.53	12.7
Tubing I.D.	inch	0.086"	0.124" (1/8")	0.156" (5/32")	0.25" (1/4")	0.374" (3/8")
	mm	2.18	3.15	3.95	6.33	9.5
Roll	8 m	●	●	●	●	●
	16 m	●	●	●	●	●
Color		Translucent (material color)				
Fluid Note 1)		Air, Water, Inert gas				
Applicable fittings Note 2)		Fluoropolymer fitting LQ1 series				
Max. operating pressure (MPa)	20°C	1.4	1.4	1.6	1.4	0.9
	100°C	0.7	0.7	0.9	0.7	0.5
	200°C	0.35	0.35	0.45	0.35	0.25
	260°C	0.2	0.2	0.23	0.2	0.15
Min. bending radius (mm) Note 3)	Recommended radius	15	20	25	40	75
	Refraction value	9	10	15	23	42
Max. operating temperature (fixed usage)		260°C				
Material		Modified PTFE (Polytetrafluoroethylene resin)				

Note 1) When using a liquid fluid, the surge pressure must be under the maximum operating pressure. If the surge pressure exceeds the maximum operating pressure, it will result in damage to fittings and tubes. Furthermore, abnormal temperature rise caused by adiabatic compression may result in the tube bursting.

Note 2) Do not use this product in a matter in which the modified PTFE tube is not fixed.
Observe the lesser value of the maximum operating pressure between the tube and fitting.
A material change over a long duration or due to high-temperature may cause leakage. Perform periodic maintenance and replace with a new product immediately when abnormalities are detected.
(Refer to Maintenance in the Series TD/TID Precautions on page 396.)

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- Use a tube above the recommended minimum bending radius.
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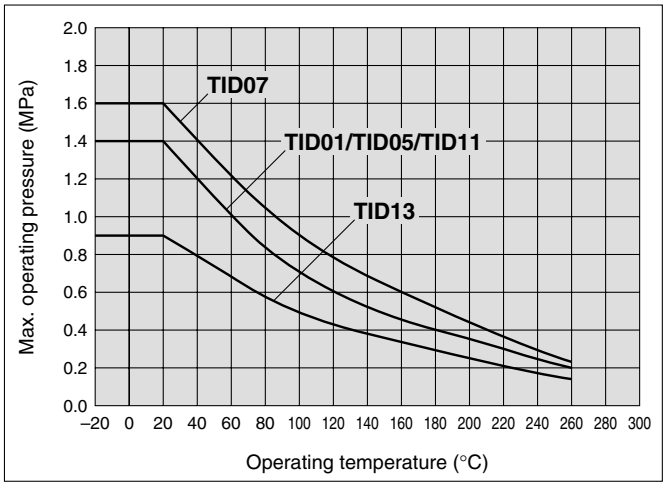
Maximum Operating Pressure



How to Order

Inch size

TID01 – 8

Tubing model

Length per roll

Symbol	Length
8	25 ft (8 m) roll
16	50 ft (16 m) roll

Fluorine ion elution Note 4)

(μg/g)

Kind	Fluorine ion
Amount of elution	0.7

Cut the fluoropolymer tube into 15 g and clean it with pure water. After letting the 15 mℓ of 25% methyl alcohol elute for 24 hours at the room temperature, dilute the elute with ultrapure water. In accordance with the dissolution method, carry out the quantitative study of fluorine ions.

Metal ion elution Note 4)

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Kind	Al	Fe	Ni	Na	Ca
Amount of elution	0.1 or less	0.1 or less	0.1 or less	0.1	0.1 or less

Clean the inside of fluoropolymer tube with ultrapure water. Weight out about 20 g of ultrapure hydrofluoric acid (48%) and pull in the tube, and then cover both sides of the tube for a week at the room temperature. Dilute the elute with ultrapure water. In accordance with the dissolution method, carry out the quantitative study of Al, Fe, Ni, Na and Ca.

Note 4) The values in the table are not warranted, but the measured values.

Applicable Fluid List
Chemical resistance of Fluoropolymer modified PTFE material

Chemicals in the list below are chemically inert [Note)] to modified PTFE material. Possible physical effects may occur such as penetration and swelling due to temperature, pressure and chemical concentration.
To use modified PTFE tube in a chemical environment, tests should be performed with the same environment to ensure no problem occurs with operating environment.

1,1,1-Trichloroethane	Formic acid	Trichloroethylene
1,1,2-Trichloroethane	Ethyl formate	Trichloroacetic acid
1,2,3-Trichloropropane	Propyl formate	Toluene
1,2-Dichlorobutane	Methyl formate	Naphtha
2,4-Dichlorotoluene	Xylene	Carbon dioxide
2-chloropropane	Glycol	Nitrogen dioxide
2-nitro-2-methylpropane	Glycerine	Nitrobenzene
2-nitrobutanol	Cresol	Nitromethane
Pentabasic benzamide	Chromic acid	Carbon disulfide
Hydrochlorofluorocarbon-22	Chloracetic acid	Piperidine
N-octadecanol	Chlorosulfonic acid	Pyridine
N-butylamine	Chloroform	Pyrogallol
o-chlorotoluene	Paraffinum liquidum	Phenol
Isobutyl adipate	Acetate	Butanol
Acetyl chloride	Amyl acetate	Phthalic acid
Acetophenone	Ethyl acetate	Hydrofluoric acid
Acetone	Potassium	Furan
Aniline	Butyl acetate	Ethyl propionate
Sulfurous acid gas	Propyl acetate	Propyl propionate
Allyl chloride	Methyl acetate	Methylpropionate
Benzoic acid	Salicylic acid	Propylene chloride
Ammonium	Sodium hypochlorite	Bromobenzene
Sulfur	Diisobutyl ketone	Hexachlorethane
Isoamyl alcohol	Diethylamine	Hexane
Isooctane	Carbon tetrachloride	Heptane
Ethanol	Dioxane	Benzyl alcohol
Ethyl ether	Cyclohexanone	Benzaldehyde
Ethylene glycol	Cyclohexane	Benzine
Ethylene chloride	Dichloroethylene	Benzoyl chloride
Ethylenediamine	Dichloropropylene	Benzonitrile
Zinc chloride	Dibutyl phthalate	Pentachloroethane
Aluminum chloride	Dimethyl ether	Boric acid
Ammonium chloride	Dimethylsulfoxide	Sodium boric acid
Calcium chloride	Dimethylformamide	Formaldehyde
Ferrous chloride	Hydrobromic acid	Acetic anhydride
Mercuric chloride	Potassium dichromate	Methanol
Stannous chloride	Bromine	Methyl ether
Ferric chloride	Deionized water	Methyl ethyl ketone
Cupric chloride	Nitric acid	Methylene chloride
Sodium chloride	Ammonium hydroxide	Ethyl butyrate
Magnesium chloride	Potassium hydroxide	Methyl butyrate
Hydrochloric acid	Sodium hydroxide	Hydrogen sulfide
Chlorine	Soap, detergent	Sulphuric acid
Aqua regia	Diethyl carbonate	Zinc sulfate
Ozone	Sodium carbonate	Ammonium sulfate
Oleic acid	Tetrachloroethane	Ferrous sulfate
Perchlorate	Tetrachloroethylene	Copper sulfate
Hydrogen peroxide	Tetrahydrofuran	Phosphoric acid
Natrium peroxide	Tetrabromoethane	Sodium phosphate
Gasoline	Triethanolamine	
Potassium permanganate	Triethylamine	

Note) “Chemically inert” means – not to cause any chemical reaction.

Series TD/TID
Tubing/Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions, pages 13 to 16 for Fittings and Tubing Precautions and pages 314, 315, 351 and 352 for Fluoropolymer Fittings Precautions.

Selection

⚠Warning

1. Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems (including vacuum).
Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.)

2. In case of using the product for medical care

This product is designed for use with compressed air system applications for medical care purposes. Do not use in contact with human bodily fluids, body tissues or transfer applications to a human living body.

⚠Caution

1. Do not use in locations where the connecting threads and tubing connection will slide or rotate.

The connecting threads and tubing connection will come apart under these conditions.

2. Use tubing at or above the minimum bending radius. Using below the minimum bending radius can cause breakage or flattening of the tubing.

3. Never use the tubing for anything flammable, explosive or toxic such as gas, fuel gas, or cooling mediums etc.

Because the contents may penetrate outward.

4. Use the fittings applicable to the tubing size.

Mounting

⚠Caution

1. Confirm model no., size, etc. before installing.

Check tubing for damage, gouges, cracks, etc.

2. When tubing is connected, consider factors such as changes in the tubing length due to pressure, and allow sufficient leeway.

3. Do not apply unnecessary forces such as twisting, pulling, moment loads, etc. on fittings or tubing.

This will cause damage to fittings and will crush, burst or release tubing.

4. Mount so that tubing is not damaged due to tangling and abrasion.

This can cause flattening, bursting or disconnection of tubing, etc.

Piping

⚠Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe. Not allowing chips of the piping thread or the seal material to go in.

Air Supply

⚠Warning

1. Types of fluid

This product is designed for use with compressed air.

2. In case of excessive condensation

Excessive condensation in a compressed air system may cause pneumatic equipment to malfunction. Installation of an air dryer, water separator before filter is recommended.

3. Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. It causes malfunction of pneumatic devices.
If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.
For compressed air quality, refer to SMC's "Air Cleaning Equipment" catalog.

Operating Environment

⚠Warning

1. Do not use in locations having an explosive atmosphere.

2. Do not operate in locations where vibration or impact occurs.

3. In locations near heat sources, block off radiated heat.

Maintenance

⚠Caution

1. Reform periodic inspections to check the following problems and replace tubing, if necessary.

1) Cracks, gouges, wearing, corrosion
2) Air leakage
3) Twists or crushing of tubing
4) Hardening, deterioration, softening of tubing

2. Do not repair or patch the replaced tubing or fittings for reuse.

3. When using insert or miniature fittings over a long period, some leakage may occur due to age deterioration of the materials. If any leakage is detected, correct the problem by additional tightening.

If tightening becomes ineffective, replace the fittings with a new product immediately.