

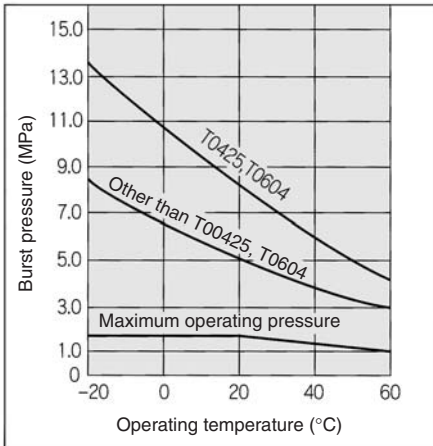
Nylon Tubing Series T/TIA



RoHS

For general pneumatic tubing, Nylon tubing

Burst Pressure Characteristics Curve and Operating Pressure



Model/Specifications

● — 20 m roll □ — 100 m roll (T1613 is reel.)

Model	Tubing size												
	Metric size (Series T)							Inch size (Series TIA)					
Tubing O.D. (mm)	T0425	T0403	T0604	T0645	T0806	T1075	T1209	T1613	TIA01	TIA05	TIA07	TIA11	TIA13
Tubing I.D. (mm)	4	4	6	6	8	10	12	16	3.18	4.76	6.35	9.53	12.7
	2.5	3	4	4.5	6	7.5	9	13	2.18	3.48	4.57	6.99	9.56
Black (B)	●	●	●	●	●	●	●	●	●	●	●	●	●
White (W)	●	●	●	●	●	●	●	●	●	●	●	●	●
Red (R)	●	●	●	●	●	●	●	●	●	●	●	●	●
Blue (BU)	●	●	●	●	●	●	●	●	●	●	●	●	●
Yellow (Y)	●	●	●	●	●	●	●	●	●	●	●	●	●
Green (G)	●	●	●	●	●	●	●	●	●	●	●	●	●
	5/32"				5/16"				Nominal size (inch)				
									1/8"	3/16"	1/4"	3/8"	1/2"
									Nominal size (mm)				
									3.2				

Fluid	Air/Water												
Max. operating pressure (at 20°C)	1.5 MPa												
Burst pressure	Refer to the burst pressure characteristics curve.												
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings												
Min. bending radius (mm)	13	25	24	36	48	60	75	100	15	20	30	60	75
Operating temperature	-20 to +60°C (Water: 0 to 40°C) (No freezing)												
Material	Nylon 12												

⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Applicable for general industrial water. Please consult with SMC if using other kinds of fluid. Surge pressure must be under the max. operating pressure. If the surge pressure exceeds the maximum operating pressure, it will result in damage to fittings and tubes.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- Please exercise caution when using this item in a clean room. There is a possibility of plasticizer and other materials precipitating on the tube surface and detracting from the cleanliness level of the room.

How to Order

T0425 B - 20

Tubing model

Color

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green

Length per roll

Symbol	Length
20	20 m roll
100	100 m roll (Black and white only)

Made to Order

(Please contact SMC for specifications in detail, dimensions, delivery and specifications other than those mentioned above.)

100 m reel Metric size and Inch size except ø16: Suffix "-X3" to the end of part number. Ex.) T0425R-100-X3

Longer length reel Metric size: Suffix "-X3" to the end of part number. Ex.) T0425G-500-X3

20 m roll Inch size: Suffix "-X4" to the end of part number. Ex.) TIA01BU-20-X4

Made to Order Availability

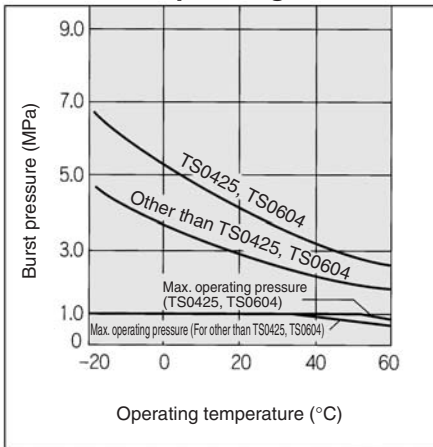
Part no.	Length	Mode	T0425 *	T0604 *	T0806 *	T1075 *	T1209 *	TIA01 *	TIA05 *	TIA07 *	TIA11 *	TIA13 *	Color
X3	100 m reel		○	○	○	○	○	○	○	○	○	○	Black, White, Red, Blue, Yellow, Green
	150 m reel				○								
	200 m reel												
X4	500 m reel		○	○									Red, Blue, Yellow, Green
	20 m roll							○	○	○	○	○	

Soft Nylon Tubing Series TS/TISA

RoHS

For general pneumatic tubing
Pliable soft nylon tubing

Burst Pressure Characteristics Curve and Operating Pressure



⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Use a nylon or polyurethane tubing for general industrial water. If using a soft-nylon tube, it may be shrunk and cause air leakage or the tube may be loosen out.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- Please exercise caution when using this item in a clean room. There is a possibility of plasticizer and other materials precipitating on the tube surface and detracting from the cleanliness level of the room.

Made to Order

Model/Specifications

● — 20 m roll □ — 100 m roll (TS1612 is reel.)

Model	Tubing size										
	Metric size (Series TS)						Inch size (Series TISA)				
Tubing O.D. (mm)	TS0425	TS0604	TS0806	TS1075	TS1209	TS1612	TISA01	TISA05	TISA07	TISA11	TISA13
Tubing I.D. (mm)	2.5	4	6	7.5	9	12	2.18	3.48	4.57	6.99	9.56
Black (B)	●	●	●	●	●	●	●	●	●	●	●
White (W)	●	●	●	●	●	●	●	●	●	●	●
Red (R)	●	●	●	●	●	●	●	●	●	●	●
Blue (BU)	●	●	●	●	●	●	●	●	●	●	●
Yellow (Y)	●	●	●	●	●	●	●	●	●	●	●
Green (G)	●	●	●	●	●	●	●	●	●	●	●
		Nominal size (inch)									
		5/32"	5/16"			1/8"	3/16"	1/4"	3/8"	1/2"	
						Nominal size (mm)					
						3.2					

Fluid	Air										
Max. operating pressure (at 20°C)	1.0 MPa										
Burst pressure	Refer to the burst pressure characteristics curve.										
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings										
Min. bending radius (mm)	12	15	23	27	31	60	12	15	23	30	40
Operating temperature	-20 to +60°C (No freezing)										
Material	Nylon 12										

How to Order

TS0604 W - 100

Tubing model

Color

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green

Length per roll

Symbol	Length
20	20 m roll
100	100 m roll (Black and white only)

100 m reel

Metric size and Inch size except ø16: Suffix "-X3" to the end of part number. Ex.) TS0425R-100-X3

Longer length reel

Metric size: Suffix "-X3" to the end of part number. Ex.) TS0425G-500-X3

20 m roll

Inch size: Suffix "-X4" to the end of part number. Ex.) TISA01BU-20-X4

Made to Order Availability

Part no.	Length	Model	TS0425 *	TS0604 *	TS0806 *	TS1075 *	TS1209 *	TISA01 *	TISA05 *	TISA07 *	TISA11 *	TISA13 *	Color
X3	100 m reel		○	○	○	○	○	○	○	○	○	○	Black, White, Red, Blue, Yellow, Green
	150 m reel					○							
	200 m reel												
	500 m reel		○	○									
X4	20 m roll							○	○	○	○	○	Red, Blue, Yellow, Green



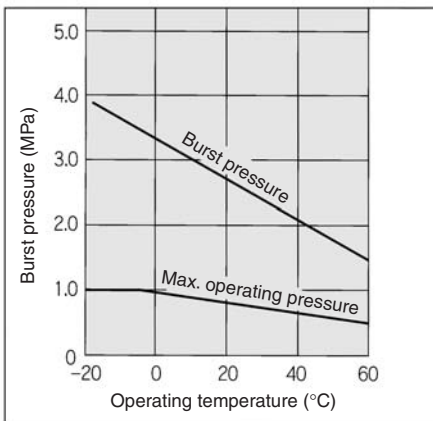
Polyurethane Tubing

Series TU/TIUB

RoHS

For general pneumatic tubing
Flexible
Polyurethane tubing
Additional 21 new colors.

Burst Pressure Characteristics Curve and Operating Pressure

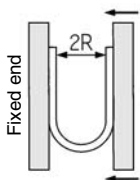


⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Applicable for general industrial water. Please consult with SMC if using for the other kind of fluid. Also, the surge voltage 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.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure below.



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Model/Specifications

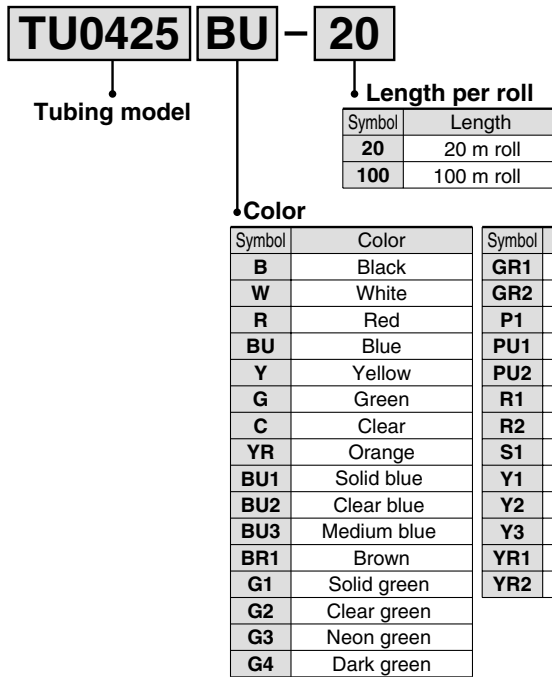
● — 20 m roll □ — 100 m roll
△ — Option ■ — Manufactured upon receipt of order (Please consult with SMC.)

Model	Tubing size											
	Metric size (Series TU)						Inch size (Series TIUB)					
	TU0212	TU0425	TU0604	TU0805	TU1065	TU1208	TU1610	TIUB01	TIUB05	TIUB07	TIUB11	TIUB13
Tubing O.D. (mm)	2	4	6	8	10	12	16	3.18	4.76	6.35	9.53	12.7
Tubing I.D. (mm)	1.2	2.5	4	5	6.5	8	10	2	3.18	4.23	6.35	8.46
Black (B)	●	●	●	●	●	●	●	●	●	●	●	●
White (W)	●	●	●	●	●	●	●	●	△	△	△	△
Red (R)	●	●	●	●	●	●	■	●	△	△	△	△
Blue (BU)	●	●	●	●	●	●	●	●	●	●	●	●
Yellow (Y)	●	●	●	●	●	●	■	●	△	△	△	△
Green (G)	●	●	●	●	●	●	■	●	△	△	△	△
Clear (C)	●	●	●	●	●	●	●	●	△	△	△	△
Orange (YR)	■	●	●	●	●	●	■	●	△	△	△	△
Solid blue (BU1)	■	●	●	●	●	●	■	●	■	■	■	■
Clear blue (BU2)	■	●	●	●	●	●	■	●	■	■	■	■
Medium blue (BU3)	■	●	●	●	●	●	■	●	■	■	■	■
Brown (BR1)	■	●	●	●	●	●	■	●	■	■	■	■
Solid green (G1)	■	●	●	●	●	●	■	●	■	■	■	■
Clear green (G2)	■	●	●	●	●	●	■	●	■	■	■	■
Neon green (G3)	■	●	●	●	●	●	■	●	■	■	■	■
Dark green (G4)	■	●	●	●	●	●	■	●	■	■	■	■
Gray (GR1)	■	●	●	●	●	●	■	●	■	■	■	■
Light gray (GR2)	■	●	●	●	●	●	■	●	■	■	■	■
Neon pink (P1)	■	●	●	●	●	●	■	●	■	■	■	■
Solid purple (PU1)	■	●	●	●	●	●	■	●	■	■	■	■
Clear purple (PU2)	■	●	●	●	●	●	■	●	■	■	■	■
Solid red (R1)	■	●	●	●	●	●	■	●	■	■	■	■
Clear red (R2)	■	●	●	●	●	●	■	●	■	■	■	■
Silver (S1)	■	●	●	●	●	●	■	●	■	■	■	■
Solid yellow (Y1)	■	●	●	●	●	●	■	●	■	■	■	■
Clear yellow (Y2)	■	●	●	●	●	●	■	●	■	■	■	■
Neon yellow (Y3)	■	●	●	●	●	●	■	●	■	■	■	■
Clear orange (YR1)	■	●	●	●	●	●	■	●	■	■	■	■
Neon orange (YR2)	■	●	●	●	●	●	■	●	■	■	■	■

Nominal size (inch)	
5/32"	5/16"
1/8"	3/16"
1/4"	3/8"
1/2"	
Nominal size (mm)	
3.2	

Fluid	Air/Water											
Max. operating pressure at 20°C	0.8 MPa											
Burst pressure	Refer to the burst pressure characteristics curve.											
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings											
Min. bending radius (mm)	4	10	15	20	27	35	45	10	15	23	27	35
Operating temperature	-20 to +60°C (Water: 0 to 40°C) (No freezing)											
Material	Polyurethane											

How to Order



- K**
- M**
- H**
- KK**
- D**
- MS**
- LQ**
- MQR**
- T**

Made to Order

(Please contact SMC for specifications in detail, dimensions, delivery and specifications other than those mentioned above.)

- 100 m reel** Metric size and Inch size: Suffix "-X3" to the end of part number. Ex.) TU0425R-100-X3
- Longer length reel** Metric size: Suffix "-X3" to the end of part number. Ex.) TU0425G-500-X3
- 20 m roll** Inch size: Suffix "-X4" to the end of part number. Ex.) TIUB07W-20-X4

Made to Order Availability

Part no.	Length \ Model	TU0425 *	TU0604 *	TU0805 *	TU1065 *	TU1208 *	TIUB01 *	TIUB05 *	TIUB07 *	TIUB11 *	TIUB13 *	Color
X3	100 m reel	○	○	○	○	○	○	○	○	○	○	Black, White, Red, Blue, Yellow, Green, Clear, Orange
	200 m reel			○								
	400 m reel		○									
	500 m reel	○										
X4	20 m roll						○	○	○	○	○	Red, White, Yellow, Green, Clear, Orange

Soft Polyurethane Tubing Series TUS

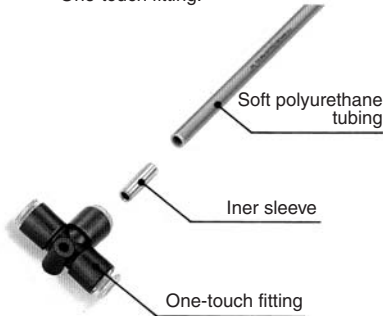


Suitable for piping in confined spaces

Extremely flexible
Soft polyurethane tubing

TUS related accessories Inner sleeve Series TJ

Reinforces soft polyurethane tubing.
Insert an inner sleeve into soft polyurethane tubing when used with a One-touch fitting.



Model

Model	Applicable tubing model	Length
TJ-0425	TUS0425	18
TJ-0604	TUS0604	19
TJ-0805	TUS0805	20.5
TJ-1065	TUS1065	23
TJ-1208	TUS1208	24

Specifications

Material	C2700T (Electroless nickel plated)
Wall thickness	0.2 mm

⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

1. Use a nylon or polyurethane tubing for general industrial water, otherwise the tube may result in being fallen out or bursted when the max. operating pressure is lower and the surge pressure is occurred.
2. The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
3. The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure on the right.
4. Use inner sleeve, taking the removing force into consideration when used with One-touch fittings.

Model/Specifications

● — 20 m roll □ — 100 m reel

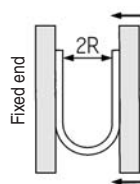
Model	TUS0425	TUS0604	TUS0805	TUS1065	TUS1208
Tubing O.D. (mm)	4	6	8	10	12
Tubing I.D. (mm)	2.5	4	5	6.5	8
Black (B)	●	●	●	●	●
White (W)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●
Translucent (N) ⁽¹⁾	●	●	●	●	●
Yellow brown (YB)	●	●	●	●	●

Fluid	Air					
Max. operating pressure at 20°C	0.6 MPa					
Burst pressure	Refer to the burst pressure characteristics curve.					
Applicable fittings	One-touch fitting, Insert tube fitting, Hose nipple ⁽³⁾					
Min. bending radius (mm) ⁽²⁾	8	15	15	22	29	
Operating temperature	-20 to +60°C (No freezing)					
Material	Polyurethane					
Tube drawing strength (N) (Using One-touch fitting)	Without inner sleeve	15	60	60	85	110
	With inner sleeve	80	230	250	300	480



Note 1) Not clear, but translucent due to material.

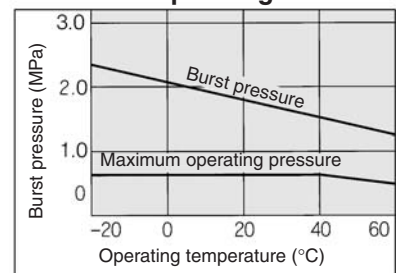
Note 2) Min. bending radius is measured as shown in the figure below.



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Note 3) Always use inner sleeve (Series TJ) in safety circuit or critical area.

Burst Pressure Characteristics Curve and Operating Pressure



How to Order

TUS1065 **B** - **100**

Tubing model

Color

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green
N	Translucent
YB	Yellow brown

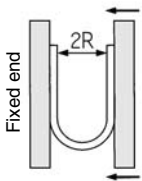
Length per roll

Symbol	Length
20	20 m roll
100	100 m reel (Black, Blue only)

Hard Polyurethane Tubing/Standard Type

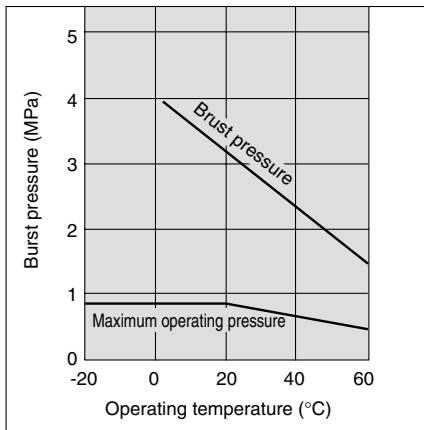
Series *TUH*

RoHS



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Burst Pressure Characteristics Curve and Operating Pressure



⚠️ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠️ Caution

- Please consult with SMC regarding other fluids. Because ester polyurethane is used, water cannot be used due to the occurrence of hydrolysis.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure above.

Model/Specifications

● — 20 m roll □ — 100 m roll

Model	TUH0428	TUH0644	TUH0858	TUH1073	TUH1288
O.D. (mm)	4	6	8	10	12
I.D. (mm)	2.8	4.4	5.8	7.3	8.8

Black (B)	●	●	●	●	●
White (W)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Translucent (N)	●	●	●	●	●

Fluid	Air				
Max operating pressure (at 20°C)	0.8 MPa				
Applicable fittings	One-touch fittings				
Min. bending radius (mm)	10	18	24	30	36
Burst pressure	Refer to the burst pressure characteristics curve.				
Operating temperature	-20 to 60°C				
Material	Polyurethane				

How to Order

TUH0644 **B** - **20**

Tubing model ●

● Length per roll

Symbol	Length
20	20 m roll
100	100 m roll

● Color

Symbol	Color
B	Black
W	White
BU	Blue
N	Translucent

K

M

H

KK

D

MS

LQ

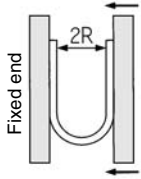
MQR

T

Hard Polyurethane Tubing/High Pressure Type

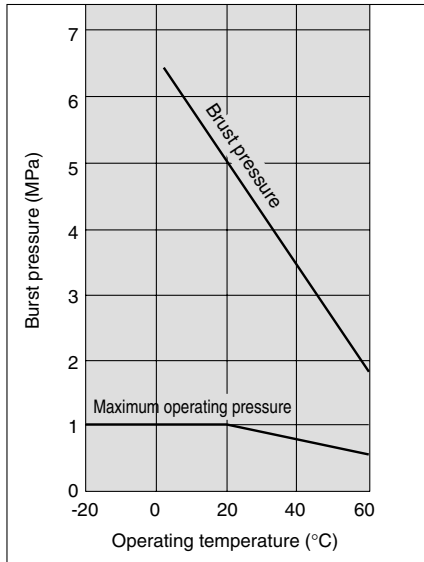
Series *TUH*

RoHS



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Burst Pressure Characteristics Curve and Operating Pressure



⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Please consult with SMC regarding other fluids. Because ester polyurethane is used, water cannot be used due to the occurrence of hydrolysis.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure above.

Model/Specifications

● — 20 m roll □ — 100 m roll

Model	TUH0425	TUH0604	TUH0805	TUH1065	TUH1208
O.D. (mm)	4	6	8	10	12
I.D. (mm)	2.5	4	5	6.5	8

Black (B)	●	□	●	□	●
White (W)	●	□	●	□	●
Blue (BU)	●	□	●	□	●
Translucent (N)	●	□	●	□	●

Fluid	Air				
Max operating pressure (at 20°C)	1.0 MPa				
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings				
Min. bending radius (mm)	10	15	20	27	35
Burst pressure	Refer to the burst pressure characteristics curve.				
Operating temperature	-20 to 60°C				
Material	Polyurethane				

How to Order

TUH0604 **B** - **20**

Tubing model ●

● Length per roll

Symbol	Length
20	20 m roll
100	100 m roll

● Color

Symbol	Color
B	Black
W	White
BU	Blue
N	Translucent

Wear Resistant Tubing

New

RoHS

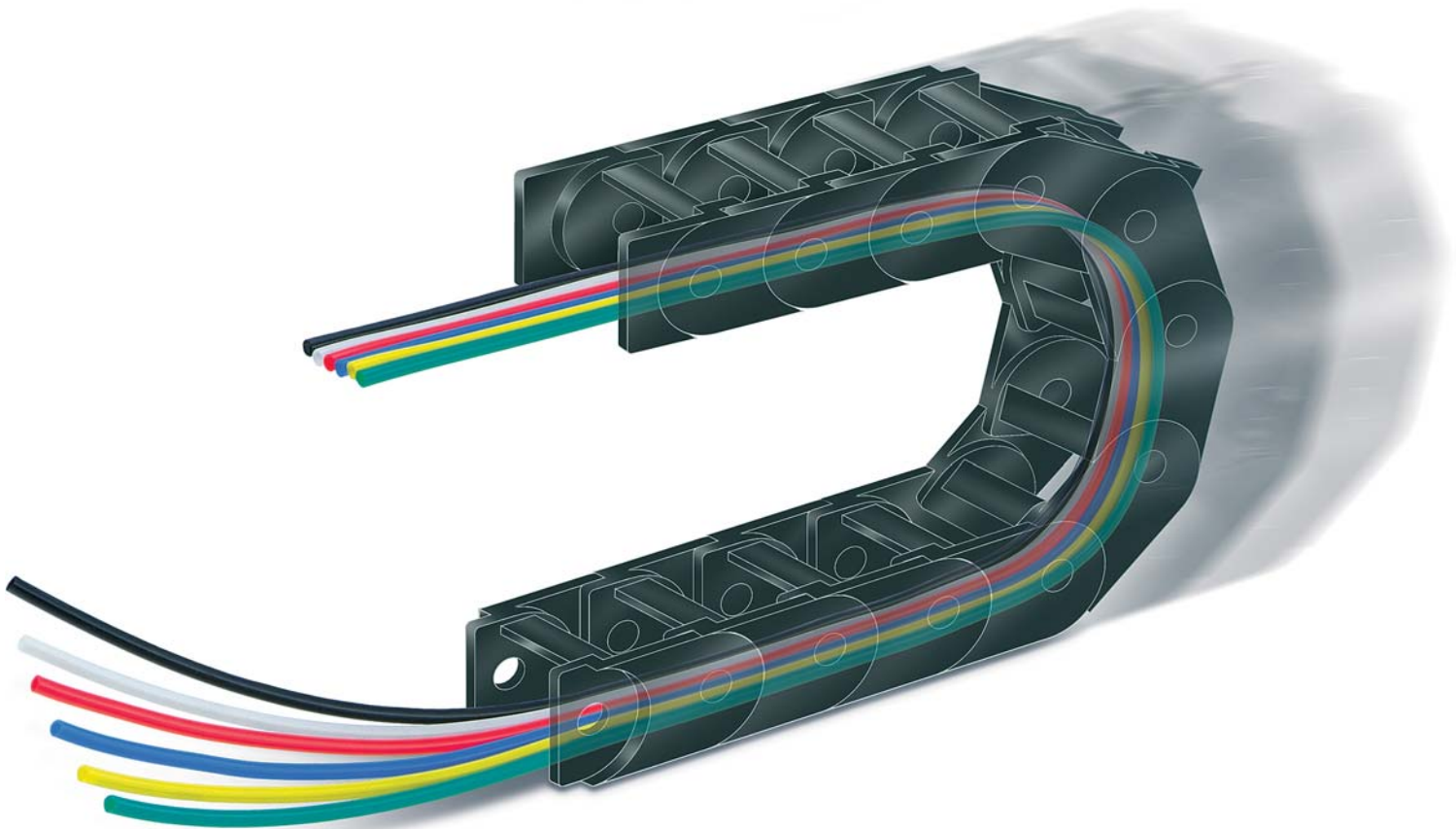
Abrasion: Approx.

(Compared with SMC polyurethane tubing TU series)

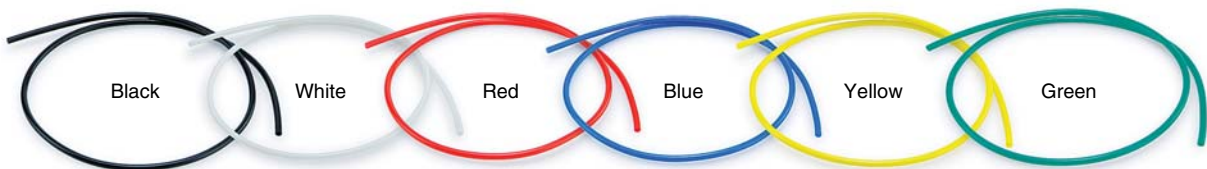
1/3

Description	Maximum abrasion (mm) After 10 million cycles
Wear resistant tubing TUZ series	0.16
Polyurethane tubing TU series	0.46

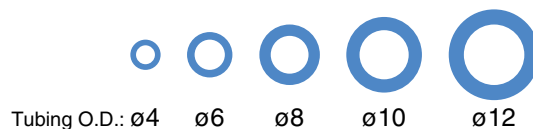
Note) Comparison based on the SMC's specific testing condition



6-color variations



5-size variations



Series TUZ



CAT.ES50-30B [®] _a

Wear Resistant Tubing Series *TUZ*

RoHS



Model

● — 20 m roll □ — 100 m roll

Model	TUZ0425	TUZ0604	TUZ0805	TUZ1065	TUZ1208
Tubing O.D. (mm)	4	6	8	10	12
Tubing I.D. (mm)	2.5	4	5	6.5	8

Black (B)	●	●	●	●	●
White (W)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●

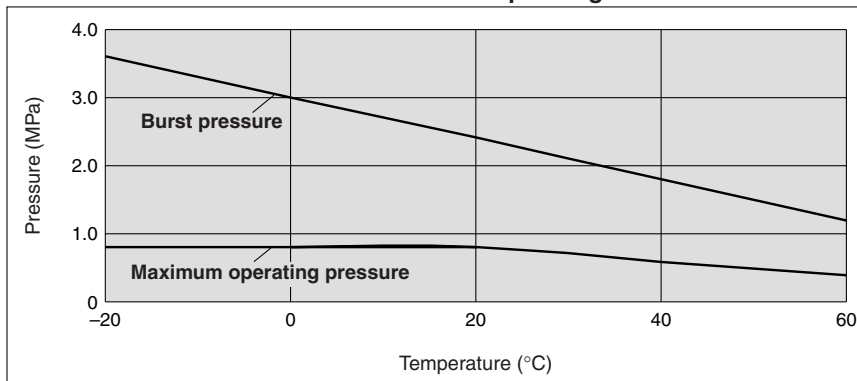
Specifications

Fluid	Air				
Applicable fittings	One-touch fittings KQ/KJ series, Insert fittings KF series, Stainless steel 316 insert fittings KFG series, Miniature fittings M/MS series (hose nipple type)				
Max. operating pressure	20°C	0.8 MPa			
	60°C	0.4 MPa			
Burst pressure	Refer to the burst pressure characteristics curve.				
Min. bending radius (mm)	10	15	20	27	35
Operating temperature	-20 to +60°C				
Material	Special polyurethane				

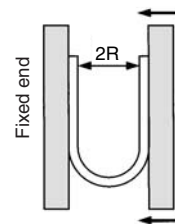
Note 1) The minimum bending radius means the value measured by the method shown in the figure at the right at the temperature of 20°C when the tube is bent. The minimum bending radius assumes static piping. If the tube is used in a moving part, provide extra length to the tube. Check the bending radius recommended by the flexible protection tube manufacturer for sure if the tube is used in the flexible protection tube.

Note 2) Not clear, but opaque due to material.

Burst Pressure Characteristics Curve and Operating Pressure



How to Calculate Minimum Bending Radius



Bend the tube into U-form at the temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

How to Order

TUZ0425 BU - 20

Tubing model

Model	O.D. x I.D. (mm)
TUZ0425	4 x 2.5
TUZ0604	6 x 4
TUZ0805	8 x 5
TUZ1065	10 x 6.5
TUZ1208	12 x 8

Color

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green

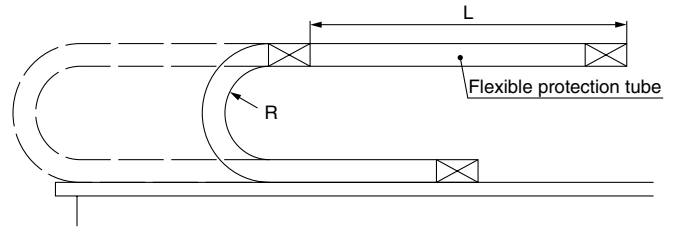
Length per roll

Symbol	Length
20	20 m roll
100	100 m roll

Reference Data: Abrasion due to Flexible Protection Tube

Test Conditions

Test tube	TUZ0604, TU0604
Quantity of tube tested	5 pcs. for each
Operating speed	1500 mm/sec
Operating frequency	90 c.p.m
Stroke L	500 mm
Bending radius R	28 mm
Material of flexible protection tube	Special engineering plastic
Tube tie	Not used



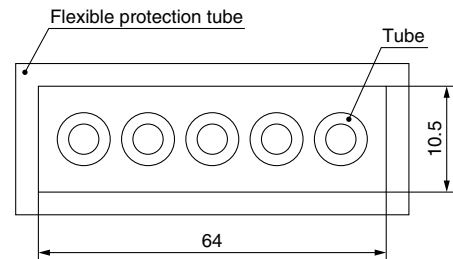
Test Results

Model	Maximum abrasion after 10 million cycles (mm)
TUZ0604	0.16
TU0604	0.46

As this test was an acceleration test, the tube bending radius was out of the flexible protection tube manufacturer's allowable range.

When the flexible protection tube is used in the actual application, check the manufacturer's catalog specifications.

The values in the table above are representative values, and not guaranteed.



Tube dimensions inside the flexible protection tube

Made to Order TFU-X73

Flat type of the TUZ series

The identification line is not shown. Color combinations are also available.

Please contact SMC for detailed specifications, dimensions, and delivery.

How to Order

TFU0425 BU - 2 - 20 - X73

• **Color**

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green

• **Special polyurethane**

• **Length per roll**

Nil	10 m
n	n m (Note)

Note) It is also available in lengths other than 10 m.

Enter the length you need.

Example) **TFU0425BU-2-20-X73**

• **Tubing model**

Model	O.D. x I.D. (mm)
TFU0425	4 x 2.5
TFU0604	6 x 4
TFU0805	8 x 5
TFU1065	10 x 6.5
TFU1208	12 x 8

• **Number of cores**

• **20 m**



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

- * 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
- ISO 4413: Hydraulic fluid power – General rules relating to systems.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1992: Manipulating industrial robots -Safety.
- JIS B 8370: General rules for pneumatic equipment.
- JIS B 8361: General rules for hydraulic equipment.
- JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- JIS B 8433-1993: Manipulating industrial robots - Safety.
- etc.

- * 2) Labor Safety and Sanitation Law, etc.

⚠ Caution: Operator error could result in injury or equipment damage.

⚠ Warning: Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possibility of serious injury or loss of life.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



Safety Instructions

Caution

The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited Warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

* 3) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).



Series TUZ

Specific Product Precautions

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Fittings and Tubing Precautions.

Selection

⚠ Warning

1. Confirm the specifications.

Products represented in this catalog are designed only for use with compressed air system applications (including vacuum). Do not use at pressure or temperature 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 transfer applications to a human living body, or in contact with human bodily fluids, body tissues.

⚠ Caution

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

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

Use rotary type one-touch fittings (KS, KX series) in cases where sliding or rotation will occur.

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

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

Because the contents may penetrate outward.

4. Use the suitable fittings for the tube size.

Mounting

⚠ Caution

1. Confirm model number, size, etc. before installing.

Check if there is damage, gouge, crack, etc. on the tube.

2. When the tube 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 and tube.

This will cause damage to fittings or flattening, bursting or disconnection of tube, etc.

4. Mount so that tube is not damaged due to tangling.

This will cause flattening, bursting or disconnection of tube, 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.

The minimum bending radius assumes static piping. If the tube is used in a moving part, provide extra length to the tube. Check the bending radius recommended by the flexible protection tube manufacturer for sure if the tube is used in the flexible protection tube.

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 compressed air may cause malfunction of pneumatic devices. Installation of an air dryer, water separator before filter is recommended.

3. Drain flushing

If condensation in the drain bowl of an air filter is not emptied on a regular basis, the condensation will enter the outlet side, causing malfunction of pneumatic devices.

If the drain flushing is difficult, installation of a filter with an auto drain option is recommended.

For compressed air quality, refer to SMC's "Air Preparation Equipment Model Selection Guide."

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

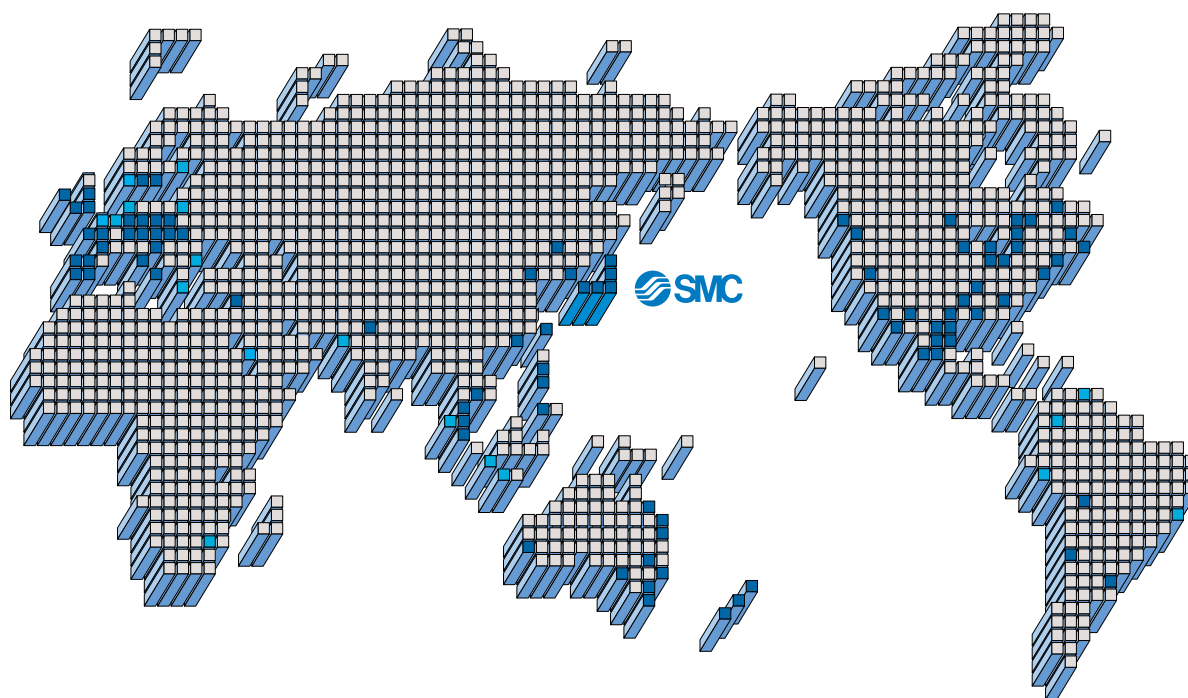
⚠ Caution

1. Perform periodic inspections to check the following problems and replace the tube, if necessary.

- Cracks, gouges, wearing, corrosion
- Air leakage
- Twists or crushing of tube
- Hardening, deterioration, softening of tube

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

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NEW ZEALAND

SMC Pneumatics (N.Z.) Ltd.



Safety Instructions

Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

SMC Corporation

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Specifications are subject to change without prior notice
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Polyurethane Coil Tubing

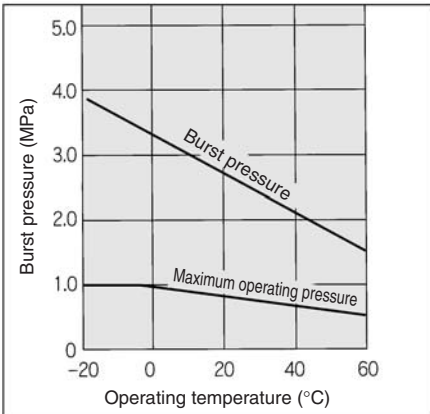
Series TCU



RoHS

For flexible tubing
Compact piping possible

Burst Pressure Characteristics Curve and Operating Pressure



⚠️ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

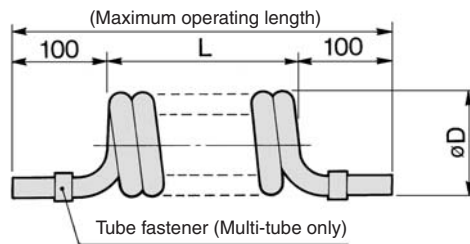
⚠️ Caution

- Please consult with SMC regarding use with any fluids other than air.
- Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.

Model/Specifications

Model	TCU 0425B-1	TCU 0425B-2	TCU 0425B-3	TCU 0604B-1	TCU 0604B-2	TCU 0604B-3	TCU 0805B-1
Number of cores	1 core	2 cores	3 cores	1 core	2 cores	3 cores	1 core
Tubing O.D. (mm)	4			6			8
Tubing I.D. (mm)	2.5			4			5
Fluid	Air						
Max. operating pressure (at 20°C)	0.8 MPa						
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings						
Burst pressure	Refer to the burst pressure characteristics curve.						
Operating temperature	-20 to +60°C						
Material	Polyurethane						
Color	Black						

Dimensions



Specifications Model	Tubing size (mm)		Coil (mm)		No. of cores	No. of coil windings per tube length	Max. operating length (m)	Standard unit of packing
	O.D.	I.D.	L	øD				
TCU0425B-1	4	2.5	210	18	1	52 ± 2	1.5	5 tubes/case
TCU0425B-2			280	28	2	35 ± 1		
TCU0425B-3			265	28	3	22 ± 1		
TCU0604B-1	6	4	325	24	1	54 ± 2	2	
TCU0604B-2			37	2	27 ± 1	1.5		
TCU0604B-3			305	3	17 ± 1	1		
TCU0805B-1	8	5	330	31	1	41 ± 2	2	

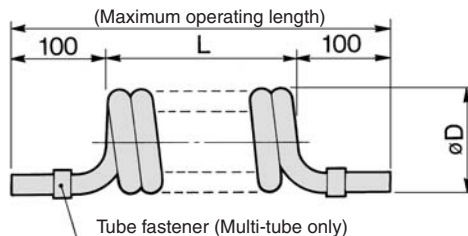
* The number of coil windings per tube length and dimensions are changeable due to material.

Made to Order

Change of coil turns, Change of color

(Please contact SMC for specifications in detail, dimensions and delivery.)

- Please do not cut the coil and insert it into the fitting. This may cause air leakage, or tubing to come out after installation.



Specifications Model	Tubing size (mm)		Coil (mm)		No. of cores	No. of coil windings per tube length (N)	Max. operating length (mm)	Specifications Model	Tubing size (mm)		Coil (mm)		No. of cores	No. of coil windings per tube length (N)	Max. operating length (mm)
	O.D.	I.D.	L	øD					O.D.	I.D.	L	øD			
TCU0425□-1-N-X6	4	2.5	N x 4	18	1	3 to 90	L x 5.9 + 200	TCU0805□-1-N-X6	8	5	N x 8	31	1	3 to 90	L x 5.2 + 200
TCU0425□-2-N-X6			N x 8	28	2	3 to 90	L x 4.4 + 200	TCU0805□-2-N-X6			N x 16	42	2	3 to 40	L x 3 + 200
TCU0425□-3-N-X6			N x 12	28	3	3 to 63	L x 2.9 + 200	TCU1065□-1-N-X6	10	6.5	N x 10	52	1	3 to 45	L x 5 + 200
TCU0604□-1-N-X6	6	4	N x 6	24	1	3 to 90	L x 5.3 + 200	TCU1065□-2-N-X6			N x 20	52	2	3 to 35	L x 3 + 200
TCU0604□-2-N-X6			N x 12	37	2	3 to 66	L x 3.8 + 200	TCU1208□-1-N-X6			12	8	N x 12	67	1
TCU0604□-3-N-X6			N x 18	37	3	3 to 44	L x 2.5 + 200	TCU1208□-2-N-X6	N x 24	67			2	3 to 30	L x 3 + 200

* □: B (Black), W (White), R (Red), BU (Blue), Y (Yellow), G (Green), C (Clear), YR (Orange)

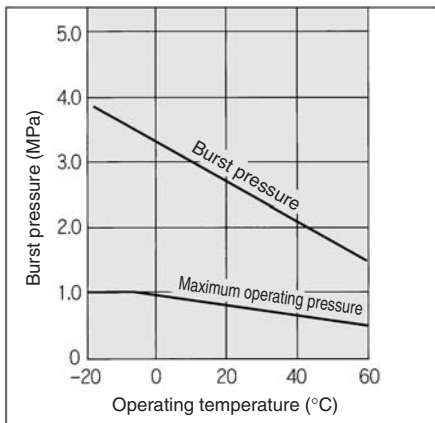


Polyurethane Flat Tubing Series *TFU*



RoHS

Compact piping possible With line markings for piping differentiation Burst Pressure Characteristics Curve and Operating Pressure



⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Please consult with SMC regarding use with any fluids other than air.
- Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
- The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure on the right.
- As a result of product design characteristics, there are cases of very slight leakage.

Model/Specifications

Model	TFU 0425B-2	TFU 0425B-3	TFU 0604B-2	TFU 0604B-3	TFU 0805B-2	TFU 0805B-3
No. of cores	2 cores	3 cores	2 cores	3 cores	2 cores	3 cores
Tubing O.D. (mm)	4		6		8	
Tubing I.D. (mm)	2.5		4		5	
Fluid	Air					
Max. operating pressure (at 20°C)	0.8 MPa					
Burst pressure	Refer to the burst pressure characteristics curve.					
Applicable fittings	One-touch fittings, Insert fittings, Self-align fittings, Miniature fittings					
Operating temperature	-20 to +60°C (No freezing)					
Material	Polyurethane					
Color	Black					
Min. bending radius (mm)	10		15		20	
Tube length per roll (m)	10					

How to Order

TFU0425 B - 2

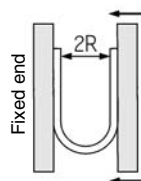
↓
Tubing model

↓
Color

Symbol	Color
B	Black

↓
No. of tubes

Symbol	No. of cores
2	2 cores
3	3 cores



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Made to Order

(Please contact SMC for specifications in detail, dimensions and delivery.)

● — 10 m roll △ — 50 m reel □ — 100 m reel

1. Change of color (10 m roll)

Suffix "-X4" to the end of part number.
Ex.) TFU0604BU-2-10-**[X4]**
• W: White, R: Red, BU: Blue, Y: Yellow, G: Green, C: Clear, YR: Orange, (All tubes are the same color regardless of 2 cores or 3 cores.)

2. Reel (50 m, 100 m length, Color changes)

Suffix "-X3" to the end of part number.
Ex.) TFU0425B-2-50-**[X3]**

3. No. of cores (10 m roll, each color)

Suffix "-X4" to the end of part number.
Ex.) TFU0604B-4-10-**[X4]**

Model	TFU0425□	TFU0604□	TFU0805□	TFU1065□	TFU1208□	
Tubing O.D. (mm)	4	6	8	10	12	
Tubing I.D. (mm)	2.5	4	5	6.5	8	
No. of cores	2	●	●	●	●	
	3	●	●	●	●	
	4	●	●	●	●	●
	5	●	●	●	●	●
	6	●	●	●	●	●
	7	●	●	●	●	●
	8	●	●	●	●	●

Flame Resistant (Equivalent to UL-94 Standard V-0) FR Soft Nylon Tubing Series TRS

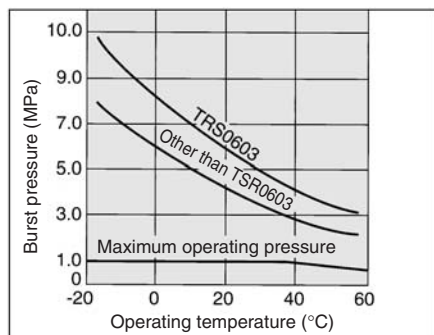


RoHS

Suitable for air and water piping in environments where sparks from spot welders, etc., may be a problem.

Flame resistant tubing

Burst Pressure Characteristics Curve and Operating Pressure



Model/Specifications

● — 20 m roll □ — 100 m reel

Model	TRS0603	TRS0805	TRS1065	TRS1208
Tubing O.D. (mm)	6	8	10	12
Tubing I.D. (mm)	3	5	6.5	8

Black (B)	●	●	●	●
White (W)	□	□	□	□
Red (R)	●	●	●	●
Blue (BU)	□	□	□	□
Green (G)	●	●	●	●

Fluid	Air/Water			
Max. operating pressure (at 20°C)	1.2 MPa			
Burst pressure	Refer to the burst pressure characteristics curve.			
Recommended fittings	FR one-touch fittings: Series KR-W2			
Minimum bending radius (mm)	17	19	27	32
Operating temperature	-20 to +60°C (Water: 0 to 60°C) (No freezing)			
Material	Flame resistant nylon (Equivalent to UL-94 standard V-0)			

⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

- Applicable for general industrial water. Please consult with SMC if using for the other kind of fluid. Also, the surge voltage 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.
- The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.

How to Order

TRS1065 **B** - **100**

Tubing model Color Length per roll

Symbol	Length
20	20 m roll
100	100 m reel

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
G	Green

K

M

H

KK

D

MS

LQ

MQR

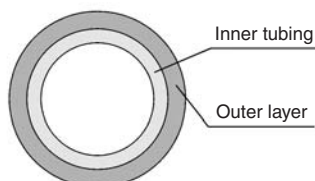
T

Flame Resistant (Equivalent to UL-94 Standard V-0) FR Double Layer Tubing Series *TRB*



Suitable for air and water piping in environments where sparks from spot welders, etc., may be a problem.

Double layer design using flame resistant resin (equivalent to UL-94 Standard V-0) for outer layer.



Sectional view of FR double layer tubing

Model

● — 20 m roll □ — 100 m reel

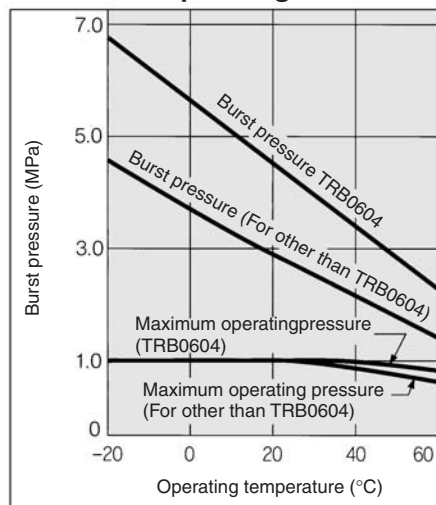
Model		TRB0604	TRB0806	TRB1075	TRB1209
Inner tubing O.D. (mm)		6	8	10	12
Inner tubing I.D. (mm)		4	6	7.5	9
Outer layer thickness (mm)		1	1	1	1
External layer color <small>(Note)</small>	Black (B)	●	●	●	●
	White (W)	●	●	●	●
	Red (R)	●	●	●	●
	Blue (BU)	●	●	●	●
	Yellow (Y)	●	●	●	●
	Green (G)	●	●	●	●
Min. bending radius (mm)		15	28	35	45

Specifications

Fluid	Air/Water	
Max. operating pressure (at 20°C)	1.0 MPa	
Burst pressure	Refer to the burst pressure characteristics curve.	
Recommended fittings	FR one-touch fittings: Series KR-W2	
Ambient and fluid temperature	-20 to +60°C (Water: 0 to 60°C) (No freezing)	
Material	Inner tubing	Nylon 12
	Outer layer	PVC (Equivalent to UL-94 Standard V-0)

Note) The color of all inner tubing is black.

Burst Pressure Characteristics Curve and Operating Pressure



How to Order

TRB1075 B - 100

Tubing model Color Length per roll

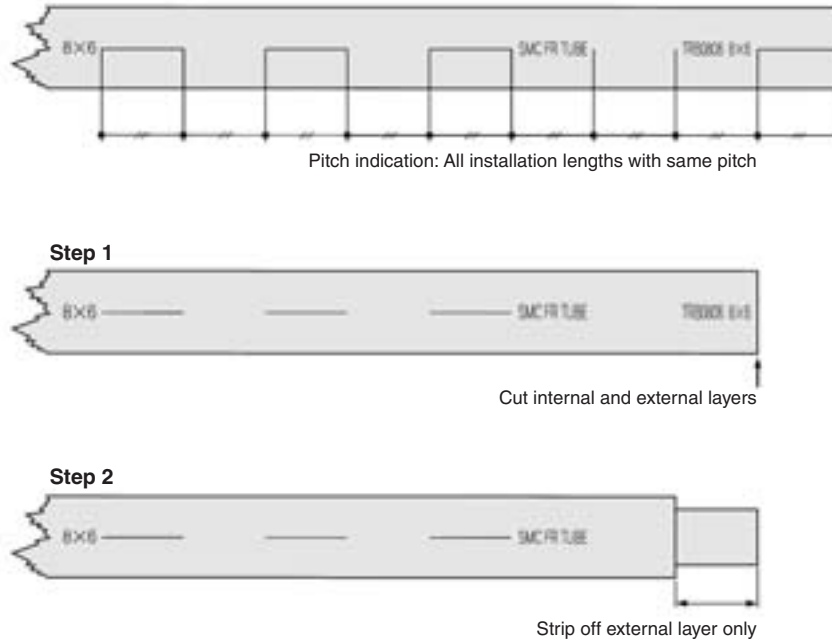
Symbol	Color	Symbol	Color
B	Black	BU	Blue
W	White	Y	Yellow
R	Red	G	Green

Symbol	Length
20	20 m roll
100	100 m reel

Installation on One-touch Fittings

⚠ Caution

Length of tubing to be inserted into One-touch fittings is indicated on the outer layer of TRB tubing. Cut the tube according to this indication, (Step 1) and then strip off the outer layer (Step 2) for installing into fittings.



K	<input type="checkbox"/>
M	<input type="checkbox"/>
H	<input type="checkbox"/>
KK	<input type="checkbox"/>
D	<input type="checkbox"/>
MS	<input type="checkbox"/>
LQ	<input type="checkbox"/>
MQR	<input type="checkbox"/>
T	<input type="checkbox"/>

⚠ Precautions

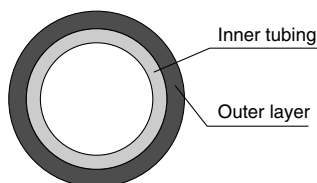
Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

1. Applicable for general industrial water. Please consult with SMC if using for the other kind of fluid. Also, the surge voltage 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 tubing.
2. The value of the max. operating pressure is at a temperature of 20°C. Refer to the burst pressure characteristics curve for other temperatures.
 Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.

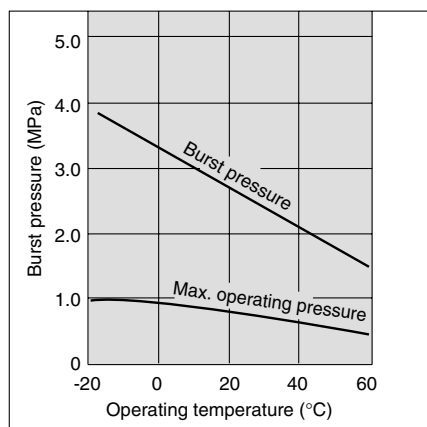
Flame Resistant (Equivalent to UL-94 Standard V-0) FR Double Layer Polyurethane Tubing Series **TRBU**

RoHS



Sectional view of FR double layer tubing

Burst Pressure Characteristics Curve and Operating Pressure



Model

● — 20 m roll □ — 100 m reel

Model	TRBU0604	TRBU0805	TRBU1065	TRBU1208
Inner tubing O.D. (mm)	6	8	10	12
Inner tubing I.D. (mm)	4	5	6.5	8
External layer thickness (mm)	1	1	1	1
External layer color <small>Note)</small>	Black (B)	● □	● □	● □
	White (W)	● □	● □	● □
	Red (R)	● □	● □	● □
	Blue (BU)	● □	● □	● □
	Yellow (Y)	● □	● □	● □
	Green (G)	● □	● □	● □
Minimum bending radius (mm)	15	20	27	35

Specifications

Fluid	Air/Water	
Max. operating pressure (at 20°C)	0.8 MPa	
Burst pressure	Refer to the burst pressure characteristics curve.	
Recommended fittings	FR one-touch fittings: Series KR-W2	
Ambient and fluid temperature	-20 to 60°C Water: 0 to 40°C (No freezing)	
Material	Internal tubing	Polyurethane
	Outer layer	Polyolefin (Equivalent to UL-94 standard V-0)

Note) The color of all inner tubing is black.

How to Order

TRBU1065 **B** - **100**

● Tubing model

● Length per roll

Symbol	Length
20	20 m roll
100	100 m reel

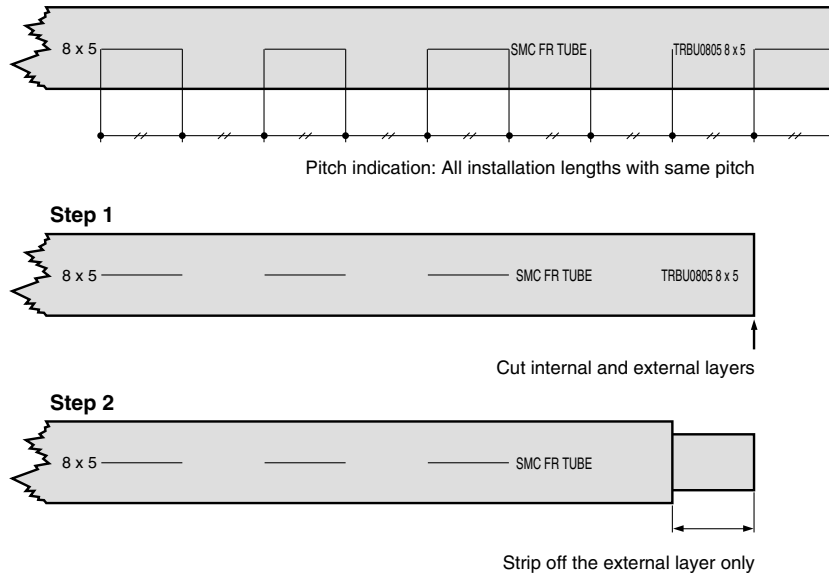
● Color

Symbol	Color	Symbol	Color
B	Black	BU	Blue
W	White	Y	Yellow
R	Red	G	Green

Installation on One-touch Fittings

⚠ Caution

Lengths of tubes to be inserted into One-touch fittings are indicated on the outer layer of TRBU tubes. Cut the tube according to this indication, (Step 1) and then strip off the outer layer (Step 2) for installing into fittings.



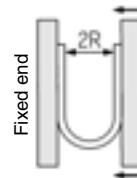
- K
- M
- H
- KK
- D
- MS
- LQ
- MQR
- T

⚠ Precautions

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

1. Applicable for general industrial water. Please consult with SMC if using for the other kind of fluid. Also, the surge voltage pressure must be under the maximum operating pressure.
2. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, abnormal temperature rises caused by adiabatic compression may result in the burst of the tube.
3. The value of the minimum bending radius is measured at the temperature of 20°C as shown in the figure on the right.



Bend the tube into U-form at a temperature of 20°C. Fix one end and close loop gradually. Measure 2R when the tube breaks or is crushed.

Related Products: Double Layer Tube Stripper Series TKS

RoHS

Allows easy stripping of the outer layer from double layer tubes.

Even the double layer polyurethane tubing (Series TRBU), which is highly adhesive to the external layer can be stripped easily.

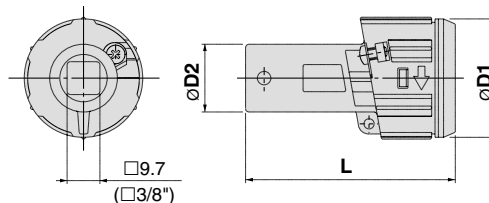


Model

Model	Tip color	Applicable tubing *	Dimensions (mm)			Mass (g)
			D1	D2	L	
TKS-06	Orange	TRB0604, TRBU0604	35	16	58	45
TKS-08	Yellow	TRB0806, TRBU0805		18		
TKS-10	Blue	TRB1075, TRBU1065		20	62	
TKS-12	Green	TRB1209, TRBU1208		22		

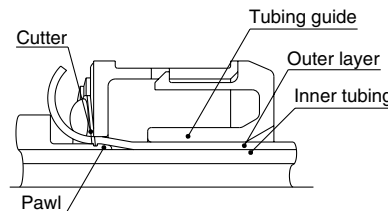
* Inner tubing material/TRB: Nylon, TRBU: Polyurethane

Dimensions



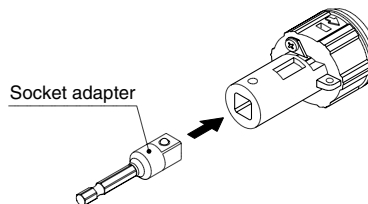
Able to strip without damaging the inner tubing

The outer tube can be stripped without damaging the inner tube because a pawl is inserted between the inner and outer tube layers.



Can be attached to tools

Stripping work can be automated by attaching an air driver, etc. with it.

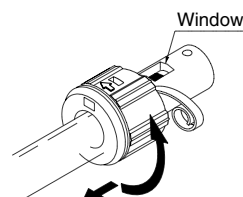


Adjustment of cutter and stripping length is unnecessary

A constant stripping length is always possible due to the fixed cutter with angle that cuts until the tube reaches the end surface inside the stripper.

Removal of stripped tube is unnecessary.

Since the stripped tube is discharged to the outside, no additional labor is required to remove it.





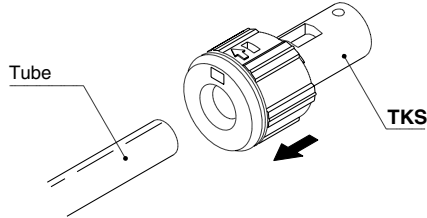
Series TKS Specific Product Precautions

Be sure to read before handling. Refer to pages 58 to 59 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 13 to 16 for Precautions on every series.

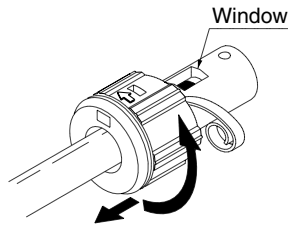
Operation

⚠ Caution

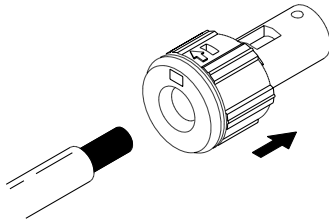
1. Insert the tube into the double layer tube stripper (Series TKS).



2. Rotate the TKS in the arrow direction while pushing it.
3. Strip the outer layer until the cut end of the tubing strikes the end surface inside the stripper.
The end surface can be confirmed in the window.
Note) Stripping is not possible by rotating in the opposite direction.



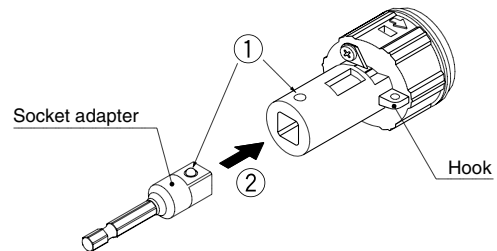
4. Pull the TKS off of the tubing to complete stripping.
The tube can be attached as it is to a FR One-touch fitting.



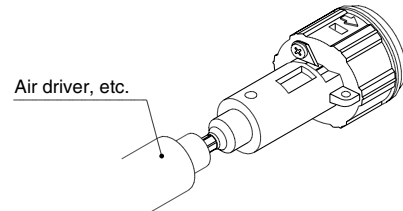
Attachment to Tools

⚠ Caution

1. Align the socket of the TKS with a commercially available male socket adapter (9.5 mm square).
2. Connect the socket adapter to the TKS.



3. Connection with tools such as an air driver is also possible.
Note) Ensure the TKS does not shake or vibrate.



K

M

H

KK

D

MS

LQ

MQR

T

Operation

⚠ Caution

1. When using a tool such as air driver, use a push-start type which rotates after the tubing is inserted.
2. Do not insert the tube when the TKS is rotating, as the pawl may be damaged.

Flame Resistant (Equivalent to UL-94 Standard V-0)

FR Three-layer Polyurethane Tubing New

RoHS

Improved spatter resistance

Spatter resistance is **twice** that of FR double layer polyurethane tubing TRBU series. * In SMC conditions

For general pneumatic and water piping in environments exposed to sparks from arc welding, etc.

Spatter resistance is improved by installing an aluminum layer between the outer layer and inner tube.



Three-layer design

Outer layer: Flame resistant polyolefin (Equivalent to UL-94 standard V-0)

Middle layer: Aluminum laminated film

Inner tube: Polyurethane

6-color variations



Model

● — 20 m roll □ — 100 m reel

Model	TRTU0604	TRTU0805	TRTU1065	TRTU1208
Inner tube O.D. (mm)	6	8	10	12
Inner tube I.D. (mm)	4	5	6.5	8
Outer layer thickness (mm)	1	1	1	1
Outer layer color	Black (B)	●	●	●
	White (W)	●	●	●
	Red (R)	●	●	●
	Blue (BU)	●	●	●
	Yellow (Y)	●	●	●
	Green (G)	●	●	●

Series TRTU

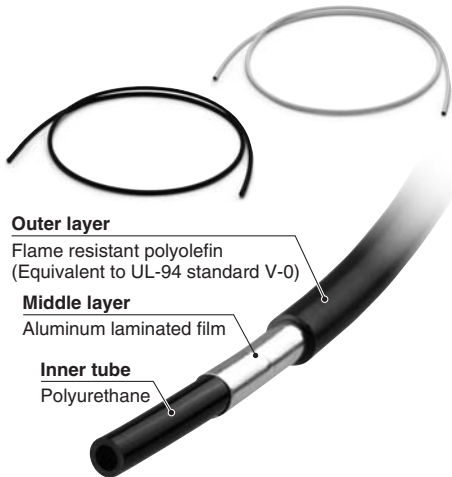


CAT.ES50-35A

Flame Resistant (Equivalent to UL-94 Standard V-0) FR Three-layer Polyurethane Tubing

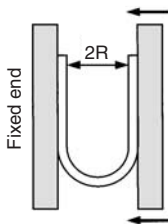
Series TRTU

RoHS



For general pneumatic and water piping in environments exposed to sparks from arc welding, etc.

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

Model	TRTU0604	TRTU0805	TRTU1065	TRTU1208
Inner tube O.D. (mm)	6	8	10	12
Inner tube I.D. (mm)	4	5	6.5	8
Outer layer thickness (mm)	1	1	1	1

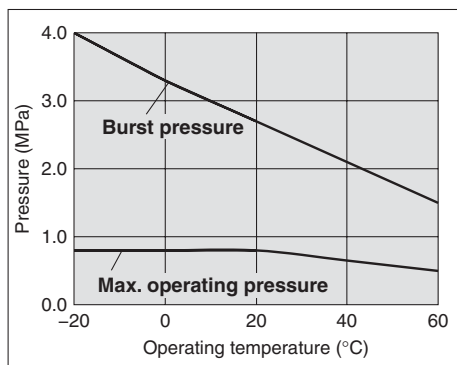
Note 3) Outer layer color	Black (B)	●	□	●	□
	White (W)	●	□	●	□
	Red (R)	●	□	●	□
	Blue (BU)	●	□	●	□
	Yellow (Y)	●	□	●	□
	Green (G)	●	□	●	□

Specifications

Fluid ^{Note 1)}	Air, Water			
Applicable fittings	FR one-touch fittings: Series KR-W2 Metal one-touch fittings: Series KQB2			
Max. operating pressure	At 20°C	0.8 MPa		
	At 40°C	0.65 MPa		
	At 60°C	0.5 MPa		
Burst pressure	Refer to the burst pressure characteristics curve.			
Min. bending radius (mm) ^{Note 2)}	50	60	70	80
Ambient and fluid temperature	-20 to +60°C Water: 0 to 40°C (No freezing)			
Material	Inner tube	Polyurethane		
	Middle layer	Aluminum laminated film		
	Outer layer	Polyolefin (Equivalent to UL-94 standard V-0)		

- Note 1) Applicable for general industrial water. Please consult with SMC if using for the other kind of fluid. Also, 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.
- Note 2) The minimum bending radius is the representative value measured as shown in the left figure. Allow extra length when piping since the tube may be bent if used under the minimum bending radius.
- Note 3) The color of all inner tubes is black.

Burst Pressure Characteristics Curve and Operating Pressure



How to Order

TRTU1065 B - 20

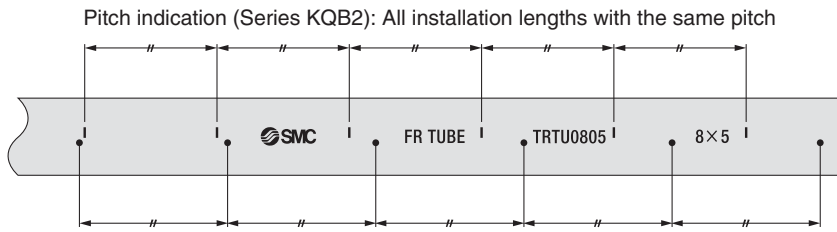
Model	Inner tube O.D. x I.D. (mm)
TRTU0604	6 x 4
TRTU0805	8 x 5
TRTU1065	10 x 6.5
TRTU1208	12 x 8

Symbol	Color
B	Black
W	White
R	Red
BU	Blue
Y	Yellow
G	Green

Symbol	Length
20	20 m roll
100	100 m reel

Installation on One-touch Fittings

Pitch length for installation on a one-touch fitting is indicated on the outer layer of the TRTU tubing.
(There are two types of applicable fittings, so two types of pitch length for installation are available.)
Cut the tube according to this indication (Step 1) and strip off the outer layer (Step 2) using a special tool.
Strip off the aluminum laminated film to prevent the inner tube from being damaged (Step 3) and install it on the one-touch fitting.
Refer to the Operation Manual for details of installation on the one-touch fitting.
The Operation Manual can be downloaded from the SMC URL below.
<http://www.smcworld.com/>



Pitch indication (Series KR-W2): All installation lengths with the same pitch

Identification of the pitch length for installation
 “//”: Series KQB2
 “•”: Series KR-W2

**Metal one-touch fittings
Series KQB2**

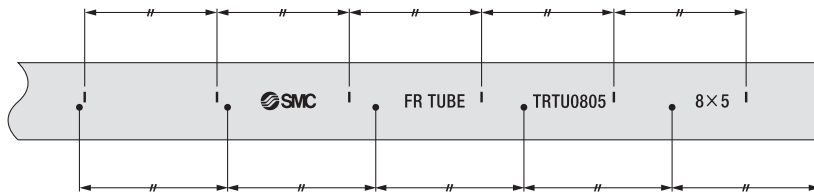


**Flame resistant
(equivalent to UL-94 standard V-0)
FR one-touch fittings
Series KR-W2**



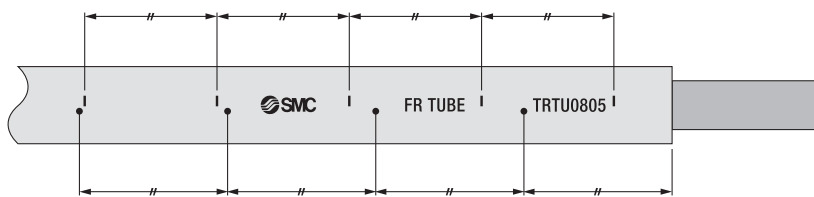
Installation on the KR-W2 series

Step 1



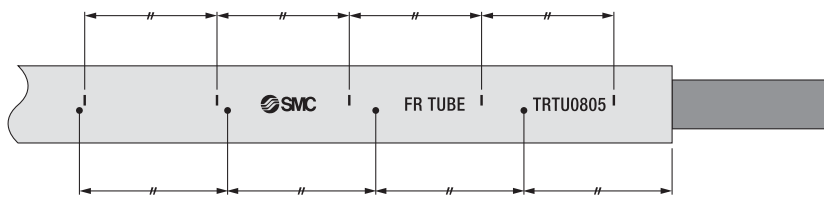
Outer layer, aluminum laminated film and inner tube are cut at the “•” mark.

Step 2



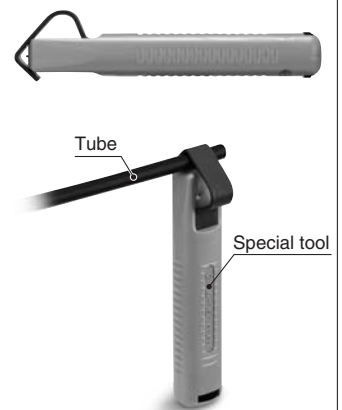
Strip off the outer layer.

Step 3




Strip off the aluminum laminated film to prevent the inner tube from being damaged.


Use a special tool for stripping off the outer layer.
Part no.: YS-100
* Refer to the Operation Manual for details of how to use the special tool.




Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

 **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

 **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

 **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
URL <http://www.smcworld.com>
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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-DN

1st printing OV printing OV 7150SZ Printed in Japan.

Antistatic Tubing

Series TA



Conductive tube prevents troubles caused by static electricity.

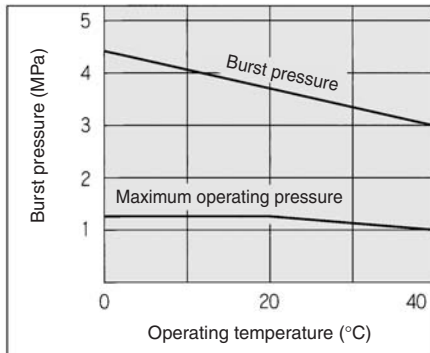
Antistatic Soft Nylon Tubing: Series TAS

For pneumatic piping and applications which require the measures against antistatic electricity.

Flame resistant tubing (Equivalent to UL-94 standard V-0)



Burst Pressure Characteristics Curve and Operating Pressure



⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

1. Refer to the burst pressure characteristics curve for other temperatures. Avoid abnormal temperature rises caused by adiabatic compression.
2. The value at temperature of 20°C and O.D. variable rate 10% max.

Model/Specifications

● — 20 m roll □ — 100 m reel

Model	TAS3222	TAS0425	TAS0604	TAS0805	TAS1065	TAS1208
Tubing O.D. (mm)	3.2	4	6	8	10	12
Tubing I.D. (mm)	2.2	2.5	4	5	6.5	8

Black (B)	●	□	●	□	●	□	●	□	●	□

Max. operating pressure (at 20°C)	1.2 MPa					
Burst pressure	Refer to the burst pressure characteristics curve.					
Recommended fittings	Antistatic one-touch fittings: Series KA Miniature fittings: Series M and MS ^{Note)}					
Minimum bending radius (mm)	12	12	15	19	27	32
Operating temperature	0 to 40°C					
Material	Conductive nylon + Flame resistant nylon (Equivalent to UL-94 standard V-0)					
Surface resistance	10 ⁴ to 10 ⁷ Ω					

Note) Miniature fittings: Only the following types are available for Series M and MS

Series M	Series MS
M-3AU-3, M-3AU-4, M-5AU-3, M-5AU-4 M-5AU-6, M-5H-4, M-5H-6	MS-5AU-3, MS-5AU-4, MS-5AU-6 MS-5H-4, MS-5H-6

How to Order

TAS1065 **B** - **100**

Tubing model Color Length per roll

Symbol	Color	Symbol	Length
B	Black	20	20 m roll
		100	100 m reel

Made to Order

Coil Tubing

Please contact SMC for details.

- K
- M
- H
- KK
- D
- MS
- LQ
- MQR
- T

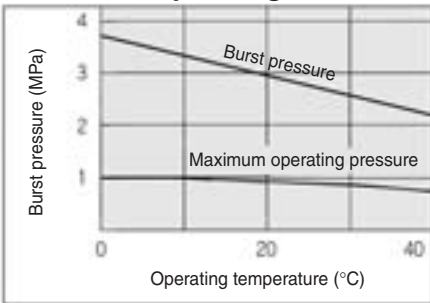
Antistatic Polyurethane Tubing: Series TAU

For pneumatic piping and applications which require the measures against antistatic electricity.

Flexible tubing



Burst Pressure Characteristics Curve and Operating Pressure

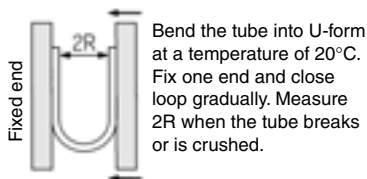


⚠ Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 13 to 16 for Fittings and Tubing Precautions.

⚠ Caution

1. Refer to the burst pressure characteristics curve for other temperatures. Avoid abnormal temperature rises caused by adiabatic compression.
2. The value of the minimum bending radius is measured at the temperature of 20°C as shown below.



3. Because ester polyurethane is adopted, water cannot be used due to the occurrence of hydrolysis.

Model/Specifications

Model	TAU3220	TAU0425	TAU0604	TAU0805	TAU1065	TAU1208
Tubing O.D. (mm)	3.2	4	6	8	10	12
Tubing I.D. (mm)	2	2.5	4	5	6.5	8
Black (B)	●	●	●	●	●	●
Max. operating pressure at 20°C	0.9 MPa					
Burst pressure	Refer to the burst pressure characteristics curve.					
Recommended fittings	Antistatic one-touch fittings: Series KA Miniature fittings: Series M and MS ^{Note)}					
Minimum bending radius (mm)	10	10	15	20	27	35
Operating temperature	0 to 40°C					
Material	Conductive polyurethane					
Surface resistance	10 ⁴ to 10 ⁷ Ω					

Note) Miniature fittings: Only the following types are available for Series M and MS

Series M	Series MS
M-3AU-3, M-3AU-4, M-5AU-3, M-5AU-4 M-5AU-6, M-5H-4, M-5H-6	MS-5AU-3, MS-5AU-4, MS-5AU-6 MS-5H-4, MS-5H-6

How to Order

TAU1065 **B** - **100**

Tubing model

Color

Length per roll

Symbol	Color
B	Black

Symbol	Length
20	20 m roll
100	100 m reel

Made to Order

Coil Tubing

Flat Tubing

Please contact SMC for details.

Color Tubing

- 5 colors
- Surface resistance 10⁹ Ω

Specifications

Fluid	Air
Max. operating pressure at 20°C	0.8 MPa
Ambient and fluid temperature	0 to 40°C
Material	Antistatic polyurethane
Surface resistance	10 ⁹ Ω
Recommended fittings	Antistatic one-touch fittings: Series KA Miniature fittings: Series M and MS ^{Note)}

Note) Miniature fittings: Only the following types are available for Series M and MS

Series M	Series MS
M-3AU-2, M-3AU-4 M-5AU-2, M-5AU-4 M-5AU-6, M-5H-4 M-5H-6	MS-5AU-4, MS-5AU-6 MS-5H-4, MS-5H-6

How to Order

TAU **0604** **BU** - **20** - **X100**

Antistatic Polyurethane Tubing

Antistatic polyurethane color tubing

Tubing size

Symbol	O.D. x I.D.
0212	ø2 x ø1.2
0425	ø4 x ø2.5
0604	ø6 x ø4
0805	ø8 x ø5
1065	ø10 x ø6.5
1208	ø12 x ø8

Length per roll

Symbol	Length
20	20 m roll

Color

Symbol	Color	Symbol	Color
W	White	G	Green
BU	Blue	C	Clear
B	Black	—	—

Fluoropolymer Tubing

Series TL/TIL

Material: Super PFA

RoHS

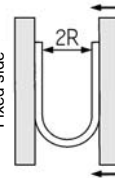
Series and Specifications

		Metric sizes (Series TL)						Inch sizes (Series TIL)							
Tubing model		TL0403	TL0604	TL0806	TL1008	TL1210	TL1916	TIL01	TILB01	TIL05	TIL07	TIL11	TIL13	TIL19	TIL25
Nominal diameter		—	—	—	—	—	—	1/8"	1/8"	3/16"	1/4"	3/8"	1/2"	3/4"	1"
Tubing size		ø4 x ø3	ø6 x ø4	ø8 x ø6	ø10 x ø8	ø12 x ø10	ø19 x ø16	1/8" x 0.086"	1/8" x 1/16"	3/16" x 1/8"	1/4" x 5/32"	3/8" x 1/4"	1/2" x 3/8"	3/4" x 5/8"	1" x 7/8"
O.D. (mm)	Basic diameter	4	6	8	10	12	19	3.18	3.18	4.75	6.35	9.53	12.7	19.05	25.4
	Tolerance	±0.1				+0.2 -0.1		±0.1				+0.2 -0.1			
Thickness (mm)	Basic diameter	0.5	1				1.5	0.5	0.8	0.8	1.2	1.6			
	Tolerance	±0.05	±0.1				±0.15	±0.05	±0.08	±0.08	±0.12	±0.15			
Bundle	10 m	—	—	—	●	●	●	—	—	—	—	●	●	—	—
	20 m	●	●	●	●	●	●	●	—	●	●	●	●	●	●
	50 m	●	●	●	●	●	●	●	—	●	●	●	●	●	●
	100 m	●	●	●	●	●	●	●	—	●	●	●	●	●	—
	50 Ft. (16 m)	—	—	—	—	—	—	●	●	●	●	●	●	●	●
	100 Ft. (33 m)	—	—	—	—	—	—	●	●	●	●	●	●	●	●
Straight pipe	2 m	●	●	●	●	●	●	—	●	●	●	●	●	●	●
Color		Translucent (color of material)													
Applicable fluid		Please refer to the applicable fluid in page 389.													
Applicable fittings ^{Note 3)}		Series LQ													
Max. operating pressure (at 20°C) ^{Note 1)}		1 MPa			0.9MPa	0.7 MPa	0.6 MPa	1 MPa						0.7 MPa	0.5 MPa
Burst pressure (at 20°C)		4.9 MPa	6.9 MPa	4.7 MPa	3.6MPa	2.9 MPa	2.6 MPa	6.4 MPa	9.9 MPa	6.7 MPa	7.9 MPa	6.7 MPa	4.6 MPa	2.8 MPa	2.0 MPa
Min. bending radius (mm) ^{Note 2)}		20		40	65	110	160	12	6	20		30	60	160	290
Max. operating temperature (Fixed use)		260°C													
Material		Super PFA													



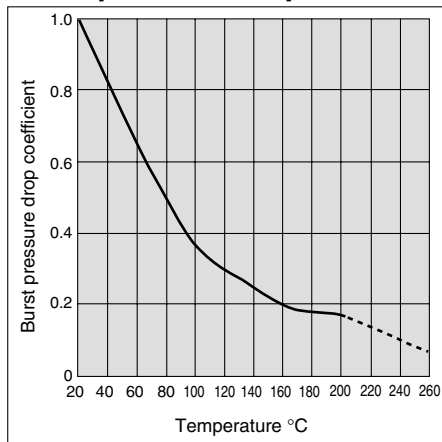
Note 1) • The maximum operating pressure is the value at 20°C. For other temperatures, calculate from the burst pressure drop coefficient. Furthermore, an abnormal temperature increase due to adiabatic compression can cause tubing to burst. To operate at a temperature other than 20°C, the operating pressure must be no more than the value calculated using the equation below: When the value (calculated using the formula below) exceeds 1 MPa, the Max. operating pressure is 1 MPa. (Max. operating pressure) = 1/4 x (burst pressure drop coefficient) x (burst pressure at 20°C)
 • When using a fluid in liquid form, the surge pressure must be no more than the maximum operating pressure.
 A surge pressure higher than the maximum operating pressure can cause breakage of the fitting or bursting of the tubing.
 Note 2) The minimum bending radius is measured using the method shown in the figure at the right.
 Note 3) One-touch and insert fittings can also be used.

Fixed side



At a temperature of 20°C bend the tubing into a U shape. Then with one side fixed, gradually close the other side and measure 2R at the point where the tubing folds or flattens, etc.

Burst pressure drop curve



Eluting fluorine ion amount ^{Note 4)} (µg/g)

Type	Fluorine ion
Eluting amount	0.1 or less

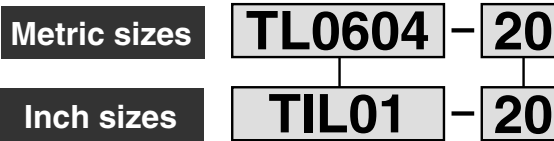
A 15 g piece of fluororesin tubing is cut off, washed in deionized water and immersed in 15 ml of 25% methyl alcohol extract at room temperature for 24 hours. Then the extract is diluted with deionized water to be subjected to a quantitative analysis of fluorine ions.

Eluting metal ion amount ^{Note 4)} (ng/cm²)

Type	Al	Fe	Ni	Na	Ca
Eluting amount	4.5	0.3	0.2	7.1	1.3

The interior of the fluororesin tubing is washed with super deionized water. Approximately 20g of super high purity hydrofluoric acid (48%) is measured and injected into the tubing. The interior wall of the tubing is immersed at normal temperature for one week with both ends of the tubing plugged. Then the extract was diluted with super deionized water to be subjected to a quantitative analysis on Al, Fe, Ni, Na and Ca by the stripping method.

How to Order



Tubing Model

Length Applicable to both metric and inch size

Symbol	Type	Length
10	Roll	10 m
20		20 m
50		50 m
100		100 m
2S	Straight	2 m

Length Applicable to inch size only

Symbol	Type	Length
16	Roll	50 Ft. (16 m)
33		100 Ft. (33 m)

Please refer to the "Series and Specifications" above, as the tubing length differs dependant on each size.

Note 4) Figures shown in tables are representative values, not guaranteed values.



Applicable Fluids

Material and fluid compatibility check list for high purity fluoropolymer fittings TL/TIL

Chemical		Compatibility
Acetic acid	100%	<input type="radio"/>
Acetone	100%	<input type="radio"/> Note 1)
Ammonium fluoride	40%	<input type="radio"/>
Ammonium hydroxide	30%	<input type="radio"/>
Butyl acetate	100%	<input type="radio"/>
Methylene chloride	100%	<input type="radio"/>
Hydrochloric acid	38%	<input type="radio"/>
Hydrofluoric acid	50%	<input type="radio"/>
Hydrogen peroxide	60%	<input type="radio"/>
Methanol	100%	<input type="radio"/>
Methyl ethyl Ketone	—	<input type="radio"/>
Nitric acid	70%	<input type="radio"/>
Phosphoric acid	86%	<input type="radio"/>
Caustic potash	85%	<input type="radio"/>
Sulfuric acid	100%	<input type="radio"/>
Toluene	—	<input type="radio"/> Note 1)
Xylene	—	<input type="radio"/>
Sodium hydroxide	100%	<input type="radio"/>
1.1.1-Trichloroethane	100%	<input type="radio"/>
Rhosphorus pentachloride	—	<input type="radio"/>
Isobutyl alcohol	—	<input type="radio"/> Note 1)
Isopropyl alcohol	—	<input type="radio"/> Note 1)
Ozone	—	<input type="radio"/>
Ethyl acetate	—	<input type="radio"/> Note 1)
Deionized water	—	<input type="radio"/>
Nitrogen	—	<input type="radio"/>
Ultrapure water	—	<input type="radio"/>
Tmah	—	<input type="radio"/>

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.

- K
- M
- H
- KK
- D
- MS
- LQ
- MQR
- T



The material and fluid compatibility check list provides reference values as a guide only.
 Note 1) Since static electricity may be generated, implement suitable countermeasures.

Table symbol can be used.

- Compatibility is indicated for fluid temperatures of 200°C or less.
- The material and fluid compatibility check list provides reference values as a guide only, therefore we do not guarantee the application to our product.
- The data above is based on the information presented by the material manufacturers.
- SMC is not responsible for its accuracy and any damage happened because of this data.



FEP Tubing (Fluoropolymer) Metric Size Series TH



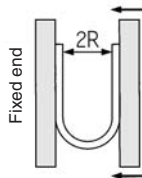
Heat-resistant: 200°C

Varies depending on the operating pressure. Refer to the maximum operating pressure graph (pages 390 and 391).

Compatible with the Food Sanitation Law

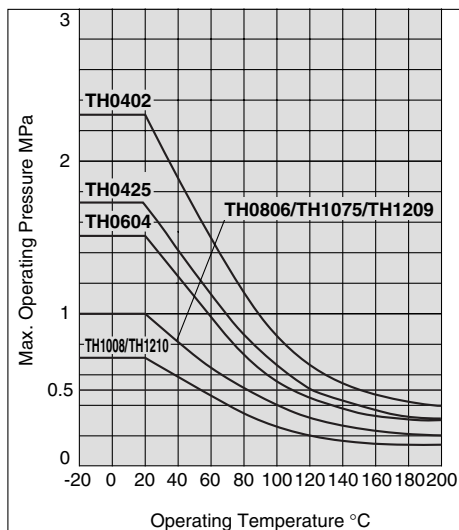
- Compatible with the test conforming to the Food Sanitation Law based on the 370th notice given by the Ministry of Health and Welfare in 1959.
- Compatible with the §177-1550 dissolution test approved by FDA (Food and Drug Administration).

How to measure the minimum bending radius.



At a temperature of 20°C, bend the tubing into a U shape. Fix one end and gradually move the other end closer. Measure 2R at the point where the outside diameter's rate of change is 5%.

Max. Operating Pressure



Note) The maximum operating pressure varies dependent on the I.D. bore size even if the O.D. is the same.

Series

● -20 m roll □ -100 m roll

Model	Metric size							
	TH0402	TH0425	TH0604	TH0806	TH1075	TH1008	TH1209	TH1210
Tubing O.D. (mm)	4	4	6	8	10	10	12	12
Tubing I.D. (mm)	2	2.5	4	6	7.5	8	9	10

Color	Symbol	TH0402	TH0425	TH0604	TH0806	TH1075	TH1008	TH1209	TH1210
Translucent	N	●	●	●	●	●	●	●	●
Red (Translucent)	R	●	●	●	●	●	●	●	●
Blue (Translucent)	BU	●	●	●	●	●	●	●	●
Black (Opaque)	B	●	●	●	●	●	●	●	●

Inch nominal size: 5/32" (for 4mm O.D. models), 5/16" (for 6mm O.D. models)

Specifications

Fluid	Air, Water ^{Note 1)} , Inert gas							
Applicable fittings ^{Note 2)}	One-touch fittings, Insert fittings Fluoropolymer fittings: Series LQ1 Miniature fittings: Series M, MS (Hose nipple type)							
Max. operating pressure (MPa)	20°C	2.3	1.7	1.5	1	0.7	1	0.7
	100°C	0.85	0.6	0.55	0.4	0.25	0.4	0.25
	200°C	0.4	0.3	0.3	0.2	0.1	0.2	0.1
Refer to below "Max. Operating Pressure."								
Min. bending radius (mm) ^{Note 3)}	15	20	35	60	95	100	130	
Operating temperature	Air, Inert gas: -20 to 200°C Water: 0 to 100°C (No freezing)							
Material	FEP (Fluorinated Ethylene Propylene Resin)							

Note 1) When using a fluid in liquid form, the surge pressure must not exceed the maximum operating pressure. A surge pressure higher than the maximum operating pressure can cause breakage of the fittings, or rupture of the tubing. Furthermore, an abnormal temperature increase due to adiabatic compression can also result in ruptured tubing.

Note 2) Do not use in locations where the FEP tubing will move.

Be sure to operate under the maximum operating pressure conditions using the lower maximum operating specification of either the tubing or fittings.

After long term use or under high temperatures, some fittings leakage may occur due to material deterioration with age. Perform periodic inspections, and if any leakage is detected, replace with a new product immediately.

When the insert and miniature fittings are used over extended periods of time, it may cause leakage due to the material deterioration of age. In such a case, give an additional tightening to the tube connection part. If leakage still occurs after giving an additional tightening, replace the fitting with a new product.

Note 3) Minimum bending radius is measured as shown left as representative values.

Allow extra length when piping since the tubing may crush if bent more than the min. bending radius.

How to Order

Metric size

TH0604 N - 20

Indication of tubing model

Color indication

Symbol	Color
N	Translucent
R	Red (Translucent)
BU	Blue (Translucent)
B	Black (Opaque)

Length per roll

Symbol	Roll size
20	20 m roll
100 ^{Note)}	100 m roll

Note) 100 m roll is available with translucent (color indication: N) only.

FEP Tubing (Fluoropolymer)

Inch Size

Series *TIH*



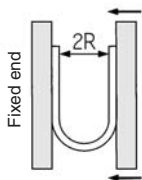
Heat-resistant: 200°C

Varies depending on the operating pressure. Refer to the maximum operating pressure graph (pages 390 and 391).

Compatible with the Food Sanitation Law

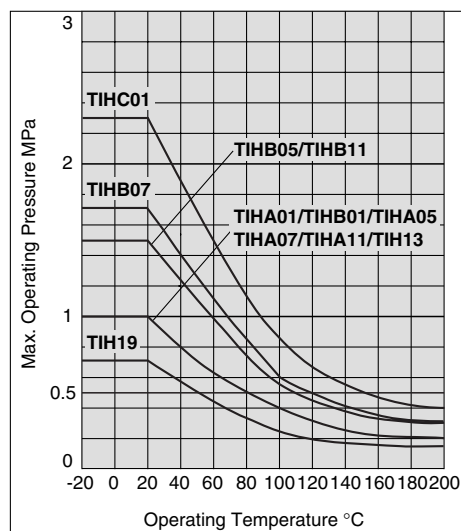
- Compatible with the test conforming to the Food Sanitation Law based on the 370th notice given by the Ministry of Health and Welfare in 1959.
- Compatible with the §177-1550 dissolution test approved by FDA (Food and Drug Administration).

How to measure the minimum bending radius.



At a temperature of 20°C, bend the tubing into a U shape. Fix one end and gradually move the other end closer. Measure 2R at the point where the outside diameter's rate of change is 5%.

Max. Operating Pressure



Note) The maximum operating pressure varies dependent on the I.D. bore size even if the O.D. is the same.

Series

● 50ft (16m) roll □ 100ft (33m) roll

Model		Inch size										
Tubing O.D.		TIHA01	TIHB01	TIHC01	TIHA05	TIHB05	TIHA07	TIHB07	TIHA11	TIHB11	TIH13	TIH19
inch		1/8"		3/16"		1/4"		3/8"		1/2"	3/4"	
mm		3.18		4.75		6.35		9.53		12.7	19.05	
Tubing I.D.		0.093"	0.086"	0.065"	0.137"	0.124" (1/8")	0.18"	0.156" (5/32")	0.275" (1/4")	0.25" (3/8")	0.374" (3/8")	0.624" (5/8")
inch		2.36	2.18	1.65	3.48	3.15	4.57	3.95	6.99	6.33	9.5	15.85
mm												

Color	Symbol	TIHA01	TIHB01	TIHC01	TIHA05	TIHB05	TIHA07	TIHB07	TIHA11	TIHB11	TIH13	TIH19
Translucent	N	●	●	●	□	□	●	●	●	●	●	●
Red (Translucent)	R	●	●	●	●	●	●	●	●	●	●	●
Blue (Translucent)	BU	●	●	●	●	●	●	●	●	●	●	●
Black (Opaque)	B	●	●	●	●	●	●	●	●	●	●	●

Specifications

Fluid	Air, Water ^{Note 1)} , Inert gas											
Applicable fittings	One-touch fittings, Fluoropolymer fittings: Series LQ1 ^{Note 3)}											
Max. operating pressure (MPa)	20°C	1	2.3	1	1.5	1	1.7	1	1.5	1	0.7	
	100°C	0.4	0.85	0.4	0.55	0.4	0.6	0.4	0.55	0.4	0.25	
	200°C	0.2	0.4	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.1	
Refer to below "Max. Operating Pressure."												
Min. bending radius (mm)	Note 4)	25	20	10	35	25	55	35	85	60	95	220
Operating temperature	Air, Inert gas: -20 to 200°C Water: 0 to 100°C (No freezing)											
Material	FEP (Fluorinated Ethylene Propylene Resin)											

Note 1) When using a fluid in liquid form, the surge pressure must not exceed the maximum operating pressure. A surge pressure higher than the maximum operating pressure can cause breakage of the fittings, or rupture of the tubing. Furthermore, an abnormal temperature increase due to adiabatic compression can also result in ruptured tubing.

Note 2) Do not use in locations where the FEP tubing will move.

Be sure to operate under the maximum operating pressure conditions using the lower maximum operating specification of either the tubing or fittings.

After long term use or under high temperatures, some fittings leakage may occur due to material deterioration with age. Perform periodic inspections, and if any leakage is detected, replace with a new product immediately. When the insert and miniature fittings are used over extended periods of time, it may cause leakage due to the material deterioration of age. In such a case, give an additional tightening to the tube connection part. If leakage still occurs after giving an additional tightening, replace the fitting with a new product.

Note 3) TIHA01, TIHC01, TIHA05, TIHA07 and TIHA11 are not available because of different internal diameters.

Note 4) Minimum bending radius is measured as shown left as representative values.

Allow extra length when piping since the tubing may crush if bent more than the min. bending radius.

How to Order

Inch size

TIHA01 **N** - **16**

Indication of tubing model ●

Color indication ●

Symbol	Color
N	Translucent
R	Red (Translucent)
BU	Blue (Translucent)
B	Black (Opaque)

Length per roll ●

Symbol	Roll size
16	50ft (16m) roll
33 ^{Note)}	100ft (33m) roll

Note) 100ft (33m) roll is available with translucent (color indication: N) only.





Chemical Resistance of the Fluoropolymer FEP Material

Chemicals in this table are inactive against FEP material ^{Note 1)}, however physical properties may be effected by temperature or pressure change.

Please make sure that operating conditions do not cause problems since the use of FEP tubing under chemical environment is unsecured.

2-nitro-2-methyl propanol	Chloroform	Nitromethane
2-nitrobutanol	Paraffinum liquidum	Perchloroethylene
Pentabasic benzamide	Allyl acetate	Perphloroxylene
N-butylamine	Ethyl acetate	Unsymmetrical dimethylhydrazine
N-octadecanol	Potassium	Hydrazine
N-butyl acetate	Butyl acetate	Pinene
O-cresol	Sodium hypochlorite	Piperidine
Di-isobutyl adipate	Carbon tetrachloride	Glacial acetic acid (Acetic acid)
Acetophenone	Dioxane	Pyridine
Acetone	Cyclohexanone	Phenol
Aniline	Cyclohexane	Phthalic acid
Abietic acid	Dimethyl ether	Dybutyl phthalate
Sulfuric chloride	Dimethylsulfoxide	Dimethyl phthalate
Isooctane	Dimethylformamide	Hydrofluoric acid
Liquid ammonia	Bromine	Naphthalene fluoride
Ethyl alcohol	Deionized water	Nitrobenzene fluoride
Ethyl ether	Nitric acid	Furan
Ethylene glycol	Mercury	Hexachlorethane
Ethylenediamine	Ammonium hydroxide	Hexane
Zinc chloride	Potassium hydroxide	Ethyl hexanoate
Aluminum chloride	Sodium hydroxide	Phenylcarbinol
Ammonium chloride	Cetane	Benzaldehyde
Calcium chloride	Soap, detergent	Benzonitrile
Sulfuric chloride	Dibutyl sebacate	Borax
Iron chloride (III)	Diethyl carbonate	Boric acid
Benzoyl chloride	Tetrachloroethylene	Formic aldehyde (Formalin)
Magnesium chloride	Tetrahydrofuran	Acrylic anhydride
Hydrochloric acid	Tetrabromoethane	Acetic anhydride
Chlorine (absolute)	Triethanolamine	Methacrylic acid
Aqua regia	Trichloroethylene	Allyl methacrylate
Ozone	Trichloroacetic acid	Vinyl methacrylate
Hydrogen peroxide	Toluene	Methyl alcohol
Sodium peroxide	Naphtha	Methyl ethyl ketone
Gasoline	Naphthalene	Methylene chloride
Permanganate	Naphthol	Sulphuric acid
Formic acid	Lead	Phosphoric acid
Xylene	Carbon dioxide	Iron phosphate (III)
Chromic acid	Nitrogen dioxide	Tri-n-butyl phosphate
Chlorosulfonic acid	Nitrobenzene	Tricresyl phosphate

Note 1) "Inactive in chemistry terminology" means - not to cause any chemical reaction.

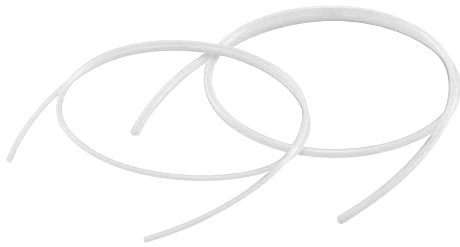
Reference cited: Teflon[®], the fluoropolymer handbook, Manual for the chemical applications of Teflon[®]. Du Pont-Mitsui Fluorochemicals Co., Ltd.

Teflon[®] is a registered trademark for the fluoropolymer produced by E.I du Pont de Nemours & Company (Inc.) and Du Pont-Mitsui Fluorochemicals Co., Ltd.

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.

Soft Fluoropolymer Tubing Metric Size Series TD



Flexibility: Improved by approx. 20%

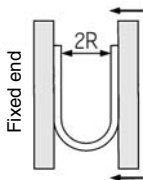
* SMC comparison (Fluoropolymer tubing, Series TL/TIL)

Applications: Food, semi-conductor, 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 LQ series ^{Note 3)}				
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 4)}	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.

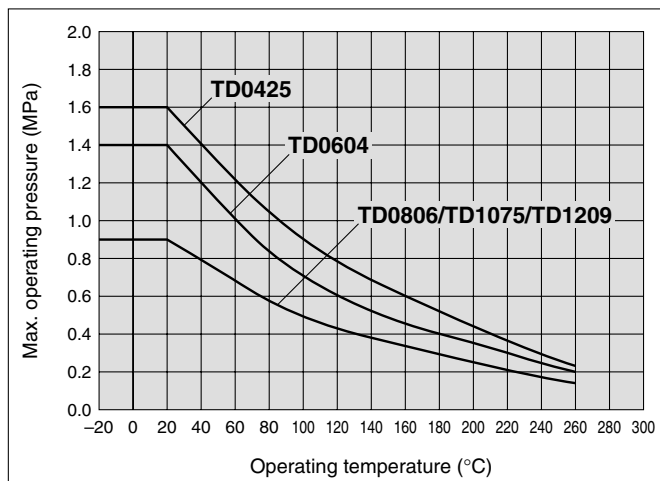
Observe the lesser value of the maximum operating pressure between the tube and fitting. A material change over a long duration or due to high-temperature may cause leakage. Perform periodic maintenance and replace with a new product immediately when abnormalities are detected. (Refer to Maintenance in the Series TD/TID Precautions on page 396.) Refer to Common Precautions on pages 13 to 16 in "Fittings and Tubing" for other precautions. For fluoropolymer fittings, refer to Precautions for Fluoropolymer Fittings/Needle Valve/Tubing in "Best Pneumatics No. 7". Select the size after confirming O.D. and I.D.

Note 3) TD0425, TD1075 and TD1209 are not available because of different internal diameters.

Note 4) 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)

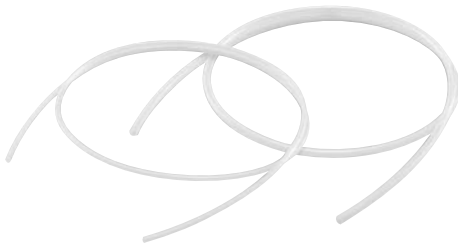
Kind	Al	Fe	Ni	Na	Ca
Amount of elution	0.1 or less	0.1 or less	0.1 or less	0.1	0.1 or less

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



Flexibility: Improved by approx. 20%

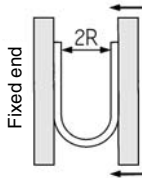
* SMC comparison (Fluoropolymer tubing, Series TL/TIL)

Applications: Food, semi-conductor, 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		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 LQ 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.

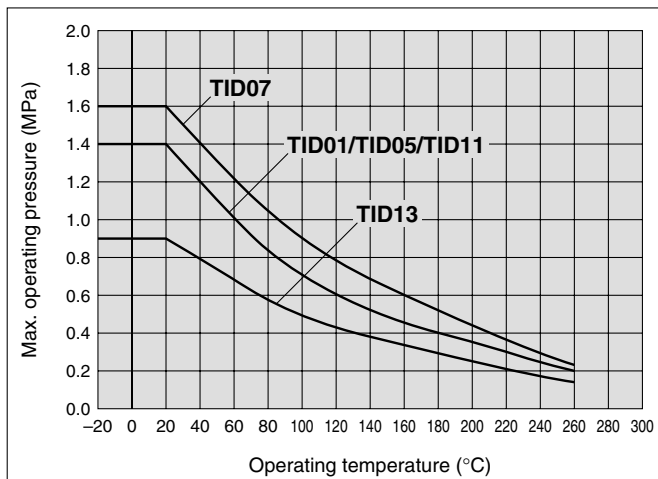
Note 2) Do not use this product in a matter in which the modified PTFE tube is not fixed. Observe the lesser value of the maximum operating pressure between the tube and fitting. A material change over a long duration or due to high-temperature may cause leakage. Perform periodic maintenance and replace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

Refer to Common Precautions on pages 13 to 16 in "Fittings and Tubing" for other precautions. For fluoropolymer fittings, refer to Precautions for Fluoropolymer Fittings/Needle Valve/Tubing in "Best Pneumatics No. 7". Select the size after confirming O.D. and I.D.

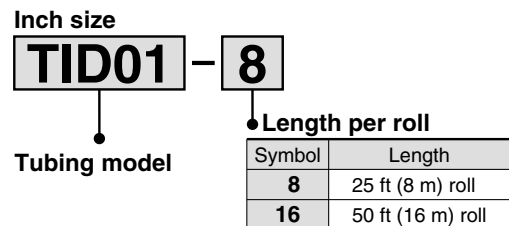
Note 3) The minimum bending radius is the representative value measured as shown in the left figure.

- 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



Fluorine ion elution ^{Note 4)}

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)}

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	Chloroacetic 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.

K
M
H
KK
D
MS
LQ
MQR
T



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.

Clean Tubing: Polyolefin Tubing Series *TPH*

RoHS



Model/Specifications

● — 20 m roll □ — 100 m reel

Model	TPH0425	TPH0604	TPH0806	TPH1075	TPH1209
O.D. (mm)	4	6	8	10	12
I.D. (mm)	2.5	4	6	7.5	9

White (W)	●	●	●	●	●
Black (B)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●

Fluid	Air/Nitrogen gas/Water (Pure water) ⁽¹⁾				
Max. operating pressure (at 20°C)	1.0 MPa ⁽²⁾		0.7 MPa ⁽²⁾		
Min. bending radius (mm)	15	25	35	45	55
Burst pressure	Refer to the burst pressure characteristics curve.				
Applicable fittings	Clean one-touch fittings One-touch fittings, brass: Series KQB One-touch fittings, Stainless steel 316: Series KQG Insert fitting				
Operating temperature	- 20 to 80°C, For water 5 to 80°C				
Material	Polyolefin resin				

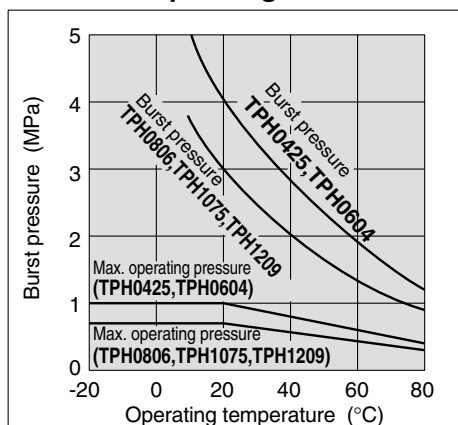
Note 1) Please consult with SMC regarding other fluids.

Note 2) The maximum operating pressure is the value at 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, an abnormal temperature rise due to adiabatic compression can cause tubing to burst.

Note 3) The minimum bending radius indicates the value at a temperature of 20°C with an outside diameter rate of change of 10% or less. At higher temperatures the outside diameter rate of change may exceed 10% within the minimum bending radius.

Note 4) Polyolefin resin is not suitable for regular pneumatic equipment piping because it is not resistant to mineral oil.

Burst Pressure Characteristics Curve and Operating Pressure



How to Order

TPH0604 B - 20

Tubing model

Color

Length per roll

Symbol	Color
W	White
B	Black
R	Red
BU	Blue
Y	Yellow
G	Green

Symbol	Length
20	20 m roll
100	100 m reel

Clean Tubing: Soft Polyolefin Tubing Series *TPS*

RoHS



Model/Specifications

● — 20 m roll □ — 100 m reel

Model	TPS0425	TPS0604	TPS0805	TPS1065	TPS1208
O.D. (mm)	4	6	8	10	12
I.D. (mm)	2.5	4	5	6.5	8

White (W)	●	●	●	●	●
Black (B)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●

Fluid	Air/Nitrogen gas/Water (Pure water) ⁽¹⁾				
Max. operating pressure (at 20°C)	0.7 MPa ⁽²⁾				
Min. bending radius (mm)	10	20	25	30	40
Burst pressure	Refer to the burst pressure characteristics curve.				
Applicable fittings	Clean one-touch fittings One-touch fittings, brass: Series KQB One-touch fittings, Stainless steel 316: Series KQG Insert fitting				
Operating temperature	- 20 to 80°C, For water 5 to 80°C				
Material	Polyolefin resin				

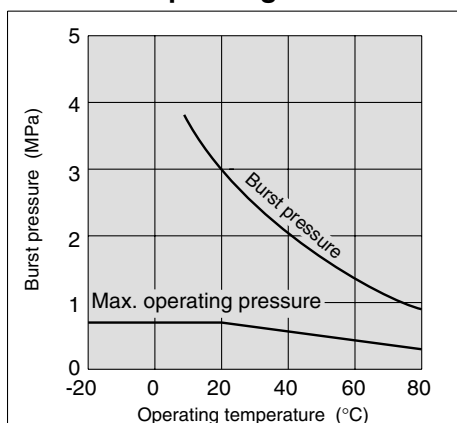
Note 1) Please consult with SMC regarding other fluids.

Note 2) The maximum operating pressure is the value at 20°C. Refer to the burst pressure characteristics curve for other temperatures. Furthermore, an abnormal temperature rise due to adiabatic compression can cause tubing to burst.

Note 3) The minimum bending radius indicates the value at a temperature of 20°C with an outside diameter rate of change of 10% or less. At higher temperatures the outside diameter rate of change may exceed 10% within the minimum bending radius.

Note 4) Polyolefin resin is not suitable for regular pneumatic equipment piping because it is not resistant to mineral oil.

Burst Pressure Characteristics Curve and Operating Pressure



How to Order

TPS0604 B - 20

Tubing model

Color

Length per roll

Symbol	Color
W	White
B	Black
R	Red
BU	Blue
Y	Yellow
G	Green

Symbol	Length
20	20 m roll
100	100 m reel