Fluoropolymer Tubing

Features

- Excellent in heat and cold resistance.
  No-Load continuous operating temperature PFA：-65～+260°C FEP：-65～+200°C
- Inert against most chemicals and solvents.
- Excellent in weathering resistance and does not change over time.
- Adhesion-Resistant.
- Flame-Resistant.
- Excellent insulating properties.
- No risks of hazardous substances eluting.

Use

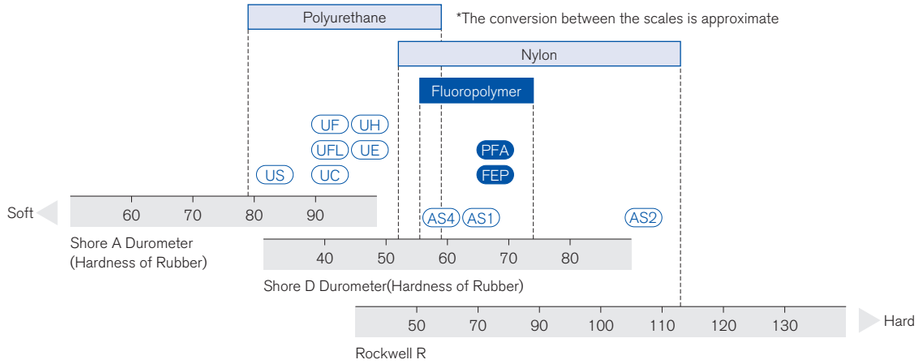
- Corrosive fluid transfer tubing
- Solvent and chemical transfer tubing
- Viscous liquid transfer tubing
- Food product plant tubing
- Various fluid transfer tubing
- Various types of equipment which require heat resistance, high insulation, and high-frequency properties

Specifications

Type	Shape	Fluid Used	Operating Temperature Range	Maximum Operating Pressure*1	Fitting Used	Fluid Used	Fitting Page
PFA Tubing: TA	Straight	Air/Water/ Corrosive Fluid	-65～+180°C	Refer to Dimensions Table	Stainless Fitting	Air/Water/ Corrosive Fluid	193～207
FEP Tubing: TF	Straight	Air/Water/ Corrosive Fluid	-65～+150°C	Refer to Dimensions Table	Stainless Fitting	Air/Water/ Corrosive Fluid	193～207
PFA Coil Tubing: FT	Coil	Air/Water/ Corrosive Fluid	-65～+180°C	Refer to Dimensions Table	Stainless Fitting	Air/Water/ Corrosive Fluid	193～207

*1 The maximum operating pressure in the dimensions table is pressure under conditions using air (gas) at 23°C.
It will change depending on the fluid and temperature; please refer to page 46 and use at the pressure below.
Air (gas): 1/4 or below the breakdown pressure by temperature
Liquid: 1/6 or below the breakdown pressure by temperature

Flexibility



Fluoropolymer Tubing

TA PFA Tubing

RoHS Compliant Product

Part No.	Tube Size O.D.x I.D. (mm)	Burst Pressure 23°C (MPa)	Max. Operating Pressure 23°C (MPa)	Min. Bending Radius (mm)	Standard Length (m)
TA040	4 × 2	9.8	<2.4	10	20・100
TA060	6 × 4	5.8	<1.6	20	20・100
TA080	8 × 6	4.4	<1.0	40	20・100
TA100	10 × 8	3.4	<0.78	70	20・100
TA120	12 ×10	2.9	<0.68	120	20・100
TA160	16 ×13	3.3	<0.82	140	20・100
TA190	19 ×16	2.5	<0.60	200	20・ 50
TA250	25 ×22	1.9	<0.48	360	20・ 50
TA1/8G	3.18× 1.65	9.3	<2.3	10	20・100
TA1/4G	6.35× 3.96	6.8	<1.6	20	20・100
TA3/8G	9.53× 6.35	5.8	<1.4	35	20・100
TA1/2G	12.70× 9.53	4.2	<0.98	75	20・100
TA3/4G	19.05×15.88	2.7	<0.68	180	20・100

- Standard Color: Translucent (please contact us for other colors)
- Sizes other than those in the table are also available, including tubing with inner diameters ranging between ϕ8 and 100mm and thin tubing with thickness ranging between 30 and 100μm.
  Please contact us for details.
- Option: Cleanroom Specification Production (Made-to-Order Products)
  PFA tubes can be produced and packaged in a cleanroom environment. Please contact us with the part number as shown below.
  [Part No. Example] TAC120 (made-to-order product)

TF FEP Tubing

RoHS Compliant Product

Part No.	Tube Size O.D.x I.D. (mm)	Burst Pressure 23°C (MPa)	Maximum Operating Pressure 23°C (MPa)	Min. Bending Radius (mm)	Standard Length (m)
TF085	4 × 2	9.8	<2.4	10	20・100
TF145	6 × 4	6.8	<1.6	20	20・100
TF185	8 × 6	4.4	<1.0	40	20・100
TF205	10 × 8	3.4	<0.78	70	20・100
TF225	12 ×10	2.9	<0.68	120	20・100
TF260	16 ×13	3.3	<0.82	140	20・100
TF1/8	3.18× 2.36	4.4	<1.0	16	20・100
TF1/4	6.35× 4.57	4.4	<1.0	28	20・100
TF5/16	7.94× 5.90	4.4	<1.0	40	20・100
TF3/8	9.53× 6.99	4.4	<1.0	46	20・100
TF1/2	12.70× 9.56	4.4	<1.0	75	20・100

- Standard Color: Translucent (please contact us for other colors)
- Stainless Fitting Inch Series is used for TF1/8 to TF1/2 fittings.
- Sizes other than those in the table are also available, including tubing with inner diameters ranging between ϕ8 and 100mm and thin tubing with thickness ranging between 30 and 100μm.
  Please contact us for details.
- UL224 compliant product is available. Please contact us for details.

Part No.	Tube Size O.D.x I.D. (mm)	Standard Length (m)
TF010	0.9 ×0.4	100
TF020	1.0 ×0.5	100
TF030	1.25×0.65	100
TF040	1.4 ×0.8	100
TF050	1.8 ×1.0	100
TF060	2.0 ×1.2	100
TF070	2.3 ×1.5	100
TF080	2.6 ×1.8	100
TF090	2.9 ×2.1	100
TF100	3.2 ×2.4	100
TF110	3.6 ×2.8	100
TF120	4.2 ×3.2	100
TF130	4.6 ×3.6	100
TF140	5.0 ×4.0	50

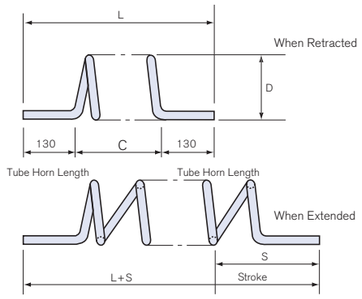
Part No.	Tube Size O.D.x I.D. (mm)	Standard Length (m)
TF150	5.5× 4.5	50
TF160	6.0× 5.0	50
TF165	7.0× 5.0	50
TF170	6.5× 5.5	50
TF180	7.0× 6.0	50
TF190	8.0× 7.0	50
TF200	9.0× 8.0	10
TF210	10.0× 9.0	10
TF215	11.0× 9.0	10
TF220	11.0×10.0	10
TF230	12.0×11.0	10
TF235	13.0×11.0	10
TF240	13.0×12.0	10
TF245	14.0×12.0	10

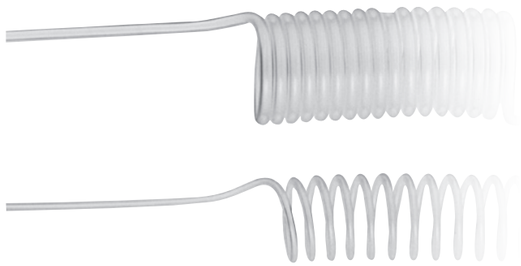
- Standard Color: Translucent (please contact us for other colors)
- Sizes other than those in the table are also available, including tubing with inner diameters ranging between ϕ8 and 100mm and thin tubing with thickness ranging between 30 and 100μm.
  Please contact us for details.
- UL224 compliant product is available. Please contact us for details.

Fluoropolymer Tubing

FT | PFA Coil Tubing

RoHS Compliant Product



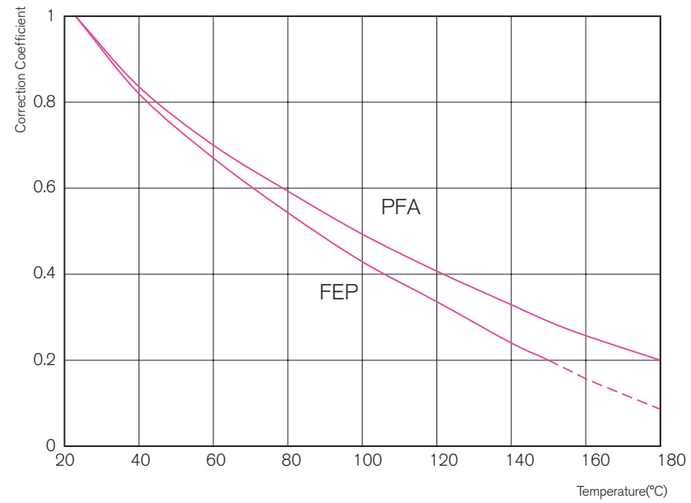


Part No.	Tube Size O.D.x I.D. (mm)	Max. Operating Length L+S (m)	Coil Size(mm)				Burst Pressure 23°C (MPa)	Max. Operating Pressure 23°C (MPa)
			L	C	S	D		
FT-04	4×2	0.9	345	85	555	42	9.8	<2.4
FT-06	6×4	0.9	365	105	535	55	6.8	<1.6
FT-08	8×6	0.8	350	90	450	95	4.4	<1.0
FT-10	10×8	0.8	360	100	440	140	3.4	<0.78

- Standard Color: Translucent
- Please contact us for dimensions, roll diameter, length, and shape of tubes other than the above.

Technical Data

How to Calculate the Maximum Operating Pressure by Temperature for Fluoropolymer Tubing



Correction Coefficient Graph for Burst Pressure by Temperature for Fluoropolymer Tubing

[Burst pressure at certain temperature] = [Burst pressure at 23°C (refer to table)] x [Correction coefficient in graph]

Operating Pressure

Please use at the pressure below.

Gas: 1/4 or below the burst pressure by temperature

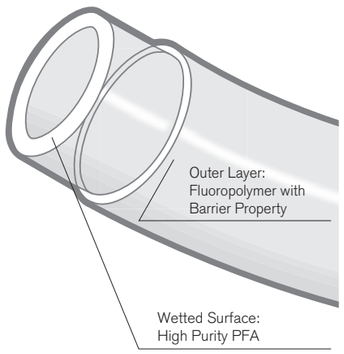
Liquid: 1/6 or below the burst pressure by temperature

High Barrier Fluoropolymer Tubing

Features

- It is a fluoropolymer tubing with excellent barrier properties.
- This is a multi-layer tubing which uses fluoropolymer PFA for the inner layer and fluoropolymer with barrier properties for the outer layer.
- The inner layer of the part which comes into contact with liquid uses high-purity PFA, which enables high-quality basic properties (purity, chemical resistance, adhesion resistance, heat durability) for semiconductor tubing uses.
- Fluoropolymer with barrier properties has excellent barrier properties against acids (hydrochloric acid and nitric acid, etc.) and ammonia.
- Reduces the permeation of acid compared to conventional PFA tube piping.
- Reduces negative impact on the surrounding environment.
- Maintains transparency of the fluid over an extended period of time.
- Has mechanical characteristics equivalent to conventional PFA tubing.
- Produced in a controlled cleanroom environment from raw material supply to molding and packaging.

Tube Construction



Use

- Semiconductor and liquid crystal manufacturing equipment tubing
- Solar panel manufacturing equipment tubing
- Chemical supply and cleaning equipment tubing
- Chemical plant tubing

Specifications

Type	Shape	Fluid Used	Operating Temperature Range	Maximum Operating Pressure※1
High Barrier PFA Tubing: TAH	Straight	Air/Water/Corrosive Fluid	-65℃~+180℃	Refer to Dimensions Table

*1 The maximum operating pressure in the dimensions table is pressure under conditions using air (gas) at 23℃. It will change depending on the fluid and temperature; please refer to page 50 and use at the pressure below.

Air (gas): 1/4 or below the burst pressure by temperature

Liquid: 1/6 or below the burst pressure by temperature

High Barrier Fluoropolymer Tubing

TAH | High Barrier PFA Tubing

RoHS Compliant Product

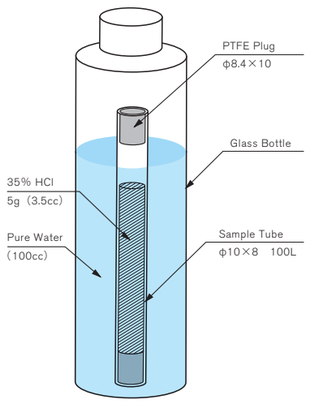
Part No.	Tube Size O.D.x I.D. (mm)	Burst Pressure 23℃ (MPa)	Maximum Operating Pressure 23℃ (MPa)	Min. Bending Radius (mm)	Straight Tube (m)	Bandle (m)
TAH060	6 × 4	6.8	1.6	20	3	20
TAH080	8 × 6	4.4	1.0	40	3	20
TAH100	10 × 8	3.4	0.78	70	3	20
TAH120	12 ×10	2.9	0.68	120	3	20
TAH250	25 ×22	1.9	0.48	360	(※)	(※)
TAH1/4G	6.35× 3.95	6.8	1.6	20	3	20
TAH3/8G	9.53× 6.33	5.8	1.4	35	3	20
TAH1/2G	12.7 × 9.5	4.2	0.98	75	3	20
TAH3/4G	19 ×15.8	2.7	0.68	180	3	20
TAH1G	25.4 ×22.2	2.0	0.50	350	3	(※)
TAH1-1/4G	31.8 ×28	1.8	0.45	500	(※)	(※)
TAH1-1/2G	38.1 ×33.7	1.8	0.45	600	(※)	(※)

- Standard Color: Translucent (Please contact us for other colors)
- (※) indicates Made-to-Order products. For the length and lot volume, please contact us for details.

Technical Data

Hydrochloric Acid Permeability Test

Using the test method as shown in Figure 1, we have measured the chloride ion concentration which permeates from the tubing into purified water, evaluating the permeability of hydrochloric acid. High-barrier PFA tubing demonstrates better barrier properties than conventional PFA tubing.



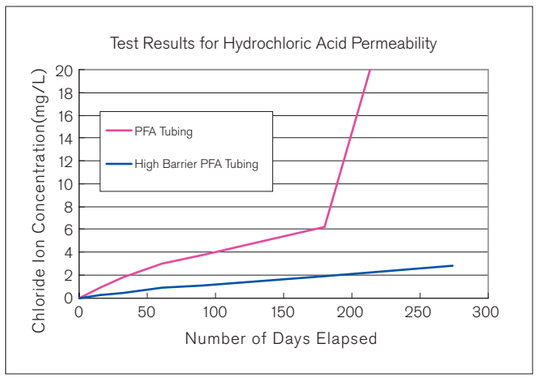
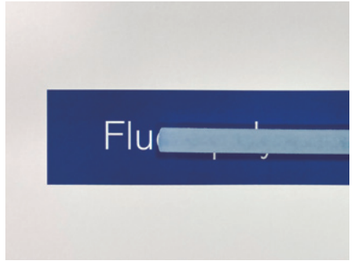


Fig.1 Hydrochloric Acid Permeability Test

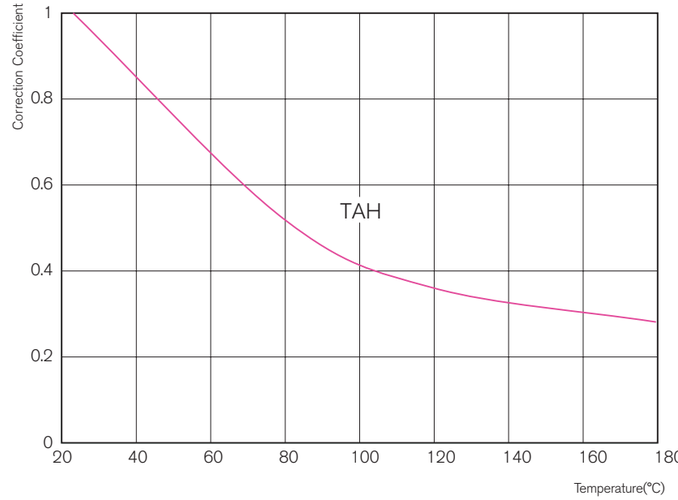
High Barrier PFA Tubing maintained its transparency even after one year of the hydrochloric acid permeability test.

High Barrier PFA Tubing



PFA Tubing

How to Calculate the Maximum Operating Pressure by Temperature for High Barrier Fluoropqymer Tubing



Correction Coefficient Graph for Burst Pressure by Temperature for High Barrier Fluoropolymer Tubing

[Burst pressure at certain temperature] = [Burst pressure at 23℃ (refer to table)] x [Correction coefficient in graph]

Operating Pressure

Please use at the pressure below.

Gas: 1/4 or below the burst pressure by temperature

Liquid: 1/6 or below the burst pressure by temperature