

# Stainless Steel 316 Insert Fittings

## Series KFG

### Superior tube mounting

#### Union nut

- No need to remove nuts
- Tube can be installed as-is
- Light tightening, and adhesion prevention as well

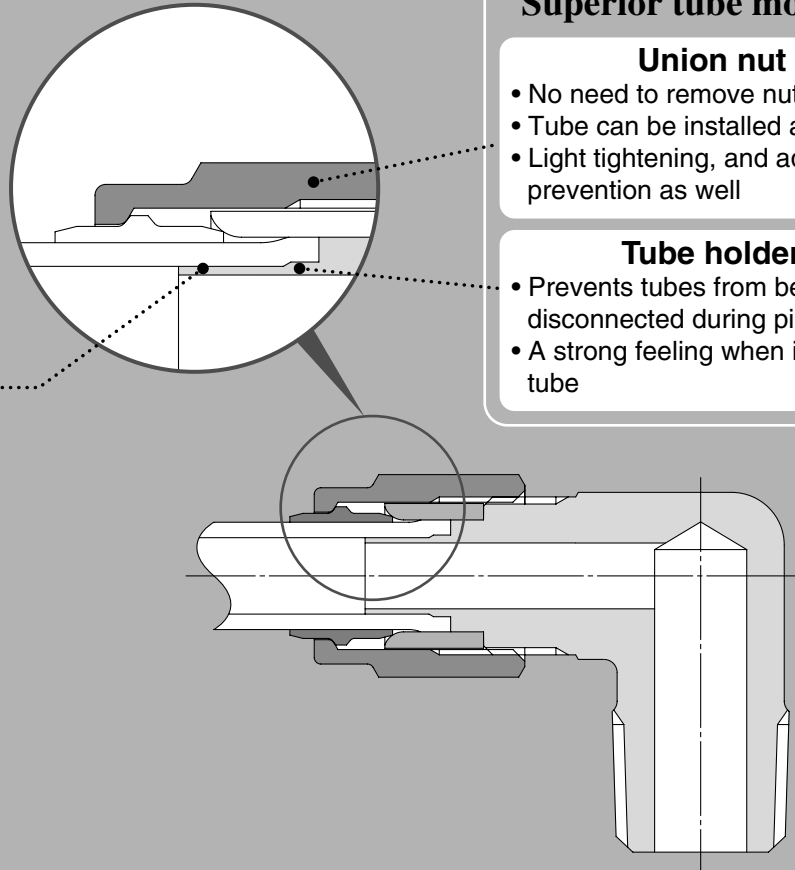
#### Tube holder

- Prevents tubes from being disconnected during piping
- A strong feeling when inserting tube

### A reliable seal Holds the tube tightly

#### Insert

An insert mechanism can provide reliable retaining force on tubes made of a wide variety of materials



K

M

H

KK

D

MS

LQ

MQR

T

## ● Material: Stainless steel 316

- Max. operating temperature 150°C
- Applicable tubing material FEP, PFA, Modified PTFE, Nylon, Soft nylon, Polyurethane, Polyolefin, Soft polyolefin
- Can be used with steam.
- Grease-free



Certified to meet current Food Sanitation Law standards.  
(Component materials have met apparatuses and container-packages standards.)

## Male Connector: KFGH

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGH0425-01S
		R1/4	KFGH0425-02S
ø6	ø4	R1/8	KFGH0604-01S
		R1/4	KFGH0604-02S
ø8	ø6	R1/8	KFGH0806-01S
		R1/4	KFGH0806-02S
		R3/8	KFGH0806-03S
		R1/2	KFGH0806-04S
ø10	ø7.5	R1/4	KFGH1075-02S
		R3/8	KFGH1075-03S
		R1/2	KFGH1075-04S
ø12	ø9	R1/4	KFGH1209-02S
		R3/8	KFGH1209-03S
		R1/2	KFGH1209-04S



## Male Branch Tee: KFGT

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGT0425-01S
		R1/4	KFGT0425-02S
ø6	ø4	R1/8	KFGT0604-01S
		R1/4	KFGT0604-02S
ø8	ø6	R1/8	KFGT0806-01S
		R1/4	KFGT0806-02S
		R3/8	KFGT0806-03S
		R1/2	KFGT0806-04S
ø10	ø7.5	R1/4	KFGT1075-02S
		R3/8	KFGT1075-03S
		R1/2	KFGT1075-04S
ø12	ø9	R1/4	KFGT1209-02S
		R3/8	KFGT1209-03S
		R1/2	KFGT1209-04S



## Male Elbow: KFGL

Applicable tubing size		Connection thread	Model
O.D.	I.D.		
ø4	ø2.5	R1/8	KFGL0425-01S
		R1/4	KFGL0425-02S
ø6	ø4	R1/8	KFGL0604-01S
		R1/4	KFGL0604-02S
ø8	ø6	R1/8	KFGL0806-01S
		R1/4	KFGL0806-02S
		R3/8	KFGL0806-03S
ø10	ø7.5	R1/4	KFGL1075-02S
		R3/8	KFGL1075-03S
		R1/2	KFGL1075-04S
ø12	ø9	R1/4	KFGL1209-02S
		R3/8	KFGL1209-03S
		R1/2	KFGL1209-04S



## Straight Union: KFGH

Applicable tubing size		Model
O.D.	I.D.	
ø4	ø2.5	KFGH0425-00
ø6	ø4	KFGH0604-00
ø8	ø6	KFGH0806-00
ø10	ø7.5	KFGH1075-00
ø12	ø9	KFGH1209-00



## Union Tee: KFGT

Applicable tubing size		Model
O.D.	I.D.	
ø4	ø2.5	KFGT0425-00
ø6	ø4	KFGT0604-00
ø8	ø6	KFGT0806-00
ø10	ø7.5	KFGT1075-00
ø12	ø9	KFGT1209-00



### Related Product

## Stainless Steel 316 One-touch Fittings Series KQG

- Material: Metal parts/  
Stainless steel 316  
Seal parts/Special FKM
- Operating fluid temperature:  
-5 to 150°C
- Grease-free

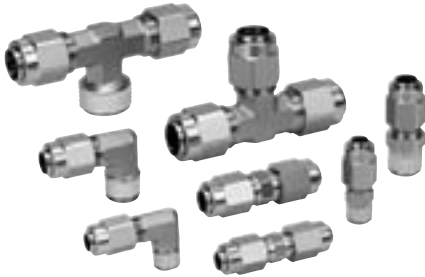


Port size	Applicable tubing O.D.				
	ø4	ø6	ø8	ø10	ø12
M5	●	●			
R1/8	●	●	●		
R1/4		●	●	●	
R3/8			●	●	●
R1/2					●

# Stainless Steel 316 Insert Fittings Series *KFG*

**Certified to meet current Food Sanitation Law standards.**

(Component materials have met apparatuses and container-packages standards.)



## Specifications

<b>Operating fluid</b>		Air, Water <sup>Note 1)</sup> , Steam <sup>Note 2)</sup>
<b>Operating pressure range</b> <sup>Note 3)</sup>		-100 kPa to 1 MPa
<b>Proof pressure</b>		3 MPa
<b>Ambient and Operating fluid temperature</b>		-5 to 150°C (No freezing)
<b>Lubricant</b>		Grease-free specification
<b>Thread</b>	<b>Mounting section</b>	JIS B0203 (Taper thread for piping)
	<b>Nut section</b>	JIS B0205 (Metric fine thread)
<b>Seal on the threads</b>		With sealant

Note 1) The surge pressure must be under the maximum operating pressure.

Note 2) Please consult SMC for applicable tubing.

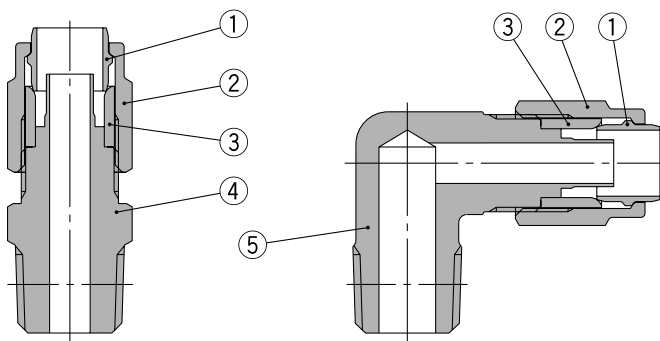
Note 3) Do not use the fittings with a leak tester or for vacuum retention because they are not guaranteed for zero leakage.

## Applicable Tubing

Series	Tubing O.D.	Tubing O.D. x I.D. (mm)				
		ø4 x ø2.5	ø6 x ø4	ø8 x ø6	ø10 x ø7.5	ø12 x ø9
TH	FEP	●	●	●	●	●
TL	PFA	—	●	●	—	—
TD	Modified PTFE	●	●	●	●	●
T	Nylon	●	●	●	●	●
TS	Soft nylon <sup>Note 4)</sup>	●	●	●	●	●
TU	Polyurethane	●	●	—	—	—
TPH	Polyolefin	●	●	●	●	●
TPS	Soft polyolefin	●	●	—	—	—

Note 4) Soft nylon tubing is not compatible with water.

## Construction



### Component Parts

No.	Description	Material	Note
1	Sleeve	Stainless steel 316	Silver plated inner surface Fluorine coating
2	Union nut		
3	Guide		
4	Male connector body		
5	Male elbow body		

# Series KFG

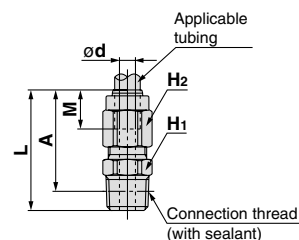
## Dimensions

### Male Connector: KFGH



Applicable tubing size		Conne- tion thread	Model	Width across flats		L	M	ød	A*	Effective area (mm <sup>2</sup> )	Mass (g)
O.D.	I.D.			H <sub>1</sub>	H <sub>2</sub>						
ø4	ø2.5	R1/8	KFGH0425-01S	10	10	32	11.5	1.5	28	1.6	16
		R1/4	KFGH0425-02S	14		36					
ø6	ø4	R1/8	KFGH0604-01S	10	12	32.7	11.2	3	28.7	6	19
		R1/4	KFGH0604-02S	14		36.7					
ø8	ø6	R1/8	KFGH0806-01S	12	14	33.7	12.2	5	29.7	17	24
		R1/4	KFGH0806-02S	14		37.7					
		R3/8	KFGH0806-03S			38.7					
ø10	ø7.5	R1/4	KFGH1075-02S	17	17	39.7	14.2	6.5	33.7	30	44
		R3/8	KFGH1075-03S			40.7					
		R1/2	KFGH1075-04S	22		43.7					
ø12	ø9	R1/4	KFGH1209-02S	17	19	39.7	14.2	8	33.7	45	47
		R3/8	KFGH1209-03S			40.7					
		R1/2	KFGH1209-04S	22		43.7					

\* Reference dimensions after installation of R thread  
Note) Figures shown when using FEP tubing

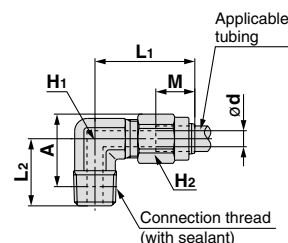


### Male Elbow: KFGL



Applicable tubing size		Conne- tion thread	Model	Width across flats		L <sub>1</sub>	L <sub>2</sub>	M	ød	A*	Effective area (mm <sup>2</sup> )	Mass (g)
O.D.	I.D.			H <sub>1</sub>	H <sub>2</sub>							
ø4	ø2.5	R1/8	KFGL0425-01S	10	10	29	17	11.5	1.5	19	1.6	22
		R1/4	KFGL0425-02S				19					
ø6	ø4	R1/8	KFGL0604-01S	10	12	29.7	17	11.2	3	20	6	25
		R1/4	KFGL0604-02S				19					
ø8	ø6	R1/8	KFGL0806-01S	12	14	31.2	18	12.2	5	22.1	12	35
		R1/4	KFGL0806-02S				21					
		R3/8	KFGL0806-03S				20					
ø10	ø7.5	R1/4	KFGL1075-02S	14	17	36.7	21	14.2	6.5	24.8	23	58
		R3/8	KFGL1075-03S				24.5					
		R1/2	KFGL1075-04S				26.6					
ø12	ø9	R1/4	KFGL1209-02S	14	19	36.7	21	14.2	8	26	27	61
		R3/8	KFGL1209-03S				25.6					
		R1/2	KFGL1209-04S				27.7					

\* Reference dimensions after installation of R thread  
Note) Figures shown when using FEP tubing

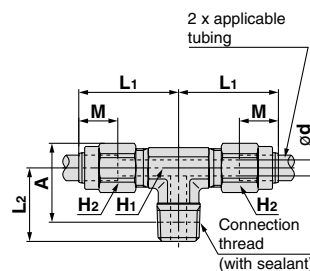


### Male Branch Tee: KFGT



Applicable tubing size		Conne- tion thread	Model	Width across flats		L <sub>1</sub>	L <sub>2</sub>	M	ød	A*	Effective area (mm <sup>2</sup> )	Mass (g)
O.D.	I.D.			H <sub>1</sub>	H <sub>2</sub>							
ø4	ø2.5	R1/8	KFGT0425-01S	10	10	29	17	11.5	1.5	19	3	35
		R1/4	KFGT0425-02S				19					
ø6	ø4	R1/8	KFGT0604-01S	10	12	29.7	17	11.2	3	20	10	41
		R1/4	KFGT0604-02S				19					
ø8	ø6	R1/8	KFGT0806-01S	12	14	31.2	20	12.2	5	24.1	16	58
		R1/4	KFGT0806-02S				23					
		R3/8	KFGT0806-03S				22					
ø10	ø7.5	R1/4	KFGT1075-02S	14	17	36.7	23	14.2	6.5	26.8	30	95
		R3/8	KFGT1075-03S				22					
		R1/2	KFGT1075-04S				27					
ø12	ø9	R1/4	KFGT1209-02S	14	19	36.7	24	14.2	8	29	32	104
		R3/8	KFGT1209-03S				28.6					
		R1/2	KFGT1209-04S				27					

\* Reference dimensions after installation of R thread  
Note) Figures shown when using FEP tubing

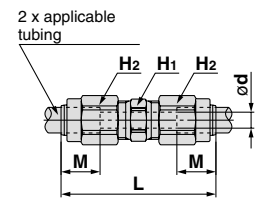


## Dimensions

### Straight Union: KFGH



Applicable tubing size		Model	Width across flats		L	M	ød	Effective area <sup>Note)</sup> (mm <sup>2</sup> )	Mass (g)
O.D.	I.D.		H <sub>1</sub>	H <sub>2</sub>					
ø4	ø2.5	KFGH0425-00	8	10	43.9	11.5	1.5	1.6	20
ø6	ø4	KFGH0604-00	10	12	45.4	11.2	3	6	28
ø8	ø6	KFGH0806-00	12	14	48.4	12.2	5	17	39
ø10	ø7.5	KFGH1075-00	17	17	52.4	14.2	6.5	30	63
ø12	ø9	KFGH1209-00	17	19	52.3		8	45	73

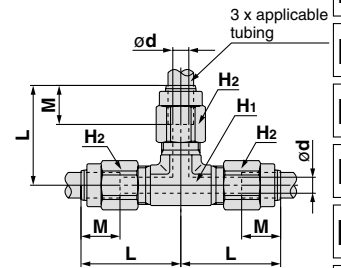


Note) Figures shown when using FEP tubing.

### Union Tee: KFGT



Applicable tubing size		Model	Width across flats		L	M	ød	Effective area <sup>Note)</sup> (mm <sup>2</sup> )	Mass (g)
O.D.	I.D.		H <sub>1</sub>	H <sub>2</sub>					
ø4	ø2.5	KFGT0425-00	10	10	29	11.5	1.5	1.6	42
ø6	ø4	KFGT0604-00	10	12	29.7	11.2	3	6	52
ø8	ø6	KFGT0806-00	12	14	31.2	12.2	5	17	70
ø10	ø7.5	KFGT1075-00	14	17	36.7	14.2	6.5	30	117
ø12	ø9	KFGT1209-00	14	19			8	45	128

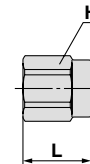


Note) Figures shown when using FEP tubing.

### Union Nut: KFGN



Applicable tubing O.D.	Model	Width across flats H	L	Mass (g)
ø4	KFGN-04	10	15	5
ø6	KFGN-06	12		6
ø8	KFGN-08	14	16	8
ø10	KFGN-10	17	18	11.5
ø12	KFGN-12	19		13.5



### Sleeve: KFGS



Applicable tubing O.D.	Model	øD	L	Mass (g)
ø4	KFGS-04	6.5	8	0.7
ø6	KFGS-06	8.5		0.9
ø8	KFGS-08	10.5		1.2
ø10	KFGS-10	13	9	2.1
ø12	KFGS-12	15		2.2



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- MS
- LQ
- MQR
- T



Series **KFG**

# Applicable Fluid Compatibility List 1

## Compatibility Checklist for Used Materials and Fluids

Chemical	Main body	Chemical	Main body
	Stainless steel 316		Stainless steel 316
Acrylonitrile	◎	Citric acid	◎
Acetamide	○	Cumene	×
Acetaldehyde	◎	Glycerin	◎
Acetone	◎	Cresol	◎
Aniline	○	Chromic acid [10%]	◎
Amylene	◎	Chlorosulfonic acid	○
Sulphurous acid gas (Humid gas)	◎	Chlorofluorocarbon (CFC) 11	—
Sodium bisulfite [50%]	◎	Chlorofluorocarbon (CFC) 113	—
Allyl alcohol	◎	Chlorofluorocarbon (CFC) 12	○
Benzoic acid	◎	Chlorofluorocarbon (CFC) 13B1	—
Ammonia (Compressed gas)	◎	Chlorofluorocarbon (CFC) 14	—
Isopropyl alcohol	○	Chlorofluorocarbon (CFC) 22	○
Isophorone	×	Chlorobenzene	×
Ethyl alcohol	◎	Chloroform (Trichloromethane)	○
Ethyl ether	○	Acetic acid	○
Ethylene	◎	Amyl acetate	◎
Ethylene glycol	×	Isopropyl acetate [20%]	◎
Ethylene diamine	◎	Ethyl acetate	×
Ethylene dichloride	◎	Butyl acetate	×
Epichlorohydrine	◎	Methyl acetate	◎
Methyl tertiary butyl ether	—	Calcium hypochlorite	◎
Allyl chloride	×	Sodium hypochlorite [5%]	◎
Ammonium chloride	◎	Potassium cyanide [50%]	◎
Calcium chloride	◎	Copper cyanide	◎
Iron chloride (II) [5%]	×	Diisobutyl ketone	◎
Sodium chloride	○	Diisobutylene	—
Magnesium chloride	◎	Diethanolamine	◎
Hydrochloric acid [5%]	×	Diethylamine	×
Chlorine gas (Humid gas)	×	Diethylene glycol	◎
Carbitol	×	Carbon tetrachloride	◎
Formic acid [50%]	○	Cyclohexanol	×
o-Xylene	△	Cyclohexanone	×
p-Xylene	△	Cyclohexane	×

Note 1) [ ] denotes the concentration. Aqueous solutions without condensation notes are in a saturated state.

Note 2) The above data is based on a room temperature of 20°C. Note that you may obtain different figures, depending on temperature conditions.

Note 3) The above data shows compatibility guidelines based upon component parts. Therefore, it is no guarantee of product performance. In addition, using fluids other than those specified in the catalog are not covered by the product's warranty.

### How to Read the Table

- ◎: Completely unaffected or largely unaffected.
- : May be slightly affected, but, dependent upon condition, can sufficiently withstand.
- △: Advisable to use as little as possible.
- ×: Not applicable, as substantially affected.
- : No data is available.



Series KFG

# Applicable Fluid Compatibility List 2

## Compatibility Checklist for Used Materials and Fluids

Chemical	Main body	Chemical	Main body
	Stainless steel 316		Stainless steel 316
Dichloroethylene	—	Butyl phthalate	×
Dichlorobenzene	—	Butyl alcohol	△
Dichloromethane (Methylene chloride)	△	Hydrofluoric acid [50%]	◎
Ethylene bromide	×	Furfural	×
Potassium bromide [30%]	◎	n-Propyl alcohol	◎
Potassium dichromate [25%]	◎	Propylene glycol	◎
Oxalic acid	◎	Bromochloroethane	—
Bromine gas	×	n-Hexane	○
Tartaric acid	◎	n-Hexyl alcohol	◎
Nitric acid [65%]	◎	n-Heptane	◎
Ammonium nitrate	◎	Benzene	×
Ammonium hydroxide	—	n-Pentane	×
Calcium hydroxide	◎	Boric acid	◎
Sodium hydroxide [50%]	◎	Gallic acid	◎
Barium hydroxide	◎	Formic aldehyde	◎
Solvent naphtha	◎	Methyl methacrylate	×
Carbonic acid (Humid gas and aqueous solution)	◎	Methyl alcohol	◎
Tetrachloroethylene	×	Methyl isobutyl ketone	×
Tetrahydrofuran	—	Methyl ethyl ketone	×
Dodecylbenzene	◎	Ethyleneglycol monomethyl ether	×
Trichloroethane	△	Monoethanolamine	◎
Trichloroethylene	◎	Morpholine	◎
Trichloroacetic acid	—	Butyric acid	◎
Toluene	◎	Hydrogen sulfide (Humid gas and aqueous solution)	◎
Naphtha	○	Sulphuric acid [10%]	◎
Naphthenic acid	◎	Ammonium sulfate	◎
Lactic acid	◎	Sodium bisulfate [10%]	◎
Carbon disulfide	○	Iron sulfate (II)	○
Picric acid	◎	Sodium sulfate	◎
Pyridine	×	Phosphoric acid [85%]	◎
Phenol	×		

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# Series KFG Specific Product Precautions

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

## Selection

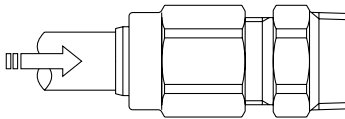
### ⚠ Caution

1. Consult with SMC regarding fluids other than air, water and steam.

## Installation and Removal of Tubing

### ⚠ Caution

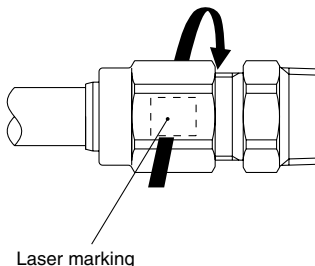
1. **Installation of tubing**
  - 1) Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tubing, use tubing cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection and leakage.
  - 2) Without loosening the union nut, grab the tube and gently push it thoroughly into the fitting.
  - 3) After insertion, confirm that the tube will not disconnect.



- 4) When the union is loose, tighten it additionally, temporarily by hand.
- 5) After fixing the body with the tightening tool, tighten the union nut by 1.5 turns, using an appropriate wrench. Shown below is the equivalent tightening torque.

Fitting size	Equivalent tightening torque N·m
KFG□0425	7 to 9
KFG□0604	11 to 13
KFG□0806	13 to 15
KFG□1075	16 to 18
KFG□1209	16 to 18

When tightening the nut, the laser marking can be used for reference.



## Operating Environment

### ⚠ Warning

1. **Do not use in environments or locations where there is a danger of damage to fittings and tubing.**  
For fitting and tubing materials, refer to specifications and construction drawings, etc.

## Maintenance

### ⚠ Caution

1. **Pre-maintenance inspection**  
When the product is removed, turn off the power, cut off the supply pressure, and confirm that fluid in the piping has been discharged.
2. **During regular maintenance, check for the following and replace any components as necessary.**
  - a) Scratches, gouges, abrasion, corrosion
  - b) Leakage
  - c) Flattening or distortion of tubing
  - d) Hardening, deterioration or softness of tubing
3. **Do not repair the fittings or patch the tubing for reuse.**
4. **Using this product for extended periods of time can result in leaks due to the material change. In such cases, tighten the union nut additionally.**  
A guide for the additional tightening is 1/6 to 1/4 turns. The limit for additional tightening is 1/2 turns.  
When there is a leak even after additional tightening, replace the sleeve and union nuts with new ones.  
Also, the outside diameter of tubes that have been used at high temperatures or for long periods of time will expand, and in some cases pipe fittings cannot be reattached. Tubes that cannot be attached should be discarded and replaced with new ones.
5. **Sleeve is not recyclable.**  
Replace it every time piping is performed.  
Body and union nut are recyclable. Refer to the table below for recyclable life.

### Recyclable Life for Body and Union Nut

Series	Tubing		Recyclable life
	Material		
TH TL TD	FEP PFA Modified PTFE		5 times
T TS TU TPH TPS	Nylon Soft nylon Polyurethane Polyolefin Soft polyolefin		Twice