

## Multi-Purpose/Chemical Resistant Hose

Single-layer teflon tubing is hard and easy to break. Our Flexible Fluorine (ETFE) Resin Tubing is a suitable alternative tubing for a teflon tubing.

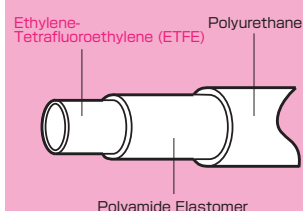
# Flexible Fluorine (ETFE) Resin Tubing Clear Inch Type

[Model Number: E-SJ-(I.D.) × (O.D.)]

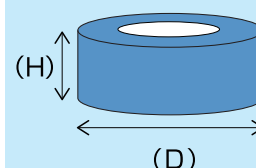
## Applications • Fluids



## [Materials / Structure]



## [Packing Dimension]



- For Industrial Ink-Jet Printers (For Ink-Supplying Pipes)
- For Transferring Paints, Solvents, and Adhesives
- For Transferring Chemicals used in Laboratory Equipment
- For Transferring Chemicals used in Semiconductor-Related Devices and Flat Panel Display (FPD) Manufacturing Devices
- For Transferring Beverage and Food
- For Transferring Fatty Acid Ester such as Biofuel (BDF)
- For Transferring Chemical and Industrial Wastes
- For Transferring Alcohol, Cosmetics, and Chemicals
- For Transferring Chemicals used in Medical Equipment, Endoscope, and so on
- For Transferring Chemicals used in Manufacturing Fuel Cell and Pure Water
- For Filling Line of Paints and Adhesives
- For Filling Line of Fragrance, Colorant, and Additive
- For Air Supplying Pipes at Clean Room

## Standard • Packing Information

Model Number	I.D.	O.D.	Working Pressure MPa		Minimum Bend Radius at 20°C	Temperature Range	Standard Length	Net Weight (*1)	Color	Packing Dimension(*2)			
										Packing Form	Diameter (D) cm	Height (H) cm	Gross Weight kg/Box
			at 20°C	at 80°C		°C	m	kg/Roll					
E-SJ-1/8" × 1/4"	3.18	6.35	0 ~ 0.6		20		20	0.6	Clear	PE Bag · Paper Box	38.5	5.5	0.8
							100	3.0		PE Bag · Paper Box	38.5	15.0	3.5
E-SJ-3/16" × 1/4"	4.57	6.35	0 ~ 0.5	0 ~ 0.2	45	-20 ~ 80	20	0.4		PE Bag · Paper Box	38.5	5.5	0.6
							100	1.9		PE Bag · Paper Box	38.5	15.0	2.4
E-SJ-1/4" × 3/8"	6.35	9.53	0 ~ 0.6		45		20	1.0		PE Bag · Paper Box	38.5	5.5	1.2
							100	5.1		Paper Bobbin · Paper Box	38.5	15.0	6.0

\*1: Please note that our product has the allowance, so Net Weight will vary slightly depending on the variation of the product dimension (Inside Diameter, Outside Diameter, and Length).

\*2: "Diameter (D)" × "Height (H)" means "External Dimensions of Cardboard Box (D)" × "Height (H)."

## Characteristics and Functions

Solvent Resistance

Non-PVC

Non-Adhesiveness

Pressure-Proof

Chemical Resistance

Low Elution

Low Odor

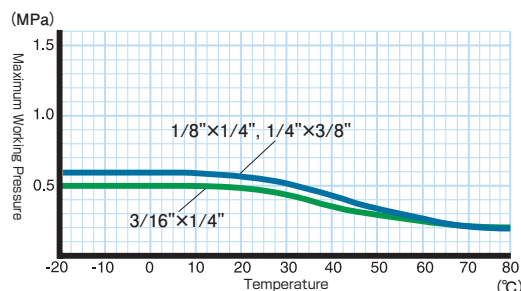
Food-Sanitation

Flexibility

- Chemical Resistance**...Since the inner layer is made of ETFE fluorine resin, E-SJ is resistant to most of the chemical substances. For more information, please refer to chemical resistance data.
- Flexibility**...Due to the laminated structure, compared with the conventional single-layer fluorine tubing, E-SJ is superior in flexibility. This improves your work efficiency.
- Hard to Break**...Unlike the conventional single-layer fluorine tubing, E-SJ is hard to break. (Even if it breaks, you can restore its shape to some extent.)
- Non-Adhesiveness**...Since fluorine resin is superior in water-proof and non-adhesiveness, you can wash out the fluids very easily.
- Abrasion Resistance**...Fluorine resin (inner layer) shows higher levels of abrasion resistance. Thus, you can transfer chemical slurry.
- Plasticizer-Free**...E-SJ does not contain plasticizer (an elution material) at all. E-SJ is an oil-free tubing.
- Non-PVC**...E-SJ is made of a non-PVC material.
- Low Elution and Low Odor**...Since this tubing contains very low levels of elution and odor, it is recommended for use in transfers of food, beverage, and cosmetics.
- High Purity**...Fluorine resin does not contain any additives such as plasticizer, so this tubing is suitable for transferring high purity chemical fluids.
- Easy to Cut**...Since we print the cut mark on the tubing every meter, it is easy to cut the length you would like to.
- Transparency**...E-SJ enables you to check the fluid very easily.
- Green Procurement**...E-SJ is compliant with RoHS2 requirements.
- Food Sanitation Standard Certified**...E-SJ conforms to the Food Sanitation Standard No.370 (The Ministry of Health and Welfare for Food Sanitation, No.370, 1959). (Conformity to N-Heptane).

## Technical Information

E-SJ: Relationship between Working Temperature and Maximum Working Pressure

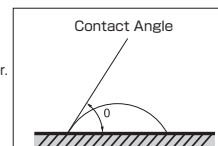


※ The above graph is the value when our original fittings are used.

### Non-Adhesiveness Comparison Data

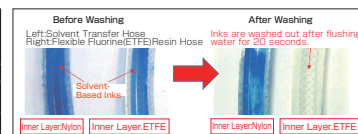
Non-adhesiveness and smoothness, which are peculiar to fluorine resin, make it easier to wash out the fluid.  
You can check the data about critical surface tension and contact angle against water.

Resins	Critical Surface Tension (dyne/cm)	Contact Angle for Water (°)
Ethylene-Tetrafluoroethylene (ETFE)	22	96
Polyvinylidene Fluoride (PVDF)	25	82
High Density Polyethylene	31	73
Hard Vinyl Chloride	39	68
PET	43	
Nylon	46	54



[Critical Surface]  
The surface Tension of the assumed liquid which has the contact angle of zero against solid.

Washing out the inks (by organic solvents) stuck inside the hose		
Test Piece 1 : Inner Layer: Nylon - Solvent Transfer Hose (E-SV)		
Test Piece 2 : Inner Layer: Ethylene-Tetrafluoroethylene - Flexible Fluorine (ETFE) Resin Yarn Reinforced Hose (E-SJB)		
Test Conditions	Kind of Ink	Solvent-Based Inks
Washing Methods	Ink Inclusion Period	7 Days (at Room Temperature)
	Cleaning Solution	Ethyl Acetate
	Cleaning Period	20 Seconds
	Pressure	Less than 0.01 MPa



Flexible Fluorine (ETFE) Resin Hose is excellent in non-adhesiveness of the inner layer, so you can reduce washing time and save cleaning solutions and labor costs.

### (Flexibility Comparative Data)

(Test Temperature: 20°C)

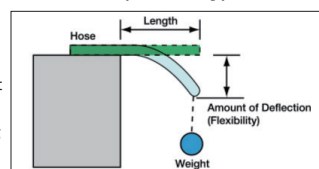
- This is one indication of flexibility. Flexibility varies depending on hose (tubing).
- The larger the amount of deflection is, the more flexible the hose (tubing) is.
- ※ The lower the minimum bend radius value is, the harder the hose (tubing) is.

Test Sample	Minimum Bend Radius (mm)	Amount of Deflection (mm)
① E-PD-4 × 6	23 (Catalog Value : 25)	28
② E-SJ-4 × 6	23 (Catalog Value : 25)	31
③ PTFE Tubing (4 × 6)	20	7
④ PFATubing (4 × 6)	23	6

### Test Method for Amount of Deflection (Flexibility)

Add a 50 gram weight to the end of the tubing for one minute. Then, measure the amount of deflection. (The test piece goes through the annealing step in advance to make it straight.)

※ ③ PTFE Tubing and ④ PFA Tubing are not our products.



## Cautions for using

- ⚠ \*Due to the laminated structure tubing, please use the joints to seal an inner surface of the hose.
- \*Please do not use the joints to seal an outer surface of the hose. This may result in the bursting or coming off from the hose.
- \*We do not have the original fittings for "Flexible Fluorine (ETFE) Resin Tubing Clear Inch Type."
- \*When you use our products, please refer to "Precautions for Use" available on our webpage and product catalog.
- \*In terms of chemical resistance, please refer to "Chemical Resistance Data" available on our webpage and product catalog.
- \*Although the inner layer is made of fluorine, please make sure whether or not E-SJ is usable for high purity fluids before you use.
- \*Although the inner layer is resistance to fluids, but depending on working environments, the fluids would be permeated through the inner layer, resulting in the danger of swelling and degradation of the middle or outer layer.

Contact us if you have any inquiries about HAKKO products.

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