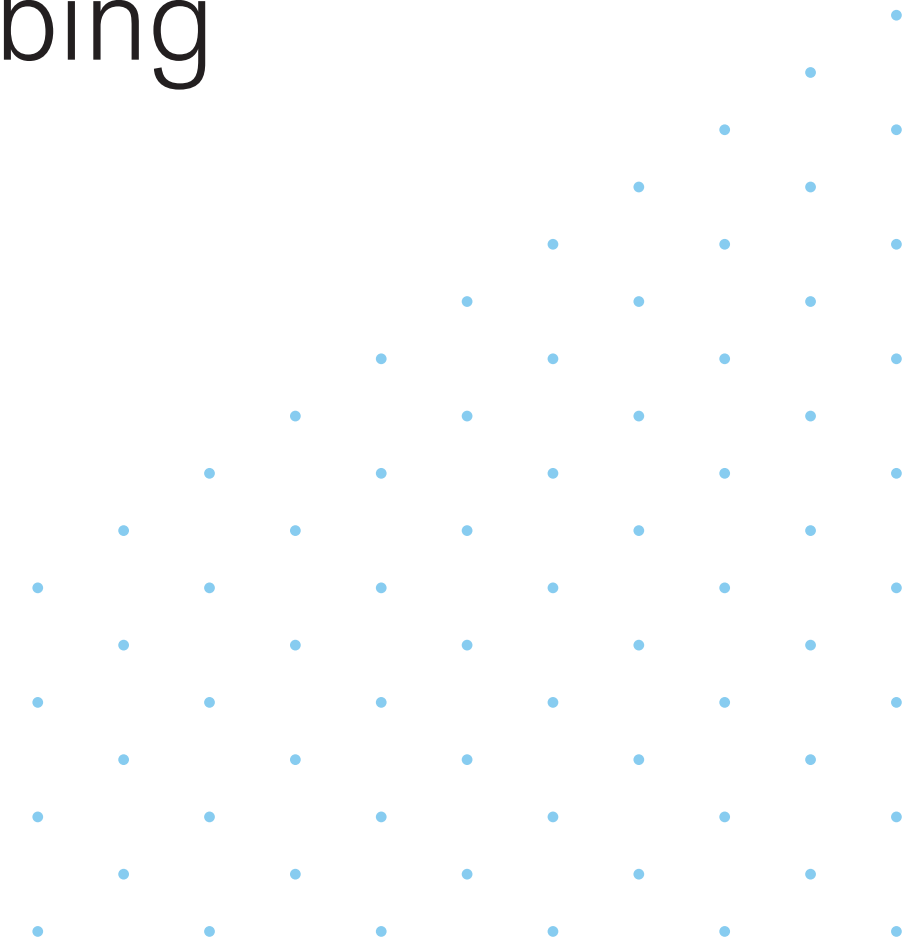


# Junkosha Fluoropolymer Heat Shrink Tubing



# Fluoropolymer Heat Shrink Tubing



Features

- Excellent in heat and cold resistance.
- No-Load continuous operating temperature 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.

Use

- Protective covering for the lead area which requires chemical resistance and nonadherent, for liquid transfer equipment and thermistors
- Protection of very small elements such as sensors
- Adding nonadherent properties to rolls, etc.
- Protective covering for chemical resistance under high temperatures, etc.

Type

| Type                                   | Inner Diameter after Shrinkage |
|----------------------------------------|--------------------------------|
| FEP Heat Shrink Tubing: NF             | 1.5~66mm                       |
| FEP Extra-Fine Heat Shrink Tubing: NFL | 0.47~2.35mm                    |

- Sizes and shrinkage ratio other than those in the table, as well as PFA heat shrinkable tubes are also available. Please contact us for details.
- ⚠ Fluoropolymer heat shrinkable tubes gradually start shrinking naturally at approx. 40°C; please store them in a cool, dark place where the temperature does not exceed the room temperature.
- Please note that the storage period is approx. one year.

Properties

|                          | Item                                                    | Unit   | Value              |
|--------------------------|---------------------------------------------------------|--------|--------------------|
| Basic Properties         | Material                                                | —      | FEP                |
|                          | Shrink Ratio                                            | —      | 1.3~1.1:1          |
|                          | Shrink Temperature                                      | °C     | 150~200            |
|                          | Continuous Operating Temperature                        | °C     | -65~200            |
|                          | Material Inflammability UL Belletin 94*                 | —      | V-0                |
| Mechanical Properties    | Tensile Strength                                        | MPa    | 20~32              |
|                          | Elongation                                              | %      | 250~330            |
|                          | Hardness (Shore D)                                      | —      | 60~65              |
| Electrical Properties    | Dielectric Strength (Short-Time Method, 1/8 Inch Thick) | kV/mm  | 19.7~23.6          |
|                          | Volume Resistivity                                      | Ω · cm | > 10 <sup>18</sup> |
| Environmental Properties | Water Absorption 24hr. 1 / 8in Thick                    | %      | <0.01              |
|                          | Sunlight Resistance                                     | —      | No Change          |
| Chemical Resistance      | Acid                                                    | —      | No Change          |
|                          | Alkaline                                                | —      | No Change          |
|                          | Alcohol                                                 | —      | No Change          |
|                          | Solvent (Trichloroethylene, Carbon Tetrachloride)       | —      | No Change          |
|                          | Aliphatic Hydrocarbons (Gasoline, Kerosene)             | —      | No Change          |
|                          | Aromatic hydrocarbons(Benzene, Toluene)                 | —      | No Change          |

\*Please notify us separately if you require UL224 approved products.

Fluoropolymer Heat Shrink Tubing

NF

FEP Heat Shrink Tubing

| Part No. | Inner Diameter before Shrinkage (Min.) (mm) | Inner Diameter after Shrinkage (Max.) (mm) | Thickness after Shrinkage (Standard) (mm) | Standard Length (m) |
|----------|---------------------------------------------|--------------------------------------------|-------------------------------------------|---------------------|
| NF015    | 1.8                                         | 1.5                                        | 0.2                                       | 1                   |
| NF020    | 2.2                                         | 1.8                                        | 0.2                                       | 1                   |
| NF025    | 3.0                                         | 2.3                                        | 0.2                                       | 1                   |
| NF030    | 3.6                                         | 2.8                                        | 0.2                                       | 1                   |
| NF040    | 4.4                                         | 3.3                                        | 0.2                                       | 1                   |
| NF050    | 5.5                                         | 4.2                                        | 0.2                                       | 1                   |
| NF060    | 6.5                                         | 5.0                                        | 0.2                                       | 1                   |
| NF070    | 7.8                                         | 6.0                                        | 0.2                                       | 1                   |
| NF090    | 9.5                                         | 7.3                                        | 0.3                                       | 1                   |
| NF100    | 11.0                                        | 9.0                                        | 0.3                                       | 1                   |
| NF120    | 13.0                                        | 10.0                                       | 0.3                                       | 1                   |
| NF140    | 15.0                                        | 12.0                                       | 0.3                                       | 1                   |
| NF150    | 16.5                                        | 14.0                                       | 0.4                                       | 1                   |
| NF170    | 18.0                                        | 15.5                                       | 0.4                                       | 1                   |
| NF200    | 21.5                                        | 17.0                                       | 0.5                                       | 1                   |
| NF220    | 23.5                                        | 20.0                                       | 0.5                                       | 1                   |
| NF250    | 27.0                                        | 22.0                                       | 0.5                                       | 1                   |
| NF300    | 34.0                                        | 26.0                                       | 0.5                                       | 1                   |
| NF400    | 44.0                                        | 34.0                                       | 0.5                                       | 1                   |
| NF500    | 55.0                                        | 43.0                                       | 0.5                                       | 1                   |
| NF600    | 68.0                                        | 54.0                                       | 0.5                                       | 1                   |
| NF700    | 78.0                                        | 66.0                                       | 0.5                                       | 1                   |

- Standard Color: Translucent

(Note) The values in the size table shows the follows: minimum value for inner diameter before shrinkage, maximum value for inner diameter after shrinkage, and standard value for thickness when shrinkage is complete.



NFL

FEP Extra-Fine Heat Shrink Tubing

| Part No. | Inner Diameter before Shrinkage (Min.) (mm) | Inner Diameter after Shrinkage (Max.) (mm) | Thickness after Shrinkage (Standard) (mm) | Standard Length (m) |
|----------|---------------------------------------------|--------------------------------------------|-------------------------------------------|---------------------|
| NFL005   | 0.55                                        | 0.47                                       | 0.2                                       | 10                  |
| NFL006   | 0.70                                        | 0.57                                       | 0.2                                       | 10                  |
| NFL007   | 0.80                                        | 0.67                                       | 0.2                                       | 10                  |
| NFL010   | 1.10                                        | 0.89                                       | 0.2                                       | 10                  |
| NFL013   | 1.40                                        | 1.10                                       | 0.2                                       | 10                  |
| NFL016   | 1.85                                        | 1.40                                       | 0.2                                       | 10                  |
| NFL021   | 2.35                                        | 1.85                                       | 0.2                                       | 10                  |
| NFL026   | 2.90                                        | 2.35                                       | 0.2                                       | 10                  |

- Standard Color: Translucent

(Note) The values in the size table shows the follows: minimum value for inner diameter before shrinkage, maximum value for inner diameter after shrinkage, and standard value for thickness when shrinkage is complete.

- FEP ultra thin heat shrinkable tubes NFL are heat shrinkable tubes with precise and ultra small diameter, enabling the minimum limit of coverage to become  $\phi 0.5$  mm.
- Production for products with long length is possible. Natural shrinkage is less likely to occur compared to FEP heat shrinkable tube NF, which enables long-term storage.



## Shrinkage Processing Method

### Selection of Size

Please make your selection referring to the inner diameter before and after shrinkage in the size table. If the temperature of actual use is high, the item to be covered has sharp edges, or thermal conduction is likely to occur, please select the largest size applicable.

### Cutting

Please cut the tube so that the length of the tube is approximately the same as the item to be covered.

### Shrinkage Processing Temperature

The inner diameter after shrinkage shows a guaranteed value heated at 200°C for 20 minutes.

Please set the temperature during shrinkage processing to between 100°C and 200°C, according to the heat durability and shape of the item to be covered, the shrinkage properties of the tube (melting point, shrinking force, heat conductivity, tensile strength under high temperature), size, and operability.

FEP heat shrinkable tubes are designed so that it almost completely shrinks between 150°C and 180°C, and completes shrinking at 200°C.

They should cover the target object tightly when heated to the shrinking temperature.

\*Cautionary Point

- 1) Heat or cool the target object uniformly.
- 2) When covering a long target object from the center to the ends, eliminating air bubbles.
- 3) Do not raise temperature more than necessary.

### Heater

Heat guns, electric furnace, infrared heaters, electrothermic equipment, and tunnel furnace, can be used.

