

Junkosha[®] Peelable Heat Shrink Tubing

Junkosha[®]

Enabling Technology Innovators

Junkosha® Peelable Heat Shrink Tubing

Product Introduction

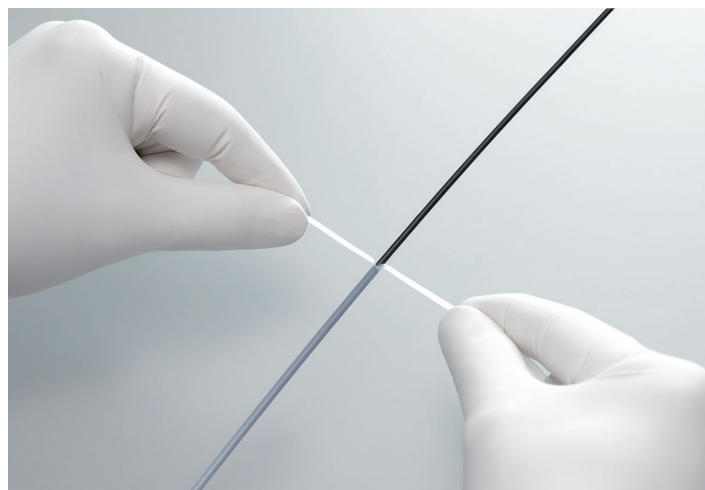
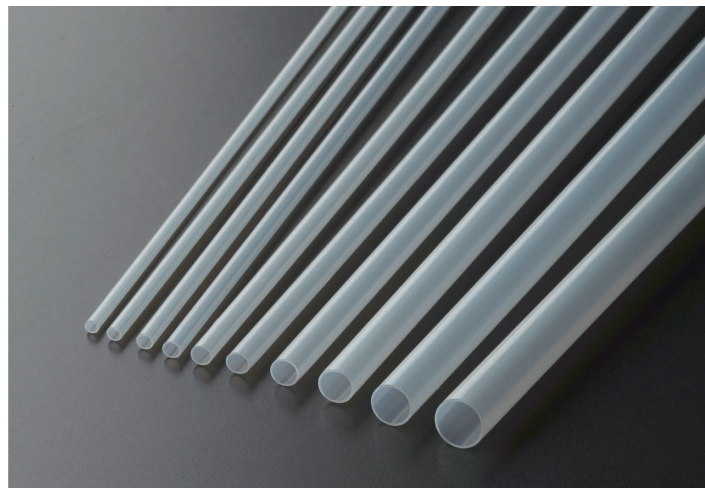
Junkosha has focused on issues in the manufacturing process of catheters and guide wires. As the pioneer of sophisticated fluoropolymer application technologies across the medical device sector, we have developed the market leading peelable heat shrink tubing.

In the industry of catheters and guide wires, we understand that simple and reliable methods help extremely fine processes remain unproblematic.

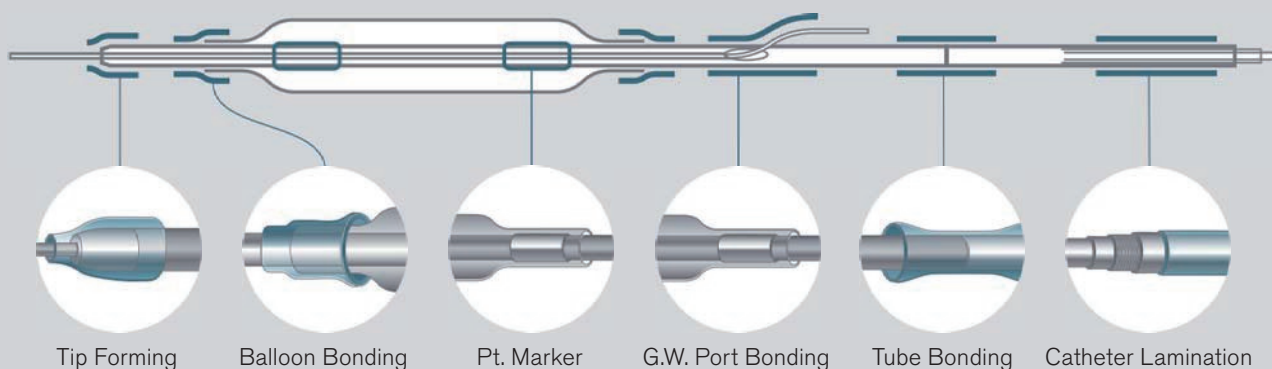
Junkosha Peelable Heat Shrink Tubing vs Other Traditional HST

Removing traditional FEP-heat shrink tubing (HST) smoothly has been a serious problem in catheter manufacturing for many years. FEP-HST is used to weld, laminate, tip and other processes. The only way to remove it from the catheter is by "skiving" it off, which not only takes significant time, there is also a possibility that the catheter can become damaged in the process. Both costly and time consuming, the market needed to find a viable solution to this unmet need.

With the challenge set, Junkosha designed a product called peelable heat shrink tubing. Offering all of the performance of standard heat shrink tubing, it included one critical difference: it is very easy to remove from the catheter. Junkosha Peelable Heat Shrink Tubing solution needs only a single slit at one end to get it started, enabling it to be easily peeled along its entire length. This solution reduces Total Cost of Ownership (TCO) for catheter manufacturers, by helping them to produce the final product more rapidly with improved yields and lower inspection levels while being more ergonomically safe. Overall, Junkosha Peelable Heat Shrink Tubing is the industry's first peelable FEP heat shrink tubing, and continues to be the industry benchmark of safety and performance.



Application



How to Target Dimensions

- 1 Review your materials and target dimension measurements



Expanded I.D. > A

and

Recovered I.D. < B

Expanded I.D. is larger than maximum value of your material O.D.

Recovered I.D. is 0.1mm less than minimum target value of your product O.D.

- 2 Select the part number of the closest target

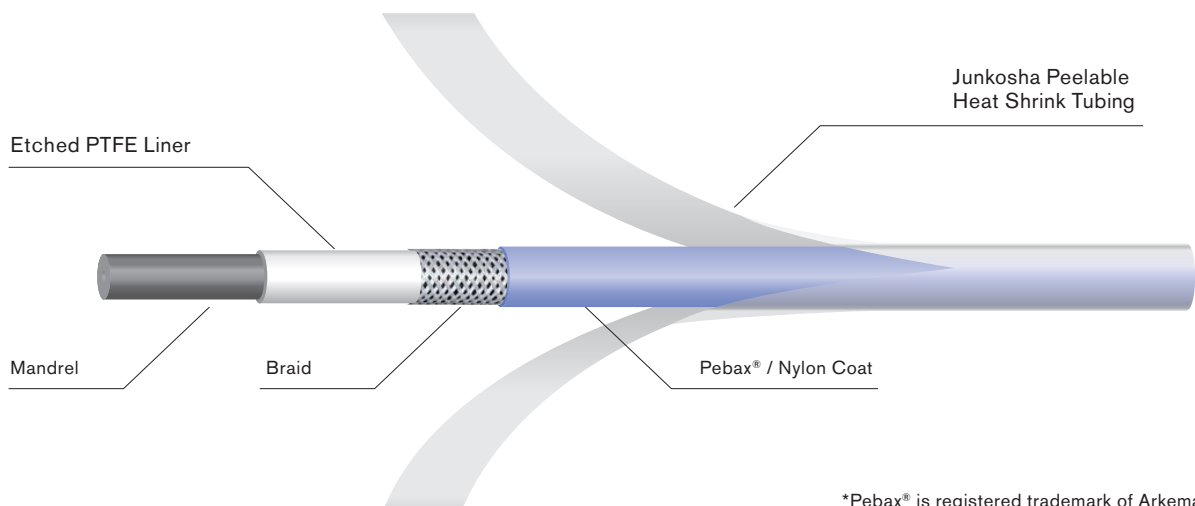
- 3 Request free samples through the website/
Junkosha Sales Associate

- 4 Receive samples and test them in your lab

Junkosha can eliminate your processing problems.

If you encounter any issues, kindly inform us. Our team of experts are well-equipped to swiftly provide tailored samples or useful technical information to resolve your specific problems.

General Catheter Layers



*Pebax® is registered trademark of Arkema.

Product Lineup

Material: Fluoropolymer
 Recommended Temperature: 200°C / 392° F

NFPX

2.0:1 Shrink Ratio / Standard / Standard Length: 1000 mm / Color: Transparent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPX0045	0.60 mm	0.30 mm	0.20 +/- 0.05 mm	0.0236"	0.0118"	0.0079 +/- 0.0020"	1.3 - 1.5 Fr
NFPX0090	1.20 mm	0.60 mm	0.25 +/- 0.05 mm	0.0472"	0.0236"	0.0098 +/- 0.0020"	2.2 - 2.3 Fr
NFPX0150	2.00 mm	1.00 mm	0.275 +/- 0.05 mm	0.0787"	0.0394"	0.0108 +/- 0.0020"	3.4 - 5.7 Fr

NFPR

1.8:1 Shrink Ratio / Standard / Standard Length: 1700 mm / Color: Translucent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPR006	0.72 mm	0.40 mm	0.25 +/- 0.05 mm	0.0283"	0.0157"	0.0098 +/- 0.0020"	1.6 - 1.8 Fr
NFPR007	0.90 mm	0.50 mm	0.25 +/- 0.05 mm	0.0354"	0.0197"	0.0098 +/- 0.0020"	1.9 - 2.4 Fr
NFPR008	1.08 mm	0.60 mm	0.25 +/- 0.05 mm	0.0425"	0.0236"	0.0098 +/- 0.0020"	2.2 - 2.9 Fr
NFPR010	1.26 mm	0.70 mm	0.25 +/- 0.05 mm	0.0496"	0.0276"	0.0098 +/- 0.0020"	2.5 - 3.5 Fr
NFPR011	1.44 mm	0.80 mm	0.25 +/- 0.05 mm	0.0567"	0.0315"	0.0098 +/- 0.0020"	2.8 - 4.0 Fr
NFPR013	1.62 mm	0.90 mm	0.25 +/- 0.05 mm	0.0638"	0.0354"	0.0098 +/- 0.0020"	3.1 - 4.6 Fr
NFPR014	1.80 mm	1.00 mm	0.25 +/- 0.05 mm	0.0709"	0.0394"	0.0098 +/- 0.0020"	3.4 - 5.1 Fr
NFPR018	2.34 mm	1.30 mm	0.25 +/- 0.05 mm	0.0921"	0.0512"	0.0098 +/- 0.0020"	4.3 - 6.7 Fr
NFPR022	2.88 mm	1.60 mm	0.28 +/- 0.05 mm	0.1134"	0.0630"	0.0110 +/- 0.0020"	5.2 - 8.4 Fr
NFPR029	3.78 mm	2.10 mm	0.30 +/- 0.05 mm	0.1488"	0.0827"	0.0118 +/- 0.0020"	6.7 - 11.1 Fr

NFPM

1.6:1 Shrink Ratio / Ultra Small / Standard Length: 1000 mm / Color: Translucent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPM0030	0.38 mm	0.23 mm	0.20 +/- 0.05 mm	0.0150"	0.0091"	0.0079 +/- 0.0020"	0.9 - 1.0 Fr
NFPM0037	0.46 mm	0.28 mm	0.20 +/- 0.05 mm	0.0181"	0.0110"	0.0079 +/- 0.0020"	1.0 - 1.2 Fr
NFPM0042	0.51 mm	0.33 mm	0.20 +/- 0.05 mm	0.0201"	0.0130"	0.0079 +/- 0.0020"	1.2 - 1.3 Fr

NFPSC

1.6:1 Shrink Ratio / Standard / Length: 1700 mm / Color: Transparent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPSC005	0.64 mm	0.40 mm	0.20 +/- 0.05 mm	0.0252"	0.0157"	0.0079 +/- 0.0020"	1.6 Fr
NFPSC007	0.80 mm	0.50 mm	0.20 +/- 0.05 mm	0.0315"	0.0197"	0.0079 +/- 0.0020"	1.9 - 2.1 Fr
NFPSC008	0.96 mm	0.60 mm	0.20 +/- 0.05 mm	0.0378"	0.0236"	0.0079 +/- 0.0020"	2.2 - 2.6 Fr
NFPSC009	1.12 mm	0.70 mm	0.20 +/- 0.05 mm	0.0441"	0.0276"	0.0079 +/- 0.0020"	2.5 - 3.0 Fr
NFPSC010	1.28 mm	0.80 mm	0.20 +/- 0.05 mm	0.0504"	0.0315"	0.0079 +/- 0.0020"	2.8 - 3.5 Fr
NFPSC012	1.44 mm	0.90 mm	0.20 +/- 0.05 mm	0.0567"	0.0354"	0.0079 +/- 0.0020"	3.1 - 4.0 Fr
NFPSC013	1.60 mm	1.00 mm	0.20 +/- 0.05 mm	0.0630"	0.0394"	0.0079 +/- 0.0020"	3.4 - 4.5 Fr
NFPSC017	2.08 mm	1.30 mm	0.20 +/- 0.05 mm	0.0819"	0.0512"	0.0079 +/- 0.0020"	4.3 - 6.0 Fr
NFPSC021	2.56 mm	1.60 mm	0.275 +/- 0.05 mm	0.1008"	0.0630"	0.0108 +/- 0.0020"	5.2 - 7.4 Fr
NFPSC028	3.36 mm	2.10 mm	0.275 +/- 0.05 mm	0.1323"	0.0827"	0.0108 +/- 0.0020"	6.7 - 9.8 Fr

NFPS

1.6:1 Shrink Ratio / Standard / Standard Length: 1700 mm / Color: Translucent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPS005	0.64 mm	0.40 mm	0.20 +/- 0.05 mm	0.0252"	0.0157"	0.0079 +/- 0.0020"	1.6 Fr
NFPS007	0.80 mm	0.50 mm	0.20 +/- 0.05 mm	0.0315"	0.0197"	0.0079 +/- 0.0020"	1.9 - 2.1 Fr
NFPS008	0.96 mm	0.60 mm	0.20 +/- 0.05 mm	0.0378"	0.0236"	0.0079 +/- 0.0020"	2.2 - 2.6 Fr
NFPS009	1.12 mm	0.70 mm	0.20 +/- 0.05 mm	0.0441"	0.0276"	0.0079 +/- 0.0020"	2.5 - 3.0 Fr
NFPS010	1.28 mm	0.80 mm	0.20 +/- 0.05 mm	0.0504"	0.0315"	0.0079 +/- 0.0020"	2.8 - 3.5 Fr
NFPS012	1.44 mm	0.90 mm	0.20 +/- 0.05 mm	0.0567"	0.0354"	0.0079 +/- 0.0020"	3.1 - 4.0 Fr
NFPS013	1.60 mm	1.00 mm	0.20 +/- 0.05 mm	0.0630"	0.0394"	0.0079 +/- 0.0020"	3.4 - 4.5 Fr
NFPS017	2.08 mm	1.30 mm	0.20 +/- 0.05 mm	0.0819"	0.0512"	0.0079 +/- 0.0020"	4.3 - 6.0 Fr
NFPS021	2.56 mm	1.60 mm	0.275 +/- 0.05 mm	0.1008"	0.0630"	0.0108 +/- 0.0020"	5.2 - 7.4 Fr
NFPS028	3.36 mm	2.10 mm	0.275 +/- 0.05 mm	0.1323"	0.0827"	0.0108 +/- 0.0020"	6.7 - 9.8 Fr

NFPS

1.6~1.4:1 Shrink Ratio / Large / Standard Length: 1000 mm / Color: Translucent

MOQ/SPQ:50/50 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFPS036	4.45 mm	2.79 mm	0.275 +/- 0.05 mm	0.1752"	0.1098"	0.0108 +/- 0.0020"	8.8 - 13.1 Fr
NFPS038	4.78 mm	2.92 mm	0.275 +/- 0.05 mm	0.1882"	0.1150"	0.0108 +/- 0.0020"	9.2 - 14.1 Fr
NFPS052	6.05 mm	4.32 mm	0.275 +/- 0.05 mm	0.2382"	0.1701"	0.0108 +/- 0.0020"	13.4 - 18.0 Fr

NFP

1.5:1 Shrink Ratio / Extra Large / Standard Length: 1500 mm / Color: Translucent

MOQ/SPQ:25/25 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFP064	7.62 mm	5.08 mm	0.33 +/- 0.05 mm	0.3000"	0.2000"	0.0130 +/- 0.0020"	15.7 - 22.7 Fr
NFP074	8.89 mm	5.93 mm	0.33 +/- 0.05 mm	0.3500"	0.2335"	0.0130 +/- 0.0020"	18.3 - 26.6 Fr
NFP085	10.16 mm	6.77 mm	0.33 +/- 0.05 mm	0.4000"	0.2665"	0.0130 +/- 0.0020"	20.9 - 30.4 Fr
NFP095	11.43 mm	7.62 mm	0.33 +/- 0.05 mm	0.4500"	0.3000"	0.0130 +/- 0.0020"	23.4 - 34.3 Fr

NFP

1.4:1 Shrink Ratio / Standard / Standard Length: 1500 mm / Color: Translucent

MOQ/SPQ:100/100 [pcs]

Parts No.	Metric			Imperial			French
	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Expanded I.D. Min.	Full Recovered I.D. Max.	Full Recovered Wall Thickness	Suitable for
NFP006	0.71 mm	0.50 mm	0.20 +/- 0.05 mm	0.0280"	0.0197"	0.0079 +/- 0.0020"	1.8 - 1.9 Fr
NFP007	0.86 mm	0.60 mm	0.20 +/- 0.05 mm	0.0339"	0.0236"	0.0079 +/- 0.0020"	2.2 - 2.3 Fr
NFP008	1.00 mm	0.70 mm	0.20 +/- 0.05 mm	0.0394"	0.0276"	0.0079 +/- 0.0020"	2.5 - 2.7 Fr
NFP010	1.14 mm	0.80 mm	0.20 +/- 0.05 mm	0.0449"	0.0315"	0.0079 +/- 0.0020"	2.8 - 3.1 Fr
NFP011	1.29 mm	0.90 mm	0.20 +/- 0.05 mm	0.0508"	0.0354"	0.0079 +/- 0.0020"	3.1 - 3.6 Fr
NFP013	1.57 mm	1.10 mm	0.20 +/- 0.05 mm	0.0618"	0.0433"	0.0079 +/- 0.0020"	3.7 - 4.4 Fr
NFP017	2.00 mm	1.40 mm	0.20 +/- 0.05 mm	0.0787"	0.0551"	0.0079 +/- 0.0020"	4.6 - 5.7 Fr
NFP021	2.30 mm	1.70 mm	0.25 +/- 0.05 mm	0.0906"	0.0669"	0.0098 +/- 0.0020"	5.5 - 6.6 Fr
NFP026	2.84 mm	2.10 mm	0.25 +/- 0.05 mm	0.1118"	0.0827"	0.0098 +/- 0.0020"	6.7 - 8.3 Fr
NFP030	3.38 mm	2.50 mm	0.25 +/- 0.05 mm	0.1331"	0.0984"	0.0098 +/- 0.0020"	7.9 - 9.9 Fr

*Junkosha is manufactured and inspected in mm and values in inch are for reference only. Measurements of each dimension are performed using metric based measuring instruments.

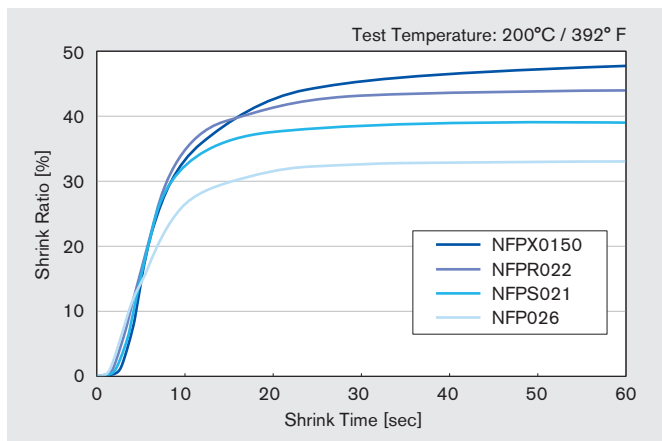
*The inch values are calculated from the actual measured values (metric values) using the following formula, with one digit below the displayed digit rounded to the nearest value (numbers 5 and above are rounded up, and numbers below 5 are rounded down). (Inch value) = (Metric value) ÷ 25.4

*Peelable Heat Shrink Tubing meets the requirement of USP Plastic Class VI. Certificates available on request.

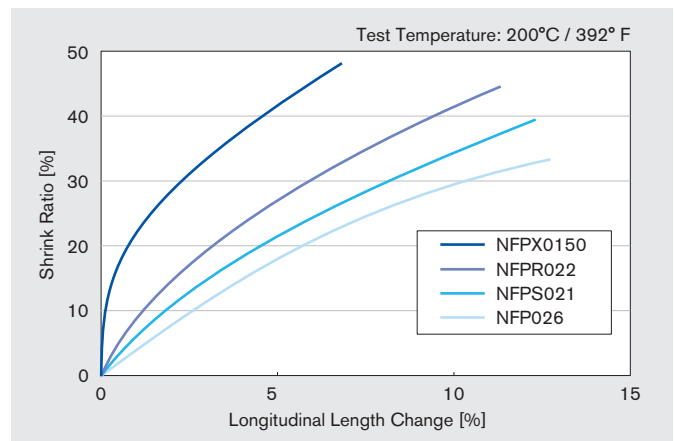
Technical Data

Properties	Unit	NFPX	NFPR	NFPM	NFPS	NFPSC	NFP
Expanded I.d.	mm in.	0.60-2.00 0.0236-0.0787	0.72-3.78 0.0283-0.1488	0.38-0.51 0.0150-0.0201	0.64-6.05 0.0252-0.2382	0.64-3.36 0.0252-0.1323	0.71-11.43 0.0280-0.450
Recovered Wall Thickness	mm in.	0.15-0.325 0.0059-0.0128	0.20-0.35 0.0078-0.0138	0.15-0.25 0.0059-0.0099	0.15-0.325 0.0059-0.0128	0.15-0.325 0.0059-0.0128	0.15-0.38 0.0059-0.0150
Specific Gravity	-	2.13	2.1	2.1	2.1	2.13	2.1
Transparency	-	Very Good	Good	Good	Good	Very Good	Good
Sterilization	-	EtO, Steam	EtO, Steam	EtO, Steam	EtO, Steam	EtO, Steam	EtO, Steam
Water Absorption	%	<0.01	<0.03	<0.03	<0.03	<0.01	<0.03
Oxygen Index	%	>65	>32	>32	>32	>65	>32
Flammability	-	V-0	V-0	V-0	V-0	V-0	V-0
Weather Resistance	-	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Chemical Resistance	-	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good
Melting Temperature	°C °F	200-275 392-527	245-275 473-527	245-275 473-527	245-275 473-527	200-275 392-527	245-275 473-527
Continuous Service Temperature	°C °F	200 392	200 392	200 392	200 392	200 392	200 392
Shrink Temperature	°C °F	60-220 140-428	60-240 140-464	60-240 140-464	60-240 140-464	60-220 140-428	60-240 140-464
Tensile Strength at Break	MPa	23-24	26-30	30-34	30-32	23-36	27-31
Elongation at Break	%	231	329	201	349	272	363
Tensile Modulus	MPa	460	422	470	387	411	362

Shrink Action of Peelable Heat Shrink Tubing



Longitudinal Length Change vs. Shrink Ratio



· These figures show a representative measurement example of shrink action from the original diameter. Values are provided for reference purposes.

Specifications and Applications

Application		GuideWire/Coils					Micro Catheter				Balloon Catheter					EP/Ablation Catheter					Guiding/Sheath				AAA/TAA/TAVI																
Catheter O.D	inch	0.008	0.012	0.016	0.020	0.024	0.028	0.031	0.035	0.039	0.043	0.047	0.051	0.055	0.059	0.063	0.067	0.071	0.075	0.079	0.083	0.087	0.091	0.094	0.098	0.102	0.106	0.110	0.114	0.118	0.122	0.126	0.130	0.134	0.138	0.142	0.157	0.315	0.315	0.315	0.450
	mm	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30	3.40	3.50	3.60	4.00	8.00	8.00	11.43	11.43
Transparent	2.0:1	NFPX										Custom																													
	1.6:1	NFPSC										Custom																													
Translucent	1.8:1	NFPR										Custom																													
	1.6:1	NFPM	NFPS										Custom																												
	1.4:1	NFP										Custom																													

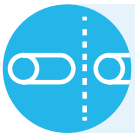
Options



Shrink ratio up to 1.8:1 for custom translucent and 2.0:1 for custom transparent. Please contact your Junkosha Sales Associate.



Inspection Sampling Plan



Cut to length and slit available for small size or short length applications



For sample requests, please contact your Junkosha Sales Associate

Patent Information for Junkosha Peelable Heat Shrink Tubing

The family of Junkosha Peelable Heat Shrink Tubing products is protected by patents or patent applications listed below. The list is not all inclusive and Junkosha Peelable Heat Shrink Tubing is covered by a global intellectual property network.

Jurisdiction	Patent Number / Patent Application Number				
China	ZL201280048315.2	ZL201510018848.1	ZL201610065436.8	CN202080026174	
Europe	EP2749802	EP3050696	EP3135313	EP20748499	
Japan	JP5518268	JP5839310	JP6990501	JP7492724	
United States	US9446171	US9623154	US9464149	US9957384	US202017427189

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