

# SUMITUBE™ F (Z)

[105°C rating, flame-retarded heat-shrinkable tubing]  
UL recognized

Catalog No. 939  RoHS directive 10 substances


 Waterproofing  Flame-retarded  UL recognized  CSA recognized



## Basic Properties

- Material : Irradiated cross-linked flexible flame-retarded polyolefin
- Shrink temperature : min. 90°C
- Shrink ratio : Radial change: min. 50%  
: Longitudinal change: min. -15%
- Continuous operating temperature : -55 to 105°C

## Features

- UL recognized  Flexible
- Flame-retarded (PBDE/PBB-free)

## Specifications/Approvals

UL224  
File No. E48762 Catalog No. SUMITUBE™ F (Z) or 939  
Rating temperature: 105°C Rating voltage: 600V  
Flammability: VW-1

Electrical Appliance and Material Safety Law (Japan)  
Flammability rating (-F-) test registration No.: F-ST53-009 - F-ST53-012

## Marking on Surface

VW-1 -F-  SUMITOMO-K SUMITUBE F (Z) CAT 939 105°C

## Applications

- Insulation, protection and reinforcement for termination and joints of electric wire
- Color identification and bundling for electric wires
- Insulation and protection of resistors and capacitors

## Properties [UL224]

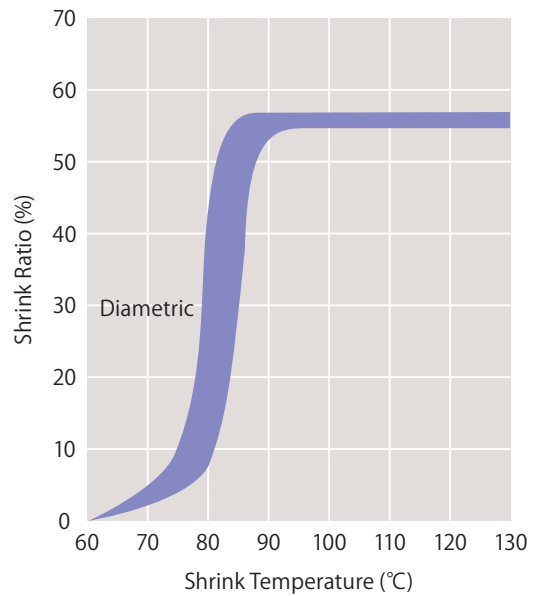
Properties	Items	Requirements	Typical values*1
Mechanical	Tensile strength (before aging)	min. 10.4MPa	12.6MPa
	Tensile strength (after aging)	136°C x 7 days, min. 7.3MPa	14.8MPa
	Elongation (before aging)	min. 200%	333%
	Elongation (after aging)	136°C x 7 days, min. 100%	358%
	Heat shock	180°C x 4 hours, no crack	Pass
Electrical	Dielectric withstand (before aging)	AC2.5kV x 60 sec., no breakdown	Pass
	Dielectric withstand (after aging)	136°C x 7 days, AC2.5kV x 60 sec., no breakdown	Pass
	Dielectric breakdown (before aging)	min. AC2.5kV	21.0kV
	Dielectric breakdown (after aging)	136°C x 7 days, min. 50% of original and min. AC2.5kV	Pass
	Volume resistivity	min. 1.0 x 10 <sup>14</sup> Ω·cm	2.7 x 10 <sup>16</sup> Ω·cm
Chemical	Corrosion against bare copper	136°C x 7 days, no corrosion after leaving under 95% humidity, 23°C x 24 hours	Pass
	Stability against copper	136°C x 7 days, elongation min. 100% after leaving under 95% humidity, 23°C x 24 hours	358%
	Flammability	Flame-retarded, pass VW-1	Pass

\*1: For reference use only

## Sizes

Trade size (mm)	After supplied (mm)		After recovered (mm)		Unit length (min.) (m)		Nominal size (mm)	As supplied (mm)		After recovered (mm)		Unit length (min.) (m)	
	Inside diameter	Wall thickness (nom.)	Inside diameter (max.)	Wall thickness (min.)	Cut	Spool		Inside diameter	Wall thickness (nom.)	Inside diameter (max.)	Wall thickness (min.)	Cut	Spool
1 × 0.2	1.30 ± 0.30	0.20	0.50	0.33	1	200	11 × 0.25	11.4 ± 0.4	0.25	5.50	0.56	1	50
1.5 × 0.2	2.00 ± 0.30	0.20	0.75	0.36	1	200	12 × 0.25	12.4 ± 0.4	0.25	6.0	0.56	1	50
2 × 0.2	2.50 ± 0.30	0.20	1.00	0.44	1	200	13 × 0.3	13.4 ± 0.4	0.30	6.5	0.69	1	50
2.5 × 0.25	3.00 ± 0.30	0.25	1.25	0.44	1	200	14 × 0.3	14.5 ± 0.4	0.30	7.0	0.69	1	50
3 × 0.25	3.50 ± 0.30	0.25	1.50	0.44	1	200	15 × 0.3	15.5 ± 0.4	0.30	7.5	0.69	1	50
3.5 × 0.25	4.00 ± 0.30	0.25	1.75	0.44	1	200	16 × 0.3	16.8 ± 0.5	0.30	8.0	0.69	1	50
4 × 0.25	4.50 ± 0.30	0.25	2.00	0.44	1	200	18 × 0.35	18.7 ± 0.5	0.35	9.0	0.77	1	50
5 × 0.25	5.40 ± 0.30	0.25	2.50	0.56	1	100	20 × 0.35	21.2 ± 0.6	0.35	10.0	0.77	1	50
6 × 0.25	6.4 ± 0.4	0.25	3.00	0.56	1	100	22 × 0.4	23.2 ± 0.6	0.40	11.0	0.77	1	50
7 × 0.25	7.4 ± 0.4	0.25	3.50	0.56	1	50	25 × 0.4	26.1 ± 0.8	0.40	12.5	0.87	1	50
8 × 0.25	8.4 ± 0.4	0.25	4.00	0.56	1	50	30 × 0.5	32.0 ± 1.0	0.50	15.0	0.87	1	50
9 × 0.25	9.4 ± 0.4	0.25	4.50	0.56	1	50	40 × 0.5	43.0 ± 1.5	0.50	20.0	0.97	1	50
10 × 0.25	10.4 ± 0.4	0.25	5.00	0.56	1	50	50 × 0.5	53.0 ± 2.0	0.50	25.0	0.97	1	50

## Shrink Properties



## Colors

- Black, Brown, Red, Orange, Yellow, Green, Blue, Purple, Gray, White

A
C
A4
LA
C (UL)
D
A2

B
LB

F (Z)
F3 (Z)
NHR2
NHR4
V (300V)
V (600V)

F2 (Z)
F4 (Z)
B2
B2 (3X)
B8

K
K2

KH200 (TW)
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KH230 (TW)
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B6
R
AN25

W
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O2C
W3C

O2B2
W3F2
W3B2
W3B2 (4X)
SA2
SA3

## IRRAX™TUBE IRRAX™TAPE

A
B
F2
F2 (UL)
V2
RP3
B8
ER2
NHR
FE2
VZL

## IRRAX™SLEEVE

SCM2
SBI 300/350
SNHM

## Composite articles

SUMISEAL
SUMITUBE SA3 CAP

## Processing equipment

SUMISHRINKER / HEATING GUN
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