

## Basic Properties

- (1) Materials : Irradiated cross-linked flexible flame-retardant polyolefin
- (2) Shrink temperature : min. 90°C
- (3) Shrink Ratio : Radial change: min. 50%  
: Longitudinal change: min. -15%
- (4) Continuous Operating Temperature : -55 to 105°C

## Features

- (1) UL224 approved
- (2) Thin wall, quick shrinkage
- (3) Flexible
- (4) Flame-retardant

## Specification/Approvals

- UL224
  - File No. E75077
  - Catalog No. Sumitube™ F3(Z) or 941
  - Rating temperature: 105°C
  - Rating voltage: 300V
  - Flammability: VW-1

Electrical Appliance and Material Safety Law (Japan)  
Flammability rating (-F-) test registration No.: F-ST3-009 - F-ST3-012

## Marking on the surface

VW-1-F-◆SUMITOMO-K SUMITUBE F3(Z) CAT 941 105°C

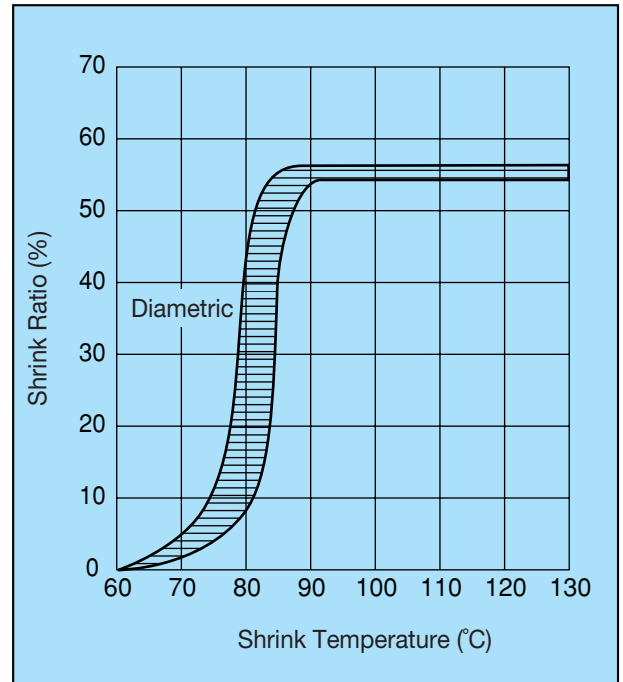
## Application

- (1) Insulation, protection and reinforcement for termination and joints of electric wire
- (2) Colour identification and bundling for electric wires
- (3) Insulation and protection for resistor and condenser

## Colours

Black, Brown, Red, Orange, Yellow, Green, Blue, Purple, Grey, White

## Shrink Property



## ■ Properties [UL224]

Properties	Items	Requirements	Typical values*1
Mechanical	Tensile strength (before aging)	min. 10.4MPa	16.0MPa
	Tensile strength (after aging)	136°C x 7 days, min. 7.3MPa	18.7MPa
	Elongation (before aging)	min. 200%	350%
	Elongation (after aging)	136°C x 7 days, min. 100%	390%
	Heat shock	250°C x 4 hours, no crack	pass
	Cold bend	-30°C x 1 hour, no crack	pass
Electrical	Voltage resistance (before aging)	AC2.5kV x 60 sec. no breakdown	pass
	Voltage resistance (after aging)	136°C x 7 days, AC2.5kV x 60 sec., no breakdown	pass
	Dielectric breakdown (before aging)	min. AC2.5kV	14.8kV
	Dielectric breakdown (after aging)	136°C x 7 days, min. 50% of original and min. AC2.5kV	pass
	Volume resistivity	min. $1.0 \times 10^{14} \Omega \cdot \text{cm}$	$3.9 \times 10^{16} \Omega \cdot \text{cm}$
Chemical	Corrosion against bare copper	136°C x 7 days, no corrosion after leaving under humidity 95%, 23°C x 24 hours	pass
	Stability against copper	136°C x 7 days, elongation min. 100% after leaving under humidity 95%, 23°C x 24 hours	335%
	Flammability	Flame-retardant, pass VW-1	pass

\*1: For reference use only

## ■ Sizes

Nominal size (mm)	Supplied ID (mm)		Recovered ID (mm)		Unit length (min.) (m)
	Inside diameter	Wall thickness (nom.)	Inside diameter (max.)	Wall thickness (min.)	
1 x 0.1	1.30 ± 0.30	0.10	0.50	0.20	200
1.5 x 0.1	1.90 ± 0.30	0.10	0.75	0.20	200
2 x 0.1	2.30 ± 0.30	0.10	1.00	0.20	200
2.5 x 0.15	2.80 ± 0.30	0.15	1.25	0.25	200
3 x 0.15	3.30 ± 0.30	0.15	1.50	0.25	200
3.5 x 0.15	3.80 ± 0.30	0.15	1.75	0.25	200
4 x 0.15	4.40 ± 0.30	0.15	2.00	0.25	200
5 x 0.15	5.50 ± 0.30	0.15	2.50	0.25	100
6 x 0.15	6.5 ± 0.4	0.15	3.00	0.28	100
7 x 0.15	7.5 ± 0.4	0.15	3.50	0.28	50
8 x 0.15	8.5 ± 0.4	0.15	4.00	0.28	50
9 x 0.15	9.5 ± 0.4	0.15	4.50	0.28	50
10 x 0.15	10.5 ± 0.5	0.15	5.00	0.28	50