Sumitube F(Z)

UL224 approved
Flame-retardant, heat-shrinkable tubing
the maximum operating temperature is 105℃

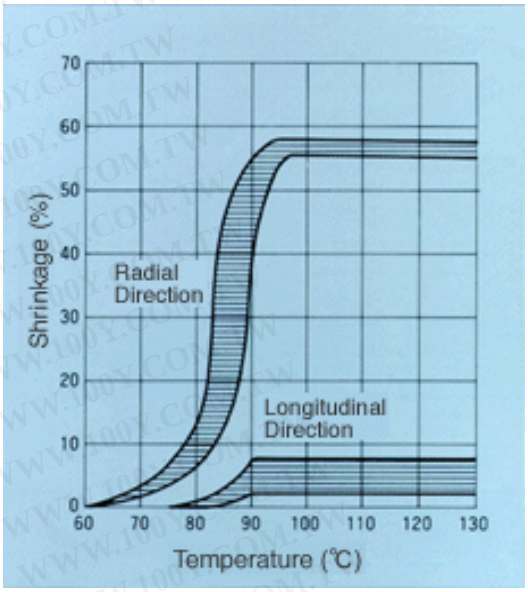
■ Basic Properties

1) Materials	: Cross-linked, flexible, flame-retardant polyolefin resin
2) Shrink temperature	: 100℃ min.
3) Shrink ratio (Radial change)	: 50% min.
4) Longitudinal change	: -15% min.
5) Continuous operating temperature	: -55 to 105℃

■ Features & Benefits

1) Compliant with UL224
2) Flexible
3) Flame-retardant
4) Free of polybrominated biphenenyl ethers(PBBEs), polybrominated biphenyl oxides(PBBOs), polybrominated biphenyls(PBBs).

■ Shrinkage-Temperature Curve



The above curve chart shows the shrink ratio in each direction. The shrink ratio in longitudinal direction should be indicated with negative sign.
(ex. 15% → -15%)

■ Specifications / Approvals

UL224

File No. : E48762
Catalogue No. : 939
Operating temperature : 105℃
Voltage rating : 600V
Flammability rating : VW-I

Electrical Appliance and Material Control Law
Optional Registration System of Compounds and Materials

Registration of flammability rating (-F-)
(Registration No. : F-STS3-009 to F-STS3-012)

■ Markings

The following letters are printed on the surface of Sumitube F(Z).
VW-I -F- ◆SUMITOMO-K SUMITUBE F(Z) CAT 939 105℃
The size will be indicated in the brackets for those tubes less than 5mm in size.

■ Applications

1) Insulation, protection and reinforcement of terminations and joints of electric wires
2) Color identification and bundling of electric wires
3) Insulation and protection of resistances and capacitors

■ Colors

Standard colors : Black, brown, red, orange, yellow, green, blue, violet, gray, and white

■ Properties [UL224]

Properties	Items	Requirements	Typical Values*
Mechanical	Tensile Strength (before aging)	10.3MPa{1.05kg/mm^2} min.	12.2MPa{1.24kg/mm^2}
	Tensile Strength (after aging)	136℃ × 7 days, 7.3MPa{0.74kg/mm^2} min.	12.5MPa{1.28kg/mm^2}
	Ultimate Elongation (before aging)	200% min.	330%
	Ultimate Elongation (after aging)	136℃ × 7 days, 100% min.	320%
	Flexibility	136℃ × 7 days, No cracking	Pass
	Heat Shock	250℃ × 4 hours, No cracking	Pass
	Cold Bend	-30℃ × 1 hour, No cracking	Pass
Electrical	Dielectric Voltage Withstand (before aging)	AC2.5kV × 60sec. No breakdown	Pass
	Dielectric Voltage Withstand (after aging)	136℃ × 7 days, AC2.5kV × 60sec. No breakdown	Pass
	Dielectric Voltage Breakdown (before aging)	AC2.5kV min.	24.2kV
	Dielectric Voltage Breakdown (after aging)	136℃ × 7 days, Percent of original 50%, and AC2.5kV min.	Pass
	Volume Resistivity	10^{14}Ω · cm min.	4.5×10^{15}Ω · cm
Chemical	Copper Corrosion	After leaving for 24hours at humidity 95% and temperature 23℃	
		136℃ × 7 days, No corrosion	Pass
	Copper Stability	After leaving for 24hours at humidity 95% and temperature 23℃,	
		136℃ × 7 days, Elongation 100% min.	290%
	Flammability	Flame-retardant, Pass VW-I	Pass

■ Sizes

Inch Sizes

Nominal Size (inch)	As Supplied (mm)		After Full Recovery (mm)		Unit Length (min.)(m)	
	Inside Diameter	Wall Thickness (nom.)	Inside Diameter (max.)	Wall Thickness (min.)	Cut	Spool
3/64	1.60±0.30	0.20	0.60	0.33	1	305
1/16	2.00±0.30	0.20	0.80	0.36	1	305
3/32	2.70±0.30	0.25	1.20	0.44	1	152.5
1/8	3.50±0.30	0.25	1.60	0.44	1	152.5
3/16	5.20±0.30	0.25	2.40	0.44	1	61
1/4	6.8 ±0.4	0.30	3.20	0.56	1	61
3/8	10.0±0.4	0.30	4.80	0.56	1	61
1/2	13.2±0.5	0.30	6.4	0.56	1	61
3/4	20.0±0.6	0.35	9.5	0.69	1	61
1	26.6±0.8	0.40	12.7	0.77	1	61

Top

Mili Sizes

Nominal Size (mm)	As Supplied (mm)		After Full Recovery (mm)		Unit Length (min.)(m)	
	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
1.5 × 0.2	2.00±0.30	0.20	0.75	0.36	1	200
2 × 0.2	2.50±0.30	0.20	1.00	0.44	1	200
2.5 × 0.25	3.00±0.30	0.25	1.25	0.44	1	200
3 × 0.25	3.50±0.30	0.25	1.50	0.44	1	200
3.5 × 0.25	4.00±0.30	0.25	1.75	0.44	1	200
4 × 0.25	4.50±0.30	0.25	2.00	0.44	1	200
5 × 0.25	5.40±0.30	0.25	2.50	0.56	1	100
6 × 0.25	6.4±0.4	0.25	3.00	0.56	1	100
7 × 0.25	7.4±0.4	0.25	3.50	0.56	1	50
8 × 0.25	8.4±0.4	0.25	4.00	0.56	1	50
9 × 0.25	9.4±0.4	0.25	4.50	0.56	1	50
10 × 0.25	10.4±0.4	0.25	5.00	0.56	1	50
11 × 0.25	11.4±0.4	0.25	5.50	0.56	1	50
12 × 0.25	12.4±0.4	0.25	6.0	0.56	1	50
13 × 0.3	13.5±0.4	0.30	6.5	0.69	1	50

14 × 0.3	14.5±0.4	0.30	7.0	0.69	1	50
15 × 0.3	15.5±0.4	0.30	7.5	0.69	1	50
16 × 0.3	16.8±0.5	0.30	8.0	0.69	1	50
18 × 0.35	18.7±0.5	0.35	9.0	0.77	1	50
20 × 0.35	21.2±0.6	0.35	10.0	0.77	1	50
22 × 0.4	23.2±0.6	0.40	11.0	0.77	1	50
25 × 0.4	26.1±0.8	0.40	12.5	0.87	1	50
30 × 0.5	32.0±1.0	0.50	15.0	0.87	1	50
40 × 0.5	43.0±1.5	0.50	20.0	0.97	1	50
50 × 0.5	53.0±2.0	0.50	25.0	0.97	1	50

▲ Caution!

All statements and technical information contained herein are based on tests we believe to be liable and only general properties are described. Therefore, safety of each specific application by the users should not be guaranteed. The users themselves should determine product conformance to your specific applications and assume all responsibility for all damages that may be caused directly or indirectly when using the products.