

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) Flexible
- (3) Flame-retardant

Specification/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-STS3-009 - F-STS3-012

Marking on the surface

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

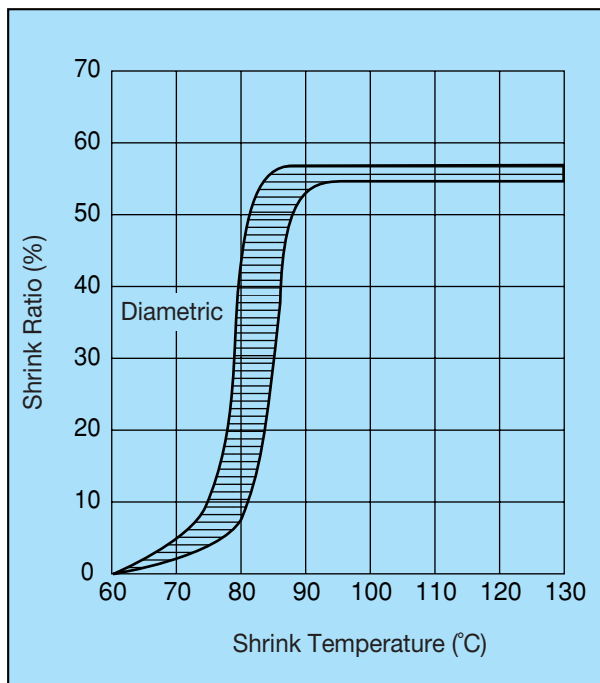
Black, Brown, Red, Orange, Yellow, Green, Blue, Purple, Grey, White

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 | 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 | 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 ¹⁶ Ω·cm | 2.7 x 10 ¹⁶ Ω·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 | 358% |
| | Flammability | Flame-retardant, pass VW-1 | pass |

*1: For reference use only

Shrink Property



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