

The Specifications of 135°C Environment Friendly Flame-retardant Heat Shrinkable Tube RSFR-135G

SHENZHEN WOER HEAT SHRINKABLE MATERIAL CO., LTD

1 CONTENTS AND APPLICATIONS

This specification defines technical requirement, testing method, testing rules of 135°C Environment Friendly Flame-retardant Heat Shrinkable Tube RSFR-135G.

This specification is applied to wire connection, electrical protection, identification, insulation of temperature sensors, high temperature motors in automobiles, ships, or aircrafts.

2 STANDARDS

Standard for Extruded Electrical Tubing UL 224 135°C and AMS-DTL-23053/5 the CLASS 1.

3 TERMS

3.1 Heat-shrinkable material

Radiate the tubes to make it cross-linked, heat and expand it.

3.2 Heat-shrinkable tubing

Extrude the tubes to the required size, radiate it to make it cross-linked, then expand and cool the tubes.

4 TECHNICAL REQUIREMENTS

4.1 CONDITIONS

4.1.1 Temperature ranges: -55°C~135°C。

4.1.2 Products meet UL224, Flame-Retardant.

4.1.3 Environment properties meet RoHS.

4.1.4 Products are soft compared with PE tubing.

4.1.5 Products can be used under acid and alkali.

4.1.6 Products can be used under strict environment.

4.2 appearance

4.2.1 No cracking in appearance.

4.2.2 Smooth, no oil or duty in appearance.

4.2.3 Printing clear.

4.3 Heat shrinking property

4.3.1 Start shrinking temperature 70°C; minimum complete shrin temperature 120°C for normal wall tubes.

4.3.2 Longitude of shrinking: less than $\pm 5\%$

4.4 Physical and Chemical Property

Refer to table 1.

4.5 Specification

Refer to table 2 and table 3.

4.6 Color

Black or other color according to requirement.

TABLE 1 PROPERTY

ITEM	TESTING	REQUIREMENT	TESTING METHOD
Tensile strength /MPa	ASTM D638	≥ 10.4	Standard for Extruded Electrical Tubing UL 224 135°C and AMS-DTL-23053/5 the CLASS 1.
Elongation at Break/%	ASTM D638	≥ 200	
Longitudinal shrinkage	UL224	$\leq \pm 5\%$	
Dielectric Strength/KV/mm	ASTM D150	≥ 15	
Volume resistance/ $\Omega \cdot \text{cm}$	ASTM D876	$\geq 1 \times 10^{14}$	
Copper stability/%	UL224	No corrosion	
Water absorption/%	ASTM D570	≤ 0.5	

TABLE 2 135°C Environment Friendly Flame-retardant Heat Shrinkable Tube RSFR-135G(2:1)

Size (mm)	As Supplied I.D. (mm)		After Supplied (mm)		After Recovered Average W. T (mm)	Standard Package (mm)
	I. D	W. T	I. D	W. T		
$\Phi 0.8$	1.1 ± 0.2	0.15 ± 0.05	≤ 0.50	0.22 ± 0.10	200	0.6~0.8
$\Phi 1.0$	1.5 ± 0.2	0.15 ± 0.05	≤ 0.65	0.28 ± 0.10	200	0.75~0.9
$\Phi 1.5$	2.0 ± 0.2	0.18 ± 0.05	≤ 0.85	0.32 ± 0.10	200	0.95~1.4
$\Phi 2.0$	2.5 ± 0.2	0.18 ± 0.05	≤ 1.00	0.35 ± 0.10	200	1.1~1.8
$\Phi 2.5$	3.0 ± 0.2	0.18 ± 0.05	≤ 1.30	0.38 ± 0.10	200	1.4~2.3
$\Phi 3.0$	3.5 ± 0.2	0.18 ± 0.05	≤ 1.50	0.40 ± 0.10	200	1.6~2.7
$\Phi 3.5$	4.0 ± 0.2	0.22 ± 0.05	≤ 1.80	0.42 ± 0.10	200	1.9~3.2
$\Phi 4.0$	4.5 ± 0.2	0.25 ± 0.05	≤ 2.00	0.45 ± 0.10	200	2.1~3.6
$\Phi 4.5$	5.0 ± 0.2	0.25 ± 0.05	≤ 2.30	0.50 ± 0.10	100	2.4~4.0
$\Phi 5.0$	5.5 ± 0.2	0.25 ± 0.05	≤ 2.50	0.55 ± 0.10	100	2.6~4.5
$\Phi 6.0$	6.5 ± 0.2	0.28 ± 0.05	≤ 3.00	0.55 ± 0.10	100	3.1~5.4
$\Phi 7.0$	7.5 ± 0.3	0.28 ± 0.05	≤ 3.50	0.55 ± 0.10	100	3.7~6.3
$\Phi 8.0$	8.5 ± 0.3	0.28 ± 0.05	≤ 4.00	0.60 ± 0.10	100	4.2~7.2
$\Phi 9.0$	9.5 ± 0.3	0.30 ± 0.08	≤ 4.50	0.60 ± 0.10	100	4.7~8.0
$\Phi 10$	10.5 ± 0.3	0.30 ± 0.08	≤ 5.00	0.60 ± 0.10	100	5.2~9.0

Size (mm)	As Supplied I. D. (mm)		After Supplied (mm)		After Recovered Average W. T(mm)	Standard Package (mm)
	I. D	W. T	I. D	W. T		
Φ11	11.5±0.3	0.30±0.08	≤5.50	0.60±0.10	100	5.7~10
Φ12	12.5±0.3	0.30±0.08	≤6.00	0.60±0.10	100	6.2~11
Φ13	13.5±0.3	0.35±0.10	≤6.50	0.65±0.10	100	6.7~12
Φ14	14.5±0.3	0.35±0.10	≤7.00	0.65±0.10	100	7.3~13
Φ15	15.5±0.4	0.40±0.12	≤7.50	0.70±0.10	100	7.8~14
Φ16	16.5±0.4	0.40±0.12	≤8.00	0.70±0.10	100	8.3~15
Φ17	17.5±0.4	0.40±0.12	≤8.50	0.70±0.10	100	8.8~16
Φ18	19.0±0.5	0.40±0.15	≤9.00	0.80±0.15	100	9.3~17
Φ20	22.0±0.5	0.40±0.15	≤10.00	0.80±0.15	100	10.4~19
Φ22	24.0±0.5	0.40±0.15	≤11.00	0.80±0.15	100	11.4~21
Φ25	26.0±0.5	0.50±0.15	≤12.50	0.90±0.15	50	12.8~24
Φ28	29.0±0.5	0.50±0.15	≤14.00	0.90±0.15	50	14.4~27
Φ30	31.5±1.0	0.50±0.15	≤15.00	0.95±0.15	50	16~29
Φ35	36.5±1.0	0.50±0.15	≤17.50	1.00±0.15	50	18~34
Φ40	41.5±1.0	0.55±0.15	≤20.00	1.00±0.15	50	21~39
Φ45	46.5±1.0	0.55±0.15	≤22.50	1.00±0.15	25	23~44
Φ50	≥50	0.55±0.15	≤25.00	1.00±0.15	25	26~49
Φ60	≥60	0.60±0.15	≤31.0	1.30±0.20	25	35~55
Φ70	≥70	0.65±0.15	≤36.0	1.30±0.20	25	40~65
Φ80	≥80	0.65±0.15	≤41.0	1.46±0.20	25	45~75
Φ90	≥90	0.65±0.15	≤46.0	1.46±0.20	25	50~85
Φ100	≥100	0.65±0.15	≤51.0	1.46±0.20	25	55~95

TABLE 2 135°C Environment Friendly Flame-retardant Heat Shrinkable Tube RSFR-135G(3:1)

Size (mm)	AS Supplied (mm)	After Recovered (mm)		Standard Package
	I. D	I. D	W. T. (mm)	
1.5/0.5	>1.5	< 0.5	0.45±0.1	200
3.0/1.0	>3.0	< 1.0	0.55±0.1	200
4.5/1.5	>4.5	< 1.5	0.60±0.1	100
6.0/2.0	>6.0	< 2.0	0.65±0.1	100

Size (mm)	AS Supplied (mm)		After Recovered (mm)		Standard Package
	I. D		I. D	W. T. (mm)	
9.0/3.0	>9.0		< 3.0	0.75±0.15	50
12.0/4.0	>12.0		< 4.0	0.75±0.15	50
15.0/5.0	>15.0		< 5.0	0.80±0.15	50
18.0/6.0	>18.0		< 6.0	0.85±0.15	50
24.0/8.0	>24.0		< 8.0	1.00±0.20	25
30.0/10.0	>30.0		< 10.0	1.15±0.20	25
39.0/13.0	>39		< 13	1.50±0.20	25
50/16	>50		< 16	2.50±0.20	1m
60/20	60		< 20	2.60±0.20	1m
70/23	>70		< 23	2.60±0.20	1m
80/26	>80		< 26	2.60±0.20	1m
90/30	>90		< 30	2.60±0.20	1m
100/33	>100		< 33	2.60±0.20	1m

4.7 Shrink Method

You can use the oven and keep the temperature at 200°C for 3 minutes.

4.8 Environment

Environment property refer to Table 4.

TALBE 4 PROPERTY

Harmful Materials	Content	Test Method
Cr (VI)	≤1000ppm	EPA3052
Pb	≤1000ppm	EPA3050B
Hg	≤1000ppm	EPA3052
Cd	≤100ppm	EN1122: 2001B
PBBS	≤1000ppm	EPA3540C、EPA3550C
PBDES	≤1000ppm	EPA3540C、EPA3550C

SHENZHEN WOER HEAT SHRINKABLE MATERIAL CO., LTD

Quality System

Sep. 1, 2011