



A CRH COMPANY

***Hongshang***

SPECIFICATIONS

FOR

**Heat shrinkable cable repair sleeve**

**HRSL**

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## 1 Aim and Scope

### 1.1 Aim

This specification is a controlled file used for describing the products customer ordered. It's applicable in the following department also:

R&D Department: Major for product design and development

Technology Department: Major for preparing production directives

Quality control Department: Major for quality control

Purchasing Department: Major for external materials purchasing

### 1.2 Scope

This specification can be used for the production and quality control of HRSL. It described the product specifications, dimension, requirements and the standards followed.

### 1.3 Product type

HRSL is a heat shrinkable wrap around sleeve that is used for repairing damaged cable over sheaths on various types of cables. Provides excellent corrosion protection, abrasion, UV and weather resistance makes it also ideal for LV cable joint outer protection.

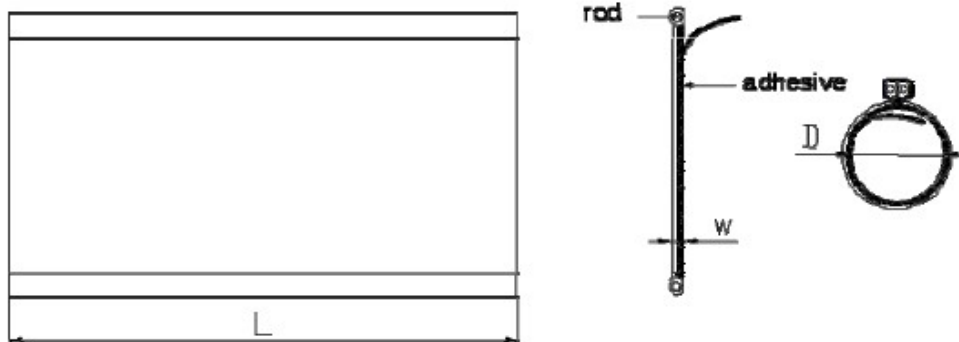
## 2 Standards

This specification takes precedence over documents referenced herein. Unless otherwise specified, the latest issue of referenced documents applies. The following documents form a part of this specification to the extent specified herein.

ASTM D 2671	Standard Test Method for Heat Shrinkable Tubing
IEC 243	Electric strength of insulating materials - Test methods
IEC 93	Methods of test for the determination of the insulation resistance of solid insulating material
ISO 62	Plastics-Determination of water absorption
ISO 37	Rubber, vulcanized or thermoplastic -- Determination of tensile stress-strain properties
ISO 1183	Plastics -- Methods for determining the density of non-cellular plastics
ISO 868	Plastics and ebonite -- Determination of indentation hardness by means of a durometer (Shore hardness)
ISO 188	Rubber, vulcanized or thermoplastic - Accelerated ageing and heat resistance tests
ISO 1817	Rubber, vulcanized or thermoplastic -- Determination of the effect of liquids
ASTM G 21	Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

## 3 Technical specifications

### 3.1 Dimensions



Type	Size			Cable's Section Area (mm <sup>2</sup> )
	D/mm	Diameter after Being Shrunk	Length (mm)/L	
HRSL 36/10	36	10	500,1000	12~20
HRSL 50/15	50	15	500,1000	15~40
HRSL 80/25	80	25	500,1000	25~70
HRSL 100/30	100	30	500,1000	30~90
HRSL 135/35	135	35	500,1000	38~120

### 3.2 Basic requirements

HRSL cable repair sleeve is made from radiation crosslinked polyolefin. Specifically designed formulation makes the tubing to have outstanding physical, chemical and electrical properties, and also meet the requirement of RoHS and other environment concerned standards. The tubing shall be homogeneous and essentially free from flaws, defects, pinholes, bubbles, seams, cracks and inclusions.

### 3.3 Technical requirements

Properties		Test Method	Typical Data
Tensile Strength		ISO 37	17 MPa min.
Ultimate Elongation		ISO 37	350% min.
Density		ISO 1183 Method A	1.0 – 1.2 g/cm <sup>3</sup>
Hardness		ISO 868	50 – 70 D
Accelerated Aging	7 days at 150°C±2°C	ISO 188	
	Tensile Strength	ISO 37	14 MPa min.
	Ultimate Elongation	ISO 37	300% min.
Thermal Endurance		IEC 60216	120°C
Low Temperature Flexibility	4 hours at -40°C±3°C	ASTM D2671 Procedure C	No cracking
Dielectric Strength		IEC 60243	1 mm 180kV/cm min.
			3.5 mm 120kV/cm min.
Volume Resistivity		IEC 60093	1 x 10 <sup>12</sup> Ω cm min.
Dielectric Constant		IEC 60250	5 max.
Water Absorption	14 days at 23°C±2°C	ISO 62 Method	0.5% max.
Resistance to Liquids	7 days in transformer oil at 23°C±2°C (VDE 0370)	ISO 1817	
	Tensile Strength	ISO 37	14 MPa min.
	Ultimate Elongation	ISO 37	300% min.
Resistance to Fungi		ASTM G21	Pass Rating 1

### 3.4 Shelf Life and Storage

HRSL has a over 5 year's shelf life from date of manufacture when stored in a humidity controlled storage (-10 °C to 40 °C and <75% relative humidity).

## 4 Environmental protection requirements

HRSL has to meet the latest RoHS and REACH requirements.

### Test Method

The environment test of the sample would be tested according to RoHS (Restriction of Hazardous Substances)

### Test Machine

Thermo Scientific NITON XL3t XRF Analyzer

### Test condition

Test temperature:  $23 \pm 3^{\circ}\text{C}$

### Test Results

Element	Content
Cd	<LOD*
Pb	<LOD
Br	<LOD
Hg	<LOD
Cr	<LOD

\*LOD: Limit of Detection (5ppm)

### Conclusions

HRSL is RoHS and REACH compliant.