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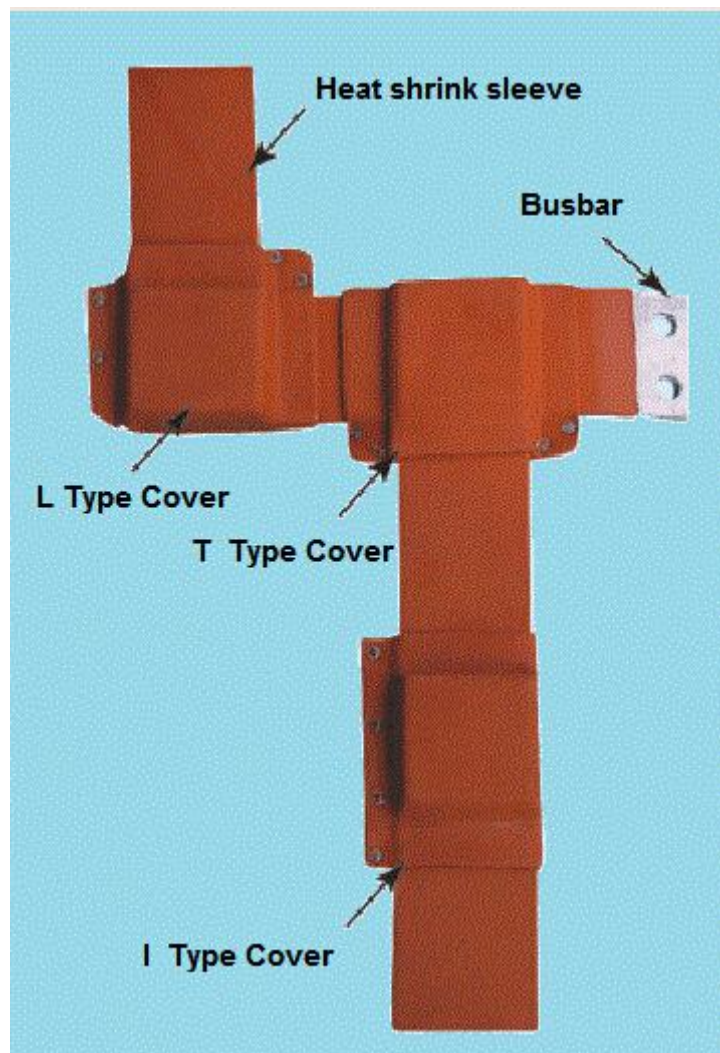
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SPECIFICATIONS

FOR

Halogen Free Busbar Insulation Heat Shrinkable Tubing

HFB (voltage 11KV)



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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 HFB. It described the product specifications, dimension, requirements and the standards followed.

1.3 Product type

The product described in this specification is Halogen Free Busbar Insulation Heat Shrinkable Tubing with type model of: HFB

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.

IEC-60684-2 Flexible insulating sleeving - Part 2: Methods of test

ASTM D 2671 Standard Test Method for Heat Shrinkable Tubing for Electrical Use

ASTM D 495 Standard Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation

ASTM D 149 Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies.

NES 711 Determination of the Smoke Index of the Products of Combustion from Small Specimens of Materials

ISO 4589 Plastics-Determination of burning behavior by oxygen index

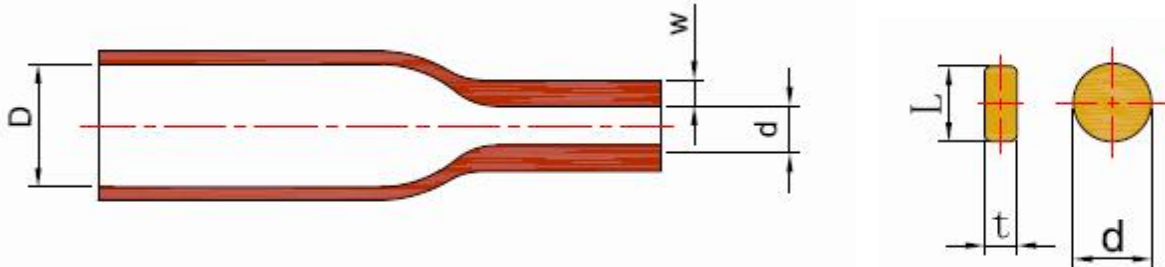
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3 Technical specifications

Normal size (mm)	As supplied (mm) Inside Diameter D(Min)	After recovered(mm)		Dimensions		Standard length*
		Inside Diameter d(Max)	Wall Thickness w(Min)	L+t	d	
HFB Φ15/6	15	6	1.60	12...18	6,5...12	30m/spool
HFB Φ25/10	25	10	1.60	15...25	10...18	30m/spool
HFB Φ30/12	30	12	1.60	22...38	13,5...25	20m/spool
HFB Φ40/16	40	16	1.60	28...45	20...30	20m/spool
HFB Φ50/20	50	20	1.60	36..51	22..43	20m/spool
HFB Φ65/25	65	25	1.60	45...65	35...50	20m/spool
HFB Φ75/30	75	30	1.60	55..76	33..58	20m/spool
HFB Φ100/40	100	40	1.60	70..102	44..74	20m/spool
HFB Φ120/50	120	50	1.60	90..143	55..102	20m/spool
HFB Φ150/60	150	60	1.60	105..180	70...120	20m/spool
HFB Φ180/75	180	75	2.50	125..210	80...150	1.0-1.5m
HFB Φ205/85	205	80	2.50	140...260	95...170	1.0-1.5m

* Other cut lengths are available

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3.2 Basic requirements

HFB is made from radiation crosslinked halogen free compounds. Specially designed formulation makes the tubing to have excellent electrical, shrinking and anti-tracking properties. The tubing is suitable for application in insulating voltage busbar up to 15KV. The tubing shall be homogeneous and essentially free from flaws, defects, pinholes, bubbles, seams, cracks and inclusions.

3.3 Technical requirements

Property	Unit	Test Method	Requirement			Typical Value		
Shrinking properties								
Longitudinal Changes	%	ASTM D 2671	0 to-10%			-5%		
Physical properties								
Tensile strength As such After shrunk	MPa	ASTM D 2671	Min10MPa.			17.8 14.2		
Elongation at break As such After shrunk	%	ASTM D 2671	Min300%			607 585		
Heat aging(120℃ 168 h) Tensile strength Elongation at break	Mpa %	ASTM D 2671	Remain 70% Min100%			14.0 574		
Heat shock 250℃ / 30min		ASTM D 2671	No cracking, flowing, dropping			No cracking, flowing, dropping		
Low temperature properties (-40℃ / 4hrs)		ASTM D 2671	No cracking			No cracking		
Electrical properties								
Arc resistance	Sec	ASTM D 495				Central: 132.6 Minimum:125.3		
Dielectrical strength	kV/mm .min	ASTM D 149	3mm	2.5mm	2mm	3mm	2.5m m	2mm
			12	15	18	14	16	18
Chemical properties								
Water absorption 24hrs immersed in water(25℃)	%	IEC 60684-2	Max 1%			0.3		
Density	g/cm ³	IEC 60684-2				1.3		
Corrosion resistance test In contact with copper at 120℃ for 168 h		UL 224	No corrosion			No corrosion		
Flammability		ISO 4589	≥25			26		
Fluid resistance		MIL-DTL-23053/4	Pass			Pass		

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4 Environmental protection requirements

The tubing 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	Unit	Content
Cd	ppm	<LOD
Pb	ppm	<LOD
Br	ppm	35.96
Hg	ppm	<LOD
Cr	ppm	<LOD