



PRODUCT STANDARD
TME DIVISION, BHOPAL

TM 10412

Rev 01

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TME/2011

**Specification for Non Adhesive Polyimide film tape for Traction Motor type
6FRA6068 & 6FXA7059**

1. General :

1.1 Scope :

This specification covers the manufacture and supply of Polyimide Foil used in 3-Phase Traction Motor type 6FRA6068 & 6FXA7059. Polyimide Foil is used as stator slot liner. The mechanical properties, electrical properties and all other listed requirement of the material should comply with specification and should adhere specification of Polyimide foil.

1.2 Reference

In the preparation of this specification assistance has been taken from CLW specification 4TMS.096.092 & 4TMS.096.029 and ABB spec HZN 02575.

2.0 Constructional Requirements

The material is to be made of aromatic polyimide foil.

3.0 Source of Raw Material/Approved Grades :

3.1 Items shall be manufactured from aromatic polyimide film of following grades

- i) Polyimide film HN type of M/s DuPont/USA/Japan
- ii) Polyimide film AV type of M/s Kaneka North America LLC/USA

3.2 The supplier shall furnish copies of original current (recent) invoices of procurement along with TC of polyimide film along with the supply.

4.0 Size:

Thickness , Width & roll length as mentioned in BHEL enquiry.

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(Signature)
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(S.P.Singh)

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TME

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Prepared:

(Signature)
10/07/2021
(Prasad Telang)

Checked:

(Signature)
10/07/21
(Vikas Rawtiya)

Date:

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5.0 Requirements:

S. No.	Description	Unit	Values		Test method
1	Thickness	mm	0.125 ± 0.010	0.0508 ± 0.004	ASTM D 374
2	Width	mm	As mentioned in BHEL enquiry (± 5%)		
3	Mass per unit area	g/mm ²	180 ± 15	72 ± 5	DIN 53352
4	Tensile strength at 23°C.	N/mm ²	>160	>160	ISO 1184
5	Elongation at rupture at 23°C.	%	> 50	> 45	ISO 1184
6	Dielectric strength at 23°C.	kV/m m	> 120	> 197	IEC 60243 (= DIN53481)
7	Shrinkage after 30 min. at 300°C.	%	≤ 0.5	-	DIN 40634 page-1 Section 2.9.3
8	Shrinkage % MD & TD at 400° C max.	%	-	≤ 2.5	

6.0 Tests


6.1 All the test specified in the specification shall be carried out preferably at manufacturers works. The manufacturer shall arrange all necessary machines, apparatus, labour and assistance required for conducting the tests without extra cost. If any testing is not available at firms premise, the test has to be done from any Government approved NABL lab at firms own cost.

6.2 Inspecting authority must check tractability like challan/ invoice of incorporated raw material. Quality of raw material consumed against PO under inspection must be endorsed under challan/ invoice.

6.3 The firm must produce original TC, WC & imported document etc. to the inspection authority. TC should not be older more than one year at the time of inspection.

6.4 The manufacturer shall provide all the necessary facilities at their works / premises for prototype as well as Routine inspection.

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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company		<p>7.0 Marking:</p> <p>Each roll shall be legibly marked at both ends with the following information :-</p> <p>(a) Manufacture's name or trademark. (b) Purchase order reference and date. (c) Name, size, quality, batch no. of mfg. and date of expiry.</p> <p>8.0 Packing :</p> <p>The material shall be supplied in suitable packing as per instruction provided in the enquiry otherwise packing shall be in 50 meter roll wound on hard tubular core/spools with an inside diameter of 76 mm and outside diameter of the roll 152 mm and also sufficient tension to form a compact roll without deforming the construction of the tape. Each roll of the material shall be suitably packed so that no damage can arise during transportation and it can be unloaded easily.</p> <p style="text-align: center;">*****</p>	