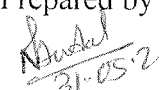
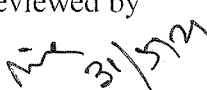



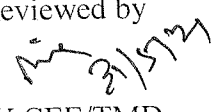
**SPECIFICATION**  
**FOR**  
**'POLYIMIDE FOIL'**  
**OF**  
**3-PHASE TRACTION MOTOR**  
**TYPE 6FRA-6068 & 6FXA-7059**

Approved by

CEE/TM

SPECIFICATION FOR 'POLYIMIDE FOIL' FOR 3- PHASE TRACTION MOTOR .	CHITTARANJAN LOCOMOTIVE WORKS, WEST BENGAL, INDIA NO.: 4TMS.096.092      DATE: 31/05/2021	Page 1 of 5
Prepared by  31-05-21 SSE/TMDO	Reviewed by  31/5/21 DY.CEE/TMD	

ALT NO.	AUTHORITY	DESCRIPTION	INITIAL	DATE

SPECIFICATION FOR 'POLYIMIDE FOIL' FOR 3- PHASE TRACTION MOTOR .		CHITTARANJAN LOCOMOTIVE WORKS, WEST BENGAL, INDIA NO.: 4TMS.096.092		DATE: 31/05/2021	Page 2 of 5
Prepared by  SSE/TMDO			Reviewed by  DY.CEE/TMD		

## **General:**

### **1.1 Scope :**

This specification covers the manufacture and supply of 'Polyimide Foil' used in 3-Phase Traction Motor type 6 FRA 6068 & 6FXA 7059.

Polyimide Foil is used as stator slot liner. The mechanical properties, electrical properties and all other listed requirement of the material should comply with this specification and should adhere specification of Polyimide foil.

### **1.2 Reference:**

In the preparation of this specification assistance has been taken from ABB Delivery Instruction HZN 02575

### **2.0 Constructional Requirements:**

The material is to be made of aromatic polyimide foil.

### **3.0 Source of Raw Material:**

3.1 Items as per para-5.0 shall be manufactured from aromatic polyimide film of following grades:

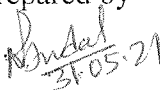
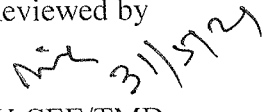
- i) Polyimide film HN type of M/s Dupont/USA/Japan.
- ii) Polyimide film AV type of M/s Kaneka North America LLC/USA.

3.2 Firm (manufacturers of items as per para-5.0 below) shall offer raw material to the authorized inspection authority to verify the use of correct grade of insulating film having sourced from specified polyimide film manufacturer only, before commencing prototype/bulk manufacture. The supplier shall furnish copies of original current (recent) invoices of procurement along with TC of polyimide film manufacturer to the Inspecting Authority.

### **4.0 QAP:**

The tenderer shall submit the process of manufacturing in the form of QAP Which includes quality plan from the stage of raw material procurement, through in process and final tests. The tenderer must submit their QAP along with tender.

After getting order, QAP shall be duly approved by the competent authority before going for prototype inspection.

SPECIFICATION FOR 'POLYIMIDE FOIL' FOR 3- PHASE TRACTION MOTOR .	CHITTARANJAN LOCOMOTIVE WORKS, WEST BENGAL, INDIA NO.: 4TMS.096.092	DATE: 31/05/2021	Page 3 of 5
Prepared by  31.05.21 SSE/TMDO	Reviewed by  31/5/21 DY.CEE/TMD		

## 5.0 Size:

Thickness-0.125 mm x width 510 mm (in continuous roll of 50 m).

## 6.0 Requirements:

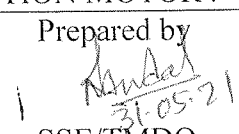
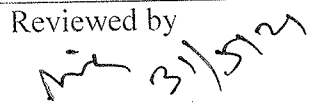
### 6.1 Properties

Size & Term	Unit	Values	Test Method
Thickness	mm	0.125 ± 0.010	ASTM D 374
Width	mm	510 ± 5%	
Mass per unit area	g/m <sup>2</sup>	180 ± 15	DIN 53352
Tensile Strength at 23 <sup>0</sup> C	N/mm <sup>2</sup>	> 160	ISO 1184
Elongation at rupture at 23 <sup>0</sup> C	%	> 50	ISO 1184
Dielectric Strength at 23 <sup>0</sup> C	kV/mm	> 120	IEC 243 (= DIN 53481, VSM 77107)
Shrinkage after 30minute at 300 <sup>0</sup> C	%	≤ 0.5	DIN 40634 page-1 section 2.9.3
Core inside diameter	mm	76	Vernier Caliper
Outside diameter of roll	mm	152	Vernier Caliper

## 7.0 TEST:

7.1 All the test specified in the specification shall be carried out preferably at manufacturer's works. The manufacturer shall arrange all the necessary machinery, apparatus, labour and assistance required for conducting the tests without Extra cost. If any testing facility is not available at firm's premises , the test has to be done from any Govt. approved NABL lab at own (Firm's) cost.

7.2 Inspection authority must check traceability like original Challan/invoice of imported raw material. Quantity of Raw material consumed against P.O under Inspection must be endorsed under Challan/Invoice.

SPECIFICATION FOR 'POLYIMIDE FOIL' FOR 3- PHASE TRACTION MOTOR .	CHITTARANJAN LOCOMOTIVE WORKS, WEST BENGAL, INDIA NO.: 4TMS.096.092	DATE: 31/05/2021	Page 4 of 5
Prepared by  SSE/TMDO	Reviewed by  DY.CEE/TMD		

7.3 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.

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

#### 8.0 **Bulk Manufacture:**

8.1 Only after clear written approval of the results of the tests on the prototype is communicated by the Dy. CEE/TMD, to the manufacture, the firm shall take-up bulk manufacture of the Polyimide Foil which shall be strictly with the same material and process as adopted for the prototype.

8.2 Any testing and approval by the purchaser of the design, drawing and prototype shall in no way absolve the supplier of his responsibilities under the terms and Conditions of the contract.

#### 9. **Marking:**

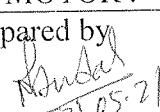
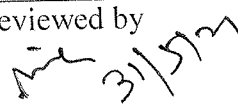
Each roll shall be legibly marked at both ends with the following information:-

- (a) Manufacture's name or trademark.
- (b) Purchase order reference and date.
- (c) Name, size, Quality, batch no. of mfg. and date of expiry

#### 10. **Packing :**

The material shall be supplied in 50 m roll wound on a 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.

-: SHEET END :-

SPECIFICATION FOR 'POLYIMIDE FOIL' FOR 3- PHASE TRACTION MOTOR .	CHITTARANJAN LOCOMOTIVE WORKS, WEST BENGAL, INDIA NO.: 4TMS.096.092	DATE: 31/05/2021	Page 5 of 5
Prepared by  31.05.21 SSE/TMDO	Reviewed by  31/5/21 DY.CEE/TMD		