

BP 4256 	BHARAT HEAVY ELECTRICALS LIMITED BHOPAL Amendment Indent FOR RATE CONTRACT												INDENT		BUY SEC	ORG DATE IF AMD
	NO 820562412		DATE 01/10/26		51		01/10/26									

CA TY	REV CD	REV NO	ST	EMR	EDU	PEN	DEV	IMP	R & D	TRIAL	NO OF CA TY2	NO OF CA TY3	ORIG EST VALUE IF AMD		Job Type	
TOTAL ESTIMATED				ATTESTED/CONTROLLED			CH. TO DEPTT						VALUE		CODE	
VALUE			CODE													
1	3	1	N	N	N	N	N	N	N	N	1	5	*****		E	
*****			E	NA			205	TC MOU		N	TC MOU REF		Tool req		N	

ENQUIRY											
GC	TEST CERTI	INSP BOOKLET	SAMPLE	ORG GATE PASS	DRAWING	CATA LOGUE	PURCHASE SPEC	QS PLAN	REPEAT FLAG	TWO PART	IMPORT TYPE
Y	Y	N	N	Y	N	N	Y	N	N	Y	

ENQUIRY TECHNICAL TERM : AS PER PI

SUPPLIER TECHNICAL TERM : IDENTIFICATION MUST

INSPECTION TERMS : AT BHEL BHOPAL

CA TY	REV CD	ITEM NO	MATERIAL CATEGORY	UNIT CD	QUANTITY	PLAN DATE	ORIG QTY. IF AMD	UNIT QUANTITY	QTY VAR%	PRESENT STOCK	AVG. QTLY REQUIREMENT
MATERIAL CODE			GMR/PTS ID	GeM REF. ID FOR MTL ADD/UPDT			NOMENCLATURE/DWG NO	SHORT DESCRIPTION			
PMD NO			PMD ITEM NO	NO OF VENDORS FOR QTY DIST.			DRAWING NO	DRAWING ITEM NO		DRAWING VARIANT	PVC
2	3	1	276910	KG	2000.000	01/12/26		1.50	0	250	400
BP5530031010			GEM/GARPTS/01102026/ZP6Y8D V22DN5	NA			PUTTY	NON ASBESTOS, MOISTURE RESISTANT PUTTY GRADE H200/RE-015 OR AS PER SPECIFICATION TM14553 REV.00.			

ATM02			88		TM14553						
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CA TY	REV CD	ITEM NO	TP	W.O. NO./CH.HEAD	LOT NO	QUANTITY	DEST CD	DELIVERY DATE	VALUES IN Rs.	P.G.M.A NO.	OUT STAND INDENT/PO/prev PO	
PROJECT NAME							GES NO		GES ITEM NO.		NO.	QUANTITY
3	3	1	O	021-205-000	1	400.000	205	01122026	*****	NA	5155162	0.00
COMMON							NA		NA			
3	3	1	O	021-205-000	2	400.000	205	01022027	*****		5155162	0.00
COMMON												
3	3	1	O	021-205-000	3	400.000	205	01042027	*****		5155162	0.00
COMMON												

**** E (00006 TO 00010) Values Rs. in Lacs

ENG. DEPT -[TME]

DOCUMENT ENCLOSED

WRIPT-UP-ON *-FUNCTION -[] * IMPORT-JUSTIFICATION [N] * EMERGENCY INDENT JUSTIFICATION[N] * C.D.C. PROFORMA[N]

PREPARED BY												
2867176				DEPT	205			1				
SHRI AMIT GAUTAM				PH NO	3584							

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				NO 820562412		DATE 01/10/26		51	01/10/26			
3	3	1	O	021-205-000	4	400.000	205	01062027	*****	5155162	0.00	
COMMON												
3	3	1	O	021-205-000	5	400.000	205	01082027	*****	5155162	0.00	
COMMON												
REMARKS: EST.AS PER TRAN.ID.15395.EST.ENCL.IN ENVELOPE. FOR THE FIRST LOT OF 400 KG. SCHEDULE DELY.DATE SHALL BE WITHIN 60 DAYS FROM THE PO DATE & THEREAFTER FOR EACH SUBSEQUENT LOT OF 400 KG.SCHEDULE DELY.DATE SHALL BE WITHIN 60 DAYS FROM THE SCHEDULE DELY. DATE OF THE PREVIOUS LOT.RC TO BE KEPT VALID FOR 12 MNTHS FROM DATE OF FREEZING OF RC. EARLY DELIVERY ACCEPTABLE. PI REV.00 NOT ISSUED.												
EXISTING PO												



TME/2011

PRODUCT STANDARD

TME DIVISION, BHOPAL

TM 14553

Rev. No. 00

PAGE 01 OF 02

PRODUCT STANDARD FOR NON ASBESTOS, MOISTURE RESISTANT, SLATE FILLED, SOLVENTLESS PUTTY

1. Scope:

This specification describes about a non-asbestos, moisture resistant slate filled solvent less putty made of two part material (One part : powder and one part: Resin) mixed in given proportion and used in filling voids and spaces in traction motor armatures and field coils.

2. Mixing guidelines:

The two parts (One part: powder and one part: Resin) to be mixed at the time of application in a ratio as recommended by supplier and converted to a tough infusible solid by heat.

3. Properties of resin:

Property	Unit	Specified value	Test method
Type of resin	-	Solvent less resin	-
Colour	-	Clear liquid (preferably)	-
Viscosity	CPS	300-400	Brook field apparatus
Storage life below 20°C	Months	6 months (minimum)	-
Gel time at 100°C with 1% catalyst	Minutes	15-30	-
Density at 25°C		1.19±0.01	
Flash point	°C	Above 200	

4. Curing Cycle for putty:

8 Hrs when cured at 90°C/6 Hrs when cured at 125°C/4 Hrs when cured at 150°C or any other curing cycle as recommended by supplier

5. Properties of cured putty:

Property	Unit	Specified value	Test method
Physical state at room temperature	-	Solid	-
BDV of 3mm thick specimen at room temperature	KV/mm	10 (minimum)	JIS-K-6911 CL.5.8 & IS2504/BS2782
Insulation Resistance	Ω CM	1.9 x 10 ¹³ at room temperature (minimum)	IS11755
		1.8 x 10 ¹³ at 125 °C (minimum)	
Dissipation factor, 500V	-	0.012 at room temperature	JIS-K-6911
		0.02 at 125 °C	
Dielectric Constant	-	4.3	JIS-K-6911 CL.5.14.1
Class of Insulation		Class H (minimum)	IEC-216-1 to 5
Pot life at room temperature	hrs	72 (minimum)	-

Rev. No. 00

Distribution

Prepared

Checked

Approved

Date: 29.10.2014

TME - 2 TNX - 1
TXM - 1 TAM - 1
QMX - 1 TSD - 1

(Shishu Pal)

(V.Rawtiya)

(S.P.Singh)

Copyright and Confidential The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED It must not be used directly or indirectly in any way detrimental to the interest of the company		PRODUCT STANDARD TME DIVISION, BHOPAL	TM 14553
	TME/2011		Rev. No. 00
			PAGE 02 OF 02
6. <u>Test Certificate:</u> Supplier to submit 2 copies of test certificate for resin and cured putty with each consignment. Test certificate shall bear following information: TM14553: NON ASBESTOS, MOISTURE RESISTANT, SLATE FILLED, SOLVENTLESS PUTTY BHEL PO NO: Batch No. /Lot No: Test values obtained w.r.t. specification: 7. <u>Packing & Marking:</u> Each package shall be marked with following information: TM14553: NON ASBESTOS, MOISTURE RESISTANT, SLATE FILLED, SOLVENTLESS PUTTY BHEL PO NO: Batch No. /Lot No: Month and year of manufacturing:			

भारत हेवी ईलेक्ट्रिकल्स लिमिटेड, भोपाल

(भारत सरकार का उपक्रम)

Bharat Heavy Electricals Limited, Bhopal

(A Government of India Undertaking)

संकर्षण मशीन अभियांत्रिकी प्रभाग

TRACTION MACHINES ENGINEERING DIVISION

TME/DC-INSU /2023-24/ H200

Dated: 11.03.25

Technical Pre- Qualification Requirement (TPQR)

Pre-Qualification requirement for “Non-asbestos, moisture resistance putty grade H200/RE-015 or as per specification TM14553” is as under:

Sl. No.	Description	Vendor to comment	
		Complied / Not complied	Supporting relevant document to be submitted
1.	Non-asbestos, moisture resistance putty should be grade H200/RE-015 or as per specification TM14553.	Yes/No	Clause by clause compliance of specification to be submitted
2.	Manufacturing and supply experience in preceding 5 years of same/similar* item to electrical machine manufacturers. Vendor to inform the quantity of same/similar* item supplied in past.	Yes/No	Un-price PO copies of same/ Similar* item.
3.	Supplier to submit technical datasheet of material with corresponding MSDS and storage / handling instructions.	Yes/No	Technical Datasheet MSDS Storage /Handling Instruction
4.	In case vendor is not a manufacturer, in such case authorization from OEM is mandatorily required	-	Authorization from manufacturer (OEM) in case vendor is not a manufacturer

NOTE: (*)：“Non-Asbestos putty used for filling gaps/voids/ spaces between windings of electrical machines” shall be considered as similar item.

Prepared By	Approved By
 Shishu Pal (Sr.Mgr./ TME)	 Vikas Rawtiya (Sr.DGM./ TME)

CHECKLIST FOR Purchase Indent

MMTCB:PI/CL Rev 03 DT. 23/10/2021

PI No: **__820562412** PUTTY**Page 1 of 5**

Sl. No.	Check Point	Remarks (Yes / No / NA / Value / Percentage) / Strike off whichever is not applicable.
1.	Technical Specification:	
	a. Technical Specification & Latest revision of Drawing is enclosed. Please mention Specification No.	YES, ATTACHED
2	Delivery Requirement	
	a. Recommended delivery schedule in terms of number of days from PO. Lot-wise schedule also to be provided, if applicable. (Indentor must be careful in giving delivery schedule as offers giving deviation in delivery are bound to be rejected)	AS PER PI REMARKS
3.	Quantity justification	
	a. In case of stock item – following details to be provided: (i) Annual requirement as per production plan (ii) Available stock including that on shop floor (iii) Pending supplies against already placed POs (iv) Quantity in running enquiry, if any	PI is issued for rate contract for 12 months (i) 2000Kg, (ii) 250 Kg (iii) Nil (iv) Nil
	b. In case of WO specific item – following details to be provided: (i) Details of actual project requirement with respect to quantity already received. (ii) Planned delivery of job and planned cash collection	WO specific item – not applicable as item is Style & Stock item
	c. Whether quantity variation for items in this indent permitted. If so, same to be mentioned in PI/checklist.	NO
4.	Documents enclosed as per Nature of PI:	
	a. Emergency Certificate in designated format enclosed? (duly approved by HOD)	NA
	b. Single Tender Certificate in designated format enclosed? (duly approved by HOD)	NA
	c. Import Justification in designated format enclosed? (duly approved by HOD)	NA
	d. Customs duty applicability format enclosed?	NA

CHECKLIST FOR Purchase Indent

MMTCB:PI/CL Rev 03 DT. 23/10/2021

PI No: **820562412** PUTTY**Page 2 of 5**

Sl. No.	Check Point	Remarks (Yes / No / NA / Value / Percentage) / Strike off whichever is not applicable.
	e. Developmental/Trial PI: Supporting documents regarding justification for development of vendor Or MOM of MISCC meeting including details of quantity to be indented to be attached.	NA
5.	Vendor List:	
	a. Correct PMD No. & Material Category indicated in PI?	YES
	b. Enquiry to be issued to all PMD vendors? – Not applicable in case of GEM tenders.	As per Purchase Norms
	c. Any additional known sources, in addition to those in PMD, to be informed about NIT in case of GeM/open tender. Supplier name and Email ids to be mentioned.	No
	d. Is customer's vendor list applicable? In case BHEL PMD vendor list has additional vendors other than those in Customer approved list, effort taken to include BHEL PMD vendors may please be recorded through supporting document/correspondence.	Refer MPMI -153/92 rev 04
	e. Customer approved vendor list is enclosed?	Refer MPMI -153/92 rev 04
	f. Is splitting of quantity among more than one vendor required? If so, ratio to be specified.	No
	g. Is the quantity divisible among two or more vendors in case Make In India or MSE Purchase preference is to be applied? (Clause No 3A (b) and (c) of MII-PPO No. P-45021/2/2017-PP (BE-II) Dt. 4/7/2020 can be referred)	NO
	h. Is the offer to be accepted only from OEMs	AS per PQR
6.	Inspection Requirements:	
	a. No specific requirement. Inspection after receipt of material at BHEL?	AS PER PI
	b. Source Inspection by BHEL required?	NO
	c. Source inspection by TPIA required. If yes, QAP to be mandatorily enclosed. QAP No. may please be mentioned.	AS PER PI
	e. Joint inspection by Customer and TPIA required?	NO
	f. Customer approved QA plan is applicable? If yes, copy to be enclosed.	NO

CHECKLIST FOR Purchase Indent

MMTCB:PI/CL Rev 03 DT. 23/10/2021

PI No: **820562412** PUTTY**Page 3 of 5**

Sl. No.	Check Point	Remarks (Yes / No / NA / Value / Percentage) / Strike off whichever is not applicable.	
	Any specific inspection requirement for Import items, to be clearly listed.	NA	
7.	Documents required from Vendor:		
	Documents required from vendor, along with offer, after PO placement and at the time of supply, to be clearly listed and indicated in PI (e.g. Test Certificates / Guarantee Certificate / QA Plan / Drawing / Information Booklet etc.)	AS PER PI	
	Basis of Estimation:		
8.	Basis of PI Estimation given? (Previous PO of identical or similar item / Budgetary quote / Estimate calculations / First principle) – Please note – all estimates to be made based on FOR Destination and should mention GST component also.	BASIS OF ESTIMATION ID#15395 BY TME ENCLOSED GST @18 % extra. REFER ESTIMATION REMARKS: ESTIMATE BASED ON LPP	
	Reason for considering Budgetary offer for estimate preparation	NA	
9.	Price Basis for PO		
	a. Firm Price / PVC?	Firm	
	b. In case of PVC, whether PVC formula / PVC factor base rate mentioned? PVC formula and ratio can be mentioned here also	NA	
	c. PO to be placed on overall L1 basis Or Individual item L1 basis?	overall L1 basis	
10.	Commissioning of Equipment / Payment Break-up:		
	a. Whether Installation Commissioning And Testing by vendor is required?	NA	
	b.	If yes, please indicate the payment break-up below:	NA
		i) Payment to be done upon supply (%):	NA
		ii) Payment to be done after commissioning (%):	NA
		iii) Time frame for commissioning of equipment, after supply? (Balance payment will be released after this period)	NA
c.	Performance Bank Guarantee required?	NA	
	Guarantee/Warranty Requirements:		

CHECKLIST FOR Purchase Indent

MMTCB:PI/CL Rev 03 DT. 23/10/2021

PI No: **820562412** PUTTY**Page 4 of 5**

Sl. No.	Check Point	Remarks (Yes / No / NA / Value / Percentage) / Strike off whichever is not applicable.
11.	Guarantee/Warranty requirements and period clearly specified – As per GeM STC / BHEL GTC / any other	Material is shelf life Item, Warranty as per shelf life. However minimum warranty period of 6 months to be ensured from date of manufacturing. However, mfg date shall not be earlier than 30 days from date of received of material.
12	Delivery Destination	
	a. Material to site (GSOS)?	NO
	b. In case of GSOS, whether PI issued in 3 series?	NA
	c. Full consignee details and address given for all project sites?	NA
13.	Information with respect to Global Tender Enquiry restriction	
	Please provide date of submission of bid by TRS for the work order against which the item is proposed to be procured.	NA
	Is the item essentially with MII content of <20%	No
14.	GeM related information:	
	GeMAR & PTS report attached with indent (If availability report is submitted, same shall be procured through specific category available on GeM, otherwise custom bid to be adopted). If category does not exist, LIB number to be specified in the indent, In case exact category does not exists then can existing broad category be used with additional parameters	REPORT ATTACHED
15	Additional Terms and Conditions for GEM – These are based on some standard templates available on GeM at https://gem.gov.in/additional-terms-and-conditions. Some or all of these criterion can be selected. Other ATCs may also be referred on GeM website and can be mentioned here for selection by Purchase Officer during preparation of NIT. Indentor may also provide their own PQR, if desired. Comments under check point column is only for guidance.	
	a. Bidder Annual Turn Over • Not Applicable - If customer approved Vendor List is applicable • Not Applicable – for small value items • Applicable for high value items. (As per GeM drop-down menu, bidder annual turnover is restricted to maximum 50% of bid estimation value. Indentor may choose any value between 0% to 50%)	NA
	b. Average Annual Turn Over Of OEM • Not Applicable - If customer approved Vendor List is applicable • Not Applicable – for small value items • Applicable for high value items- PQR to be made as per Vigilance circular guidelines	NA

CHECKLIST FOR Purchase Indent

MMTCB:PI/CL Rev 03 DT. 23/10/2021

PI No: **820562412** PUTTY**Page 5 of 5**

Sl. No.	Check Point		Remarks (Yes / No / NA / Value / Percentage) / Strike off whichever is not applicable.										
		This should be selected if item is to be necessarily procured through OEM only. (As per GeM drop-down menu, bidder annual turnover is restricted to maximum 400% of bid estimation value. Indentor may choose any value between 0% to 400%)											
	c.	Years of Past Experience required • Not Applicable - If customer approved Vendor List is applicable • 2 years or as per customer requirement	As per PQR										
	d.	Past Performance (% supply made to central/ state utilities/ PSUs/Public listed companies in the last 3 years) • Not Applicable - If customer approved Vendor List is applicable • For other cases<table><tr><td>Item Qty.</td><td>% Supply</td></tr><tr><td>1 - 2</td><td>80%</td></tr><tr><td>3 - 4</td><td>50%</td></tr><tr><td>5 - 50</td><td>20%</td></tr><tr><td>>50</td><td>10%</td></tr></table>	Item Qty.	% Supply	1 - 2	80%	3 - 4	50%	5 - 50	20%	>50	10%	As per PQR
Item Qty.	% Supply												
1 - 2	80%												
3 - 4	50%												
5 - 50	20%												
>50	10%												
	e.	Document required from seller - i) Experience Criteria - Yes/ No depending on point number 11.c) above, ii) Past Performance - Yes/ No depending on point number 11.d) above iii) Bidder Turnover - Yes/ No depending on point number 11. a & b above iv) Any other Certificate (As requested in ATC) - Yes/No, as per special conditions of Enquiry, if any v) OEM Authorization Certificate - Yes, if applicable vi) OEM Annual Turnover - Yes/ No depending on point number 11. a & b above	As per PQR										
	f.	Do You Want Comprehensive Maintenance Contract For This Bid?	NO										
	g.	Do You Want Annual Maintenance Contract For This Bid?	NO										
	h.	Material safety datasheet whether required or not	NO										
	i.	Any additional PQR to be added in ATC	NO										
	j	Any relaxation in PQR to be provided under MII startup or MSE vendors.	NO										

Indent Initiator**10****Indent Approver**



Report ID: GEM/GARPTS/01102026/ZP6Y8DV22DN5

Report Name: NON ASBESTOS, MOISTURE RESISTANT PUTTY

Generated By: AMIT GAUTAM , Department of Heavy Industry , Ministry of Heavy Industries and Public Enterprises

Generated On: 01/10/2026

Valid till: 31/10/2026

GeM Availability Report and Past Transaction Summary

GeM Availability Report and past transaction summary report is generated based on the specifications searched by the Buyer. The specification may be modified appropriately for searching relevant categories on GeM. Buyer may navigate to GeM category page by clicking on the category link to view category specifications and products/services available in the category.

Order Count and Order Value displayed is on a cumulative basis since GeM inception.

1. Search String: NON ASBESTOS, MOISTURE RESISTANT PUTTY GRADE H200/RE-015 OR AS PER SPECIFICATION TM14553REV.00.

Search type: Product

Search Result: Category not available on GeM for the text string searched by the buyer.

This is a one-time requirement hence new category creation is not proposed / or requirement is recurring but request for new category creation will be submitted separately post generation of GeMARPTS.

Estimated Value Of Procurement: ₹ 892000.0



भारत सरकार
रेल मंत्रालय

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

**डीजल विद्युत लोकोमोटिव के कर्षण मशीनों में
प्रयोग होने वाले
रेसिन एवं वार्निश**

RESINS & VARNISHES FOR TRACTION MACHINES

USED ON

DIESEL ELECTRIC LOCOMOTIVES

चा.श.एम.आई. संख्या १५३/१२ (संशोधन - ०४)
सितम्बर, २०१४

MPMI NO. 153/92 (Revision-04)
SEPTEMBER, 2014

अनुसंधान अभिकल्प एवं मानक संगठन
लखनऊ - २२६०११

**RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011.**

RESINS & VARNISHES FOR TRACTION MACHINES USED ON DIESEL ELECTRIC LOCOMOTIVES

1. OBJECT

Periodic overhaul of traction machines, which is done by Diesel locomotive sheds and workshops, is a very important aspect of regular diesel locomotive maintenance. In addition, there are a number of Railway units, which undertake rehabilitation/rewinding of traction machines, viz., DMW/Patiala and the workshops at Golden Rock, Parel, Jamalpur, Kharagpur and Jaipur. Use of unsuitable/incorrect varnishes during overhaul or rewinding can lead to failure of insulation. MP.MI.-153/92 was compiled in November '92 with a view to informing various units about the standard varnishes and their application details. The standardization carried out in this MI was based on laboratory evaluation tests done by BHEL and subsequent evaluation in the field by RDSO and users.

The insulation scheme has been upgraded in many traction machines since the issue of the said MI. Many new and improved varnishes/resins have been tried out successfully, thus necessitating that this MI be revised. Fourth revision of MP.MI.-153/92 is therefore, being issued to bring out the latest recommendations in respect of varnishes and resins to be used on traction machines.

2. PROPERTIES REQUIRED FROM VARNISHES

2.1 Mica Bonding Varnishes

- Complete flexibility in C-stage.
- Flexibility retention even on prolonged aging.
- Good adhesive strength.
- Quick drying and curing property.
- Used as binder in glass mica or Nomex mica tapes, flexible mica sheets and wrappers.

2.2 Laminating Varnishes

- High bonding strength.
- Semi rigid cured film.
- Thermosetting properties - used for moulding under heat and pressure.
- Some flexibility after curing to take-up twisting of coils during armature winding.
- Used for binding the conductors in a coil and for providing a void free compact interturn in the slot portion.

2.3 Impregnating Resins

- Short and lower temperature curing.
- Tough elastic bonding.
- Long activated resin (useful) life.
- Excellent dielectric properties.
- Good resistance to chemicals.
- Long storage and pot life.
- Negligible losses during VPI processing.

Impregnating resins could be of solvent or solventless type. Use of solvent type impregnating varnishes on traction machines should however, be discontinued.

- Excellent resistance to moisture, mild acids and alkalis.
- Fast curing properties.
- Good adhesion to most organic and inorganic materials.
- Good mechanical and electrical properties.
- High arc resistance and track resistance.

2.5 Filling Putty

- Quick drying and curing property in thick sections.
- High electrical strength.
- Non-conducting filters.
- Consistency.

The evaluation tests show that amongst the indigenously available class H (or higher class) varnishes, which are commonly used for such applications, no varnish meets all the requirements simultaneously. The best available alternatives, which are compatible with the insulation scheme of the machine, have therefore, been selected for adoption.

- 3.1 The recommendations are detailed in **Annexure A** along with brief application and curing details. It may be added that certain precautions have to be taken by the staffs while using these products. It is therefore, necessary that manufacturers' recommendations for use must be followed while using these products.
- 3.2 For complete curing, the armatures/coils should be maintained at the prescribed temperature for the prescribed time and therefore, the time required to raise the temperature of the armatures/coils to its prescribed value has not been included in this table. This period can be as high as 4 to 6 hours and should be allowed over and above the curing time.
- 3.3 In most baking ovens, the job temperature is lower than the thermostat setting. Correct armature/coil temperature should be ensured by conducting trials on each oven and for each type of armature.
- 3.4 Proper curing of varnishes at each stage is very essential to obtain their declared properties. Whereas it is the duty of the manufacturers of built up mica products, like glass mica tapes, kapton mica tapes to ensure proper solvent removal, it is for the rewinding shops to ensure that correct moulding cycle is followed in manufacture of armatures/coils and prescribed baking schedule is followed for curing of impregnating varnishes after winding and Vacuum Pressure Impregnation (VPI).
4. The declared properties, which have been tested and established, and test methods of varnishes are given in the attached format (**Annexure B**) for guidance. Rewinding shops should test these products and ensure that the properties match with these values. Acceptance tests for varnishes & resins are added at **Annexure-E**. The test may be conducted at the manufacturer's premises for each lot supplied, as facilities in Railway workshops may not be available.
5. Addresses, phone and fax numbers of the authorized distributors of manufacturers of varnishes & resins are given in **Annexure – D**.

MPMI NO. 153/92 (Revision-04) Annexure - A

S.N.	TYPE	APPROVED BRANDS (Manufacturer)	HOW TO USE	CURING SCHEDULE
1.	Mica bonding for insulating tapes	• Xiameter RSN 0994 Resin • RE 3440 (Rotomac)	For conveyerised impregnation & coating of machine for glass mica tapes. Apply by brush on dried Nomex paper. Apply by brush for inter layer. Apply by dip & bake	• <u>Xiameter RSN 0994 Resin:</u> General application Initial: 1 hr. at 135 - 140°C Final: 6 – 8 hrs. at 200 to 220°C Or: 6 hrs. at 250°C
	Mica bonding for V-cone & segment	• RE 3440 (Rotomac) • Sahney AV resin	Conveyor belt system – varnish is allowed to drip on a bed of mica flakes Conveyor belt system – varnish is allowed to drip on a bed of mica flakes	• <u>RE 3440 (Rotomac):</u> 3 to 5 hrs. at 160 to 180° C • <u>Sahney AV resin:</u> 3 to 5 hrs. at 170 to 195° C
2.	Laminating and coil moulding	• Xiameter RSN 2104 Resin (For laminating) • Xiameter RSN 0996 Resin (For coil moulding)	Brush application	• <u>Xiameter RSN 2104 Resin:</u> Pre curing : at 160°C for 2 hrs. Final curing : at 160°C for 1 hr. Post curing : at 200°C for 24 hrs. depending upon section. • <u>Xiameter RSN 0996 Resin:</u> Slot section coil 170°C to 180°C – 15 to 20 min. Cool down to 40 to 50°C before releasing the pressure.
3.	Putty for application behind commutator riser	• Putty 015 (Rotomac) • Putty H 200 (Intaf)	Apply by hand using a flat wooden strip	90°C for 8 hrs. 150°C for 4 hrs.
4.	Putty/compound between split field coils and gaps at lead/coil turns	• RTV 1080 (Dow Corning)	RTV 1080: Apply by brushing or spraying before VPI.	No separate curing required if job is heated before VPI. Else, cure at 150°C - 160°C for 4 - 6 hrs.

➤ Manufacturers' addresses at Annexure – C

MPMI NO. 153/92 (Revision-04) **Annexure - A**

S.N.	TYPE	APPROVED BRANDS (Manufacturer)	HOW TO USE	CURING SCHEDULE				
5.	Impregnating (solventless)	- Dobeckan FT 2005/ 500 EK (Elantas-Beck) Diluent V Inhibitor UP 1 - RE – 009 (Rotomac) - Elmotherm H-71A (Elantas -Beck)	- Dobeckan FT 2005/ 500 EK : Can be applied by dipping but suitable particularly for VPI. - RE 009 (Rotomac): Resin must be thoroughly blended with catalyst before use. The measured quantity of (1% by wt.) should be added. Can be applied by dipping but suitable for VPI. - Elmotherm H-71A (Elantas -Beck): Can be applied by dipping but suitable particularly for VPI. Thinner 218 addition is necessary to adjust the viscosity for this application.	<u>Dobeckan FT – 2005/500 EK (Elantas -Beck):</u> 10-12hrs. at 160°C <u>RE – 009 (Rotomac):</u> 2 to 3hrs. at 160°C or, 4 to 6hrs. at 150°C or, 6 to 8hrs. at 135°C <u>Elmotherm H-71A (Elantas -Beck):</u> 8 hrs. at 150°C				
6a.	Finishing (Anti Tracking) (All armatures & main field / interpole coils of DC traction machines & stator / rotor of traction alternators)	<table><tr><th>Oven Curing</th><th>Room Temp. Curing</th></tr><tr><td> - RE-118 (Red) (Rotomac) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs </td><td> - SI 620 (Dow Corning) in single pack - DC 1-2620 (Dow Corning) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs </td></tr></table>	Oven Curing	Room Temp. Curing	- RE-118 (Red) (Rotomac) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs	- SI 620 (Dow Corning) in single pack - DC 1-2620 (Dow Corning) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs	<u>RE 118 (Red) (Rotomac):</u> Preheat armatures to 60-80°C in an air circulated oven then remove. Contents of supplied anti-tracking varnish [RE 118 (Red)] should be mixed thoroughly before application. Brush or spray the contents on armatures to give a good coat and cure in an air circulated oven as per curing schedule mentioned. <u>SI 620 (Dow Corning):</u> Can be applied by spraying, dipping, brushing or flow coating. For spraying, thinner coatings can be achieved by diluting SI 620 Silicone Varnish with dry xylene or toluene. <u>DC 1-2620 (Dow Corning):</u> To be applied by brushing or spraying. For spraying thinner coatings can be achieved by diluting DC 1-2620 Silicone Varnish with dry xylene or toluene. <u>Ultimeg 2000-372RH (PRS Permaceal):</u> It is a single component and can be applied by applied by spraying, dipping or brushing directly. Shake the container well before opening.	<u>RE – 118 (Red) (Rotomac):</u> 2 to 3 hrs. at 100°C Followed by 4 – 5 hrs. at 150°C-160°C <u>SI 620 (Dow Corning):</u> 1Hr. at room temperature <u>DC 1-2620 (Dow Corning) :</u> 1. Dry touch @ RT: – 25 minutes. 2. Final cure @ RT: – 72 Hrs. <u>Ultimeg 2000-372RH (PRS Permaceal):</u> Curing time @ 21°C - 1. Touch dry: - 45 mins. 2. Hard dry: - 60-90 mins. 3. Full dry: - 24-48 hrs. Or, Curing time can be accelerated by heating for 2-3 hrs at 80°C. <u>RE120 (Rotomac) in two packs:</u>
Oven Curing	Room Temp. Curing							
- RE-118 (Red) (Rotomac) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs	- SI 620 (Dow Corning) in single pack - DC 1-2620 (Dow Corning) - Ultimeg 2000-372RH (PRS Permaceal) - RE-120 (Rotomac) in two packs							

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MPMI NO. 153/92 (Revision-04) Annexure - A

S.N.	TYPE	APPROVED BRANDS (Manufacturer)	HOW TO USE	CURING SCHEDULE
			• <u>RE-120 (Rotomac)</u> in two packs: It is a two component modified polyester air drying, class 180 ° C varnishes. It can be applied by spraying, dipping or brushing after mixing 100 parts by wt. of component A and 23 parts by wt. of component B. Varnish may be thinned after mixing the two components, if necessary, with MAC COAT® Thinner TH-02 in very small proportions.	Curing time @ 30°C – 1. Dust free dry :- 2 hours 2. Touch dry :- 6 hours 3. Thorough Cure:- 72 hours Or, Curing time @ 80°C – 1. Dust free dry: - 10 mins. 2. Touch dry: - 20 mins. 3. Thorough Cure:- 1 hours
6b.	Finishing (Anti Tracking) (AGs & field coils of TM 4601/ TM 4603)	• Epoxy Gel Coat (Red) (Elantas -Beck) • Bectol (Red) (Elantas -Beck) • DC 1-2620 (Dow Corning) • SI 620 (Dow Corning) in single pack • Ultimig 2000-372 RH (PRS Permace)	• <u>SI 620 (Dow Corning)</u> Same as above. • <u>DC 1-2620 (Dow Corning)</u>, Same as above. • <u>Epoxy Gel Coat (Red) (Elantas - Beck)</u> Drying – 4 hrs. at room temp. Curing – 24 hrs. at room temp • <u>Bectol (Red) (Elantas -Beck)</u> Drying – 4 hrs. at room temp. Curing – 24 hrs. at room temp. • <u>Ultimig 2000-372RH (PRS Permace)</u>:- Same as above.	

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S.N.	TYPE	APPROVED BRANDS (Manufacturer)	HOW TO USE	CURING SCHEDULE
7.	Epoxy based potting compound (Field coils of TM 4601 & 4603)	SIB4302A + SIB4302B (ISOLA)		4 – 6 hrs. at 160 ± 5

Dobeckan FT 2005/500 EK (Elantas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	1.054	IS:10026 - 2
2	Viscosity at 27°C + 2°C / 23°C (Brookfield)	480-520 mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Flash point	32°C	IS:10026 - 2
4	Ability to cure	OK	IS : 10026 - 2
5	Gelling time at 118 °C / 120 °C	20-40 min	ISO:2535 / IEC:455-2-2
6	Drying in thin film at 120 °C / 1 h	Tackfree	IS : 10026 – 2
7	Electric strength at 27°C+2°C KV/mm After immersion in water for 24 hrs.	115 68	IS:10026 - 2
8	Dissipation factor	0.004	IEC : 464 – 2 & IEC:455-2
9	Pot life	Six months	IEC : 455 - 2
10	Bond Strength	215	IS:10026-2
11	Thermal Endurance	180 °C	IEC:216 (Part 1&3)
12	Volume Resistivity in air at 25°C at 155°C & after immersion in water	10E15 10E12 10E15	IS:10026-2

Elmotherm H 71A (Elastas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Colour and appearance	Brown clear	
2	Viscosity at 27°C + 2°C Viscosity at 23°C	65 – 75 secs	DIN 53211 Cup 4 /IS 3944-1966 Cup 4
3	Solids content(1.5 g/150°C?2h)	45 – 47%	----

Epoxy Gel Coat (Red) (Elantas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
	Colour appearance	Reddish brown opaque, thixotropic	----
1	Density	1.1	IS:10026 - 2
2	Viscosity at 27°C ± 2°C / 25°C (Brookfield)	45000-55000mPa.s 85000mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Ability to cure	OK	IS:10026 – 2
4	Gelling time at 25°C with hardener 758 (100 ; 10pbw)	55-65 min.	ISO 2535 / IEC:455-2-2
5	Drying in thin film	Hard, Tackfree	IS : 10026 – 2
6	Pot life (hrs)	1.5	IEC : 455 - 2
7	Curing in thick layer 10g/25°C/24 h Resin : hardener 758 (100 : 10 pbw)	Hard, tackfree	

Hardener EH 411 (Elantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density		IS : 10026 - 2
2	Viscosity at 27°C $\pm$ 2°C / 25°C (Brookfield)	10000-30000mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Ability to cure	OK	IS : 10026 - 2
4	Pot life at 25°C with Dobeckot 505 C (100 : 50 pbw)	80-120 min.	IEC : 455 - 2

Hardener EH 758 (Eiantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	----	IS : 10026 - 2
2	Viscosity at 25°C (Brookfield)	15 - 35mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Ability to cure	OK	IS : 10026 - 2
4	Pot life at 25°C with Dobeckot 505 C (100 : 10 pbw)	30 min.	IEC : 455 - 2

Bectol (Red) (Elantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Colour and appearance	Red opaque	IS : 10026 - 2
2	Viscosity at 23°C	50 –150 secs	DIN 53211 / 4 mm cup / IS 3944-1966 Cup 4
3	Solids content 1.5 g/150°C/2h	53 –57%	

RE 3440 (ROTOMAC)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	0.963+0.980	IS : 10026 - 2
2	Viscosity at 27°C + 2°C CPS	600-1000	IS : 10026 – 2 / IS : 3944-1966 Cup 4
3	Flash point	22°C	IS : 10026 - 2
4	Ability to cure	OK	IS : 10026 - 2
5	Non volatile content	40 + 2	IS : 10026 - 2
6	Thermal Endurance	155°C	IEC:216 (Part 1&3)

RE – 009 (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.09 + 0.02	IS:10026 - 2
2.	Viscosity at 27°C + 2°C (CPS)	660 + 260	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Flash point	93°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Gelling time	15 –25 minutes	ISO 2535 / IEC:455-2-2
6.	Drying in thin film	2 – 3 hrs.	IS:10026 - 2
7.	Electric strength at 27°C+2°C KV/mm	100 min.	IS:10026 - 2
8.	Dissipation factor P.C.	0.9 max.	IEC : 464 – 2 & IEC:455-2
9.	Non volatile content P.C.	100	IS:10026 - 2
10.	Pot life	6 months	IEC : 455 - 2
11.	Bond Strength	25	IS:10026-2
12.	Thermal Endurance	220°C	IEC:216 (Part 1&3)
13.	Volume Resistivity in air & after immersion in water	4 x 10 ⁵	IS:10026-2

Putty – 015 (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.19 + 0.01	IS:10026 - 2
2.	Viscosity at 27°C + 2°C cps	320 - 380	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Flash point	91°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Gelling time	15 –30 minutes	ISO 2535 / IEC:455-2-2
6.	Electric strength at 27°C + 2°C KV/mm	10 - 14	IS:10026 - 2
7.	Pot life	6 hrs.	IEC : 455 - 2
8.	Dissipation factor P.C.	0.012	IEC : 464 – 2 & IEC:455-2
9.	Thermal Endurance	155 - 160°C	IEC:216 (Part 1&3)
10.	Volume Resistivity in air & after immersion in water	2.2*10 ¹³ 1.2*10 ¹²	IS:10026-2

RE – 118 (Red) (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.12 + 0.02	IS:10026 - 2
2.	Viscosity at 27°C + 2°C (CPS)	150 -225	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Flash point	40°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Drying in thin film	4 – 5 hrs.	IS:10026 - 2
6.	Electric strength at 27°C + 2°C KV/mm	90 min.	IS:10026 - 2
7.	Dissipation factor P.C.	0.8	IEC : 464 – 2 & IEC:455-2
8.	Non volatile content P.C.	58 + 2	IS:10026 - 2
9.	Pot life	1 month	IEC : 455 - 2
10.	Bond Strength Kgs.(lbs)	12	IS:10026-2
11.	Thermal Endurance	200	IEC:216 (Part 1&3)
12.	Volume Resistivity in air & after immersion in water	1.3*10 ¹⁷ 1.5*10 ¹⁶	IS:10026-2

Putty H200 (INTAF)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	1.19 + 0.01	IS:10026 - 2
2	Viscosity at 27°C + 2°C CPS	300-400	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Flash point	>200°C	IS:10026 - 2
4	Gelling time	15 –30 minutes	ISO 2535 / IEC:455-2-2
5	Ability to cure	OK	IS:10026 - 2
6	Hardness, Typical Shore D	75 - 80	JIS K-6911-1979, Clause 5.16.1
7	Electric strength at 27°C + 2°C KV/mm	10 - 15	IS:10026 - 2
8	Dissipation factor at room temp. at 125°C	0.012 0.020	IEC : 464 – 2 & IEC:455-2

Xiameter RSN 2104 Resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.04	IS:10026 - 2
2.	Viscosity at 27°C ± 2°C	19	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Ability to cure	OK	IS:10026 - 2
4.	Gelling time	11	ISO 2535 / IEC:455-2-2
5.	Dissipation factor	0.006	IEC : 464 – 2 & IEC:455-2
6.	Non volatile content	59	IS:10026 - 2
7.	Pot life (hrs.)	20	IEC : 455 - 2
8.	Shelf life: A) from the date of receipt of material at store B) from the date of manufacture whichever is latest	9 months 12 months	---

Xiameter RSN 0994 Resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.02	IS:10026 - 2
2.	Viscosity at 27°C + 2°C	46	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Ability to cure (minutes)	OK	IS:10026 - 2
4.	Gelling time (minutes)	25	ISO 2535 / IEC:455-2-2
5.	Electric strength at 27°C + 2°C KV/mm	61.9	IS:10026 - 2
6.	Dissipation factor	0.008	IEC : 464 – 2 & IEC:455-2
7.	Non volatile content (%)	51	IS:10026 - 2
8.	Shelf life: A) from the date of receipt of material at store B) from the date of manufacture whichever is latest	9 months 12 months	---

SI 620 (Dow Corning)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Viscosity at 27°C $\pm$ 2°C	20	IS:10026 – 2 / IS:3944-1966 Cup 4
2.	Flash point	32°C	IS:10026 - 2
3.	Ability to cure	OK	IS:10026 - 2
4.	Pot Life	1 year	IEC:455 - 2

Xiameter RSN 0996 Resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.01	IS:10026 - 2
2.	Viscosity at 27°C ± 2°C	1.50 poises	IS:10026 – 2 / IS:3944-1966 Cup 4
3.	Flash point	32°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Electric strength at 27°C ± 2°C	1600 v/mil	IS:10026 - 2
6.	Dissipation factor - At 100 Hz. - At 1 M Hz.	0.008 0.005	IEC:464 – 2 & IEC: 455-2
7.	Shelf life at ambient temp.	12 months	IEC:464 - 1
8.	Volume Resistivity in air & after immersion in water	2.0*10 ¹⁴	IS:10026-2

9.	Shelf life: A) from the date of receipt of material at store B) from the date of manufacture whichever is latest	9 months 12 months	---
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DC 1 - 2620 (Dow Corning)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.11 (SG)	CTM0768
2.	Viscosity at 27°C + 2°C (CPS)	144	CTM004
3.	Flash point	27°C	CTM0021A
4.	Ability to cure	Air drying	NA
5.	Drying in thin film	72 Hr.@RT	CTM021A
6.	Electrical strength at 27°C + 2°C KV/mm	17	CTM0114
7.	Dissipation factor @ 100 Hz.	0.0025	CTM0112
8.	Non-Volatile content	60	CTM0208
9.	Volume Resistivity in air & after immersion in water	8.6 X 10 ¹³	CTM0249

Sahney AV resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Specific gravity @ 25°C (avg.)	1.009	IS:10026 - 2
2.	Viscosity @ 25°C (Brookfield), CPS, avg.	600 -1000	IS:10026 – 2
3.	Flash point (Pensky-Martens closed cup)	22°F	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Solids % by weight	40 + 4	IS:10026 - 2
6.	Thermal Endurance	155 deg. C	IEC: 60216 (Part 1&3)
7.	Shelf life @ 25°C	12 months	IEC:464 - 1

Ultimag 2000-372 RH (PRS Permcel)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Specific gravity	<1.00	IS:10026 - 2
2.	Viscosity @ 25°C (Sec.)	16+/- 2 seconds	BS3900 PTA6 B4 flow cup
3.	Flash Point	27°C Nominal	IS:10026 - 2
4.	Drying time		IS:10026 - 2
	a) Touch dry (minutes)	45	
	b) Hard dry (minutes)	60-90	
	c) Full / thorough dry (hours)	24	
5.	Dielectric strength @ RT	75 KV / mm	IS:10026 - 2
6.	Non-volatile matter	35 +/- 3 %	IS:10026 - 2

RE-120 (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density at 27+ 2°C (in gms/ml) Component A	1.00 ± 0.02	IS:101 (Part 1/Sec. 7) - 1987
	Component B	0.99 ± 0.02	
2.	Viscosity at 27+ 2°C, Ford cup B4, seconds Component A	60 - 100	IS:10026 – 2 / IS:3944 -1966 Cup 4
	Component B	25 - 45	
3.	Flash Point (Closed Cup); after mixing component A and B	30°C, minimum	IS:101 (Part 1/Sec 6) - 1987
4.	Dielectric strength, KV/mm; tested after 1 hr. force drying at 80 °C a) At room temperature b) After 24 hrs. water immersion	80, minimum 50, minimum	IS:10026 (Part -2) - 1999
5.	Tracking resistant at 200 V; tested after 1 hr. force drying at 80 °C	100 drops, minimum	IS:10026 (Part – 2) - 1999
6.	Flexibility (1/8" mandrel); tested after 1 hr. force drying at 80 °C	Passes without any visual damage.	IS:10026 (Part – 2) - 1999

MPMI NO. 153/92 (Revision-04) Annexure - C**ADDRESSES OF THE APPROVED MANUFACTURERS OF VARNISHES & RESINS**

S. No.	Approved Manufacturers	Address
1.	Dow Corning	M/s Dow Corning India Pvt. Ltd., Wockhardt Towers, East Wing, Level 2, Bandra-Kurla Complex, Bandra-East, Mumbai – 400 051.
2.	ROTOMAC	- M/S Rotomac Electricals Pvt. Ltd., 1-1624, Chittaranjan Park, New Delhi. PIN – 110019. - M/S Rotomac Electricals Pvt. Ltd., 105, Park Street, Calcutta – 700016.
3.	INTAF	M/s Industrial Tapes & Fabrics Pvt. Ltd., 1/1, Vansittart Row, 3 rd Floor, Opp. Telephone Bhawan, Calcutta – 700001.
4.	Elantas -Beck	M/s Elantas Beck India Ltd., 147, Mumbai Pune Road, Pimpri, Pune – 411018.
5.	ISOLA	M/s VON ROLL ISOLA S.P.A. Fabbricazione Isolanti Elettrici, 20121, Milano, ITALIA.
6.	Sahney	M/s Sahney Kirkwood Pvt. Ltd., E-81, MIDC Ambad, Nashik – 422 010.
7.	PRS Permacerl	M/s PRS Permacerl Pvt. Ltd., 63, Bombay Samachar Marg, Mumbai-400 001.

ADDRESSES OF THE AUTHORISED DISTRIBUTORS OF MANUFACTURERS OF VARNISHES & RESINS

S.No.	Approved Manufacturers	Address of Authorised Agents
1.	Dow Corning Co, USA	- Mr. Praful Modi, Electrical Micanite Corporation, 7th floor, 11 Pollock Street, Kolkata – 700001. - Mr. Mahesh Mehta, Oriental Enterprises, 45, Abdul Rehman Street, 1st floor, P.O. BOX No. 3205, Mumbai – 400003.
2.	Elantas Beck India Ltd., Pune	<u>NORTHERN REGION</u> i) Bindra Automotive Systems Pvt. Ltd., 707, Bhikaji Cama Bhawan, Bhikaji Cama Place, New Delhi-110066. Phone/Fax: 011-26100322, 26191170, 26170686. ii) Vishal Enterprises, S.C.O. 265,, 2nd floor, Sector-32-D, Chandigarh-160009. Phone/Fax: 0172-3919206 / 2603082. iii) Shreekrishna Electrical Sales, Shop No. 3, New Market, Shastri Nagar Crossing, Sagra, Varanasi-221002. Phone/Fax: 0542-2222873 / 2585756. iv) La Nova, 110/232, Jawar Nagar. Kanpur-208001. Phone: 0512-2543165. v) Allied Agencies, Mirza Ismail Road, Opp All India Radio, Jaipur- 302001. Phone/Fax: 0141-374204, 366455 / 368164. <u>EASTERN REGION</u> i) British Electric manufacturing Co., 31, Ezra Street, Kolkata-700001. Phone/Fax: 033-22218015, 22150931 / 2215632. ii) CMD Techno, Shop No. 10A, Ground Floor, 55 Ezra Street, Kolkata-700001. Phone/Fax: 033-30286856, 30286859 / 22155231, 22157472. iii) Hatim & Co., 90 Ripon Street, Kolkata-700016. Phone/Fax: 033-22298429, 22298369 / 2229982. iv) Component Engineers, 9/9, New Market, Prajapati Bhawan, Rourkela- 769001. Phone/Fax: 0661-2506291, 2507657 / 2506291.

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2.	Elantas Beck India Ltd., Pune	<u>WESTERN REGION</u> i) Mahesh Vidut Udyog / Mahesh Enterprises, 'Kabra House' Laheripura New Road, Vadodara-390001. Phone/Fax: 0265-2553788, 2424714 / 2427615. ii) Jjagruti Electric Stores, 1053, Kothari Pole, Gandhi Road, Ahmedabad-380001. Phone/Fax: 079-22147241 / 22143765. iii) Basant Electricals, 564/2, M.G. Road, Basant Niwas, Gandhi Statue, Indore-452001. Phone/Fax: 0731-22431808, 22433429, 22431606 / 22434790. iv) Engineering Services, A-42, T-Market, Nandini Road, Post Office Khusipar, Bhilai-490011. Phone/Fax: 0788-2296893, 2223571 / 2355241. v) Indian Monitor Company, 1049, Shukrawar Peth, Tilak Road, Opp Hira Baug, Pune-411002. Phone/Fax: 020-4471561, 4476111 / 4490762. vi) G R Traders, 63 Trikamji Gheeya Marg,(Kitchen Garden Road), Mangaldas Road, Lohar Chawl, Post Box No. 2779, Mumbai-400002. Phone/Fax: 022-22082487, 22018316 / 22065184. vii) Magnet Wires & Insulation, 358, Kaliandas Udyog Bhawan, Mumbai-400025. Phone/Fax: 022-24228113, 24220983 / 24306596. viii)Shree Marketeers, 714 B, Raviwar Peth, Pune-411002. Phone/Fax: 020-24471583, 2712564 / 24467656. ix) Shriniwas Enterprises, 5/1, Bhagyanagar Society, Behind Market Yard, Bibewadi, Pune-411037. Phone/Fax: 020-4268569, 4260528 / 4268569. <u>SOUTHERN REGION</u> i) Hyderabad Electric Syndicate, 4-1-314, Bank Street, Hyderabad-500001. Phone/Fax: 040-24753834, 24753779 / 24753834 ii) Shahani India Company, No 3, 5th Cross, Kilari Road, Bangalore-560053. Phone/Fax: 080-2281808, 2380170. iii) Sri Vijaydurga Investments & Agencies Pvt. Ltd., Flat No. 13, A Block, navrathna Apts., 17th Cross Malleswaram, Bangalore-560055. Phone/Fax: 080-3311509, 3347043. iv) Modi & Modi, Modi Enterprises, First Floor, New 300(Old 172), Linghi Chetty Street, Madras-600001. v) Hi-Tech Insulation, No. 14, Old No.11, Francis Joseph Street, Chennai-600001. Phone/Fax: 044-5387786, 5361218. vi) Arvind Elect & Machine Tools, 335, Ramachandra Layout, Ramnagar, Coimbatore-641009. Phone/Fax: 0422-2235373, 2236438 / 2236438.
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MPMI NO. 153/92 (Revision-04) Annexure - D

2.	Elantas Beck India Ltd., Pune	vii) Packs Sales Corporation, XLI/1929, Banerji Road, Emakulam North, Cochin- 682018. Phone/Fax: 0484-2369036 / 2360967. viii) Southern Packeging, #41 jainagar, 3 rd Street, Valsarvakkam, Chennai- 660087. Phone/Fax: 044-24760077.
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Acceptance Tests for Resins & Varnishes

Dobeeckan FT 2005/500 EK (Elantas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	1.054	IS:10026 - 2
2	Viscosity at 27°C + 2°C / 23°C (Brookfield)	480-520 mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Flash point	32°C	IS:10026 - 2
4	Ability to cure	OK	IS : 10026 - 2
5	Gelling time at 118 °C / 120 °C	20-40 min	ISO:2535 / IEC:455-2-2
6	Drying in thin film at 120 °C / 1 h	Tackfree	IS : 10026 – 2

Elmotherm H 71A (Elantas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Colour and appearance	Brown clear	
2	Viscosity at 27°C ± 2°C Viscosity at 23°C	65 –75 secs	DIN 53211 Cup 4 /IS 3944-1966 Cup 4
3	Solids content (1.5 g/150°C?2h)	45 – 47%	----

Epoxy Gel Coat (Red) (Elantas – Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Colour appearance	Reddish brown opaque, thixotropic	----
2	Density	1.1	IS:10026 - 2
3	Viscosity at 27°C $\pm$ 2°C / 25°C (Brookfield)	45000- 55000mPa.s 85000mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
4	Ability to cure	OK	IS:10026 – 2
5	Gelling time at 25°C with hardener 758 (100 ; 10pbw)	55-65 min.	ISO 2535 / IEC:455-2-2

Hardener EH 411 (Elantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density		IS : 10026 - 2
2	Viscosity at 27°C ± 2°C / 25°C (Brookfield)	10000-30000mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Ability to cure	OK	IS : 10026 - 2

Hardener EH 758 (Elantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	----	IS : 10026 - 2
2	Viscosity at 25°C (Brookfield)	15 - 35mPa.s	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Ability to cure	OK	IS : 10026 - 2

Bectol (Red) (Elantas– Beck)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Colour and appearance	Red opaque	IS : 10026 - 2
2	Viscosity at 23°C	50 –150 secs	DIN 53211 / 4 mm cup / IS 3944-1966 Cup 4
3	Solids content 1.5 a/150°C/2h	53 –57%	

RE 3440 (ROTOMAC)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	0.963+0.980	IS : 10026 - 2
2	Viscosity at 27°C $\pm$ 2°C CPS	600-1000	IS : 10026 – 2 / IS : 3944-1966 Cup 4
3	Flash point	22°C	IS : 10026 - 2
4	Ability to cure	OK	IS : 10026 - 2
5	Non volatile content	40 + 2	IS : 10026 - 2

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Putty – 015 (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.19 ± 0.01	IS:10026 - 2
2.	Viscosity at 27°C ± 2°C cps	320 - 380	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Flash point	91°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2
5.	Gelling time	15 – 30 minutes	ISO 2535 / IEC:455-2-2

Putty H200 (INTAF)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density	1.19 + 0.01	IS:10026 - 2
2	Viscosity at 27°C + 2°C CPS	300-400	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3	Flash point	>200°C	IS:10026 - 2
4	Gelling time	15 – 30 minutes	ISO 2535 / IEC:455-2-2
5	Ability to cure	OK	IS:10026 - 2

Xiameter RSN 0994 Resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.02	IS:10026 - 2
2.	Viscosity at 27°C + 2°C	46	IS:10026 – 2 / IS:3944 – 1966 Cup 4
3.	Ability to cure (minutes)	OK	IS:10026 - 2
4.	Gelling time (minutes)	25	ISO 2535 / IEC:455-2-2

Xiameter RSN 0996 Resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.01	IS:10026 - 2
2.	Viscosity at 27°C + 2°C	1.50 poises	IS:10026 – 2 / IS:3944-1966 Cup 4
3.	Flash point	32°C	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2

DC 1 - 2620 (Dow Corning)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Density	1.11 (SG)	CTM0768
2.	Viscosity at 27°C $\pm$ 2°C (CPS)	144	CTM004
3.	Flash point	27°C	CTM0021A
4.	Ability to cure	Air drying	NA
5.	Drying in thin film	72 Hr.@RT	CTM021A

Sahney AV resin			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Specific gravity @ 25°C (avg.)	1.009	IS:10026 - 2
2.	Viscosity @ 25°C (Brookfield), CPS, avg.	600 -1000	IS:10026 – 2
3.	Flash point (Pensky-Martens closed cup)	22°F	IS:10026 - 2
4.	Ability to cure	OK	IS:10026 - 2

Ultimeg 2000-372 RH (PRS Permcel)			
S.No	PROPERTY	VALUE	TEST METHOD
1.	Specific gravity	<1.00	IS:10026 - 2
2.	Viscosity @ 25°C (Sec.)	16+/- 2 seconds	BS3900 PTA6 B4 flow cup
3.	Flash Point	27°C Nominal	IS:10026 - 2
4.	Dielectric strength @ RT	75 KV / mm	IS:10026 - 2

RE-120 (Rotomac)			
S.No	PROPERTY	VALUE	TEST METHOD
1	Density at 27 $\pm$ 2°C (in gms/ml) Component A	1.00 $\pm$ 0.02	IS:101 (Part 1/Sec. 7) - 1987
	Component B	0.99 $\pm$ 0.02	
2	Viscosity at 27 $\pm$ 2°C, Ford cup B4, seconds Component A	60 - 100	IS:10026 – 2 / IS:3944 -1966 Cup 4
	Component B	25 - 45	
3	Flash Point (Closed Cup); after mixing component A and B	30°C, minimum	IS:101 (Part 1/Sec 6) - 1987
4	Dielectric strength, KV/mm; tested after 1 hr. force drying at 80 °C a) At room temperature b) After 24 hrs. water immersion	80, minimum 50, minimum	IS:10026 (Part -2) - 1999