

	CORPORATE PURCHASING SPECIFICATION			AA 275 41	
				Rev. No. 01	
				PAGE 1 OF 5	
MAGNETIC STEEL SHEET VARNISH					
1.0 GENERAL: This specification covers the technical requirements of pigmented, water-thinnable and hot curing synthetic resin varnish. 2.0 APPLICATION: The varnish is used for insulation of cold and hot rolled magnetic steel sheets. The cured varnish is suitable for temperature endurance stability at 180⁰ C and for short periods at 220⁰ C 3.0 COMPLIANCE WITH NATIONAL STANDARDS: There is no Indian standard covering this material. The standard is based on BHEL experience. 4.0 QUALITY CONTROL TESTS : 4.1 Physical Conditions : The varnish shall be homogenous after stirring and freely soluble in water. The varnish shall be free from gelled particles and foreign impurities. 4.2 Density : 1.70 to 1.90 Kg / dm³ 4.3 Viscosity : 130 ± 20 seconds at 20 ± 2°C by DIN cup of 4 mm orifice to DIN 53211. Alternatively 180 ± 30 seconds at 27 ± 2°C by IS flow cup to IS 3944.					
Revisions : 32 nd MOM of MRC-E			APPROVED : INTERPLANT MATERIAL RATIONALISATION COMMITTEE-MRC (E)		
Rev. No. 01	Amd.No.	Reaffirmed	Prepared	Issued	Dt. of 1 st Issue
Dt:01.11.2002	Dt :	Year :	HARDWAR	Corp. R&D	APRIL 2002

AA 275 41	CORPORATE PURCHASING SPECIFICATION	
Rev. No. 01		
PAGE 2 OF 5		

4.4 Composition of the varnish (in weight %) :

Solid content : 75 ± 5

4.5 pH value : 8.5 ± 1

5.0 INFORMATION FOR REFERENCE :

5.1 Materials :

5.1.1 Type of binder : Phenolic resin, Melamine resin

5.1.2 Organic solvents : Butylglycol, Butyldiglycol, Butanol, dimethylethanamine

5.1.3 Fillers : Barium sulphate, Zinc sulphide

5.1.4 Solid content by volume : 51 ± 5% (The volatile portion consists of organic solvents and water in the weight ratio of 7 ± 1 to 20 ± 3).

5.1.5 Composition of solid content (in weight %) :

Total binder content	: 29	⁺⁵ -8	(This includes a maximum of 12% emulsifier part)
Filler content	: 71	⁺⁸ -5	

5.1.6 Flash point : Not less than 55°C

5.2 Properties of cured varnish :

5.2.1 Colour : Grey

5.2.2 Lead Pencil Hardness : 7H, min

5.2.3 Interlaminar insulation resistance :

90% of results	:	Minimum 1 Megaohm-cm ² / sheet
10% of results	:	Minimum 1 Kilo-ohm-cm ² / sheet



CORPORATE PURCHASING SPECIFICATION

AA 275 41

Rev. No. 01

PAGE 3 OF 5

- 5.2.4 Cross cut test : Gt OB as per DIN 53151
- 5.2.5 Method of usage : The varnish shall be satisfactorily stirrable and processable by means of rubber rollers. (Rubber of shore hardness 40°–60°). The coating, after curing shall have minimum roughness.
- 5.2.6 Test for curing of the varnish on the stamping : A soft cloth moistened with spirit (denatured Ethyl alcohol) is rubbed to and fro with hand pressure 10 times on the varnished surface of the sheet and observed. No varnish material removed from the sheet shall be seen on the moistened cloth. Also, there shall be no softening or dissolving of the insulation layer.

6.0 SHELF LIFE :

When stored in the original sealed container at normal temperature (max. 30°C), the varnish shall have a shelf life of minimum 12 months after delivery and shall satisfy all the requirements of this specification.

7.0 SAMPLING :

A sample shall be taken for testing from each supply after thorough stirring. If the results of these tests do not conform to this specification, two more samples from different containers are taken for repeat testing of those parameters, which were found deviating. If the results of the repeat tests also do not conform to this specification, then the entire supply is considered as not conforming to this specification.

8.0 TEST METHODS :

8.1 Tests for Varnish in as-received condition :

- 8.1.1 Test for Density : This shall be determined by accurately weighing exact volume (minimum 25 ml) of the varnish at the specified temperature and calculating the ratio of weight to volume.
- 8.1.2 Test for viscosity : This shall be determined by finding the time required for the varnish to flow while using either the DIN or IS flow cup, as the case may be, at the specified temperature.



8.1.3 Test for Solid content : This shall be determined by finding the weight loss in a sample of not less than 0.1 g of the varnish when subjected to a temperature of $80 \pm 5^{\circ}\text{C}$ for 16 hours.

Alternatively, solid content can be determined on 1-2 g sample by finding weight loss at 120°C for 4 hours.

8.1.4 Test for pH value : This shall be determined by using a suitable electro-chemical pH meter.

9.0 TEST CERTIFICATE AND COMPLIANCE CERTIFICATE :

Unless otherwise specified, three copies of test certificates incorporating the properties as per clause 4 and compliance certificate with respect to other clauses shall be supplied with each consignment, indicating the following information :

- AA 275 41 (Rev 01): Magnetic Steel Sheet Varnish
- BHEL Order No.
- Batch / Lot No.
- Date of manufacture
- Size and No. of drums

10.0 PACKING & MARKING :

The varnish shall be suitably packed in 250 Kg drums or as stated in BHEL order to provide adequate protections to prevent any damage during transit and storage. The drum shall have a fully openable and sealable cover.

Each drum shall bear the following information :

- * Magnetic Steel Sheet Varnish
- * Specification No.,
- Batch / Lot No.
- Date of manufacture
- Date of expiry / Shelf life
- Net weight
- Supplier's name / grade



CORPORATE PURCHASING SPECIFICATION

AA 275 41

Rev. No. 01

PAGE 5 OF 5

11.0 ACCEPTANCE CRITERIA :

The material supplies shall be accepted on the basis of the following :

- i) Compliance certificate to AA27541, Rev 01 furnished by the supplier.
- ii) Test certificate furnished by the supplier and / or testing carried out at BHEL end.

12.0 ENVIRONMENTAL REQUIREMENTS :

The supplier shall furnish Material Safety Data Sheet (MSDS) covering all information relating to human safety and environmental impacts of the hazardous materials particularly during their transportation, storage, handling and disposal alongwith each supply.

Each container shall be marked with corresponding symbol and minimum worded cautionary notice for flammable / corrosive / toxic / harmful / irritant and oxidizing etc. as applicable.

13.0 REJECTION :

BHEL reserves the right to reject the entire lot of the material, if found not to comply with these requirements. Parts of the lot which are found to be defective or not complying with these requirements can also be rejected at a later stage.

14.0 REFERRED STANDARDS (Latest Publications Including Amendments) :

- 1) DIN 53211
- 2) DIN53151
- 3) IS : 3944