SILICONE BONDING VARNISH TEMPERATURE INDEX 220

1. **GENERAL:**
This specification covers the technical requirements of heat resistant flexible, insulating varnish of temperature index of at least 220.

2. **APPLICATION:**
This material may be used for coating glass cloth sleevings and for bonding mica glass or other flexible mica products.

3. **COMPLIANCE WITH NATIONAL STANDARDS:**
There is no Indian Standard covering this material.

4. **REQUIREMENTS:**

4.1 **Composition and class:**
The varnish shall be obtained from methyl phenyl polysiloxane resin. Whenever required by BHEL the manufacturer shall furnish relevant information on composition. The material shall be of the temperature index of at least 220.

The infra red spectra of the individual varnish lots shall always comply with the sample lot type approved earlier and no deviation from this shall be allowed.

4.2 The material shall also comply with the requirements given in Table 1 with a test sample drawn in accordance with the clause 2 of Corporate Standard AA 085 17 10. The test panel shall be made according to clauses 3.1 and 3.3 of CS AA 085 17 10 at 250 deg. C with a 1 to 2 hours baking cycle.

TABLE - 1

Sl.No.	Characteristics	Requirements	Method of test refer to clause in CS AA 085 17 10
1.	**Properties of Varnish:**		
1.	Colour	Light Straw	
2.	Weight per 10 litre - in kgs. at 27°C	10 - 10.2	5
3.	Viscosity at 27°C in CP	80 - 150 (30 to 50 secs.)	IS: 197
4.			
4.	Non-volatile matter as (%) at 140°C	49 ± 2	7
5.	Compatibility - xylene/Toluene	To pass the test	12
6.	Flash point (°C) (Type Test)	25 Min.	14
	Properties of Film		
7.	Drying time at 250°C (in minutes)	30 to 60	21
	Grade	B 2	
8.	Finish	To pass the test	22

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Sl.No.	Characteristics	Requirements	Method of test refer to clause in CS AA 085 17 10
9.	a) Flexibility & adhesion (Type Test)	To pass the test	23.1
	b) Effect of heat ageing on flexibility at 250 deg.C after 28 days (Type Test)	To pass the test	23.2
10.	Dielectric strength kV/mm		32
	a) at room temp.	50	
	b) at 180°C	25	
	c) after immersion in water for 24 hours	25	
11.	Dissipation factor (Type Test)		
	At 500 Volt, Film thickness of 65 - 70 microns		34
	a) at 27°C	.01 Max.	
	b) at 180°C	.04 Max.	
	c) at 220°C	.05 Max.	
12.	Weight loss at 270°C after 28 days. % by weight (Type Test)	4.0 Max.	Appendix I

4.3 The material shall comply with the general conditions as stipulated in clause 4.1 of AA 085 17 10 and the varnish shall be deemed to have been approved for final acceptance only after necessary shop trials as a type approval test.

Recommended thinners are xylene, toluene and a mixture thereof.

4.4 **Shelf life/keeping property:**
When stored under cover in a dry place in the original sealed container under aircooled (25°C) temperature conditions, the material shall retain the properties prescribed in this specification for a period of 12 months after the date of manufacture which shall be subsequent to the date of placing order.

5. **TEST CERTIFICATE:**
Three copies of test certificate shall be supplied giving the following information:

AA 27535 : Silicone Bonding Varnish Temperature Index 220.
Rev. 01 Index 220.

BHEL Order No.

Name of Supplier. Batch No.

Date of Manufacture

Date of Expiry.

Size & No. of Drums.

Test results for the properties of enamel and cured film as per Table I.

6. **PACKING AND MARKING:**

The material shall be packed in non-reactive drums of 20 litres or any suitable size as per our order and sealed. The drums are to be suitably packed to prevent damage during transit. Each drum shall, bear the following information:

AA 27535 : Silicone Bonding Varnish Temperature Index 220.

BHEL Order No.

Batch No.

Date of Manufacture

Date of Expiry

Net Weight.

Supplier's Name.

APPENDIX 1

DETERMINATION OF WEIGHT LOSS

1.0 **Sample Preparation:**

Take a desized glass cloth as specified below:

Weight per unit area	- (approx) 55 g/m^2
Thickness	- 0.05 - 0.07 mm
Yarn	- Continuous glass filament yarn free from alkali.
Residual size content	- 0.2% max.

Take the specified glass cloth of convenient size so that four specimens of 10 x 10 cm could be prepared.

1.1 **Impregnation:**

Immerse the glass cloth vertically and completely in the varnish sample and withdraw it from the varnish at a rate at which the excess of varnish slips down the surface of the glass cloth, care being taken to avoid air bubbles sticking to the surface. Dry the specimen in a well ventilated dust free chamber for 10 minutes. Dry the specimen at 200°C till it's surface is dry. Repeat the above immersion procedure turning upside down for second coat, in order to obtain a uniform coating. Cure the specimen at 200°C for 1 to 2 hours. The immersion and curing cycle may be repeated in the manner it is specified above till a dry coating thickness of 0.16 ± 0.02 mm is obtained.

1.2 Take the 10 x 10 cm specimen of uncoated and varnish coated glass cloth. Keep both the specimens at 110°C for 2 hours. Cool the specimens to room temperature in desiccator. Record the initial weight of uncoated (W1) and varnish coated specimen (W2) to the nearest 0.001 mg. Keep the varnish coated specimen in a oven at 250°C for 24 hours, remove and cool to room temp. in a desiccator. Record the weight of the specimen. Repeat the heating, cooling and weighing after every 24 hours. At the end of the specified period, take the final weight of the specimen (W3).

1.3 Report the percentage weight loss as

$$\% \text{ Wt. loss} = \frac{(W2-W1) - (W3-W1)}{(W2-W1)} \times 100$$