

सामग्री चुकी सख्या को
SUPERSEDES
INVENTORY NO

COPYRIGHT AND CONFIDENTIAL
The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way, detrimental to the interest of the company.

स्वत्वाधिकार एवं गोपनीय
इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इस्का प्रलेख एवं आशुका रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए

हस्ताक्षर एवं दिनांक
SIGN & DATE

SEMI CONDUCTING VARNISH

1. GENERAL :

This specification governs the requirements of Semi conducting varnish consisting of modified Phenolic resin as binding agent, solvents and silicone carbide powder. The material is of proprietary nature and corresponds to varnish grade SIB 8001 of M/s VonRoll Isola – Switzerland. The varnish is suitable for machines of Thermal class B-F .

2. APPLICATION :

The varnish is used for end corona protection applications on stator coils and bars of High voltage electrical rotating electrical machines. The varnish is applied generally with a brush on the insulation surface.

3. COMPLIANCE WITH NATIONAL STANDARDS :





There is no Indian standard covering this type of material. This is based on BHEL experience.



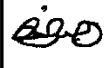
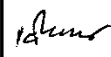
4. PROPERTIES :


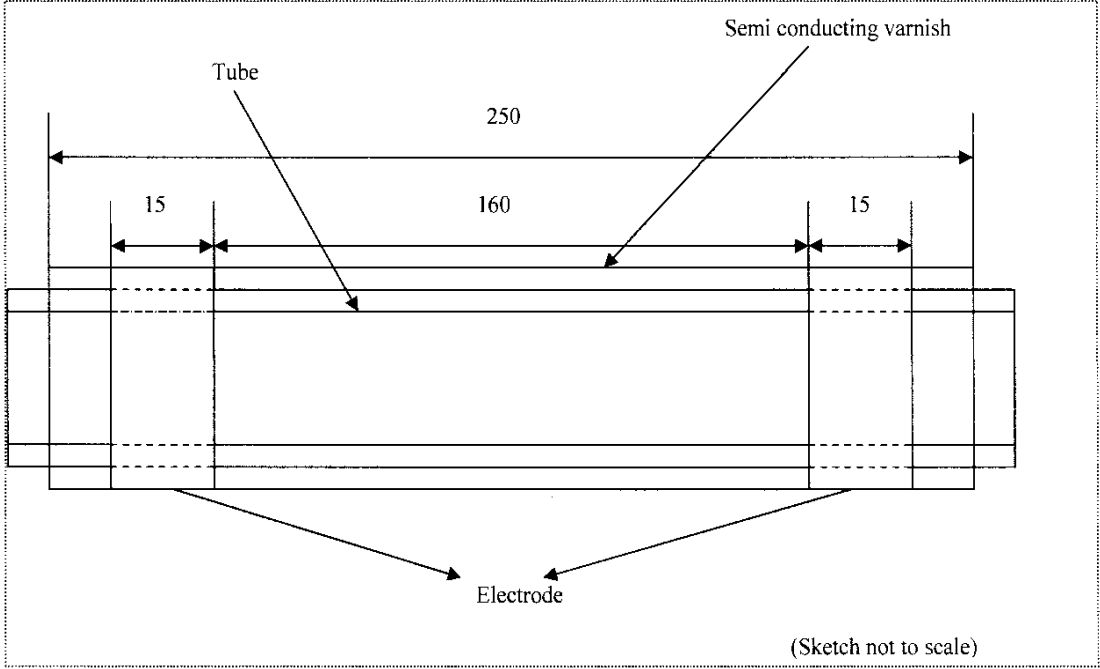

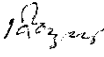
4.1 GENERAL QUALITY :





Because of the high density of the pigment/filler, it has a tendency to settle down. The varnish shall be thoroughly stirred to make it uniform before use. The quality of coating obtained shall be smooth, uniform and without hair-line marks. Skin formation in sealed container of the varnish is not permissible.

				नाम NAME		दिनांक एवं हस्ताक्षर SIGNATURE & DATE	
TSX	A.K. HATWANI			अनुवादक TRANSLATED BY			
QAX	R. K. SINGH			निर्माणकर्ता WORKED BY	S.A. MIRAJ		
EME	S.K. AGRAWAL			जांचकर्ता CHECKED BY	V.C. GOYAL		
सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE		पर्यवेक्षणकर्ता SUPERVISED BY	V.C. GOYAL		
				स्वीकृति APPROVED :	संस्थान मानक समिति PLANT STANDARDS COMMITTEE		PPS 2-71
REV.NO. 02	(SUPERSEDES)			निर्माण PREPARED :	जारी ISSUED :	मानक विभाग STANDARDS DIVISION	दिनांक DATE : 05.08.93
Dt. 30.04.07							

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)		HW 27869 पृष्ठ का Page 2 of 5	
सामग्री सूची संख्या को अधिष्ठापित करें।	SUPERSEDES INVENTORY NO.	<p>4.2 Colour : Grey</p> <p>4.3 Viscosity : (a) 900 ± 100 mPa.s at 20°C (When measured as per DIN 53019) (OR) (b) 190 ± 10 seconds at 27±2°C (When measured using Flow cup No.4 as per IS 3944)</p> <p>4.4 Solid content : 52 ± 3 %</p> <p>4.5 Pigment content : Min. 35 % :- For reference</p> <p>4.6 Drying time at Room Temp. (≈ 23°C) : Surface dry : ≈ 30 minutes Complete dry : ≈ 10 hours</p> <p>4.7 High voltage test on tube : Shall withstand 60 kV for 10 minutes without flashover , tracking or excessive heating</p> <p>5.0 SAMPLING :</p> <p>One sample of about 0.5 litre quantity shall be taken for testing from a lot of every ten containers, after thorough stirring of the contents . If the results of this sample do not meet the specification , then two more samples are drawn from remaining containers. If two of three results do not meet the requirements of this specification then the lot is considered as not conforming to the specification.</p> <p>6.0 SHELF-LIFE :</p> <p>The varnish shall have a minimum shelf-life of 12 months when stored at 20 – 25°C under sealed condition in a dry place .</p> <p>7.0 TEST METHODS :</p> <p>7.1 Solid content : As per standard IEC 60464-1/-2 OR IS 101 , Part-2 , Section 2</p> <p>7.2 Pigment content : As per standard IS 101 , Part 8 , Section 2</p>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical, Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.					
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं अनावका रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।					
हस्ताक्षर एवं दिनांक SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO.	REV.NO.		निर्मणकर्ता WORKED BY	S.A. MIRAJ	 30.04.07
P-3306	02		जांचकर्ता CHECKED BY	V.C. GOYAL	 30.04.07

दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;">संस्थान क्रय विनिर्देश (डीप - हरिद्वार)</p> <p style="text-align: center;">PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)</p>	<p style="text-align: right;">HW 27869</p> <p style="text-align: right;">पृष्ठ का Page 3 of 5</p>		
सामग्री सूची संख्या INVENTORY NO.	<p>7.3 Drying time :</p> <p>Preparation of Test panel : A plane glass panel , free from surface irregularities , of approximate size 150 x 150 x 2 mm , shall be taken. This shall be cleaned to remove oil and grease, by the following method..</p> <p>The panel is dipped in Trichloroethylene or carbon tetra chloride solvent and rubbed with a clean and soft cloth. The panel is further rinsed thoroughly with water and then washed with soap and water until the wetted panel shows no water breaks, when held in vertical position. The panel is then allowed to dry in dust-free air.</p> <p>The semi conducting varnish is applied on the test panel, prepared as above, either by brush or by careful spraying , to obtain a smooth and uniform coat. The coated panel is dried in horizontal position at an ambient temperature of about 23 – 27°C for the specified time period. After this period , a piece of tissue paper of approx. diameter 20 mm is placed on the dried varnish film and is further loaded with 100 g weight for surface-dry check and 200 g weight for complete(hard)-dry check , for one minute. The paper should not stick to the varnish film when lifted after removal of the weight.</p>				
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>7.4 High voltage test on tube :</p> <p>Approximately 250 ml sample is taken from the original container after thorough stirring. The viscosity of this sample is adjusted to 25 – 30 seconds by flow cup by adding thinner of following composition.</p> <ol style="list-style-type: none"> 1. Butanol (Butyl Alcohol) - LR Grade : 3 Parts by Vol. 2. Ethyl Acetate - LR Grade : 2 Parts by Vol. <p>The varnish is then applied uniformly by brush on a Phenolic laminate tube or any other suitable tube of outer diameter approx. 30 mm and of length approx. 400 mm . After a period of minimum one hour , a second coat of the same varnish is applied. This is allowed to dry for about 24 hours at Room temperature. Aluminium foil electrodes are applied as per the arrangement shown in Figure-I . The sample is subjected to high voltage test at 60 kV for 10 minutes between the two electrodes. The sample is considered to have passed the test, if there is no flash-over or tracking during the test duration and no excessive heating is observed on the surface of the sample after completion of the test .</p>				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं आरक्षण रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।					
हस्ताक्षर एवं दिनांक SIGN & DATE					
सामग्री सूची संख्या INVENTORY NO. P-3306	REV.NO. 02		निर्माणकर्ता WORKED BY S.A. MIRAJ		30.04.07
			जांचकर्ता CHECKED BY V.C. GOYAL		30.04.07

दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;">संस्थान क्रय विनिर्देश (हीप - हार्डवयर)</p> <p style="text-align: center;">PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)</p>	HW 27869		
सामग्री सूची संख्या को अधिकृतित करना SUPERSEDES INVENTORY NO.	<p style="text-align: center;">FIGURE - I</p> 				
COPYRIGHT AND CONFIDENTIAL. The information on this documents is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p>8. TEST AND COMPLIANCE CERTIFICATE :</p> <p>The supplier shall furnish certificate of compliance to this specification/Grade SIB 8001 and Test certificate , with each supply of the material. The certificate shall carry information about the grade , Batch/lot No., date of manufacture/expiry, Test results obtained and preferably BHEL P.O.No.</p> <p>9. CRITERIA FOR ACCEPTANCE :</p> <p>The material shall be accepted on the basis of compliance certificate to this Specification / Grade SIB 8001 furnished by the supplier .</p>				
स्वतंत्राधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत देशी इलेक्ट्रिकल्स की सम्पत्ति है इस्का प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।					
दिनांक एवं हस्ताक्षर SIGN & DATE 15/5/07					
सामग्री सूची संख्या INVENTORY NO. P-3306	REV. NO. 02		निर्माणकर्ता WORKED BY S.A. MIRAJ		30.04.07
			जांचकर्ता CHECKED BY V.C. GOYAL		30.04.07

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हार्डवयर) PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)	HW 27869	
सामग्री सूची संख्या को अधिकाधिकृत करना SUPERSEDES INVENTORY NO.	<p>10. PACKING & MARKING :</p> <p>The varnish shall be packed in air-tight tin containers of 5 kg capacity.</p> <p>Each container shall be marked giving following information.</p> <ul style="list-style-type: none"> i) Material name / Specification No. ii) BHEL P.O.No. (Optional) iii) Net weight / Gross weight iv) Manufacturer's name & Lot reference v) Date of manufacture./ expiry & Storage conditions <p>11. ENVIRONMENTAL REQUIREMENTS :</p> <p>The supplier shall furnish Material safety datasheet (MSDS) covering all information relating to human safety and environmental impacts , particularly during transportation , storage , handling and disposal. The containers shall accordingly be marked appropriately.</p> <p>12. CROSS REFERRED STANDARDS : DIN 53019 , IS 3944 , IEC 60464-1/-2 , IS 101 , Part-2 , Section 2 , IS 101 , Part 8 , Section 2</p> <p>13. REJECTION :</p> <p>BHEL reserves the right to reject the entire lot of the material not conforming to the requirements of this specification. Parts of the lot not subjected to testing but found to be defective or to contain hidden defects can be rejected at a later stage.</p>			
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electrical, Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.				
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इस्तेमाल के लिए न किया जाए । उपरोक्त रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में प्रतिकारक हो न किया जाए ।				
दिनांक एवं हस्ताक्षर SIGN & DATE 				
सामग्री सूची संख्या INVENTORY NO. P-3306	REV.NO. 02		निर्माणकर्ता WORKED BY S.A. MIRAJ 	30.04.07
			जांचकर्ता CHECKED BY V.C. GOYAL 	30.04.07