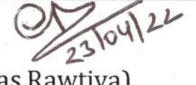
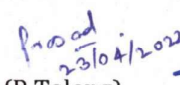
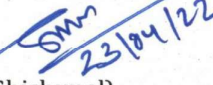
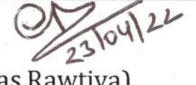
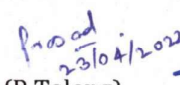
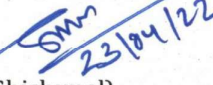
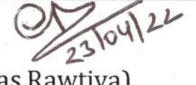
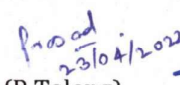
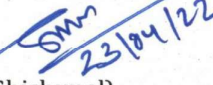


 <p><b>PRODUCT STANDARD</b> TME DIVISION, BHOPAL</p>	<p><b>TM 20597</b></p> <p>REV 01</p> <p>PAGE: 01 OF 03</p>									
		<p align="center"><b><u>SOLVENT LESS SILICONE IMPREGNATING RESIN &amp; ITS FILLER/ AUXILIARY MATERIAL</u></b></p>										
<p align="center"><b>COPYRIGHT AND CONFIDENTIAL</b></p> <p>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</p>	<p><b>1.0 General</b> This specification governs technical requirements of liquid, solvent less, Silicone Impregnating Resin and its filler/ Auxiliary material of Class-200 and above. The material shall comply with specification instructions regarding chemical composition, mechanical properties and all other listed requirements in this specification.</p> <p><b>1.1 Resin</b> Silicon Impregnating Resin used for Vacuum Pressure Impregnation or equivalent to SILRES H62C for is methylphenylvinylhydrogenpolysiloxane not modified with organic components, very low volatility (suitable for Vacuum Pressure Impregnation). It contains no decomposable and physiologically problematic components.</p> <p><b>1.2 Filler/ Auxiliary material</b> Filler/ Auxiliary material (if required) is a liquid component of Silicone Impregnating Resin for VPI or equivalent, when cured by heat through catalyzed addition cross linking without the formation of cleavage products. It also cures in thick layers, even contact with air, tack free and without formation of bubbles.</p> <p>Mixture contains no decomposable and physiologically problematic components.</p> <p><b>2.0 Application</b> Used for vacuum pressure impregnation of traction machines winding.</p> <p><b>Typical ratio for use is as follows</b></p> <ul style="list-style-type: none"> <li>• Silicon Impregnating Resin or equivalent – 110 parts by weight</li> <li>• Filler/ Auxiliary material (if any) – 02 parts by weight</li> </ul> <p>Any other ratio as recommended by supplier/ OEM, suitable for corresponding grades can be used.</p> <p><b>3.0 Compliance with national standard</b> There is no Indian standard covering this type of material. This is based on BHEL experience. Reference has been drawn from CLW specification no. 4TMS.096.093, Alt 00.</p> <p><b>4.0 Technical Requirements</b></p> <p><b>4.1 Special Features</b></p> <ul style="list-style-type: none"> <li>• Resin should be Silicone Based preferably transparent yellow in color.</li> <li>• Resin should be very low volatility (suitable for Vacuum Pressure Impregnation).</li> <li>• Resin should be curable by heat without any formation of cleavage products; resin should also cure in thick layers even in contact with air, tack-free and without formation of bubbles.</li> <li>• The resin should be remarkably insensitive during curing to the influence of various kinds of insulating materials.</li> <li>• The resin can be processed at temperatures up to a maximum of 80°C to reduce viscosity.</li> <li>• The resin should confirm to fire safety requirements defined in UL 94 V0.</li> <li>• Resin should be compatible with silicon bonded glass mica tape, as per BHEL specification TM97239.</li> </ul>											
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<b>4.3 Gel Time of Resin</b>	<ul style="list-style-type: none"> <li>The electrical component to be impregnated is dried at elevated temperature under vacuum (0.5-5 mbar) in the impregnating vessel.</li> <li>To accelerate impregnation pressure (2-5 bar) is applied until impregnation is completed.</li> <li>The electrical part is lifted from the impregnation vessel and excessive resin drips off. Thickness of the surface coating should be &lt; 50 micro m to exclude cracks due to differing thermal expansion of materials.</li> <li>Curing is done at 200°C, 12 hours or else recommended by manufacturer.</li> </ul>																																														
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 <b>TME 2011</b>	<b>PRODUCT STANDARD</b> <b>TME DIVISION, BHOPAL</b>		<b>TM 20597</b>												
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<p>All testes specified in the specification shall be carried out preferably at manufacturers work. The manufacturer shall all necessary machines, apparatus, labour and assistance required for conducting tests without extra cost. If any testing facility is not available at firm's premise the test is to be done from any Government approved NABL lab at firm's own cost.</p>															
<b>6.0 Storage &amp; Shelf Life</b> The shelf life of resin in original sealed drum should be more than 9 months or above when stored at room temperature (25°C). The shelf life of Filler/ Auxiliary material (if any) should be more than 12 months or above when stored at room temperature (<25°C). The 'Best use before end' date should be mentioned on each drum/ container.															
	<b>6.0 Test Certificate</b> Three copies of test certificates shall be supplied for each lot, unless otherwise specified on order. In addition, the supplier shall ensure to enclose one copy of the test certificate along with their dispatch documents to facilitate quick clearance of the material. The test certificate shall bear the following information: TM20597, BHEL purchase Order No., Supplier's Name/Grade/Identification No., Weight, and Packet/Container/Drum No., Properties of test as per this standard.														
	<b>7.0 Approved Grades</b> The material shall be ordered on BHEL approved grade only. At present following grade is approved by BHEL:														
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<b>Notes:</b> <ul style="list-style-type: none"> <li>Any other grade can be offered against this specification, subject to meeting material properties as per this specification and prior approval of BHEL.</li> <li>For any other grades supplier to submit Technical data sheet, MSDS, test certificate as per this specification from NABL/ any internationally accredited lab.</li> <li>If any deviation in product data, firm may seek approval of same submitting detail justification regarding gelling time, viscosity, color, ratio etc. Firm should VPI procedure of their product along with their offer. Firm should submit compatibility test report of their product vs Existing Silicone based resin combination for Vacuum Pressure Impregnation (VPI) before prototype inspection indicating that there will be no adverse effect on existing insulation scheme.</li> </ul>															
	<b>8.0 Revision History</b>														
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