



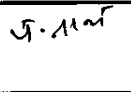




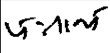


दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हर्द्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)	HW 19797 मुख पृष्ठ PREFACE SHEET
सामग्री सूची संख्या को अति-क्रियित करता है SUPERSEDES INVENTORY NO.	CASTING WITH LAMELLAR GRAPHITE MATERIAL GRADE: GG 25 केवल आंतरिक प्रयोग हेतु प्रदायक को देने से पूर्व इस मुखपृष्ठ को निकाल दें । FOR INTERNAL USE ONLY REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS.		
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	समतुल्य मानक/सूची आदि COMPARABLE STANDARDS / CATALOGUES ETC. <p style="text-align: right;">} : NIL</p>		
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	सुझाए/सम्भावित प्रदायक एवं श्रेणी SUGGESTED / PROBABLE SUPPLIERS AND GRADES. <p style="text-align: right;">} : AS PER PMD</p>		
दिनांक एवं हस्ताक्षर SIGN & DATE 11/17/05	कोई अन्य जानकारी ANY OTHER INFORMATIONS <p style="text-align: right;">} : BASED ON TLV 9021 01 11' 1991</p>		
सामग्री सूची संख्या INVENTORY NO. P-2171	REV 01 11.6.05	स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE निर्माण : PREPARED : MTE	जारी : मानक विभाग ISSUED : STANDARDS DIVISION दिनांक : DATE : 10-06-1994

दिनांक एवं हस्ताक्षर & DATE		संस्थान क्रय विनिर्देश (डीप - हार्डवार) PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)		HW 19797 पृष्ठ का Page 1 of 4	
		सामग्री सूची संख्या को SUPERSEDES INVENTORY NO. अधिकारित करता है	CASTING WITH LAMELLAR GRAPHITE MATERIAL GRADE: GG 25		
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	1. GENERAL This specification governs the quality of GG 25 (material no. 0.6025) casting as per DIN 1691 part-1 and the following additional requirement.				
	2. APPLICATION Castings are required for Gas and Steam Turbine components.				
3. CONDITION OF DELIVERY The castings shall be supplied in rough machined condition unless otherwise specified in the ordering drawing.					
4. REFERENCED DOCUMENTS EN 1691, DIN 1685-1, EN 1370, BNIF 359-01, MSS-SP-55, EN 10204, HW0980829 (PA 11.61). Equivalent standard can also be used after approval from BHEL					
5. DIMENSION & TOLERANCE					
5.1 castings shall be supplied to the dimensions shown on the drawing accompanying the order. The rough machining is to be done as per the surface finish mentioned on the drawing.					
5.2 Tolerance: General tolerances as per DIN 1685 part-1 accuracy degree GTB 18 are applicable unless otherwise specified in the ordering drawing.					
6. MANUFACTURE					
6.1 The method of manufacture is left at the discretion of the supplier unless otherwise mutually agreed upon.					
6.2 Internal area of castings must, by all means, be leak proof. The supplier shall stand guarantee to this. If mentioned on the drawing or in the technical delivery condition testing with kerosene oil or other equivalent fluid (with respect to fluidity) may be carried out.					
6.3 <u>Any repair of defects in the casting is not accepted neither by welding, brazing or any other techniques.</u>					
स्वत्वाधिकार एवं गोपनीय इस प्रलेख में की गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए।	हस्ताक्षर एवं दिनांक SIGN & DATE 21/7/05		नाम NAME		दिनांक एवं हस्ताक्षर SIGNATURE & DATE
	T SX KISHAN LAL 20/7/05 MEMBER P.S.C. N.R. De 18/4/05		अनुवादक TRANSLATED BY		
QAX N.K.MANWANI 21/7/05 सहमत विभाग नाम दिनांक एवं हस्ताक्षर		निर्माणकर्ता WORKED BY SSG		15/9/05	
AGREED DEPTT NAME DATE & SIGNATURE		जांचकर्ता CHECKED BY P.NATH		9/11/05	
INVENTORY NO. P-2171 11.6.05		पर्यवेक्षणकर्ता SUPERVISED BY VB ARORA		9/11/05	
स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE					
REV 01 11.6.05		निर्माण : MTE PREPARED : MTE		जारी : मानक विभाग ISSUED : STANDARDS DIVISION	
				दिनांक : DATE : 10-6-94	

दिनांक एवं हस्ताक्षर SIGN & DATE		<p align="center">संस्थान क्रय विनिर्देश (डीप - हरिद्वार)</p> <p align="center">PLANT PURCHASE SPECIFICATION</p> <p align="center">(HEEP - HARDWAR)</p>	<p align="right">HW 19797</p> <p align="right">पृष्ठ का Page 2 of 4</p>																									
सामग्री सूची संख्या को अधिकृत करना है SUPERSEDES INVENTORY NO.	<p>7 HEAT-TREATMENT</p> <p>If heat treatment is not mentioned on the drawing and supplier feels it necessary, the casting may be stress relieved to achieve the desired strength, hardness and microstructure.</p> <p>8 FINISH</p> <p>The surface finish of rough machined surface shall be maintained as specified on the drawing. Caulking peening and revetting are not permitted.</p> <p>9. FREEDOM FROM DEFECTS</p> <p>9.1 Visual Inspection: The castings shall be sound and free from shrinkage, blowhole and cracks. The unfused seam, chaplets, chills and similar things are not permitted. The casting must be well cleaned. Casting seam, runner and risers are to be clear flushed. The surfaces are to be shot blasted. Minor surface defects are only to be ground. Smooth fillets and change in section should also be ground.</p> <p>9.2 NDT for surface defect : Unless otherwise specified on the drawing, MPI or DP or combination of both test shall be carried out to cover all accessible surface as per HW 0980829 (PA 11.61) to quality level 2.</p> <p>10. CHEMICAL COMPOSITION</p> <p>The chemical composition is left to supplier's discretion for achieving the desired microstructure and mechanical properties as per clause 12.0.</p> <p>11. SELECTION OF TEST SAMPLES</p> <p>The test piece shall be taken from separately cast samples of 30 mm diameter from each melt and heat treatment batch for rough machined individual casting weight upto 1000 Kgs. For casting weight more than 1000 Kgs. integrally cast K-type samples as per DIN 1691 to be cast on each casting. Sufficient numbers of test samples shall be provided for testing at BHEL.</p> <p>12. MECHANICAL PROPERTIES</p> <p>The mechanical properties shall be tested at 20°C (test method as per standards given in DIN 1691 or equivalent national or international standard) and values are :</p> <table border="1" data-bbox="446 1585 1339 1774"> <thead> <tr> <th>Dimensions</th> <th>Type of samples</th> <th>Tensile Strength</th> <th>BHN (min)</th> </tr> </thead> <tbody> <tr> <td align="center" colspan="4">Separate Cast Sample 250-350 N/mm Sq</td> </tr> <tr> <td>> 20 - < 40</td> <td>Integral Cast Samples</td> <td>210</td> <td>180</td> </tr> <tr> <td>> 40 - < 80</td> <td>- do -</td> <td>190</td> <td>180</td> </tr> <tr> <td>> 80 - < 150</td> <td>- do -</td> <td>170</td> <td>170</td> </tr> <tr> <td>> 150 - < 300</td> <td>- do -</td> <td>160</td> <td>160</td> </tr> </tbody> </table> <p>The tensile values for thickness greater than 150 mm are for information.</p>				Dimensions	Type of samples	Tensile Strength	BHN (min)	Separate Cast Sample 250-350 N/mm Sq				> 20 - < 40	Integral Cast Samples	210	180	> 40 - < 80	- do -	190	180	> 80 - < 150	- do -	170	170	> 150 - < 300	- do -	160	160
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			जांचकर्ता CHECKED BY P.NATH																									

दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;">संस्थान क्रय विनिर्देश (हीप - हार्डवयर)</p> <p style="text-align: center;">PLANT PURCHASE SPECIFICATION</p> <p style="text-align: center;">(HEEP - HARDWAR)</p>	<p style="text-align: right;">HW 19797 .</p> <p style="text-align: right;">पृष्ठ का Page 3 of 4</p>			
सामग्री सूची संख्या को अधिकांशित करना है SUPERSEDES INVENTORY NO.	<p>Scope of hardness testing 100%. Hardness shall be carried out on each casting at HB 30. The value shall be ≤ 250. For castings on which it is difficult to carry out direct hardness test, a test on cast on sample of upper $\varnothing 30$, lower $\varnothing 35$ and length 30 may be agreed. Cast on sample shall only be separated (by cold method) after heat treatment where this applies. The parting surface should be ground and hardness measured on it.</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>13 RECTIFICATION WELDING</p> <p><u>Weldings are only allowed after approval by the purchaser in a written form.</u></p> <p>The casting defects shall not be rectified by welding or brazing or lany other sealing method. Such defects are to be reported to BHEL so that a suitable method of rectification can be decided. If the casting is rectified without prior aproval of BHEL , it shall be rejected and sent back to the supplier.</p> <p>14.0 INSPECTION AT SUPPLIER'S WORKS</p> <p>14.1 Unless otherwise agreed, test and inspection are to be conducted in the presence of the customer's representative. The representative shall have free access at all times while the work on the contract is being performed, to all parts of the supplier's works. The supplier shall offer the purchaser's representative all reasonable facilities, without charge, to satisfy the later that the material is being furnished in accordance with the specification.</p> <p>14.2 The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premisses. If facilities are not available in his works, the supplier shall make necessary arrangements for lcarrying out the prescribed test elsewhere.</p>					
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हस्ताक्षर एवं दिनांक SIGN & DATE <i>[Signature]</i> 21/7/05						
सामग्री सूची संख्या INVENTORY NO. P-2171	REV 01	DATE 11.6.05	निर्माणकर्ता WORKED BY	SSG	<i>[Signature]</i>	1973
			जांचकर्ता CHECKED BY	P.NATH	<i>[Signature]</i>	

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सामग्री सूची संख्या को SUPERSEDES INVENTORY NO. अधिकारित करता है।	<p>15.3 Result of Test</p> <ul style="list-style-type: none"> - Melt analysis - Mechanical properties and Brinell Hardness on the casting and or samples - NDT Report. <p>15.4 Dimensional report.</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>16. CLEARANCE FOR DELIVERY</p> <p>16.1 For clearance, the results of all the tests carried out in totality are to be decisive.</p> <p>16.2 BHEL evaluates these total results with regards to the intended operational requirements of the casting and judges admissibility of deviation from the properties required in this specification (in case there is any).</p> <p>16.3 The clearance does not release the supplier of his responsibilities for the hidden non-permissible defects which are found later. BHEL must be informed immediately on the difficulties which may cause delay in delivery schedule.</p> <p>17. IDENTIFICATION MARKING</p> <p>The supplier shall cast or punch to identify the casting as per ordering drawing.</p> <p>18. PACKING</p> <p>Each casting shall be suitably protected from corrosion and damage during transit by anticorrosive paint HE 1707 (Produced by Central Insulation Technology BHEL Bhopal) or Petrolatom (product of Bharat Petroleum). The overseas suppliers may use Tectyle 506 (produced by M/s Vololine, Germany).</p>					
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