












दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हरिद्वार) PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)	HW 1992 मुख पृष्ठ PREFACE SHEET
सामग्री सूची संख्या को SUPERSEDES INVENTORY NO.	<p align="center">SAND CASTING COPPER, CHROMIUM G-CuCr F35</p> <p align="center">केवल आंतरिक प्रयोग हेतु प्रदायक को देने से पूर्व इस मुखपृष्ठ को निकाल दें ।</p> <p align="center">FOR INTERNAL USE ONLY REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS.</p> <p>समतुल्य मानक/सूची आदि COMPARABLE STANDARDS / CATALOGUES ETC. } :</p> <p>सुझाए/सम्भावित प्रदायक एवं श्रेणी SUGGESTED / PROBABLE SUPPLIERS AND GRADES. } : AS PER PMD</p> <p>कोई अन्य जानकारी ANY OTHER INFORMATIONS } : BASED ON TLV 9732/01 OCTOBER'2000</p>		
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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 ।			
हस्ताक्षर एवं दिनांक SIGN & DATE 			
सामग्री सूची संख्या INVENTORY NO. P-3111	REV. NO. 03 (REAFFIRMED) Dt. 18-8-09	स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE निर्माण : PREPARED : MTE	जारी : मानक विभाग ISSUED : STANDARDS DIVISION दिनांक : DATE : 5-1-90


दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (हीप - हरिद्वार)	HW 19992
		PLANT PURCHASE SPECIFICATION (HEEP - HARDWAR)	पृष्ठ का Page 1 of 4

सामग्री सूची संख्या INVENTORY NO.	SUPERSEDES को अधिकृत करता है।	Based on TLV 9732 - 01, October'2000
		<p align="center"><u>SAND CASTING COPPER, CHROMIUM G - CuCr F35</u></p> <p>1. GENERAL: This specification governs the requirements of high conductivity copper chromium sand castings of Grade G-CuCr F35.</p> <p>2. APPLICATION: For components like connection pieces used for Terminal connections in Turbo - Generators.</p> <p>3. CONDITION OF DELIVERY: To be supplied as 'Rough machined to drawing dimensions'.</p> <p>4. DIMENSION & TOLERANCE: The dimension & Tolerance of the casting shall be in accordance with the drawing supplied with the order.</p> <p>5. MANUFACTURE: The material shall be sand cast followed by artificial ageing.</p> <p>6. HEAT TREATMENT: The casting shall be supplied duly heat treated i.e. solution treatment followed by ageing. The ageing temperature shall not be less than 350°C. The material must be stable up to 350°C.</p>

हस्ताक्षर एवं दिनांक SIGN & DATE	स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है। इसका प्रयोग एवं आरक्षण के बिना किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए। 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.	नाम NAME	दिनांक एवं हस्ताक्षर SIGN. & DATE
		TSX L. B. MALHOTRA QAX N. K. MANWANI TGE M. K. GOEL सहमत विभाग AGREED DEPTT.	अनुवादक TRANSLATED BY निर्माणकर्ता WORKED BY जांचकर्ता CHECKED BY पर्यवेक्षणकर्ता SUPERVISED BY
सामग्री सूची संख्या INVENTORY NO.	P-3111 30/7/03	स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE	
		Rev. No: 03 Date: 18.8.09	निर्माण : PREPARED : MTE

दिनांक एवं हस्ताक्षर SIGN & DATE		<p align="center">संस्थान क्रय विनिर्देश (हीप - हरिद्वार)</p> <p align="center">PLANT PURCHASE SPECIFICATION</p> <p align="center">(HEEP - HARDWAR)</p>	<p align="center">HW 19992</p> <p align="center">पृष्ठ का Page 2 of 4</p>										
सामग्री सूची संख्या को अधिकारिता करता है SUPERSEDES INVENTORY NO.	<p>7. FINISH:</p> <p>The casting must be well cleaned, smooth, free from any sand deposits and if required grinding of surface may be carried out. The surface finish shall be as indicated in the drawing.</p> <p>8. FREEDOM FROM DEFECTS:</p> <p>The casting shall be free from defects such as blowholes, pores, inclusions, and cracks. Use of sealing agent of any kind shall not be permitted. Brazing and welding for removal of defects is not permitted without prior approval of BHEL.</p> <p>9. CHEMICAL COMPOSITION:</p> <p>The chemical composition of the material when analysed in accordance with IS: 440 (Method of Analysis of Copper) or any other conventional/ instrumental method shall be as follows:</p> <table border="0"> <tr><td>Chromium (Cr)</td><td>: 0.40 - 1.40</td></tr> <tr><td>Cadmium (Cd)</td><td>: 0.50 Max.</td></tr> <tr><td>Zinc (Zn)</td><td>: 0.20 Max.</td></tr> <tr><td>Others (All impurities)</td><td>: 0.10 Max.</td></tr> <tr><td>Copper (Cu)</td><td>: Remaining.</td></tr> </table> <p>10. TEST SAMPLES:</p> <p>10.1 A separately cast specimen is to be taken from each melt employed as a test bar for testing of Tensile Strength. This test bar must be heat treated together with the casting. Brinell Hardness testing shall be carried out on casting preferentially. Incase hardness testing on casting is not possible then testing can be carried out on integral cast test bar.</p> <p>10.2 The electrical conductivity shall be done on every individual casting or on the test bar. Any dechromed surface layer on casting must be removed by machining or grinding for testing the Brinell hardness and conductivity test.</p>			Chromium (Cr)	: 0.40 - 1.40	Cadmium (Cd)	: 0.50 Max.	Zinc (Zn)	: 0.20 Max.	Others (All impurities)	: 0.10 Max.	Copper (Cu)	: Remaining.
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स्वत्वाधिकार एवं गोपनीय संस्थाधिकार एवं दिनांक SIGN & DATE P-3111 3/10/02	<p>COPYRIGHT AND CONFIDENTIAL</p> <p>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>												
सामग्री सूची संख्या INVENTORY NO. P-3111	हस्ताक्षर एवं दिनांक SIGN & DATE 3/10/02	Rev. No. 03	<table border="1"> <tr> <td>निर्माणकर्ता Worked by</td> <td>ASHISH</td> <td><i>Ashish</i></td> <td>10.9.02</td> </tr> <tr> <td>जांचकर्ता Checked by</td> <td>PKS</td> <td><i>PKS</i></td> <td>12.9.02</td> </tr> </table>	निर्माणकर्ता Worked by	ASHISH	<i>Ashish</i>	10.9.02	जांचकर्ता Checked by	PKS	<i>PKS</i>	12.9.02		
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दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;">संस्थान क्रय विनिर्देश (हीप - हरिद्वार)</p> <p style="text-align: center;">PLANT PURCHASE SPECIFICATION</p> <p style="text-align: center;">(HEEP - HARDWAR)</p>	<p style="text-align: right;">HW 19992</p> <hr/> <p style="text-align: right;">पृष्ठ का</p> <p style="text-align: right;">Page 3 of 4</p>								
सामग्री सूची संख्या को अधिकतम करता है SUPERSEDES INVENTORY NO.	COPYRIGHT AND CONFIDENTIAL <small>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</small>	<p>11. MECHANICAL & PHYSICAL PROPERTIES:</p> <p>11.1 Tensile Strength: When tested in accordance with IS: 1608 (Mechanical Testing of Metals -Tensile testing), the material shall show the following tensile properties:</p> <p style="margin-left: 40px;">Yield Strength (0.2 % Proof Stress) : $\geq 250 \text{ N/mm}^2$</p> <p style="margin-left: 40px;">Tensile Strength : $\geq 350 \text{ N/mm}^2$</p> <p style="margin-left: 40px;">Elongation after fracture (l = 5d) : $\geq 10\%$</p> <p>11.2 Hardness: The material when tested in accordance with IS: 1500 shall have Brinell Hardness equal to or greater than 110.</p> <p>11.3 Electrical Conductivity: The electrical conductivity of the casting shall be equal to or greater than 45 MS/m (77% I.A.C.S)</p>									
स्वत्वाधिकार एवं गोपनीय <small>इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं आरक्षण कर ले किये जा सकते हैं, जो कि भारत की हिदा में हार्मिफरस को न किया जाए।</small>	<p>12. DYE PENETRANT TEST:</p> <p>D.P. test shall be carried out as per specification number AA0850131 on the rough machined surface only. The acceptance norm shall be as per quality level II of specification number AA0850132 or to higher quality level as mentioned in the drawing / purchase order.</p>	<p>13. TEST CERTIFICATES:</p> <p>Five copies of the Test Certificates shall be furnished by the supplier giving the following Information:</p> <ol style="list-style-type: none"> 1. BHEL Order No. 2. BHEL Specification No. 3. Heat Analysis. 4. Supplier's Ref. & Name. 5. Identification No. 6. Test Results of Mechanical Properties, Hardness, & Electrical Conductivity. 7. Details of Heat Treatment actually followed by the supplier. 									
हस्ताक्षर एवं दिनांक SIGN & DATE											
सामग्री सूची संख्या INVENTORY NO.	P-3111	Rev. No. 03	<table border="1" style="width: 100%;"> <tr> <td style="width: 20%;">निर्माणकर्ता Worked by</td> <td style="width: 20%;">ASHISH</td> <td style="width: 20%; text-align: center;"></td> <td style="width: 40%; text-align: center;">10.9.02</td> </tr> <tr> <td>जांचकर्ता Checked by</td> <td>PKS</td> <td style="text-align: center;"></td> <td style="text-align: center;">12.9.02</td> </tr> </table>	निर्माणकर्ता Worked by	ASHISH		10.9.02	जांचकर्ता Checked by	PKS		12.9.02
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सामग्री सूची संख्या को अधिकृत करारा है। SUPERSEDES INVENTORY NO.	14. PACKING & MARKING: The casting shall be suitably packed to prevent damage during transit. Each package or casting shall be legibly marked with the following information: <ol style="list-style-type: none"> 1. BHEL Order No. 2. BHEL Specification No. 3. Heat No. 4. Identification No. 5. Supplier's Reference & Name. 6. Weight. 			
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.	15. ACCEPTANCE & REJECTION: All the results of these tests performed shall be criterion for selection of supplies. The admissibility and deviations of the results if any, from the prescribed properties shall only be considered on the basis of results of tests and their evaluation with respect to the working stresses of the parts by BHEL if found necessary. In the event of any casting found defective during processing, machining, testing etc. The same shall be rejected notwithstanding any previous certification of satisfactory testing and for inspection. The supplier shall undertake to replace the material free of charge without delay and arrange to take back the rejected material at his own cost.			
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सामग्री सूची संख्या INVENTORY NO. P-3111	हस्ताक्षर एवं दिनांक SIGN & DATE [Signature] 3/10/02	Rev. No. 03	निर्माणकर्ता Worked by ASHISH	[Signature] 10.9.02
			जांचकर्ता Checked by PKS	[Signature] 12.9.02