

	<b>PLANT PURCHASING PECIFICATION BHOPAL</b>	BP 19898 REV NO. 04 PAGE 1 OF 3
<b><u>COPPER - CHROMIUM ALLOY FORGINGS</u></b>		<b>SUPERSEDES BP 19898 Rev.03</b>
<p><b>1. GENERAL:</b></p> <p>The specification governs the quality of specially heat treated, high conductivity, high tensile, copper chromium alloy forgings.</p> <p><b>2. APPLICATION:</b></p> <p>For components of transformers and motors requiring high strength, current carrying and current transfer purposes.</p> <p><b>3. CONDITION OF DELIVERY:</b></p> <p>Forgings shall be supplied in heat treated condition.</p> <p><b>4. COMPLIANCE WITH NATIONAL STANDARDS:</b></p> <p>There is no Indian Standard covering this type of material. However assistance has been drawn from " IS: 3347 ( Pt. V / Section 2 ) -1979 " (Reaffirmed 2004) in preparing this standard.</p> <p><b>5. DIMENSIONS AND TOLERANCES:</b></p> <p>The dimensions of the forgings shall be in accordance with the drawing / order.</p> <p><b>6. MANUFACTURE:</b></p> <p>By any convenient process of forging.</p> <p><b>7. FINISH:</b></p> <p>As specified in the drawing/order.</p> <p><b>8. FREEDOM FROM DEFECTS:</b></p> <p>Forgings shall be free from flaws, cracks &amp; other harmful defects.</p> <p><b>9. CHEMICAL COMPOSITION:</b></p> <p>The chemical composition of the material, when analysed in accordance with any suitable instrumental/chemical method shall be as follows:</p> <p style="margin-left: 40px;">Chromium : 0.3 - 1.2 Percent                  Impurities : 0.3 Percent Max.                  Copper : Remainder</p>		
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10. TEST SAMPLES:

10.1 One sample per heat shall be taken for chemical analysis.

10.2 In any consignment, all the pressings / forgings produced from the same batch of raw material under similar conditions shall be grouped together to constitute a lot. One sample per heat/lot shall be taken for mechanical tests. The test pieces shall be taken directly from forgings and shall receive no further heat treatment.

10.3 Electrical conductivity measurement shall be performed on each sample.

11. MECHANICAL PROPERTIES:

11.1 Tensile :

The test bar when tested in accordance with IS:1608 ( Method for tensile testing of copper and copper alloys ) shall show the following properties.

Tensile Strength : 370 N/mm<sup>2</sup> Min.

0.1 % Proof Stress : 270 N/mm<sup>2</sup> Min.

Elongation on  
5.65 √So Gauge Length : 13 percent Min.

11.2 Hardness (Brinell):

When tested in accordance with IS:1500, the material shall show a Brinell Hardness of 125 HB Minimum.

12. ELECTRICAL CONDUCTIVITY:

When tested in accordance with ASTM E1004, Eddy current probe test method, the material shall have an electrical conductivity of not less than 81 % IACS at 20°C.

Refer IS : 613 Appendix B for temperature correction factor.

13. TEST CERTIFICATES:

Unless otherwise stated on the order three copies of test certificates shall be supplied.

In addition, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents, to facilitate quick clearance of the material.





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The test certificate shall bear the following information.

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BHEL Order No.

Supplier's Name.

Drawing No.

Method of Manufacture.

Consignment / Identification No.

Results of tests :

Results of chemical analysis, mechanical test, electrical conductivity, dimensional tolerances and all other tests called for in this specification /order.

**14. PACKING AND MARKING:**

The pressings/forgings shall be suitably packed to prevent corrosion and damage during transit. Machined surfaces, if any, shall be properly protected with anticorrosive compounds.

Each package shall be marked with the following information.

BP 19898 : Copper - Chromium Alloy Forgings.

BHEL Order No.

Identification No.

Weight.

Supplier's reference / Name.