
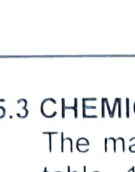



दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ. पी-हरिद्वार) <b>PLANT PURCHASE SPECIFICATION</b> (CFFP - HARIDWAR)		<b>FF-04065 Rev03</b>					
				पृष्ठ 3 का 1 Page 1 of 3					
SPECIFICATION FOR INGOTS IN GRADE ALLOY 617									
<b>1.0 GENERAL</b> This specification covers the quality requirements of ingot in grade ALLOY 617 made through VIM + VAR / ESR route.									
<b>2.0 APPLICATION</b> Ingot in grade ALLOY 617 to be used for manufacturing of forgings of higher rating.									
<b>3.0 CONDITION OF DELIVERY</b> ALLOY 617 ingot shall be supplied in homogenized condition with no visible surface deformities.									
<b>4.0 DIMENSIONS AND TOLERANCES</b> ALLOY 617 ingot of weight 22 MT (min.) shall be supplied as size range:									
		<table border="1"> <tr> <td>Diameter range (mm)</td> <td>Length range (mm)</td> </tr> <tr> <td>1150-1300</td> <td>2550-2000</td> </tr> </table>		Diameter range (mm)	Length range (mm)	1150-1300	2550-2000		
Diameter range (mm)	Length range (mm)								
1150-1300	2550-2000								
		Tolerance on all dimensions to be +25, -0 mm.							
<b>5.0 MANUFACTURING:</b>									
<b>5.1 GENERAL REQUIREMENTS:</b> Before start of manufacturing the supplier shall submit a flow chart of the Manufacturing and Inspection Sequence (MIP) for BHEL approval. BHEL may visit the vendor works and witness the facilities available before the placement of the order.									
<b>5.2 MELTING</b> a) Alloy 617 Ingots shall be produced by using vacuum induction melting (VIM) followed by Vacuum Arc Remelting (VAR) or Electro Slag Refining (ESR). b) Electrode for VAR/ESR remelting has to be single/multiple piece/s without any weld joint.									
अनुवादक TRANSLATED BY									
निर्माणकर्ता WORKED BY									
जांचकर्ता CHECKED BY									
परीक्षणकर्ता APPROVED BY									
सहमत विभाग AGREED DEPT									
नाम NAME									
दिनांक एवं हस्ताक्षर DATE & SIGNATURE									
स्वीकृती APPROVED :									
संस्थान मानक समिति PLANT STANDARDS COMMITTEE									
निर्माण फोर्ज तकनीकी PREPARED FORGE TECH									
जारी ISSUED									
फोर्ज तकनीकी FORGE TECH									
दिनांक DATE									

दिनांक एवं हस्ताक्षर _____ (निर्माणकर्ता)		<b>संस्थान क्रय विनिर्देश</b> <b>(सी.एफ.एफ.पी-हरिद्वार)</b> <b>PLANT PURCHASE SPECIFICATION</b> <b>(CFFP - HARIDWAR)</b>		<b>FF-04065 Rev03</b>																																																											
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कॉपीराइट और गोपनीयता 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.	<p><b>5.3 CHEMICAL COMPOSITION: Heat Analysis in weight%</b></p> <p>The material shall conform to the chemical composition (in weight% limits specified in table -1 at both top and bottom of the Ingot. The chemical analysis shall be carried out as per ASTM E-350 or equivalent method for melt as well as product.</p>																																																														
	<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th colspan="14">Table-1: Chemical composition (in weight %) of Alloy 617</th> </tr> <tr> <th></th> <th>Cr</th> <th>Fe</th> <th>Mn</th> <th>Mo</th> <th>Co</th> <th>Al</th> <th>C</th> <th>Cu</th> <th>B</th> <th>Si</th> <th>S</th> <th>N</th> <th>Ti</th> <th>Ni</th> </tr> </thead> <tbody> <tr> <td>Min</td> <td>21.0</td> <td></td> <td></td> <td>8.0</td> <td>11.0</td> <td>0.8</td> <td>0.05</td> <td></td> <td>0.003</td> <td></td> <td></td> <td></td> <td>0.3</td> <td>Bal.</td> </tr> <tr> <td>Max</td> <td>23.0</td> <td>1.5</td> <td>0.3</td> <td>10.0</td> <td>13.0</td> <td>1.3</td> <td>0.08</td> <td>0.05</td> <td>0.005</td> <td>0.3</td> <td>0.008</td> <td>0.05</td> <td>0.5</td> <td></td> </tr> </tbody> </table>					Table-1: Chemical composition (in weight %) of Alloy 617															Cr	Fe	Mn	Mo	Co	Al	C	Cu	B	Si	S	N	Ti	Ni	Min	21.0			8.0	11.0	0.8	0.05		0.003				0.3	Bal.	Max	23.0	1.5	0.3	10.0	13.0	1.3	0.08	0.05	0.005	0.3	0.008	0.05	0.5
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	<p><b>7.0 MANUFACTURING FACILITIES:</b></p> <p>Vendor has to provide details of in house melting, refining facility (VIM + VAR or VIM + ESR), testing facility and heat treatment facility as per the melting requirement at point 5.2 stated above.</p>																																																														
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	<p>At the time of submission of offer manufacturers must indicate all the quality parameters envisaged for testing &amp; ensuring sound ingot.</p>																																																														
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<div style="writing-mode: vertical-rl; transform: rotate(180deg);">         जहाँ भी सूची में          Where ever mentioned in the list       </div>	<b>9.0 TEST CERTIFICATES</b> A test certificate showing the following information shall be furnished. <ul style="list-style-type: none"> <li>- PO No</li> <li>- Size and Weight of Alloy 617 ingot.</li> <li>- Grade</li> <li>- Heat No / Identification No</li> <li>- VAR/ESR Electrode melting route, size, weight. Chemical composition of each cast analysis.</li> <li>- Chemical composition in final VAR/ESR ingot as per clause 6.3.</li> <li>- Post heat treatment details</li> <li>- Surface inspection report.</li> </ul>															
	<b>10.0 MARKING:</b> The following details shall be marked clearly on the final Alloy 617 ingots. <ul style="list-style-type: none"> <li>(a) Melt No.</li> <li>(b) Grade</li> <li>(c) Manufacturer's Stamp</li> <li>(d) BHEL/Third Party Inspector's Stamp</li> <li>(e) Top and Bottom sides of ingot</li> <li>(f) Top and Bottom discard length</li> </ul>															
<div style="writing-mode: vertical-rl; transform: rotate(180deg);">         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.       </div>	<b>11.0 PACKING AND TRANSPORTATION:</b> ESR Stock shall be properly protected from any damage during transit.															
	<div style="text-align: center;"> <b>RECORD OF REVISIONS</b> </div> <table border="1" style="width: 100%;"> <thead> <tr> <th>Rev. No.</th> <th>Date</th> <th>Revision Details</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>21.08.2021</td> <td>CI 7.1 modified</td> </tr> <tr> <td>02</td> <td>15.03.2022</td> <td>           CI 2.0 modified            CI 4.0 modified            CI 5.1 modified            CI 7.0 of R01 deleted            CI 7.1 of R01 deleted            CI 7.2 of R01 renamed to CI 7.0            CI 9.0 of R01 deleted            CI 10.0 of R01 renamed to CI 9.0            CI 11.0 of R01 modified and renamed to CI 10.0            CI 12.0 of R01 renamed to CI 11.0         </td> </tr> <tr> <td>03</td> <td>03.06.2022</td> <td>CI 5.3 modified</td> </tr> </tbody> </table>					Rev. No.	Date	Revision Details	01	21.08.2021	CI 7.1 modified	02	15.03.2022	CI 2.0 modified CI 4.0 modified CI 5.1 modified CI 7.0 of R01 deleted CI 7.1 of R01 deleted CI 7.2 of R01 renamed to CI 7.0 CI 9.0 of R01 deleted CI 10.0 of R01 renamed to CI 9.0 CI 11.0 of R01 modified and renamed to CI 10.0 CI 12.0 of R01 renamed to CI 11.0	03	03.06.2022
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<div style="writing-mode: vertical-rl; transform: rotate(180deg);">         निम्न सूची में          INVENTORY NO.       </div>	निर्माणकर्ता WORKED BY <i>P. K. Saini</i>	जांचकर्ता CHECKED BY <i>P. K. Saini</i>	स्वीकृति APPROVED : <i>P. K. Saini</i>	संस्थान मानक समिति PLANT STANDARDS COMMITTEE												
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