

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ. पी-हरिद्वार) PLANT PURCHASE SPECIFICATION (CFFP - HARIDWAR)		FF-04065 Rev00 पृष्ठ 4 का 1 Page 1 of 4	
		<u>SPECIFICATION FOR INGOTS IN GRADE ALLOY 617</u>			
सामग्री सूची संख्या INVENTORY NO	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.	1.0 GENERAL This specification covers the quality requirements of ingot in grade ALLOY 617 made through VIM + VAR / ESR route.			
		2.0 APPLICATION Ingot in grade ALLOY 617 based on ASME SB-564 to be used for manufacturing of forgings of higher rating.			
स्वत्वाधिकार एवं गोपनीय 8 इस प्रलेख में दी गयी सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ती है इन्का प्रत्यक्ष एवं अप्रत्यक्ष रूप से किम्वं भी तरह प्रयोग जो की कंपनी के हित में हानिकारक हो न किया जाय ।		3.0 CONDITION OF DELIVERY ALLOY 617 ingot shall be supplied in homogenized condition with no visible surface deformities.			
		4.0 DIMENSIONS AND TOLERANCES ALLOY 617 ingot shall be supplied as Dia 1300 x Length 2000 mm. Tolerance on all dimensions to be +25, -0 mm.			
एवं दिनांक हस्ताक्षर SIGN		5.0 MANUFACTURING: 5.1 General Requirements: Before start of manufacturing the supplier shall submit a flow chart of the Manufacturing and Inspection Sequence (MIP) for BHEL approval.			
		5.2 MELTING 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.			
सहमत विभाग AGREED DEPTT.		5.3 CHEMICAL COMPOSITION: Heat Analysis in weight% 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.			
		अनुवादक TRANSLATED BY निर्माणकर्ता WORKED BY VIKAS PALIWAL जांचकर्ता CHECKED BY PRADEEP KALHAN पर्यवेक्षणकर्ता APPROVED BY A.N. SUDHAKAR			
नाम NAME		दिनांक एवं हस्ताक्षर DATE & SIGNATURE			
Q+BE		G.M.VARMA			
स्वीकृती APPROVED :		संस्थान मानक समिति PLANT STANDARDS COMMITTEE			
निर्माण: फोर्ज तकनीकी PREPARED : FORGE TECH		जारी : फोर्ज तकनीकी ISSUED : FORGE TECH		दिनांक : DATE : 10/10/20	

दिनांक एवं हस्ताक्षर DATE & SIGNATURE		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी-हरिद्वार) PLANT PURCHASE SPECIFICATION (CFFP - HARIDWAR)		FF-04065 Rev00 पृष्ठ 4 का 2 Page 2 of 4																																														
सामग्री सूची संख्या INVENTORY NO.	Table-1: Chemical composition (in weight %) of Alloy 617 <table border="1"> <thead> <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>						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	
	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																																					
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.	6.0 SURFACE QUALITY The ingot surface shall have good surface finish, free from cracks, slagpatches, scabbing, discontinuity, loose metal skin etc. The ingot shall be free from bends. Slag runoff during remelting at any stage is not acceptable.																																																	
	7.0 MINIMUM QUALIFICATION REQUIREMENT FOR SUPPLY OF ALLOY 617 INGOTS: Following are the Mandatory Qualification Requirements . Offers of vendors not meeting these requirements will not be considered.																																																	
	7.1 EXPERIENCE REQUIREMENT: Vendor must meet any one of the following experience criteria given below: a) Vendor must have VAR/ ESR of capacity 20 T. b) Vendor must have manufactured ingots in material grade alloy 617 or equivalent nickel alloys, through VIM + VAR/ESR route, of weight ≥ 10 Ton on the enquiry opening date. In support of the above, the vendor has to furnish details of their past supply in the format below: <table border="1"> <thead> <tr> <th>SL NO</th> <th>WEIGHT (KG)</th> <th>SIZE DIA X LENGTH</th> <th>MATERIAL GRADE</th> <th>QTY</th> <th>INGOT USED INTERNALLY FOR FORGING OR INGOT SUPPLIED TO CUSTOMER</th> <th>DATE OF SUPPLY</th> <th>PO NO OF CUSTOMER TO WHOM INGOT/FORGING WAS SUPPLIED</th> <th>NAME & ADDRESS OF CUSTOMER</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> Vendor to submit documentary evidence like copy of unpriced purchase order/test Certificates/shipping documents showing PO number customer name and weight of supplied item etc in support of the above experience.					SL NO	WEIGHT (KG)	SIZE DIA X LENGTH	MATERIAL GRADE	QTY	INGOT USED INTERNALLY FOR FORGING OR INGOT SUPPLIED TO CUSTOMER	DATE OF SUPPLY	PO NO OF CUSTOMER TO WHOM INGOT/FORGING WAS SUPPLIED	NAME & ADDRESS OF CUSTOMER																																				
SL NO	WEIGHT (KG)	SIZE DIA X LENGTH	MATERIAL GRADE	QTY	INGOT USED INTERNALLY FOR FORGING OR INGOT SUPPLIED TO CUSTOMER	DATE OF SUPPLY	PO NO OF CUSTOMER TO WHOM INGOT/FORGING WAS SUPPLIED	NAME & ADDRESS OF CUSTOMER																																										
दिनांक एवं हस्ताक्षर SIGN & DATE	c) In case vendor has experience of supplying weight < 10 Ton ingot, following has to be furnished by vendor: - Flow chart of manufacturing of ingot. - Details of VIM furnace to be furnished.																																																	
सामग्री सूची संख्या INVENTORY NO.	निर्माणकर्ता WORKED BY <i>Vikas Kalwal</i>	स्वीकृती APPROVED : संस्थान मानक समिति PLANT STANDARDS COMMITTEE	निर्माण: फोर्ज तकनीकी PREPARED : FORGE TECH																																															
	जांचकर्ता CHECKED BY <i>Pradeep Kallan</i>	जारी : फोर्ज तकनीकी ISSUED : FORGE TECH	दिनांक : DATE : 10/10/2020																																															

दिनांक एवं हस्ताक्षर INVENTORY NO.	SUPERSEDES INVENTORY NO.		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी-हरिद्वार) PLANT PURCHASE SPECIFICATION (CFFP - HARIDWAR)	FF-04065 Rev00 पृष्ठ 4 का 3 Page 3 of 4		
सामग्री सूची संख्या एवं अधिकारी		- Vendor to submit details of their supply as per above format at 7(b) for Alloy 617 or equivalent Ni alloys forging. Documentary evidence like copy of unpriced purchase order/test certificates/shipping documents showing PO number customer name and weight of supplied item etc in support of the above experience.				
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.		7.2 MANUFACTURING FACILITIES: 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. 8.0 ADDITIONAL REQUIREMENTS The Manufacturer shall mention the amount of Top and Bottom Discards considered in the mentioned ingot as per standard practice. These discards will suffice to have high integrity of forgings without any defects. The hot topping practice should be in such way that the top surface of the ingot shall be flat without depression. At the time of submission of offer manufacturers must indicate all the quality parameters envisaged for testing & ensuring sound ingot. 9.0 VISIT TO SUPPLIER WORKS (a) BHEL shall have the right to visit the vendor works and witness the facilities available before the placement of the order. (b) After placement of the order 2 nos BHEL personnel shall have the right to visit vendor works for witness /inspection of the manufacturing of the Ingot from VIM + VAR/ESR.				
स्वत्वाधिकार एवं गोपनीय 8 इस दस्तावेज में दी गयी सूचना भारत हेतु ईलेक्ट्रिकल्स की संपत्ती है। इसका प्रयोग एवं प्रकाशन रूप से किसी भी तरह प्रयोग जो भी कंपनी के हित में सकारात्मक हो न किया जाए।						
दिनांक एवं हस्ताक्षर INVENTORY NO.	निर्माणकर्ता WORKED BY जांचकर्ता CHECKED BY	Vivas Paliwal Pradeep Kallan	done gf	स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE निर्माण: फोर्ज तकनीकी PREPARED : FORGE TECH	जारी : फोर्ज तकनीकी ISSUED : FORGE TECH	दिनांक : DATE : 10/10/20

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी-हरिद्वार) PLANT PURCHASE SPECIFICATION (CFFP - HARIDWAR)		FF-04065 Rev00	
				पृष्ठ 4 का 4 Page 4 of 4	
SUPPLEMENTARY INVENTORY NO. सामग्री सूची संख्या को अतिरिक्त	10.0 TEST CERTIFICATES A test certificate showing the following information shall be furnished. - PO No - Size and Weight of Alloy 617 ingot. - Grade - Heat No / Identification No - VAR/ESR Electrode melting route, size, weight, quantity of electrodes. Chemical composition of each cast analysis, heat treatment given any for electrodes. - Chemical composition in final VAR/ESR ingot as per clause 6.3. - Post heat treatment details - Surface inspection report.				
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	11.0 Marking: The following details shall be marked clearly on the final Alloy 617 ingots. (a) Melt No. (b) Grade (c) Manufacturer's Stamp (d) BHEL Inspector's Stamp (e) Top and Bottom sides of ingot				
	12.0 Packing and Transportation: ESR Stock shall be properly protected from any damage during transit.				
स्वतंत्राधिकार एवं गोपनीय 8 इस प्रलेख में दी गयी सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रत्यक्ष एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग जो की कंपनी के हित में हानिकारक हो न किया जाए। D:\alok\macM\alok\collection\Bharat					
दिनांक सामग्री सूची संख्या INVENTORY NO.	निर्माणकर्ता WORKED BY जांचकर्ता CHECKED BY	विकस Palwal Shadep Kalhan	स्वीकृती APPROVED : निर्माण: फोर्ज तकनीकी PREPARED : FORGE TECH	संस्थान मानक समिति PLANT STANDARDS COMMITTEE जारी : फोर्ज तकनीकी ISSUED : FORGE TECH	दिनांक : DATE : 10/10/2020