

दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी. – हरिद्वार) PLANT PURCHASE SPECIFICATION (CFFP - HARDWAR)	FF09107 Rev 01																														
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SUPERSEDES INVENTORY NO. सामग्री सूची संख्या को अधिकतम	EXTRA LOW HYDROGEN COVERED ARC WELDING ELECTRODES FOR WELDING OF STEEL CASTINGS WITH IDENTIFICATION NUMBER (C12A ASTM A 217M & GX12CrMoVNbN 9-1)																																
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	1.0 Scope This specification prescribes the requirements for Shielded Metal Arc Welding Electrodes that are nearest to ASME Sec-II(C) –SFA 5.5, E9018-B9 / 9015-B9 /E9015-B91 .																																
	2.0 Compliance with National and International Standards Assistance has been taken from ASME Sec-II(C) in preparing the specification.																																
	3.0 Condition of Delivery Electrodes shall be supplied in seaworthy and tight packing to avoid any damage / exposure to atmosphere during handling, transit and storage.																																
	4.0 Manufacture The core wire and the coating used for the manufacture of the electrodes shall be at the discretion of the supplier. The type of electrodes shall be the same as approved by BHEL.																																
	5.0 General The creep rupture properties for 1000hrs at 600°C, 160 Mpa and 3000hrs at 600°C, 140 Mpa for the weld metal deposited by this electrodes shall be furnished by the supplier for acceptance. The test should be conducted at any Government lab/corporate R&D, BHEL, Hyderabad/NABL approved Lab.																																
0.08-0.13 स्वत्वधिकार एवं गोपनीयता इस दस्तावेज़ में दी गई सभी जानकारी हेली इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं प्रकाशना के बिना कम्पनी के हित किया जाए।	6.0 Chemical Composition Chemical composition of deposited weld metal, when tested in accordance with ASME Sec. II (c) shall conform to the following requirements.																																
	<table border="1"> <tr> <td>C</td> <td>0.08-0.13</td> <td>Mo</td> <td>0.85-1.20</td> </tr> <tr> <td>Mn</td> <td>1.20 Max</td> <td>V</td> <td>0.15-0.30</td> </tr> <tr> <td>Si</td> <td>0.30 Max</td> <td>Cu</td> <td>0.25 Max</td> </tr> <tr> <td>P</td> <td>0.01 Max</td> <td>Al</td> <td>0.04 Max</td> </tr> <tr> <td>S</td> <td>0.01 Max</td> <td>Nb</td> <td>0.02-0.10</td> </tr> <tr> <td>Ni</td> <td>0.80 Max</td> <td>N</td> <td>0.02-0.07</td> </tr> <tr> <td>Cr</td> <td>8.0-10.5</td> <td>Mn+Ni</td> <td>1.5 max</td> </tr> </table>				C	0.08-0.13	Mo	0.85-1.20	Mn	1.20 Max	V	0.15-0.30	Si	0.30 Max	Cu	0.25 Max	P	0.01 Max	Al	0.04 Max	S	0.01 Max	Nb	0.02-0.10	Ni	0.80 Max	N	0.02-0.07	Cr	8.0-10.5	Mn+Ni	1.5 max	
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हस्ताक्षर एवं दिनांक SIGN &	7.0 Radiographic Soundness The electrodes with DCEP shall deposit weld metal, which meet radiographic soundness requirements specified in ASME Sec-II(C) –SFA 5.5, E9018-B9 / 9015-B9 / E9015-B91.																																
	<table border="1"> <tr> <td>RMI</td> <td>A K AGARWAL</td> <td>अनुवादक</td> <td>TRANSLATED BY</td> <td></td> </tr> <tr> <td>MPIC</td> <td>ROHIT VARSHNEY</td> <td>निर्माणकर्ता</td> <td>WORKED BY</td> <td>SUSHANT PANDEY</td> </tr> <tr> <td>CHAIRMAN CPSC</td> <td>VK AGARWAL</td> <td>जांचकर्ता</td> <td>CHECKED BY</td> <td>ANIL SHARMA</td> </tr> <tr> <td>सहमत विभाग AGREED DEPTT.</td> <td>नाम NAME</td> <td>दिनांक एवं हस्ताक्षर DATE & SIGNATURE</td> <td>पर्यवेक्षणकर्ता SUPERVISED BY</td> <td>VK AGARWAL</td> </tr> <tr> <td colspan="2"></td> <td colspan="3"> स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE </td> </tr> <tr> <td colspan="2"></td> <td> निर्माण : PREPARED : WELDING TECH </td> <td> ISSUED : WELDING TECHNOLOGY </td> <td> दिनांक: DATE :22.12.16 </td> </tr> </table>				RMI	A K AGARWAL	अनुवादक	TRANSLATED BY		MPIC	ROHIT VARSHNEY	निर्माणकर्ता	WORKED BY	SUSHANT PANDEY	CHAIRMAN CPSC	VK AGARWAL	जांचकर्ता	CHECKED BY	ANIL SHARMA	सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	VK AGARWAL			स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE					निर्माण : PREPARED : WELDING TECH	ISSUED : WELDING TECHNOLOGY
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सामग्री सूची संख्या को अधिकृत करता है INVENTORY NO.	8.0 Mechanical Properties The mechanical properties of weld metal deposited using the electrodes after stress relieving the test plate assembly at 730° C for 12 hours shall be follows. <table border="0"> <tr> <td>Yield Strength (0.2 % offset)</td> <td>-</td> <td>530 Mpa min.</td> </tr> <tr> <td>Tensile Strength</td> <td>-</td> <td>620 Mpa min.</td> </tr> <tr> <td>% Elongation</td> <td>-</td> <td>16.0 min.</td> </tr> <tr> <td>% Ra</td> <td>-</td> <td>40.0 min.</td> </tr> <tr> <td>Charpy V notch (ISO-V)</td> <td>-</td> <td>35J, avg. of 3 specimens at + 20° C , where smallest value shall be at least 30 J</td> </tr> </table>				Yield Strength (0.2 % offset)	-	530 Mpa min.	Tensile Strength	-	620 Mpa min.	% Elongation	-	16.0 min.	% Ra	-	40.0 min.	Charpy V notch (ISO-V)	-	35J, avg. of 3 specimens at + 20° C , where smallest value shall be at least 30 J
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COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bhaat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company	9.0 Selection of Test Samples The selection of test samples for acceptance for chemical composition and mechanical properties shall be done as follows 9.1 Electrodes shall be drawn from one or more than one packet from each batch no. for carrying out chemical and mechanical properties. 9.2 Test Sample for chemical analysis shall be made according to ASME Sec. II (c) 9.3 Electrode shall be deposited on carbon steel plates for radiography and mechanical properties in accordance with ASME Sec. II (c).																		
	10.0 Preparation of Test Samples Tensile and Impact specimen shall be prepared in accordance with ASME Sec. II (c).																		
स्वत्वाधिकार एवं गोपनीयता: इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।	11.0 Freedom from Defects Weldment on the test plate made as per ASME Sec. II (c) shall be free from inclusions, cracks and lack of fusion etc , on radiography, as per recommendation of ASME Sec. II (c).																		
	12.0 Diffusible Hydrogen Content Of Weld Metal Diffusible Hydrogen content of weld metal deposited using the electrode shall be 4ml/100grams maximum. Test to be done as per ASME Sec-II(C) –SFA 5.5, E9018-B9 / 9015-B9/ E9015-B91.																		
दिनांक SIGN & DATE	13.0 Acceptance 13.1 Only following brands are approved (i) Cromocord 9 M (ii) Fox C 9MV (iii) Cromo 9V (iv) Cromotherm-91 (v) Mailarc-95B9 13.2 Each batch of electrodes supplied by approved vendor shall be accepted on the basis of properties given in Cl. 6.0 and properties as per Cl. 7.0 & 8.0 shall be checked on surveillance basis.																		
सामग्री सूची संख्या INVENTORY NO.	निर्माणकर्ता WORKED BY SUSHANT PANDEY																		
	जाँचकर्ता CHECKED BY ANIL SHARMA																		

SIGN दिनांक एवं हस्ताक्षर & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी – हस्तिवार) PLANT PURCHASE SPECIFICATION (CFFP - HARDWAR)	FF09107 Rev 01	
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सामग्री सूची संख्या को INVENTORY NO.	SUPERSEDES INVENTORY NO.	13.3 For a new vendor/brand, initial approval will be done on the basis of properties(given in Cl. 4.0 to 9.0, 11.0 & 12.0) obtained on the test samples prepared from the test plate made as per ASME Sec. II (c) at BHEL.		
COPYRIGHT AND CONFIDENTIAL येन पदविनिर्देशपत्र वद जीमे कववनउमन्दते ये जीम चववममाजल वी जीमि मन्शल सममबजपमर्षस सपसपममकपमज उनेज दवव इम मेक कपममबजसल वद पदकपममबजसल पद दल ुल कपममसपसपममजस जव जीम पदमममेज वी जीम बववदल		14.0 Test Certificates The supplier shall submit one original and 3 copies of original manufacturer's test certificates giving the following information along with delivery.		
		14.1 BHEL REFERENCE 14.1.1 PO Number 14.1.2 Specification No. 14.1.3 Chemical Analysis 14.1.4 Result of mechanical properties 14.1.5 Diameter of core wire and length of electrodes. 14.1.6 Result of Creep rupture properties		
		14.2 SUPPLIER REFERENCE 14.2.1 Supplier Name and Emblem. 14.2.2 Batch No. 14.2.3 Date of manufacture		
		14.3 Suppliers other than the original manufacturer shall ensure providing original manufacturer's test certificates with linkage to supplier's invoice stating the Batch No., Lot No., etc of the supply.		
स्वत्वाधिकार एवं गोपनीयः इत प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रलेख एवं अप्रलेख रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।		15.0 Packing & Marking Packing should be that of original manufacturer and suitable to avoid any damage during handling, transit and storage. Each electrode shall be marked by imprint of Plant Standard No./ AWS No. and brand name of supplier near to the gripping end. Ink used for imprinting shall provide sufficient contrast with the electrode covering, so that it is legible before and after normal welding operation. Party shall imprint following information on each carton.		
हस्ताक्षर एवं दिनांक SIGN & DATE	निर्माणकर्ता WORKED BY SUSHANT PANDEY			
सामग्री सूची संख्या INVENTORY	जांचकर्ता CHECKED BY ANIL SHARMA			

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सुपरसेडिड INVENTORY NO.		RECORD OF CHANGES					
समस्यी सूची संख्या INVENTORY NO.							
COPYRIGHT AND CONFIDENTIAL The information on this documents is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company		REV CODE	NO. OF CHANGES	DOCU. NO.	SHEET NO.	SIGN	DATE
		01	Title, Clause 1.0, 4.0, 7.0 & 8.0 modified to incorporate in line with latest ASME Sec-IIIC:2015 & material spec HW19683. Clause 13.0, approved brand name added		Sheet 1 &2 Sheet 2 &3		22.12.2016 22.12.2016
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		RMI	✓				
दिनांक एवं हस्ताक्षर SIGN & DATE		STANDARD SECTION	✓				
		MPIC	✓				
समस्यी सूची संख्या INVENTORY NO.					निर्माणकर्ता WORKED BY	SUSHANT PANDEY	
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