


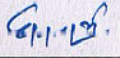

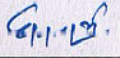

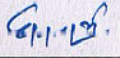



दिनांक एवं हस्ताक्षर SIGN & DATE		संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी. - हरिद्वार)		FF77185 Rev 08	
		PLANT PURCHASE SPECIFICATION (CFFP - HARDWARE)		पृष्ठ 6 का 1 Page 1 of 6	
SUPERSEDES INVENTORY NO.	<b>GOUGING ELECTRODE FOR USE IN FOUNDRIES</b>				
सामग्री सूची संख्या को अधिकृतित करना है	<b>1. General:</b> This specification covers the requirement of non-jointed type gouging electrodes for use in Steel Foundry.				
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	<b>2. Application:</b> The gouging electrode will be used for removal of metal/localized defects from casting maintained in temperature range of 30°C to 350°C with the help of Gouging arc holder.				
	<b>3. Compliance with national standard:</b> There is no national standard available for this item.				
	<b>4. Properties:</b>				
	4.1 Size : Diameter 9 mm X length 350 mm / 450 mm Diameter 12 mm X length 350 mm / 450 mm Tolerance on Diameter shall be +1 mm /-0.2 mm and on length will be +10 mm /-2 mm.				
	4.2 Bulk density: 1.55 – 1.75 gm/cc without copper coating. 1.80 – 2.20 gm/cc with copper coating. Difference in density with & without Cu coating shall be minimum 0.20 gm/cc. Bulk density will be measured by physical measurement method in which diameter will be taken by vernier caliper or screw gauge for both serrated & non serrated electrodes.				
	4.3 The gouging electrodes shall have uniform Cu coating & may be smooth or serrated finish. The Cu coating shall not have any crack/discontinuity.				
	4.4 Specific Resistance at RT: $2.5 \times 10^{-3}$ ohm-cm max. without copper coating. $4.0 \times 10^{-4}$ ohm-cm max. with copper coating.				
	4.5 The carbon shall not disintegrate during gouging operation.				
	4.6 Chemical Composition: Fixed Carbon content: 98% minimum Ash: 2% maximum				
	4.7 Electrode should be able to work with air pressure of 5-8 kg/cm <sup>2</sup> .				
4.8 Electrode should be able to work upto 900 A & 600 A (DCEP) respectively for 12mm & 9mm dia.					
4.9 The copper coating shall not flake or peel off during use at rated amperage. The electrode shall not split or crack while in use.					
हस्ताक्षर एवं दिनांक	RMI	अरुण अग्रवाल	अनुवादक TRANSLATED BY	धनन्जय आजाद	धनन्जय आजाद
CHAIRMAN CPSC	जी. एम. वर्मा	जांचकर्ता CHECKED BY	रंजीत लाकरा	रंजीत लाकरा	रंजीत लाकरा
सहमत विभाग AGREED DEPTT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता SUPERVISED BY	ए. एन. राधाकर	ए. एन. राधाकर
सामग्री सूची संख्या INVENTOR	स्वीकृति : संस्थान मानक समिति APPROVED : PLANT STANDARDS COMMITTEE		PREPARED : WELDING TECH ISSUED : WELDING TECHNOLOGY		
				दिनांक : २.०२.२०२१ DATE 2.02.2021	



दिनांक एवं हस्ताक्षर SIGN & DATE		<b>संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी – हरिद्वार)</b> <b>PLANT PURCHASE SPECIFICATION</b> (CFFP - HARDWAR)	<b>FF 77185 Rev 08</b> पृष्ठ 6 का 2 Page 2 of 6																								
सामग्री सूची संख्या को अधिकाधिक करता है	SUPERSEDES INVENTORY NO.	4.10 The gouging rod shall not produce toxic smoke or excess noise during normal gouging operation.  <b>5. Sampling:</b> The number of electrodes, to be selected, shall be according to below table for testing. <table border="1" style="width:100%; margin-top: 10px;"> <thead> <tr> <th>Lot Size (Nos)</th> <th>No's of boxes/packets selected from lot</th> <th>No's of electrode taken from each box</th> <th>Sample size (Nos)</th> </tr> </thead> <tbody> <tr> <td>Less than 10,000</td> <td>2</td> <td>4</td> <td>8</td> </tr> <tr> <td>10,000 – 25,000</td> <td>4</td> <td>3</td> <td>12</td> </tr> <tr> <td>25,001 – 60,000</td> <td>5</td> <td>3</td> <td>15</td> </tr> <tr> <td>60,001 – 1,00,000</td> <td>6</td> <td>3</td> <td>18</td> </tr> <tr> <td>More than 1,00,000</td> <td>7</td> <td>3</td> <td>21</td> </tr> </tbody> </table> <p>The boxes &amp; electrode shall be selected at random to represent complete lot &amp; average of values considered for acceptance. However, if variation in individual pieces are more, then vendor shall be intimated for improvement in future supply. For specific resistance 2 samples having highest &amp; lowest density with Cu coating will be taken. The same sample may be considered for chemical composition test.</p>		Lot Size (Nos)	No's of boxes/packets selected from lot	No's of electrode taken from each box	Sample size (Nos)	Less than 10,000	2	4	8	10,000 – 25,000	4	3	12	25,001 – 60,000	5	3	15	60,001 – 1,00,000	6	3	18	More than 1,00,000	7	3	21
Lot Size (Nos)	No's of boxes/packets selected from lot	No's of electrode taken from each box	Sample size (Nos)																								
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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		<b>6. Acceptance:</b>  For technical scrutiny vendor shall be furnish technical data sheet as per Annex-II.  All vendors shall submit samples for shop trial along with their offer. Acceptance shall be on the basis of tests at Clause 4 as well as shop trial at both technical scrutiny stage and at the time of bulk supply.																									
स्वत्वधिकार एवं गोपनीयता इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं आश्रय रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए ।		<b>7. Packaging &amp; Marking:</b>  a) Each electrode should bear supplier's name, trademark, if any and size near the holding end together with batch no (If supplier not able to imprint identification on each electrode, then supplier shall ensure that each paperboard box/other containing these electrodes shall have such identification. Nature of identification shall be clearly intimated at enquiry stage with technical bid). b) The supply should have BHEL PO No. c) TC and GC d) Date of manufacturing and Lot No.  The electrodes should be supplied in original manufacturer's packing, suitably in paperboard box after encased in polythene sheet. These paper board boxes should be housed in cardboard carton to avoid any damage during handling, transit and storage.																									
दिनांक एवं हस्ताक्षर SIGN & DATE	दिनांक एवं हस्ताक्षर SIGN & DATE	<table border="1" style="width:100%;"> <tr> <td style="width:20%;">निर्माणकर्ता WORKED BY</td> <td style="width:20%;">धनन्जय आजाद</td> <td style="width:20%;">[Signature]</td> <td style="width:20%;">2/2/21</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>रंजीत लाकरा</td> <td>[Signature]</td> <td>2/2/21</td> </tr> </table>		निर्माणकर्ता WORKED BY	धनन्जय आजाद	[Signature]	2/2/21	जांचकर्ता CHECKED BY	रंजीत लाकरा	[Signature]	2/2/21																
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दिनांक एवं हस्ताक्षर SIGN & DATE			संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी - हार्डवेयर) <b>PLANT PURCHASE SPECIFICATION</b> (CFFP - HARDWAR)		<b>FF 77185 Rev 08</b> पृष्ठ 6 का 3 Page 3 of 6									
समग्री सूची संख्या को अधिकृतित करता है	SUPERSEDES INVENTORY NO.	<b>8. Inspection, Deviation and Replacement:</b>  8.1 BHEL reserves the right to inspect material at site before dispatch. The supplier shall intimate in advance about readiness of material enclosing a copy of test certificate of the material offered for inspection. However, inspection at BHEL shall be final. The supplier shall offer BHEL representative all reasonable test facilities without charge to satisfy the latter that the material being furnished is in accordance with this specification. The supplier shall prepare and provide necessary test specimens for testing to be carried out at his premises. If facilities are not available at his works, the supplier shall make necessary arrangements for carrying out the prescribed tests elsewhere.  8.2 If the material received at CFFP is not found in accordance with the requirements, it shall be liable to be rejected and the supplier will have to replace it free of cost at the earliest.  8.3 For any deviation from the specification sought by the supplier, prior approval of BHEL must be obtained in writing.												
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		<b>9. Test Certificates:</b>  9.1 Unless otherwise specified, one original and three copies of original manufacturer's test certificates shall be supplied with each consignment bearing the following information. In order to facilitate quick clearance of material, the supplier shall ensure to send a copy of test certificate along with dispatch document. <ul style="list-style-type: none"> <li>a. BHEL PO No. with Date</li> <li>b. Specification No.</li> <li>c. Supplier reference / trade mark</li> <li>d. Identification No. / Batch No.</li> <li>e. Properties as per Clause 4</li> <li>f. Date of manufacture</li> <li>g. Any other specific information which the supplier would like to convey.</li> </ul> 9.2 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.												
समग्री सूची संख्या	हस्ताक्षर एवं दिनांक SIGN & DATE	<table border="1" style="width: 100%;"> <tr> <td data-bbox="829 1926 1013 1993">निर्माणकर्ता WORKED BY</td> <td data-bbox="1013 1926 1220 1993">धनन्जय आजाद</td> <td data-bbox="1220 1926 1364 1993"></td> <td data-bbox="1364 1926 1508 1993">2/2/21</td> </tr> <tr> <td data-bbox="829 1993 1013 2060">जांचकर्ता CHECKED BY</td> <td data-bbox="1013 1993 1220 2060">रंजीत लाकरा</td> <td data-bbox="1220 1993 1364 2060"></td> <td data-bbox="1364 1993 1508 2060">2/2/21</td> </tr> </table>					निर्माणकर्ता WORKED BY	धनन्जय आजाद		2/2/21	जांचकर्ता CHECKED BY	रंजीत लाकरा		2/2/21
निर्माणकर्ता WORKED BY	धनन्जय आजाद		2/2/21											
जांचकर्ता CHECKED BY	रंजीत लाकरा		2/2/21											





संस्थान क्रय विनिर्देश (सी.एफ.एफ.पी - हरिद्वार)

**PLANT PURCHASE SPECIFICATION**  
(CFFP - HARDWAR)

FF 77185 Rev 08

पृष्ठ 6 का 4

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**Annexure-I**

**PROCEDURE FOR SHOP TRIAL OF GOUGING ELECTRODES**

**1.0 PROCEDURE**

1. Take 8-10 (or as required) gouging electrodes from supplied lot/ sample.
2. Check the supplier Identification No.
3. Trial may be carried out on casting to grade of plain carbon/ high alloy steel/ Base metal of any steel grade
4. Confirm the air pressure in between of 5-8 kg/cm<sup>2</sup>
5. Confirm the operational condition of gouging holder for testing.
6. Set the rectifier current up to max 900 A & 600A (DCEP) respectively for 12mm & 9mm dia.
7. For trial electrode should be held such that a maximum of 178mm (7 inch) extends from the cutting torch.
8. Trial may be carried out at an angle 90° to 160° (angle b/w holder axis and electrode axis in anticlockwise direction) of position of defect.
9. Before striking the arc, turn the air jet on and grip the cutting torch as per defect location.

**2.0 ACCEPTANCE**

The gouging electrodes shall be treated as satisfactory on meeting the following.

1. The copper coating shall not flack or peel off during use at rated amperage (Cu peel off shall not lead more than 25 mm than carbon, after use of 270-280 mm electrode length).
2. The carbon shall not disintegrate during gouging operation.
3. Uniform material removal.
4. The gouging rod shall not produce toxic smoke or excess noise during normal gouging operation.

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**स्वाधिकार एवं गोपनीयता**  
इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की सम्पत्ति है इसका प्रयोग एवं आश्रय 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

निर्माणकर्ता  
WORKED BY

धनन्जय आजाद

धनन्जय

2/2/21


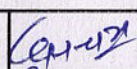
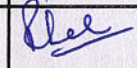
जांचकर्ता  
CHECKED BY

रंजीत लाकरा


रंजीत

2/2/21



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		<b>PLANT PURCHASE SPECIFICATION</b> (CFFP - HARDWAR)		पृष्ठ 6 का 5 Page 5 of 6		
सामग्री सूची सख्या को अधिकतम करना है	SUPERSEDES INVENTORY NO.	<b>Annexure -II</b> <b>GOGING ELECTRODE DATA SHEET FOR TECHNICAL SCRUTINY</b>				
		Ref:	Vendor			
<b>COPYRIGHT AND CONFIDENTIAL</b> 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.	SL NO.	CL. NO.	Properties/particulars*	Specified	Confirmation from Vendor	
	1	7 (a)	Identification on electrode	Brand Name/Other		
	2	4.1	Size: Diameter (mm) Length (mm)	9/12 +1 / -0.2 350/450, +10 / -2		
	3	4.2	Density: With Cu coating : Without Cu coating Difference in density with & without Cu coating	1.55 – 1.75 gm/cc 1.80 – 2.20 gm/cc 0.20 gm/cc Min.		
	4	4.3	Uniform Cu coating & visual	No crack/discontinuity		
	5	4.4	Specific Resistance at RT: (a) With Cu coating, (ohm-cm) (b) Without Cu coating (ohm-cm)	(a) $4.0 \times 10^{-4}$ max. (b) $2.5 \times 10^{-3}$ max		
	6	4.5	No carbon disintegration during operation	To confirm		
	7	4.6	Chemical composition (a) Fixed Carbon content (%) (b) Ash content (%)	(a) 98% Min (b) 2 % Max		
	8	4.7	Suitability to working Air Pressure.	5-8 kg/cm <sup>2</sup>		
	9	4.8	Working current rating	Upto 900 A/600A (DCEP)		
	10	4.9	Cu coating shall not be flack or peel off during use at rated amperage	To confirm		
	11	4.10	No production of toxic gas or excessive noise	To confirm		
	12	5.0	Acceptance of Cl.5, Sampling	To confirm		
	13	6.0	Acceptance of Cl. 6, Acceptance	To confirm		
	14	7.0	Acceptance of Cl. 7, Marking & Packaging	To confirm & specify		
	15	8.0	Acceptance of Cl. 8, Inspection , Deviation & Rejection	To confirm		
	16	9.0	Acceptance of Cl. 9, Test Certificate	To confirm		
	17	Anne x-I	Acceptance of procedure and acceptance norms of shop trial	To confirm		
18	-	Confirmation of PPS FF77185 R07, If any deviation & clarification, specify	To confirm/ specify			
* These are indicative, for more details refer Spec Clause as mentioned.						
दिनांक एवं हस्ताक्षर SIGN & DATE	निर्माणकर्ता WORKED BY		धनन्जय आजाद		2/2/24	
	जांचकर्ता CHECKED BY		रंजीत लाकरा		2/2/24	
सामग्री सूची सख्या						



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		<b>PLANT PURCHASE SPECIFICATION</b> (CFFP - HARDWAR)		पृष्ठ 6 का 6 Page 6 of 6	
सामग्री सूची संख्या SUPERSEDES INVENTORY NO.	<b>RECORD OF CHANGES</b>				
<b>COPYRIGHT AND CONFIDENTIAL</b> 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 जाए ।	REV CODE	NO. OF CHANGES	Nature of change	SIGN	DATE
	02	1	Format changed. Technical details introduced.		15.3.01
	03	1	Technical details modified		25.06.01
	04	1	Tolerance on diameter of rod was $\pm 0.2$ mm		19.5.09
	05	2	Clauses 8 & 9 modified to introduce original manufacturer's TC and packing conditions.		31.8.09
	06	-	Specification rewritten		09.03.15
	07	-	Cl 4.0 modified, Cl 5.0 as sampling introduce, Cl 6 & 7 Acceptance & Marking modified, Cl 9.0, Merged with Marking Annex-I, Testing removed, Annex-II & III Shop trial & Technical scrutiny modified		19.10.15
	08	3	<ul style="list-style-type: none"> <li>Addition of 450 mm in size (4.1)</li> <li>Instead of <math>\pm 0.1</math> range added (4.2)</li> <li>Instead of <math>\pm 0.1</math> range added in col 4.2 of Annexure - II</li> </ul>		02.02.2021
	<b>DISTRIBUTION OF PRINTS</b>				
RMI		✓			
STANDARD SECTION		✓			
MPIC		✓			
हस्ताक्षर एवं दिनांक SIGN & DATE	सामग्री सूची संख्या		निर्माणकर्ता WORKED BY	धनन्जय आजाद	2/2/21
			जांचकर्ता CHECKED BY	रंजीत लाकरा	2/2/21