

Research Designs and Standards Organisation  
(Traction Installation Directorate)

Reasoned document of RDSO's Specification No. ETI/OHE/76(6/97) for hard drawn grooved copper(HDGC) contact Wire, which is now renamed as TI/SPC/OHE/CW/0971

1. RDSO's Specification No. TI/SPC/OHE/CW/0971 for hard drawn grooved copper(HDGC) contact Wire was uploaded on RDSO website for one month dated 24.07.2020 for seeking comments,
2. Comments/Suggestion received from viewers are as below.

Clause No.	Particular	Comments Recieved	RDSO's Remark
4.1	<p>The HDGC Contact wire shall be drawn out of indigenous or imported CCC wire rods manufactured by South Wire process of diameter as given in Table-3. The composition of the CCC wire rod &amp; Contact wire shall be as given in Table-2.</p> <p style="color: red;">Copper used, should be Grade `A` Copper conforming to the chemical composition of Cu-Cath 1 of IS 191:2007 or latest.</p> <p style="color: red;"><del>The manufacturer of CCC Wire Rod which is used in the manufacture of prototype Contact Wire will be treated as approved vendor for CCC Wire Rod once the prototype Contact Wire manufactured by this CCC Wire Rod is approved.</del></p> <p style="color: red;">Procurement of CCC wire rod on job work basis is not allowed.</p>	<p><b><u>M/s Vedanta Limited</u></b></p> <p>i. The HDGC Contact wire shall be drawn out of indigenous CCC wire rods manufactured by South Wire/Contirod process of diameter as given in Table-3.</p> <p>ii. Copper used should be ETP copper cathodes LME Grade A and also whose chemical composition conforming to Cu- Cath-1 of IS:191-2007 or latest. Important to include both LME Grade A and Cu- Cath-1 of IS 191:2007 to ensure check on Input raw material quality</p>	<p>i. Not accepted at this stage. Inclusion of Contirod process requires field trials of Contact wire drawn out of CCC rod manufactured by Contirod process. M/s Vedanta vide letter no. TI/OHE/CW/POLICY/18 dated 20.03.2020 was advised to submit the comparison of 19.6 mm rod manufactured by Southwire process and Contirod process. Reply from firm awaited.</p> <p>ii. May be accepted</p>
		<p><b><u>M/s Hindalco</u></b></p> <p>Raw material: Copper used, should be Electrolytic Grade Copper cathodes conforming to the requirement of LME Grade `A` copper as listed in the London Metal Exchange. Grade `A`</p>	May be accepted

		copper conforming to the chemical composition of Cu-Cath-1 of IS 191: 2007 or latest. Reason: To ensure best raw material is used & to maintain consistency in Quality.							
6.2	The cross-sectional areas, weights, maximum resistances and other properties shall be as detailed in TABLE - 3. The figures therein shall be subject to a tolerance of +/- 3% except weights. Tolerance on weight shall be +/- 3.0% in case of 107 mm <sup>2</sup> and 150 mm <sup>2</sup> contact wire and +/- 2.0% in case of 161 mm <sup>2</sup> & 193 mm <sup>2</sup> contact wire maximum values given in Table 3.	<b>M/s APAR Industries</b>  Replacing "The cross-sectional areas, weights, maximum resistance and other properties shall be as detailed in TABLE- 3" with "The cross-sectional areas, weights, nominal resistance and other properties shall be as detailed in TABLE- 3."  Typographical error: Instead of maximum resistance nominal resistance shall be mentioned.	Not accepted. Resistance mentioned in Table 3 is maximum resistance on nominal diameter.  Word 'nominal resistance' changed to 'Max. Resistance' in Table 3  Line "The figures therein shall be subject to a tolerance of +/- 3% except weights", is discarded as the mentioned line is contradictory to Table-3.						
9.2	TSame as type tests except that indicated in Clause <del>9.1.10</del> 9.1.11 In addition weight of 3 or 1/5 <sup>th</sup> of offered Contact Wire drums for acceptance tests, whichever is higher, for gross weight. The Inspector shall verify the results of manufacturer's tests.	<b>M/s APAR Industries</b>  Omission of Microstructure Examination test in the acceptance test. As per this clause it becomes mandatory to perform Micro Structure Examination in Acceptance test which is to be omitted. As the average time taken to carry out Microstructure is 30 to 45 minutes per sample. Also, sampling plan is not defined in acceptance test in clause 9.6.	Not accepted as microstructure examination is an important test to ensure the quality of Contact wire, hence this test cannot be omitted. Sampling criteria is added as para 9.6.3.8.						
13 (6)	<table border="1"> <tr> <td>Grain size of CCC rod.</td> <td>ACTM</td> <td>Finer than ASTM-5</td> </tr> </table>	Grain size of CCC rod.	ACTM	Finer than ASTM-5	<b>M/s APAR Industries</b>  Typographical error, it should be Grain size number of micro structured CCC rod /Number (Unit)/Finer than ASTM No. 5	May be accepted  <table border="1"> <tr> <td>Grain size number of micro structured CCC rod.</td> <td>Number (Unit)</td> <td>Equiaxed re-crystallised fine grains having grain size finer than ASTM-5</td> </tr> </table>	Grain size number of micro structured CCC rod.	Number (Unit)	Equiaxed re-crystallised fine grains having grain size finer than ASTM-5
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13 (8)	Resistance /km of HDGC Contact Wire at 20°C are: 107 sq.mm 0.1660 (max.) 150 sq.mm 0.1184 (max.) 161 sq.mm 0.1103 (max.) 193 sq.mm 0.0921(max.)			<b><u>M/s APAR Industries</u></b>  Replacing maximum resistance with nominal resistance.  Typographical error: Instead of maximum resistance nominal resistance shall be mentioned.	Not accepted. Resistance mentined in Table 3 is maxium resistance on nominal diameter.			
13 (14)	Grain size of micro-structured Contact rod.	ASTM	Finer than ASTM-5	<b><u>M/s APAR Industries</u></b>  Typographical error, it should be Grain size number of micro structured Contact Wire/Number (Unit)/Finer than ASTM No. 7	May be accepted  <table border="1" data-bbox="1621 451 2132 703"> <tr> <td data-bbox="1621 451 1794 703">Grain size number of micro structured Contact Wire</td> <td data-bbox="1803 451 1944 703">Number (Unit)</td> <td data-bbox="1953 451 2132 703">Equiaxed re-crystallised fine grains having grain size finer than ASTM-7</td> </tr> </table>	Grain size number of micro structured Contact Wire	Number (Unit)	Equiaxed re-crystallised fine grains having grain size finer than ASTM-7
Grain size number of micro structured Contact Wire	Number (Unit)	Equiaxed re-crystallised fine grains having grain size finer than ASTM-7						