

Research Designs and Standards Organisation
(Traction Installation Directorate)

Reasoned document of A&C slip 06 to RDSO's Specification No. ETI/OHE/50(06/97) of Cadmium Copper Conductor

1. A & C slip 06 to RDSO's Specification No. ETI/OHE/50(6/97) with A & C Slip No. 1,2,3,4 & 5 of cadmium copper conductor was uploaded on RDSO website for one month for seeking comments,
2. Comments/suggestions received so far from viewers are summarized below:

Clause No.	Particular	M/s Veekay	RDSO remarks
<u>8.3.8</u>	Chemical Composition The samples taken from the copper wire bar/cadmium copper billet and copper cadmium wires shall be tested for trace elements/impurities by spectrometer. . The copper of copper wire bar shall be determined in accordance with IS 440-1964.The chemical composition of copper wire bar shall be as given in Table-2. For oxygen content of copper wire bars, certificate from the manufacturer of copper shall be furnished. The cadmium content and phosphorous content in the cadmium copper billet and copper cadmium wires shall be as per Clause 4.1.2. The trace elements/impurities in the cadmium copper billet and copper cadmium wires shall not exceed the values given in Table-2.	Our View: As you already understand that the purpose for selection of copper raw material for manufacture of Copper Cadmium Wire used to manufacture end conductor in railway application is to suitably balance the current carrying capacity with tensile strength. Thus, as the end conductor already goes through resistance test during final material acceptance stage to determine the conductivity parameters required for railway application suitability, further conducting chemical analysis of copper cadmium wire would serve no practical improvement. Further, if purity of copper is lower than specification requirement the conductor would in any case not satisfy the required resistance/conductivity parameters and chemical analysis of copper cadmium wire can only be considered for check on purity of copper in such case of rejection. Our Concerns: Further, even though there is no practical improvement in final product quality in our view, inclusion of such test would have far reaching impact on the way of doing business for suppliers, inspection agency as well as railway. Below is the impact analysis on various stakeholders in our opinion: a. Suppliers: This would drastically increase the inspection turnaround time as Chemical Analysis using Electro Analysis Method is a time-consuming lengthy process. Thus, suppliers	May not be Accepted There were failure cases reported, where tensile strength of stranded wire observed less than the specified tensile strength due to absence of cadmium. RITES and QA/Elect directorate has proposed to incorporate chemical analysis test in Acceptance test . Even though there is no practical improvement in final product, inclusion of such test will ensure the chemical composition of final product is as per specification. Since the chemical analysis test in Acceptance test is to be conducted using
<u>9.1(ix)</u>	Chemical composition analysis of 2.1 mm Cu-Cd wire.		

		<p>would require longer delivery period while also supplying lesser quantity of finished conductor due to huge new bottleneck in inspection process for acceptance of offered catenary conductor.</p> <p>b. Inspection Agency: At present RITES is carrying out all the inspection of OHE Copper Conductors supplied to Indian Railways. You will understand and note that they are already short staffed as evident from long inspection response time at their end. Thus, asking them to conduct such time-consuming exhaustive testing process like electro analysis would further increase their turnaround time as well as their availability for other railway product inspections.</p> <p>c. Railway: Inclusion of the proposed testing procedure would result in less supplies with higher turnaround period bids from vendors thereby resulting in increased future cost of supplies in procurement for railways. At a time when railways are targeting ambitious project execution while also ensuring cost efficiency the proposed testing procedure would have an adverse effect on Railways at various fronts.</p> <p>Our Suggestion: We respectfully submit that 'Chemical Analysis of Copper Cadmium Wire' in Acceptance Test not be implemented as it would create significantly concerning issues for all stake holders without serving any material improvement in end product quality.</p>	<p>spectrometer instead of Electro Analysis Method, very less time (approx 10 min per sample) will be consumed in chemical analysis.</p> <p>--- AS above ---</p> <p>--- AS above ---</p> <p>Chemical analysis test will ensure that chemical composition of final product is as per specification which will prevent material failure in field.</p>
--	--	--	---