

**Reasoned Document of Final Draft Specification No.**  
**RDSO/2008/EL/SPEC/0064(Rev'2' 3)**

<b>SNo</b>	<b>Comments of Firms &amp; Remarks of RDSO.</b>
<b>1</b>	
<b>Clause 2.0 of RDSO's specification (Pg No.2/11)</b>	Governing Specifications: Table-1(Pg No.2/11 of Final Draft Spec)
<b>M/s Pahladrai Steel Forging Works comments.</b>	Governing Specifications: ASTM B 747 has been excluded in Rev.3, as per our understanding there is no other specification in the governing specifications list that covers properties of Copper Zirconium alloy. Essentially C15000 is similar to C15100, therefore inclusion of ASTM B 747 will complete the list and can be used as a good cross reference when need arises.
<b>RDSO's remarks</b>	ASTM B 747 is already mentioned in draft specification and same will remain in the Final Draft of the specification.
<b>2</b>	
<b>Clause 5.0 of RDSO's specification (Pg No.3/11)</b>	Chemical Composition: Table-2(Pg No.3/11 of Final Draft Spec)
<b>M/s Pahladrai Steel Forging Works comments.</b>	Chemical Composition: The oxygen content in the material needs to be reported in the test certificate of Raw Material Producer. It should be less than 10 PPM, it is important since less oxygen in material signifies the purity of the melting process. This in turn ensures that the quality of the finished product is superior. Also it is to be noted that presence of oxygen leads to hydrogen embrittlement at the time of brazing , leading to cracks. It is suggested that the Oxygen content may be made mandatory to report by Raw Material producer, it may not however, be necessary to be checked at time of inspection.
<b>RDSO's remarks</b>	Oxygen content is not specified in ASTM B747.From the T.C of M/s Mitsubishi, the OEM of material has shown 10 PPM as maximum oxygen content, same has been considered in the specification.
<b>3</b>	
<b>Clause 7.0 of RDSO's specification (Pg No.3/11)</b>	Source of Raw Material:

<p><b>India Metal &amp; Alloys comments.</b></p>	<p>Refer Point 7, deletion of the name of M/S Mitsubishi/Japan is surprise for us. As its raw material are not only the best but already proven and consistence since the supply of our last 12 years. We would like to share our experience during the early days of our development of above item. We had tried almost all RM from different manufacturers but not found as consistent as RM from Mitsubishi/Japan as they are the only manufacturer who maintain oxygen content less than 5 PPM.</p> <p>Deletion of the name of M/s Buntmetall /Austria and M/s Luvata is okay. Though they are manufacturing ZrCu material as per C15000 but again their consistency of RM is not so proven. In some cases, the have agreed that their RM does not conform to Railways Specification which is different than C15000 in many ways. Also they do not mention the oxygen contents in their Mill TC.</p> <p>In view of above we are of opinion that the name of M/S Mitsubishi/Japan as source raw materials must be allowed only and mentioned in the specification, till the others RM is not came in existence after successfully trial and up to your entire satisfaction.</p>
<p><b>RDSO's remarks</b></p>	<p>Name of firms are being deleted based on instructions from vigilance directorate. Which are provided below:-</p> <p>(i) SDG/VD RDSO vide note No.Spl.DG/VD/Mom dated 31.08.2020 , clause 2 (vi) specifies “ All the provisions /conditions/clauses restricting wider vendor participation, any restrictions to indigenous Vendors, coming in the way of preference to make in India Policy and to other extant policies of the Government of India, should be removed/modified”.</p> <p>(ii) Vigilance Directorate vide its note No.CVO/RDSO/Confdl/20202 dated 23.06.2020 at clause 2 (b) states following “ Very restrictive/narrow eligibility criteria by specifying experience of same item has been stipulated in some of the STRs. Eligibility criteria to be broad based.</p> <p>Therefore no change is required.</p>

<b>4</b>	
<b>Clause 8.5 of RDSO's specification (Pg No.4/11)</b>	Freedom from Defects: The Punched type resistance ring shall be clean, smooth and free from all surface defects, both surface and internal defects, such as scales, peelings, sharp edges and other defects.
<b>M/s Pahladrai Steel Forging Works comments</b>	We request you to clarify “ other defects” since this leads to ambiguity at time of inspection.
<b>India Metal Alloys &amp; comments</b>	In point 8.5.2 in place of “ by way of radiography”, it should be “ By way of Radiography/UT, etc”.
<b>RDSO's remarks</b>	In place of other defects , other <u>visual</u> defects are being added.  By way of Radiography/UT may be accepted as both can depict healthiness of material.
<b>5</b>	
<b>Clause 15.4 of RDSO's specification (Pg No.8/11)</b>	Chemical Composition (Pg No.8/11 of Final Draft Spec)
<b>M/s Pahladrai Steel Forging Works comments</b>	Chemical Composition: The quality of the material is very much dependent on the oxygen content in the material, as it signifies how clean the melting process is, while casting .Presence of Oxygen leads to hydrogen embrittlement at time of brazing, thereby leading to cracks. Therefore Oxygen content must be reported by the supplier of raw material in their test certificate and must be less than 10 PPM. The same must be mentioned in table 3 of clause 6 as well. It may be only for purpose of reporting in the Raw Material Test Certificate of Raw Material Supplier.
<b>RDSO remark</b>	Oxygen content is not specified in ASTM B747/C1500,C15100. From the T.C of M/s Mitsubishi, the OEM of material has shown 10 PPM as maximum oxygen content, same has been considered in the specification.
<b>6</b>	
<b>Clause 15.5 of RDSO's specification (Pg No.8/11)</b>	Ultrasonic test
<b>M/s Pahladrai Steel Forging Works comments</b>	Please add ASNT Level II certified operator, after government approved operator in this clause. It does not come out clearly that ASNT level II operator is also acceptable

<b>RDSO remark</b>	Same is considered and accordingly added in the specification as “ASNT level II government certification”.
<b>7</b>	
<b>Clause 15.6 of RDSO’s specification (Pg No.8/11)</b>	Hardness test
<b>M/s Pahladrai Steel Forging Works comments</b>	It is to be noted that the mechanical properties of the resistance rings is only being measured in the test sample prepared in accordance with Cl.15. However there is no correlation of this testing for mechanical properties with the actual resistance ring being supplied .It is proposed that hardness measurement may be made on actual resistance rings being offered for inspection. Since hardness test is non destructive in nature , the same can be conducted on about 10 % of the Resistance Rings Offered for inspection. This will ensure that the resistance Rings thus offered/Supplied actually do adhere to similar mechanical properties as the separate samples offered.
<b>RDSO remarks</b>	This test is already covered under routine test. No change is required.
<b>8</b>	
<b>India Metal &amp; Alloys comments</b>	Mill test certificate (Chemical & O2 contents) from M/S Mitsubishi /Japan should be mandatory till other RM source is not developed.
<b>RDSO remark</b>	It is already in practice and is part of existing QAP. Thus no change is required.