

Specefication No. RDSO/M&C/RP-183/2020 (Revision 1.0)

**Government of India
Ministry of Railways**

Indian Railway Standard Specification for
**Plastic End Caps for Galvanized Steel Tubes Assemblies
Of Traction System (Revision 1.0)**

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Lucknow - 226011**

0. **FOREWORD:**

- 0.1 This specification was first adopted on the Indian Railways in the year 1994 and was issued under fixed serial No. RDSO/M&C/RP-183/2020 (Revision 1.0), the final number indicates the year of adoption as standard or in case of revision, the year of last revision.
- 0.2 This specification is intended to cover the technical provisions relating to materials constructions and tests, and does not include all the necessary provisions of the contracts.
- 0.3 This specification draws reference to some of the relevant national and international specifications. Latest versions of these specifications shall be taken as reference.
- 0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with the IS:2:1960 (Reaffirmed 2016). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.
- 0.5 In framing the specification due consideration has been given to the development in the field of polymeric materials and process technologies and serviceability requirements of the Indian Railways.
- 0.6 This specification contained a code of practice for quality control and inspection of rubber & plastic components (Appendix 'A') to ensure satisfactory process and quality control at the works of the manufacturers. The provisions of this code shall be applicable for all the rubber & plastic components being used on the railways.

1. **SCOPE**

- 1.1 This specification covers the requirements, methods of tests and sampling for plastic caps for use as cover/seal at the ends of ERW/CDS galvanized steel tubes in the bracket assemblies of 25 KV, 50 Hz single phase a.c traction system. The caps are not subjected to any mechanical or electrical stresses but are expected to varying climatic conditions prevailing all over the country on outdoor exposure and are subjected to thermal stresses.

2. **REQUIREMENTS**

2.1 **Material :**

2.1.1 Acrylonitrile-butadiene- styrene copolymer (ABS) plastics conforming to the requirements stipulated in this specification shall be used in the manufacture of the caps. Unless otherwise specified the color of the material shall be black. The material shall be incorporated with ultra violet resistance ingredient for extended serviceability.

2.2 **Construction/Manufacture :**

2.2.1 The caps shall be manufactured as per the relevant drawings by injection molding with automatic screw type machine.

2.3 **Dimension & Tolerances :**

2.3.1 The dimension and tolerances shall be as per the relevant drawings.

2.4 **Workmanship and Finish :**

2.4.1 The surface finish shall be smooth, free from porosity, voids, lamination and other general molding defects.

2.5 **Physical Properties of the Material :**

S. No.	Properties	Specified values	Method of Tests
1.	Density (gm/cm ³)	1.04 ± 0.02	ASTM D 792
2.	Melt Flow Index (I5) at 190°C (G/10 min), max	15	ASTM D 1238
3.	Hardness (Rockwell R), min	100	ASTM D 785
4.	Tensile Strength* at Break (Mpa), min	40	ASTM D 638

*Speed of testing shall be 100 mm/min

- Note :**
- i) Tests shall be carried out on finished products wherever practicable or from the prepared test specimens using the same material.
 - ii) All the tests shall be carried out for the purpose of product approval or approval of manufacturers.
 - iii) The tests at S. No. 1 and 2 shall constitute acceptance tests.

3. **Lot Size, Sampling & Criteria of Conformity :**

- 3.1 For the purpose of inspection, 10,000 nos. of plastic caps or part thereof, in case ordered quantity is not a multiple of 1000 nos. shall constitute a lot. Five numbers of polymer wheels shall be selected at random from each lot, and out of these two may be subjected to destructive tests as required for conducting various tests specified. However, any deviation in the distribution of the samples for different tests shall be at the discretion of the Inspecting/Purchasing authority.
- 3.2 Should the samples fail to meet with the requirements of the tests specified, the tests shall be repeated in the same manner with double the number of samples from the same lot comprising two sets of tests. Should any of the set of tests fail to meet the requirements, the entire lot represented by these test samples shall be rejected.
- 3.3 Visual and dimensional check shall be conducted on minimum of 10 samples irrespective of lot size. In case of non-compliance in regard to visual and dimensional check, the manufacturer shall be permitted to segregate the lot and re-offer for ones.

4. **Marking**

- 4.1 Each polymer wheel shall bear the following in raised letters/figures ayt the end – outer surfaces -
- a) Manufacturer’s initial or trade mark as approved by the purchaser.
 - b) Last two digits of the year of manufacture along with the quarter of manufacture.
 - c) Drawing Number.

5. **Packing**

- 5.1 The plastic cap shall be packed in stout wooden boxes to avoid any damage in transit. The boxes shall be sealed and labeled bearing-
- a) Name of the supplier
 - b) Order No. and date
 - c) Year of manufacture
 - d) Consignee
 - e) Quantity
- 6.0 . “Firm should comply Make in India policy and Public Procurement (Preference to Make in India) order -2017 under this specification” and subsequent amendment done time to time.

APPENDIX 'A'

CODE OF PRACTICE FOR QUALITY CONTROL AND INSPECTION OF RUBBER AND PLASTIC COMPONENTS

A.1 THE SYSTEM

The manufacturers shall furnish to the purchasing/Inspecting Authorities information in respect of quality control systems in force at their works on various materials used in the manufacture of components.

A.2 RECORDS, TESTS & SAMPLING:

A.2.1 The manufacturer shall furnish the Purchasing/Inspecting authorities the detail of tests and inspection records and other relevant records as required under the quality control systems in force. These records and reports shall be maintained by the Competent Technical Authority of the manufacturers and shall be open to examine by the Purchasing/Inspecting authorities at all reasonable time. The Purchasing/Inspecting authorities at their discretion may draw samples of materials used in manufacture and products at any stage of production for conforming tests either at the works of the manufacturers or in an approved laboratory. In case the samples do not conform to the requirements of the specification double the number of samples from the same lot/batch shall be drawn for re-tests. Should any one of the re-test a sample does not conform to the requirements, the entire lot/batch shall be rejected.

A.3 APPROVED MANUFACTURERS:

A.3.1 The manufacturer should have complete manufacturing and quality control facilities as per the specification at their works.

A.3.2 For reasonable quality assurance, it is desirable that the components are procured from manufacturers approved by Research Designs & Standards Organization (RDSO), Lucknow or by any other agency as assigned by the Purchasing Authority, based on evaluation of the components as per the specification, manufacturing and quality control facilities and quality assurance programme. However, such approval does not guarantee the supply of consistent quality of material/components and therefore every lot offered shall be subjected to inspection and testing as per the specification.

- A.3.3 The approved manufacturers shall be subjected to periodical re-appraisal (periodicity for each component shall be assigned by the approving authority). In case of withdrawal of any manufacturing and quality control facilities provided at the time of approval of the component produced at the time of re-appraisal are not conforming to the specification, the manufacturers are liable to be withdrawn from the approved list. The approving authority reserves the right to withdraw the manufacturers from the approved list without assigning any reason.
- A.3.4 The consignee may also periodically arrange testing if so desired, at RDSO or in an approved laboratory for confirmatory tests within six months from the date of receipt of the supplies, in their original packing. In case of samples do not conform to the specification, the consignee may at their discretion suspend the manufacturer for further supply and the fact brought to the notice of approving/inspecting authorities for appropriate action.
