

**Specification No. RDSO/M&C/RP-186/2020 (Revision 2.0)**

**Government of India  
Ministry of Railways**

*Indian Railway Standard Specification for*  
**Sealant, Rubberized Bitumen Emulsion for Ballast less Track Assembly (Revision 2.0)**

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## **0. FOREWARD**

- 0.1 This specification is issued under fixed Sl. No. RDSO/M&C/RP-186/2020 (Revision 2.0), the final number indicates the year of adoption as standard or in case of revision, the year of last revision.
- 0.2 This specification was first adopted in year 1994 and has been revised mainly for incorporating quality control practices. A code of practice for quality control and inspection of rubber and plastic components (Appendix 'A') is incorporated to ensure satisfactory process and quality control at the works of the manufacturers. The provision of this code shall be applicable for all the rubber & plastic components being used in the railways.
- 0.3 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.
- 0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated, expressing the result 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.

## **1.0 SCOPE**

- 1.1 This specification covers the requirements, methods of test and sampling for rubberized bitumen emulsion used as sealant in ballast less track assembly. The sealant is used as a flexible air-tight and water proof joint along the edges of sleeper. The sleeper is subjected to high frequency vibration with amplitude of about 1 mm.

## **2.0 REQUIREMENTS**

- 2.1 The material shall be in the form of a homogenous emulsion of rubberized bitumen in water manufactured by a proven process so as to conform to the requirements stipulated in this specification. It shall have sufficient stability (minimum 6 months from the date of manufacture) under ambient conditions prevailing in the country. It shall have good adhesion with concrete surface.
- 2.2 On setting under atmospheric conditions, the emulsified product shall form a non-tacky (touch dry) and non-porous solid mass.

- 2.3 The mass shall be flexible and shall recover elasticity under high frequency vibrations of the sleeper and shall not show any surface crack over an extended period of serviceability.

### 3.0 TESTS

- 3.1 The test shall be carried out from the product offered for inspection and shall comply with the requirements stipulated in the specification.
- 3.2 Characteristics of the rubberized bitumen emulsion:

SN	Properties	Specified value	Methods of tests
1.	Visual (color)	Darkish brown which on drying turns black	-
2.	Solid content (wt%)	68-72	IS:7393:1974 (Reaffirmed 2015) (shall be calculated for solid)
3.	Ductility of the solid at 27 ± 1°C (Cm), min	50	IS:1208:1978

### 4.0 DIMENSION & TOLERANCES

- 4.1 The dimensions and tolerances of the foam shall be as agreed to by the purchaser and manufacturer. Unless otherwise specified, a tolerance of ± 10 mm shall be allowed on the length, +0/-2 mm on width and ± 0.5 mm on the thickness.

### 5.0 LOT SIZE AND SAMPLING

- 5.1 The lot size shall be 100 nos. or part thereof in case ordered quantity is not a multiple of 100 nos. or as agreed to by the Purchaser/Inspecting Authority and manufacturer.

### 6.0 TESTS

- 6.1 The test shall be carried out from the finished foam offered for inspection and shall comply with the requirements stipulated in clause 6.2.

## 6.2 Physical characteristics of the rubber:

SN	Properties	Specified Value	Method of test
1.	Bulk density (g/dm <sup>3</sup> )	35 +5 -2	By weight and volume measurements
2.	Compression Set (%),max	50	Appendix 'A'

## 7.0 RE-TEST

- 7.1 Should the samples fail to meet with the requirements of the tests of clause 6, 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.
- 7.2 In the event of rejection of the entire lot, after the retest, the lot offered for inspection shall be made unusable in the presence of Inspecting/Purchasing authority.

## 8.0 DIMENSIONAL CHECK

- 8.1 The rubber foam complying with requirements of clauses 6 and 7 shall be arranged in lots of 100 or part quantity thereof.
- 8.2 Two percent of foam selected at random shall be checked for dimensions and tolerances as stipulated.
- 8.3 If any of the sample foam does not conform to the dimensions and tolerances as stipulated in drawing, twice the number of samples taken for check earlier shall be checked. Should any of these samples fail to meet the requirements of dimensions, the lot represented by these samples shall be rejected and or otherwise, the batch shall be accepted.
- 8.4 If foam do not meet the stipulations of clause 8.2 and 8.3, the manufacturer shall re-submit the quantity of rubber sole plates after sorting out the defective pieces. The quantities so offered shall meet the requirements of clauses 8.2 and 8.3.

## 9.0 MARKING

- 9.1 Each foam shall bear the following marking in inedible ink.
- Manufacturer's initial or trade mark as approved by the purchaser
  - Last two digits of the year of manufacture along with the quarter of manufacture.
  - Drawing Number.

**10.     PACKING**

- 10.1     The foam shall be packed suitable to avoid any damage during transit. Each package shall be sealed and labeled bearing:
- a)       Name of the supplier
  - b)       Order No. and date
  - c)       Period of manufacture
  - d)       Consignee
11.     “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'

- A.1 No. of test specimens.
- A.1.1 Three test specimens measuring 100 x 100 mm with original thickness shall be cut from the foam.
- A.1.2 The test specimens shall be compressed in a compression device up to 25% of its original thickness (T<sub>0</sub>) by using spacers (TS) and then the assembly shall be kept at 27 ± 2°C for 244 +0/-2 hrs. The specimens shall then be removed from the device and kept at room temperature for 30 min. The thickness (Tr) of the test specimens shall be measured.

A.2 Calculation:

- A.2.1 Compression set % shall be calculated from the following formula:-

$$\text{Compression Set\%} = \frac{T_0 - T_r}{T_0 - T_s} \times 100$$

- A.2.2 The results to be taken into account shall be second in the series of three measurements arranged in order of decreasing values.
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