



**Government of India
Ministry of Railways**

***Schedule of Technical Requirements for Infrastructural,
Manufacturing, Testing Facilities & Quality Control Requirements***

For

**R/M paint, Red-oxide (ISC: 446), Brushing, Finishing,
Glossy for general purposes**

**STR No: M&C/ PCN/051/2020
(Revision 2.0)**

2020

**Issued By
METALLURGICAL & CHEMICAL DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
LUCKNOW-226 011**

TABLE OF CONTENTS

1.	FOREWORD
2.	SCOPE
3.	APPLICABLE/REFERENCE DOCUMENTS
4.	TERMINOLOGY/ABBREVIATIONS
5.	GENERAL REQUIREMENTS
6.	M&P REQUIREMENTS
7.	TESTING FACILITIES
8.	QUALITY CONTROL REQUIREMENTS & TRAINING FACILITIES
9.	MANDATORY REQUIREMENTS OF ISO CERTIFICATION
10.	R&D FACILITIES
11.	REPAIR/SERVICE CENTRE
12.	CAPACITY OF THE FIRM
13.	MAJOR STEPS INVOLVED IN GETTING THE FIRMS APPROVED/REGISTERED
14.	ANNEXURE – I & II

1. FOREWORD

- 1.1 This document has been revised [earlier reference STR No. M&C/PCN/051/2011.(Revision1)] and prepared to lay down the eligibility and capability of suppliers seeking approval for manufacturing & supply of paints for R/M Paint Red-Oxide (ISC:446), Brushing, Finishing, Glossy, for General Purposes as per RDSO Specification No. M&C/PCN/122/2006 with amendments if any or its latest version to Indian Railways as per the recommendations of design directorate.

2. SCOPE

3. APPLICABLE/REFERENCE DOCUMENTS

- (i) IS: 101 Methods of Test for Ready Mixed Paints and Enamels
- (ii) RDSO Specn. No. M&C/ PCN/122/2006
- (iii) IS : 1303 Glossary of Terms Relating to Paints (*Revised*)

4. TERMINOLOGY

- STR – Schedule for Technical Requirements
- NTH – National Test House
- ISO – International Standards Organisation
- M&P – Machinery & Plant
- NABL – National Accredited Board of Laboratories
- NSIC – National Small Industries Corporation Limited

5. GENERAL REQUIREMENTS

The vendor seeking approval shall comply all the under mentioned requirements :

- 5.1 The firm should have covered area with adequate space for the storage of raw material, intermediate and finish products like pigments, resin, oils, varnish, paints etc. with the firm which is free from dampness and humidity and all manufacturing facilities should be available in same campus of factory. One bond room with lock and key facility for keeping finished products should also be available.

- 5.2 ~~Should have minimum 2 years manufacturing and supplying experience for the product for which the approval is sought to the related national organisations like Railway, Defence or other similar sector. (Proposed for deletion)~~
- 5.3 ~~Should have No Objection Certificate from Pollution Control Board. (Proposed for deletion)~~
- 5.4 ~~Shall have minimum turnover of 1.0 crores per annum for last 2 years. (Proposed for deletion)~~ Proposed for modification as: Shall have balance sheet for last 2 years.
- 5.5 Approval to a firm will be given only after:
- i) Inspection of the factory premises to assess the capacity and capability of the firm.
 - ii) Samples of paints drawn during inspection meets the requirements of the relevant RDSO Specification on testing at RDSO.
- 5.6 The firms approved as “List of RDSO Vendors for developmental orders”/ “List of approved vendors” shall submit statement of supplies during the duration between two periodic quality audits to RDSO, about the details of the supplies of the relevant paint systems to Zonal Railways/PUs and Wagon Builders in the format as Annexure-II.
- 5.7 Approval of a firm will be given as per laid down procedure given in ISO apex document only after inspection of the factory premises to assess the capacity/capability of the firm and samples of paints drawn during inspection (comprising of a full system of painting) meets the norms and requirements of the relevant RDSO specifications on testing at RDSO. The initial approval shall be given in “List of RDSO Vendors for developmental orders” and further upgradation to “List of approved vendors” will be given after meeting the requirement given in ISO apex document and supply of minimum 20,000 litres after initial approval.

6. M & P REQUIREMENTS

- 6.1 Firm should possess the following minimum machines and plants as given in Table-1 for manufacturing of R/M Paint Red-Oxide (ISC:446), Brushing, Finishing, Glossy, for General Purposes as per RDSO Specification No. M&C/ PCN/122/2006. The required machinery & plant should be calibrated on regular basis (where it is required) and have valid calibration certificate. Calibration record should also be maintained.

Table-1

S No.	Machinery & Plants	Quantity (Minimum)
1	Balances of following capacity are required : i) Electronic weighing balance of min. 5 Kg. capacity ii) Electronic/ Mechanical weighing balance Of min. 50 Kg. capacity iii) Heavy duty balance of min. 200 Kg. capacity	1 no. 1 no. 1 no.
2	i) 4 nos. Of Ball mill of min. size 4 feet x 4 feet or ii) 2 nos. Of Attritor of min. 300 litres capacity/one no. of Attritor of 600 lit capacity or other suitable high tech grinding machine of same capacity like Sand Mill, Bead Mill, Dyno Mill etc.	
3	Mixing tank of min. 3000 litres	1 no.
4	High speed stirrer for mixing of paint	1 no.
5	Varnish kettle with heating arrangement, of min.1000 litres	1 no.
6	Blending tank of min.2000 litres	1 no.
7	Resin plant of solvent process with suitable arrangement for Styrenation and Acrylation of resin with stainless steel vessel of min 500 litres	1no.

7. TESTING FACILITIES

- 7.1 There should be a well equipped laboratory having full testing facilities. The testing equipment should meet the requirements of the specifications which are covered by IS: 101 latest version. Other equipment not covered by IS: 101 shall be of standard make.
- 7.2 The firm should have proper air conditioned laboratory to maintain the normal test conditions of 27 ± 2 °C temperature and $65 \pm 5\%$ R.H. for which suitable indicating instruments should be available.
- 7.3 Firm should possess the following minimum test equipment as given in Table-2 for quality Control of R/M Paint Red-Oxide (ISC:446), Brushing, Finishing ,Glossy, for General Purposes as per RDSO Specn. No. M&C/ PCN/122/2006.
- 7.4 The required test equipment should be calibrated on regular basis and have valid calibration certificate .Calibration record should also be maintained.

Table-2

S No.	Name of the Equipment	Quantity (minimum)
1.	Humidity Chamber	1 No.
2.	Cryptometer/ Chequer board or Black and white charts	1 No. Adequate nos.
3.	Gloss-O-Meter of 60° angle of incidence	1 No.
4.	Abel's Flash Point Apparatus	1 No.
5.	Flexibility & Adhesion Apparatus	1 No.
6.	Salt Spray Test Cabinet	1 No.
7.	Flow Cup (Ford Cup No. 4)	1 No.
8.	Weight/10 Liter Cup	1 No.
9.	Hegman Gauge	1 No.
10.	Centrifuge	1 No.
11.	Dry Film Thickness Measuring Equipment	1 No.
12.	Dean & Stark Apparatus	1 No.
13.	Hygrometer	1 No.
14.	Lovibond Tintometer/Colour Comparator for resin	1 No.
15.	Hot Air Electric Oven	1 No.
16.	Muffle Furnace	1 No.
17.	Distilled Water Plant	1 No.
18.	Mild steel, tinned and glass panels	Adequate Qty./Nos.
19.	Hydrometer of different ranges	1 No. of each range
20.	Set of Sieves, Thermometers, Heating Mantles, Glass Wares, Crucibles, Mild steel panels, Steel discs for determination of volume solids, Reagents & Chemicals for Testing of Raw Materials, Intermediate & Finished Products, and suction pumps as per relevant specifications	Adequate Qty./Nos.
21.	Hot Plate	1 Nos.
22.	Water Bath	1 No.
23.	Chemical balance, upto 3 decimal places	1 No.
24.	Physical balance, upto 2 decimal places	1 No.
25.	Stop watch	1 No.

8. QUALITY CONTROL REQUIREMENTS & TRAINING FACILITIES

8.1 There should be a system to ensure the traceability of the product from raw material stage to finished product stage. The system should be such as to facilitate the identification of the raw material, intermediate products and finish products.

8.2 Shall have ERP/SAP supported multimodule applications software.

8.3 Ensure that the system of 'first in first out' is followed for raw materials and the intermediate stage products.

8.4 Ensure that there is Quality Assurance Plan for the products detailing various aspects as per Guidelines of ISO Document no. QM-RF-8.1-3 (Latest version)

- Organisation chart
- Write up on manufacturing process of resins and paints
- Process flow chart for resins and paints
- Traceability of various products.
- Inspection and testing plan for all the products starting from raw materials, in process and final product.
- Details of non-conformity.
- Details of customer complaints and Warranty failures/In service failures.
- M&P/T&P as per specification/STR/IS

The QAP shall be available and submitted (in triplicate) along with vendor approval application form for approval by RDSO.

8.5 The technical supervisors/managers responsible for production & quality control activities related to manufacturing of subject paint item should have the minimum qualification of B.E. / B.Tech (Paint /Polymer Technology/Chemical Engg.) with a minimum of 3 years experience or M.Sc. (Chemistry) with a minimum of 7 years experience in relevant fields to look after the production, quality control and testing activities and should have knowledge of paint manufacturing, testing of raw materials etc. They should be able to take corrective steps in case of difficulties in maintaining quality control and they should be regularly employed by the firm.

8.6 The quality manual of the firm for ISO should clearly indicate the control over manufacturing and testing of said product. at any stage.

- 8.7 Ensure that proper analysis is being done on monthly basis to study the rejection at various levels and it is documented.
- 8.8 Ensure that all the relevant specification, IS standards are available with the firm.
- 8.9 ~~Firm should have test certificate issued by NTH/MSME/HBTI or any other NABL approved test house, not older than 6 years for R/M Paint Red-Oxide (ISC:446), Brushing, Finishing, Glossy, for General Purposes as per RDSO Specn. No. M&C/PCN/122/2006 with amendments if any or its latest version. (Proposed for deletion)~~
- 8.10 A periodical/Need basis Quality Audit check may be carried out of the firm to check the quality of paint and other infrastructure and testing facilities mentioned in the STR .

9. MANDATORY REQUIREMENT OF ISO: 9000 CERTIFICATION

The vendor should possess valid ISO 9001-2015 or latest certificate in respect of the products applied for.

10. R&D FACILITIES

- 10.1 ~~Firm should have their own R&D facilities approved by Govt. Agency or the firm should have tie up with Govt. R&D Laboratory/Deemed/Govt. University. Valid certificate with clear date of validity on it should be available with the firm and same need to be submitted to RDSO/Lucknow. (Proposed for deletion)~~

11. REPAIR/SERVICE CENTRE

- 11.1 The firm should have 24X7 customer complaint registration & redressal mechanism through website.

12. CAPACITY OF THE FIRM

- 12.1 The firm should have valid capacity certificate issued by NSIC /Other approved agency for small scale industries.
- 12.2 In case of medium & large scale industries, if capacity certification is not possible by any approved agency, capacity shall be declared by the firm itself detailing the points to arrive at the capacity and subsequently assessing officer will verify the capacity during the assessment of the firm.

13. MAJOR STEPS INVOLVED IN GETTING THE FIRMS APPROVAL/REGISTRATION AS PER LATEST ISO APEX DOCUMENTS:

- 13.1 The firm shall apply online for vendor registration on RDSO website.
- 13.2 The application form and other relevant documents shall be scrutinized at M&C Dte and if any deficiencies are found, the firm shall be asked to comply the deficiencies as per latest ISO apex guidelines.
- 13.3 After all deficiencies are complied by the firm, the capacity , capability and STR verification of the firm shall be assessed by nominated official. Samples shall also be drawn from the firms premises after satisfactory compliance of STR and shall be tested at RDSO/National Test House (Lab which is accredited by an accrediting agency which meets the criteria laid down in QO-D-8.1-11 {Latest version}) and if test facility for any of parameter is not available either at RDSO/NTH/as specified in QO-D-8.1-11 then it may be referred to Govt lab/University/any other NABL accredited lab, where it exist.
- 13.4 If all the test results are satisfactory and all other requirements are fulfilled, the firm shall be approved for “List of RDSO Vendors for developmental orders”.

ANNEXURE -I

SN	Description of Machine/Equipment/Man power	Capacity requirement/Qualification	Total requirement	No. of Machines available	Operation to be performed by Machine/Equipment	Capacity of available Machine	Year & Make of machine	Present Status— Working/Undercommencing/Not working
1	2	3	4	5	6	7	8	9
1	Balance,Electronic	5 kg	1No.					
2	Balance,Electronic	50 kg	1No.					
3	Balance,Heavy Duty	200 kg	1No.					
4	Ball Mill Or Attritor Or Sand Mill/Bead Mill/Other	300lit. 300 lit. 1200 lit.	4Nos. 2Nos. Suitable Qty.					
5	Mixing Tank	3000 lit.	1No.					
6	High speed stirrer		1No.					
7	Varnish Kettle	1000 lit.	1No.					
8	Blending Tank	2000 lit.	1No.					
9	Resin plant of solvent process with suitable arrangement for Styrenation and Acrylation of resin with stainless steel vessel.	500 lit.min.	1No.					
10	Humidity Chamber		1No.					
11	Cryptometer/Chequer board		1No.					
12	Glossometer	60° Angle	1No.					
13	Abel's Flash point Apparatus		1No.					
14	Flexibility & Adhesion Apparatus		1No.					
15	Salt Spray Test Cabinet		1No.					
16	Ford Cup no.4		1No.					
17	Weight/10 lit Cup		1No.					
18	Hegman Gauge		1No.					
19	Centrifuge		1No.					
20	Dry Film Thickness MeasuringApparatus		1No.					
21	Dean & Stark Apparatus		1 No.					
22	Hygrometer		1 No.					
23	Lovibond Tintometer/Colour Comparator for resin		1 No.					

1.	2.	3.	4.	5.	6.	7.	8.	9.
24	Hot Air Electric Oven		1 No.					
25	Muffle Furnace		1 No.					
26	Hot Plate		1 No.					
27	Water Bath		1 No.					
28	Chemical Balance, upto 3 decimal place		1 No.					
29	Physical Balance, upto 2 decimal place		1 No.					
30	Stop Watch		1 No.					
31	Set of Sieves, Thermometers, Heating Mantles, Glass Ware, Crucible, Mild Steel panel, Steel Discs for determination of volume solids, Reagents & Chemicals for testing of Raw materials, Intermediate & Finished Products, and suction pumps as per relevant specifications.		Adequate qty.					
32	Mild steel, tinned and glass panels		Adequate qty.					
33	Distilled water plant		1 No.					
34	Hydrometers of different ranges		Adequate qty.					
35	Manpower — The Technical supervisors/ managers responsible for production & quality control activities related to manufacturing of subject paint item should have the minimum qualification of B.E./ B.Tech (Paint /Polymer Technology/ Chemical Engg.) with a minimum of 2 years experience or M.Sc. (Chemistry) with a minimum of 7 years experience in relevant fields.		1 No. each for Production & Quality Control respectively.					

Note: Information in column 1 to 4 shall be indicated by RDSO whereas information in column 5 to 9 shall be furnished by vendor.

