



**Government of India
Ministry of Railways**

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

For

Enamel, Interior a) Under Coating and b) Finishing with

Fire Retardant Properties

STR No. M&C/PCN/054/2020

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**Issued By
METALLURGICAL & CHEMICAL DIRECTORATE
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1. SCOPE

1.1 The schedule for technical requirement covers the norms for manufacturing of Enamel interior a) undercoating b) finishing with fire retardant properties for painting of interior of coaches etc. as per RDSO specification No. M & C /PCN/120/2005 with amendment if any or its latest version .

2. REQUIREMENTS:

The vendor seeking approval shall comply with all the under mentioned requirement from Para 2.1 to 8.1.

2.1 GENERAL

2.2 a.) Covered area with adequate space for the storage of raw material, intermediate and finished products like pigments, resin, oils varnish paints etc. should be available free from dampness and humidity and should be available in same campus of factory. One bond room with lock and key facility for keeping finished products should also be available.

b) Should have sufficient manufacturing experience for the product for which the approval is sought.

c) ~~Should have No objection Certificate from Pollution Control Board.~~ (Proposed for deletion)

d) Approval of a firm will be given only after.

I. Inspection of Factory premises to assess the capacity and capability of the firm.

II. Samples of paints drawn during inspection meets the requirement of relevant RDSO Specification on testing at RDSO.

2.3. The approval to the firm will be given for full painting system for painting of interior of coaches and not for individual paint items.

2.4. ~~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)

2.5. Shall have manufacturing experience of these paints, at least for 2 years.

2.6. ~~Shall have minimum turnover of Rs. 1 Crore per annum for last 2 years.~~ (Proposed for deletion)
Proposed for modification as: Shall have balance sheet for last 2 years.

3. MANUFACTURING FACILITIES:

3.1 Firm should possess the following minimum machines and plants as given in Table – I for manufacturing of enamel interior 1) under coating b) finishing with fire retardant properties for painting of interior of coaches etc. as per RDSO specification No. M & C /PCN/120/2005. The required Machinery and plant should be calibrated on regular basis and have valid calibration certificate Calibration record should be maintained.

Table No. 1.

S. No.	Machinery and Plant	Quantity (Minimum)
1.	Balances of following capacity are required: I. Electronic weighting balance of min. 5 Kg. capacity II. Electronic/Mechanical weighting balance of min 50 Kg. capacity. III. Heavy duty balance of min 200 Kg. capacity	1 No. 1 No. 1 No.
2.	Attritor and or sand mill of min 300 liters each Or Ball Mill of min. size 4 feet x 4 feet	2 No. 4 No.
3.	Mixing tank of min. 3000 liters	1 No.
4.	High speed stirrer for mixing of enamel	1 No.
5.	Varnish kettle with heating arrangement of min. 1000 liters	1No.
6.	Blending tank of min 2000 liters	1 No
7.	Resin plant (either fusing or solvent process) with stainless steel vessel, 500 liters.	1 No

4. TESTING FACILITIES:

4.1 There should be well equipped lab having full testing facilities .The testing equipment should meet the requirement of the specification, which are covered by IS:101 latest version. Other equipment not covered by IS: 101 shall be standard make.

4.2 The firm should have proper air conditioned Laboratory to maintain the normal test conditions of $27 \pm 2^{\circ}\text{C}$ temperature and $65 \pm 5\%$ R.H. for which suitable indicating instruments should be available .

4.3 Firm should posses the following minimum test equipment as given in Table -2 quality control of Enamel interior a) under coating b) finishing with fire retardant properties for painting of coaches etc. as per RDSO specification No. M & C /PCN/120/2005.

4.4 The required test equipment should be calibrated on regular basis and have valid calibration certificate. Calibration record should be maintained.

Table – 2

S.No.	Name of equipment	Quantity (minimum)
1.	Humidity Chamber	01 No.
2.	Crypto meter/Chequer board or Blank and white charts.	01 No. Adequate nos.
3.	Gloss – O -Meter of 60 ^o angle of incidence	01 No.
4.	Abel's Flash Point Apparatus	01 No.
5.	Flexibility and Adhesion Apparatus	01 No.
6.	Scratch Hardness Tester, with automatic indicator indicate bare metal contact.	01 No.
7.	Flow Cup (Ford Cup No. 4)	01 No.
8.	Natural Fiber Thermal Composite (NFTC) Sheets to RDSO specification No. C- K 511/2005	Adequate Qty./ No.
9.	Weighting / 10 liter Cup	01 No.
10.	Hegman Gauge	01 No.
11.	Centrifuge	01 No.
12.	Dry Film Thickness Measuring Equipment	01 No.
13.	Dean & Stark Apparatus	01 No.
14.	Hygrometer	01 No.
15.	Lovibond Tintometer/Camparator	01 No.
16.	Hot Air Electric Oven	01 No.
17.	Muffle Furnace	01 No.
18.	Distilled Water Plant	01 No.
19.	Mild steel, tinned and glass panels	Adequate Qty /Nos
20.	Hydrometer of different ranges	01 No. of each range
21.	Set of sieves, Thermometers, Glass wares, Crucibles, Mild steel panel, Steel discs for determination of volume solids, Reagents & Chemical for Testing of Raw Materials, Intermediate and Finishing product as per relevant specifications.	Adequate Qty /Nos.
22.	Hot Plate	01 No.
23.	Bunsen burner of 10 mm internal dia	01 No.
24.	Water Bath	01 No.
25.	Chemical balance upto 3 decimal places.	01 No.
26.	Physical balance upto 2 decimal place	01 No.
27.	Stop watch	01 No.

5. QUALITY CONTROL REQUIREMENTS

- 5.1 There should be a system to ensure 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 finished products.
- 5.2 Ensure that the system of “first in first out” is followed for raw material and the intermediate stage products.
- 5.3 Ensure that there is a Quality Assurance Plan for the products detailing various aspects as per Guidelines of ISO Document no. QM-RF-8.1-3 (Latest version)

- Organization 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 submitted (in Triplicate) along with vendor approval application form for approval by RDSO.

- 5.4 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.
- 5.5 The vendor should possess valid ISO 9001-2015 or latest certificate in respect of product applied for.
- 5.6 The quality manual of the firm for ISO should clearly indicate the control over manufacturing and testing of said product, at every stage.
- 5.7 Ensure that proper analysis is being done on a monthly basis to study the cases of rejection at various levels and should be documented.
- 5.8 Ensure that all the relevant specification IS standards are available with the firm.

5.9 ~~Firm should have test certificates, not older than 06 years, issued by NTH/MSME/HBTI/Labs under CSIR or any other NABL approved test house for enamel interior a) under coating b) finishing with fire retardant properties for painting of interior of coaches etc. as per RDSO Specification No.. M & C /PCN/120/2005 with amendments if any or its latest version. (Proposed for deletion)~~

5.10 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 .

5.11 Shall have ERP/SAP supported multimodule applications software.

6. Repair/Service Centre

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

7. Capacity of the firm

7.1 The firm should have valid capacity certificate issued by NSIC /Other approved agency for small scale industries.

7.2 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.

8. 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.

8.1 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.

9. Major steps involved in getting the firm’s approval/registration as per latest ISO apex documents:

9.1 The firm shall apply online for vendor registration on RDSO website.

9.2 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.

9.3 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.

9.4 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

S. No.	Description of Machine/equipment/ Manpower	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/ under coming/ not working
1	2	3	4	5	6	7	8	9
1.	Balances of following capacity are required: I. Electronic weighting balance of min. 5 Kg. capacity II. Electronic/Mechanical weighting balance of min 50 Kg. capacity. III.Heavy duty balance of min 200 Kg. capacity	5 kgs 50 kgs 200 kgs	1 No. 1 No. 1 No.					
2.	Attritor and or sand mill of min 300 liters each Or Ball Mill of min. size 4 feet x 4 feet	300 litres min. size 4 feet x 4 feet	2 No. 4 No.					
3.	Mixing tank of min. 3000 liters	3000 litres	1 No.					
4.	High speed stirrer for mixing of enamel	----	1 No.					
5.	Varnish kettle with heating arrangement of min. 1000 liters	Minimum 1000 litres	1 No.					

6.	Blending tank of min 2000 liters	Min. 2000 litres	1 No.					
7.	Resin plant (either fusing or solvent process) with stainless steel vessel, 500 liters.	500 litres	1 No.					
8.	Humidity Chamber		1 No.					
9.	Crypto meter/Chequer board Or Blank and white charts		1 No. Adequate no.					
10.	Gloss – O -Meter of 60 ⁰ angle of incidence	60 ° angle	1 No.					
11.	Abel's Flash Point Apparatus		01 No.					
12.	Flexibility and Adhesion Apparatus		01 No.					
13.	Scratch Hardness Tester, with automatic indicator indicate bare metal contact.		01 No.					
14.	Flow Cup (Ford Cup No. 4)		01 No.					
15.	Natural Fiber Thermal Composite (NFTC) Sheets to RDSO specification No. C- K 511/2005		Adequate Qty /Nos					
16.	Weighting / 10 liter Cup		01 No.					
17.	Hegman Gauge		01 No.					
18.	Centrifuge		01 No.					
19.	Dry Film Thickness Measuring Equipment		01 No.					
20.	Dean & Stark Apparatus		01 No.					
21.	Hygrometer		01 No.					
22.	Lovibond Tintometer/Camparator		01 No.					
23.	Hot Air Electric Oven		01 No.					
24.	Muffle Furnace		01 No.					
25.	Distilled Water Plant		01 No.					
26.	Mild steel, tinned and glass panels		Adequate Qty /Nos					
27.	Hydrometer of different ranges		01 No. of each range					
28.	Set of sieves, Thermometers, Glass wares, Crucibles, Mild steel panel, Steel discs		Adequate Qty /Nos					

	for determination of volume solids, Reagents & Chemical for Testing of Raw Materials, Intermediate and Finishing product as per relevant specifications.							
29.	Hot Plate		01 No.					
30.	Bunsen burner of 10 mm internal dia		01 No.					
31.	Water Bath		01 No.					
32.	Chemical balance upto 3 decimal places.		01 No.					
33.	Physical balance		01 No.					
34.	Stop watch		01 No.					
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 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.		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.

ANNEXURE –II**Statement of supplies during the duration between two periodic quality audits as per QO-D-8.1-13 (Latest version)**

Name of the Vendor:

SN	Period	Full Item detail with specification	Supplied to ZonalRly/ PU/ WagonBuilder	PO No. and date	Quantity	Inspecting Agency	Performance Report of Inspecting Agency	Other Information,if any

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