Reasoned Document for Draft of specification no. MMDTS 19041, Rev-3

Comments/suggestions received from firms and MCF's decisions on them are given below.

1. **Clause no. 3 (Composition):**

Description draft of MMDTS19041, Rev-3 (CP-145):

a) Organic Surface Painting schemes comprises of 3 sub system:
   i. Quartz Sand Based Organic Hard Surface Painting
   ii. Quartz Sand Based Organic Painted Surface Painting
   iii. Organic Textile/Soft Surface Painting

Or

b) Organic polysilazane Si-N-Si and Si-O-Si structure

Firm's comments:

(i) M/s Surface Paints Pvt. ltd-lucknow(CP-34):

(a)Comments: Please confirm whether it is single component or two components (CP-34)

MCF decision: It will be single components.

(b)Comments: Under composition Organic polysilazane compound mentioned. The same has already been specified in dedicated RDSO spec. M&C/PCN/127/2020 as well. Kindly confirm the draft specification should supersede the RDSO spec. M&C/PCN/127/2020.

MCF decision: It will not supersede the RDSO spec. M&C/PCN/127/2020., since Anti-graffiti clear coat as per RDSO spec. M&C/PCN/127/2020 is applicable for exterior surface while this coating is applied on interior surface (i.e. window glass, door, doors handle, internally on Toilets (wall panels, hand basin, mirrors, and floor area), sidewall panels, floor, partition wall, Gangway area, taps, sink and Seats & berths) as per requirement.

2. **Drying time at 25±2˚C: as** IS: 101-86 (Part 3/ Sec. 1), Reaffirmed 2017 or latest
   a. Surface dry, max, 0.5 hrs
   b. Curing time, max., 12 Hrs

Firm's comments:

(i) M/s Surface Paints Pvt. ltd-lucknow(CP-34):

Surface dry should be 1 hrs (Max.) as mentioned in RDSO spec. M&C/PCN/127/2020

MCF decision: Acceptable, Surface dry will be 1 hrs (Max.) similar as Anti-graffiti clear coat as per RDSO spec. M&C/PCN/127/2020. Accordingly, clause has modified as under:

Drying time at 25±2˚C:

a. **Surface dry, Max, shall be 1 hrs in place of 0.5 hrs as IS: 101-86 (Part 3/ Sec. 1), Reaffirmed 2017 or latest**

3. **Dry film thickness per coat, min., by sponge/ airless spray (CP-14/6):** (≥5) microns as per IS: 101-89 (Part 3/ Sec. 2) Reaffirmed 2019 or latest/ASTM D7091/ by DFT gauge.

Firm's comments:

(i) M/s Henkel(CP-33):

Please mention Minimum coating thickness required for your application and it has to be min 30 Micron for 36 Months life **asking as per technology you have selected, No technology mentioned in the spec can give 36 Months Life and protection** on 5 Micron thickness please

reconsider, a joint meeting with all organisations making this type of coating will get this more clear.

Our recommendation for better application specification clarity**, Dry film thickness (Min.) = 30 microns, during inspection- field validation as per** IS 101-89, ASTM D7091by DFT gauge.

MCF Decision: Acceptable, Accordingly, clause has modified as under:
Dry film thickness per coat, min., by sponge/ airless spray: (≥5) microns as per IS: 101-89 (Part 3/ Sec. 2) Reaffirmed 2019 or latest/ASTM D7091/ by DFT gauge.
However, firm shall specify the minimum DFT required for their system to comply all the requirements of this specification. Such specified minimum DFT shall be applicable for testing as well as application by the firm.

4. **Flash Point (Above 32 °C) as per IS: 101-87 (Part 1/ Sec. 6), Reaffirmed 2019 or latest(CP-14/6):**

(i) M/s Surface Paints Pvt. ltd-lucknow(CP-34):
Flash point shall be not less than 25 °C instead of above 32 °C in RDSO spec. M&C/PCN/127/2020

MCF decision: Acceptable, clause modified as under
Flash point should not less than 25 °C instead of above 32 °C like Anti graffiti clear coat as per RDSO spec. M&C/PCN/127/2020 which is applied on exterior surface of coaches.
Flash Point is above 25 °C in place of above 32 °C as per IS: 101-87 (Part 1/ Sec. 6), Reaffirmed 2019 or latest.

5. **Resistance to salt spray:**
No sign of corrosion & no sign of deterioration up to 3000 hours as per ASTM B – 117/90.
Firm's comments:

(i) M/s Henkel(CP-32):
Railways must mention the coating thickness (DFT) in the test on which railway wants this coating to provide this protection, it should be same as the min coating thickness required on rail coaches otherwise vendor may give chemical resistance report on 100 Micron thickness as pass whereas the same coating will fail on 5 Micron coating thickness.

MCF Decision: Accordingly, clause has modified as under:
Resistance to salt spray test shall be carried out on (≥5) microns, Min., No sign of corrosion & no sign of deterioration up to 3000 hours as per ASTM B – 117/90.

However, Minimum Spreading & Covering surface area requirement shall change in direct proportion to Min. DFT specified by the suppliers against Sr. no.5 of this Table for their respective system for tests & application.

6. **Mass in kg/10 litres, min.(10.9)as per IS: 101-87 (Part 1/ Sec. 7) Reaffirmed -2020 or latest(CP-14/7):**

Firm's comments:

(i) M/s Surface Paints Pvt. ltd-lucknow(CP-34):
Wt./10 Ltr should be min.10 Kg/lts. Instead of 10.9 Kg/ltrs due to un-pigmented coat.

MCF Decision: Not acceptable,
Since, Weight of 10 liters of water = 10 kilograms.

7. **Protection against corrosion under condition of condensation test(CP-32):**

No sign of corrosion & no sign of deterioration up to 2500 hours as per IS: 101-88 (Part 6 /Sec. 1), Reaffirmed 2015 or latest

Firm's comments:

(i) **M/s Henkel(CP-32):**

Railways must mention the coating thickness (DFT) in the test on which railway wants this coating to provide this protection, it should be same as the min coating thickness required on rail coaches otherwise vendor may give chemical resistance report on 100 Micron thickness as pass whereas the same coating will fail on 5 Microns coating thickness.

MCF Decision: Accordingly, clause has modified as under:

Protection against corrosion under condition of condensation test shall be carried out on (≥5) microns, Min DFT, No sign of corrosion & no sign of deterioration up to 2500 hours as per IS: 101-88 (Part 6 /Sec. 1), Reaffirmed 2015 or latest .

However, Minimum Protection against corrosion under condition of condensation test requirement shall change in direct proportion to Min. DFT specified by the suppliers against Sr. no.5 of this Table for their respective system for tests & application.

8. **Keeping Properties (CP-):** Not less than 36 months as per Appendix-II of RDSO specification no. M&C/PCN/127/2020

Firm's comments:

(i) **M/s Henkel(CP-32):**

Shelf life of material or performance life after application of coating.

MCF Decision: Already mentioned in Appendix-II of RDSO specification no. M&C/PCN/127/2020.

9. **Resistance to chemical on:**

1) 25% Caustic Soda solution (W/V)
2) 30% (V/V) H2SO4

Shall not show any sign of cracking, dislocation blister, wrinkling and peeling or softening of paint film for 24 Hrs as per IS 101-89 (part7/Sec.2) reaffirmed -2020 or latest

Firm's comments:

(i) **M/s Henkel(CP-31):**

Railways must mention the coating thickness (DFT) in the test on which railway wants this coating to provide this protection, it should be same as the min coating thickness required on rail coaches otherwise vendor may give chemical resistance report on 100 Micron thickness as pass where as the same coating will fail on 5 Microns coating thickness.

MCF Decision: Accordingly, clause has modified as under:

Resistance to chemical on test shall be carried out on (≥5) Micron, Min DFT,

1) 25% Caustic Soda solution (W/V)
2) 30% (V/V) H2SO4

Shall not show any sign of cracking, dislocation blister, wrinkling and peeling or softening of paint film for 24 Hrs as per IS 101-89 (part7/Sec.2) reaffirmed -2020 or latest.

However, Minimum Resistance to chemical test requirement shall change in direct proportion to Min. DFT specified by the suppliers against Sr. no.5 of this Table for their respective system for tests & application.

10. **Gloss at 60° angle of incidence(CP-14/7):**70-87 on painted metals/ maintained original gloss as per IS: 101-88 (Part 4/ Sec.4) Reaffirmed -2017 or latest version

Firm's comments:

(i) **M/s Surface Paint Pvt. ltd-Lucknow(CP-34) :**
Gloss should be 70 at 60° angle instead of 70-87.
MCF Decision: The Gloss value range 70-87 units already defined.

11. **Anti-graffiti properties (CP-14/7):** Graffiti completely removed, and no marks of Edding 3000 should be left behind as per ASTM D-6578/13 (latest version)

Comments:

(i) **M/s Nippon Paint (India)Pvt. ltd-Ranipet (CP-22):**
Anti-graffiti level to be mentioned as per specification of ASTM D 6578/13(we suggested level 9 to be mentioned as mentioned in Train 18 spec.)

MCF Decision: Firm suggestion is not acceptable. Since, Graffiti shall be completely removed and no marks of Edding 3000 should be left behind as per ASTM D-6578/13 as per latest RDSO specification no. M&C/PCN/100/127/2020, Rev.02.

12. **Clause no. 5 (Documents to be submitted along with offer):**

Description draft of MMDTS19041, Rev-3:

i. First time supplier/OEM as per Rev.03 of this specification shall submit clause wise comments on the specification for compliance and deviation (if any).

ii. Supplier/OEM shall submit test certificate of parameters(Table -1 of clause 4) of specification from:
   a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.
   b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, any government's lab in India report will be acceptable.

In absence of any of above details for offered product, the offer would not be considered.

iii. The submitted test reports along with offer shall not be more than one (01) years old from the date of tender opening except for type test (Fires and smoke test) (item no. 22 of table-1 of Para 4). Test report for Fire and smoke characteristics as per EN 45545/2 R1/HL3 Shall not be more than three (03) years older from date of tender opening.

iv. Valid audit report/CCA report except by bidder seeking developmental order based on availability of M&P & shall be subjected to CCA before placement of purchase order if its bid is acceptable.

Firm comments:

(i) **M/s Merck performance material Pvt. Ltd-Mumbai(CP-28):**
Firm comments {clause no. 5(i)}:

i. Phrase "**First time" should be removed**. It should be read as supplier/OEM as per Rev.02 or latest of this specification shall submit clause wise comments on the specification for compliance and deviation (if any).

Reason: The term "First time" unnecessarily restrict the requirement to only new suppliers or OEMs. This creates ambiguity and might lead to the exclusion of existing suppliers who may also need to provide clause wise comments on the specification as part of their submission. By removing "First time," the clause ensures that all suppliers, whether new or existing, are, treated uniformly in the terms of compliance and deviation submission. This enhances clarity and ensures a standard approach to evaluating all suppliers. Also its important that currently there is no Vendor list for this product.

MCF Decision: acceptable and clause modified as under :

i. Supplier/OEM as per Rev.02 or latest of this specification shall submit clause wise comments on the specification for compliance and deviation (if any).

Firm comments {clause no. 5(iii)}:

The submitted test reports as per MMDTS 19041 Rev.02 or latest along with offer shall not be **more than (05) five years** old from the date of tender opening **except for type test (Fires and smoke test). Fire and smoke characteristics as per EN 45545/2 R1/HL3 Should be repeated after (03) three years.**

Reason: this specification has been in existence since December 30, 2020, and the comprehensive testing of the products was completed in 2021. Over time, the specifications have undergone several revisions, and we have consistently updated our tests report to meet these changing requirements.

Secondly, we do not know when the railways will starts tendering these products. therefore even if we start the testing of the products as on date, this test report will render useless at the time of tender opening as we do not know when the tender will be published, secondly if we wait for tender to be published the usual time between the issue of NIT and dated of opening of the tender is 30-45 days and the time required for some of the long duration test mentioned in the table-1 is more than 6-9 months, this time line discrepancy makes it impractical of complete fresh tender within the tender submission period, therefore instead of 1 years the test report which is not older more than 5 years should be acceptable just as mentioned in clause 5(iii) in MMTS19041 rev.02 dated 01.01.2024.

Additionally, **test report as per MMDTS19041 rev.02 dated 01.01.2024 should be acceptable since the testing parameters remains the same in MMDTS19041 Rev.03**. So therefore it can be written as MMDTS19041 Rev.02 or latest.

(ii) <u>M/s G.S Industries, Jalandhar (CP-20):</u>

Clause no. 5(iii): Test report validity period (3 Years):

- We request the validity of the submitted test reports to be extended to **three years** instead of one. The reasoning is based on:
    - The comprehensive testing completed in 2021.
    - **The evolution** of the specification through multiple revision, and we kept the test reports updated accordingly to meet changing requirement.
    - **Uncertainty in tendering timelines:** As the exact timing for tender publication is unknown, even starting testing now may lead to test reports becoming outdated by the time the tender is opened(because the tender may not be released for month or longer).The required testing often has a **long duration** (almost 6 month), which further complicate the time.

➢ **Fire and smoke tests:**

- We acknowledge that for **fire and smoke characteristic** (as per EN45545/2, R1, HL-3), the tests must be repeated every 3 years.

➢ **Timeline discrepancy:**

- There's a significant time discrepancy between the NIT publication and the tender opening(usually 30-45 day). this short time frame is incompatible with the long duration tests (some tests takes 6months), making it practically impossible to conducts fresh testing within tender submission period.

MCF Decision: Suggestion partially accepted. Reports no older than 3 years clause modified as under:

i. **The submitted test reports along with offer shall not be more than one (03) years old from the date of tender opening ~~except for type test (Fires and smoke test) (item no. 22 of table-1 of Para 4). Test report for Fire and smoke characteristics as per EN 45545/2 R1/HL3 Shall not be more than three (03) years older from date of tender opening.~~**

13. <u>Clause no.8 (</u>List of Machineries and plant):

A. Machinery and Equipments :

1. Reaction Vessel
2. Intermediate vessel
3. Isolation equipment
4. Finished goods vessel
5. Filling & Packaging machine
6. Air Handling and filtering unit with humidity control
7. Heating & cooling media for reaction & intermediate vessels
8. Inert gases storage tank and cylinder.

B. Material storage area

1. Raw material storage area = Well ventilated & covered
2. Intermediate WIP (Work in Process) material storage area = Well ventilated, temperature controlled with HVAC.
3. Finished goods storage area = Well ventilated, temperature controlled with HVAC.
4. Inspection & Quality control well ventilated, temperature controlled with HVAC.

C. Testing facilities:

1. Dry time recorder
2. DFT gauge
3. Gloss meter
4. Weighing machine
5. Electronic balance
6. automatic scratch hardness testers
7. Flexibility & Adhesion apparatus
8. salt spray chamber
9. corrosion chamber
10. Impact tester
11. Abel flash point apparatus
12. Taber type abrasion tester
13. QAV/Xenon arc chamber

<u>Firm's comments:</u>

(i) <u>M/s Merck performance material Pvt. Ltd-Mumbai(CP-27 & 28):</u>

Comments on clause no.8(c) (Testing facilities) (CP-27 & 26):

Dry time recorder: as per IS101-86 standard, there is no "dry time recorder" mentioned, however, standard say, Allow the coated test panel to dry in a vertical position shield from air currents, in absence of direct sunlight and under standard atmospheric condition of 27+/-2^{o} C and 60+/-5% relative humidity.
After the specified time place the test panel in a horizontal position. Sprinkle uniformly about 0.5g of ballotini on to the surface of coating and allow to remain for about one minute. Then hold the panel at angle of 20^{o} to the horizontal and brush the coating using a camel hair brush gently and remove the ballotini. Examine the surface of the coating under normal corrected vision. The coating is considered to be surface dry if all the ballotini can be brushed away without any injury to paint film. Thus allow to test by manual touch dry.
MCF Decision: clause is self explanation.

Note: **shall be mentioned for test facilities**: that any testing facilities/equipment which is not available in house of OEM, these tests can be done from ant NABLE accredited lab(outside) having tests & testing method mentioned in table-1 of clause 4 in its scope of accreditation or can be done from NTH/NPL. Test reports if taken from any NABL accredited lab must contain NABL logo/seal. In case, there is no NABL accredited lab available in India for some test(with test method mentioned in the specification) and the test facility for the same test is not available with OEM(with test method mentioned in the specification) or with NTH/NPL, then those tests can be conducted at any government lab in India.

MCF Decision: accepted and clause has modified as under :
In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.

14. Clause no.9 (Quality Assurance, test & document:

Requirement description	Requirement detail	Remarks
Quality Assurance plan	The manufacturer shall have the detailed quality Assurance plan. The Plan shall be submitted for the approval by respective PU. The QAP document shall clearly document the following and control the test record formats. **1.** Control over outsourced products and processes **2.** Testing of raw material and establishing its traceability **3.** Sampling Plan **4.** Type Tests **5.** Routine tests **6.** Acceptance tests **7.** Raw Materials	The QAP shall be submitted in PDF as per MCF format (Annexure-A)
Type Tests	These tests shall be done on a sampled lot of prototype. Such Tests are required only on initial approval, change of design and chance of manufacturing process or raw material. These tests are to be repeated after every 36	The records of the type tests shall be maintained by the manufacturer and shall be made available upon

	months or as specified. • Fire and smoke characteristics as per EN 45545-2, R1, HL3 (item no. 22 of table-1 of Para 4). However, if the consignee or inspecting agency desires to do the type tests, before 36 months, the supplier should not deny the same. There are various circumstances when type tests may be needed on next supply before three (03) year of last supply /last type tests. eg: • In case of doubt in type test certificate. (Previous) • Complaint regarding type test certificates. • Failure of material attributable to any of the parameters covered in type tests, etc. *Moreover, during type test, all tests, listed in routine tests & acceptance tests shall also be conducted.*	demand. These records shall be traceable and verifiable.
Routine Tests	These tests are required to verify the functional working of the system. These may require simulated in-puts for testing the operation under full range of inputs. These tests shall be done by the manufacturer during manufacturing and record maintained for inspection. These tests are to be repeated after every 12 months or as specified. • Resistance to salt spray • Protection against corrosion under condition of condensation • Resistance to distilled Water • Durability Test	The records of the routine tests shall be maintained by the manufacturer shall be made available upon demand. These records shall be traceable and verifiable.
Acceptance tests	These tests shall be done on all or samples of lot for bulk supply. Sampling shall be done as per IS:2500 Following tests shall be considered as acceptance tests: • Drying time • Consistency • Finish • colour • Dry film thickness • Textile Painting • Scratch hardness • Flexibility & Adhesion • Flash Point	These shall be conducted by the consignee or their authorized agency prior to dispatch. All infrastructures required to enable acceptance tests shall be provided by the bidder / OEM. The records of the acceptance tests shall be enclosed along with the supply

	• Spreading & Covering surface area Capacity • Resistance to chemicals • Impact resistance test, • Abrasion resistance • Gloss at 60^{o} angle of incidence • Anti graffiti test • All other parameters apart from Type test & routine test shall be checked as per Acceptance test. • Documents for routine test & type test with above detailed periodicity & validity shall also be checked during acceptance test & enclosed with acceptance test documents. *Moreover, during routine tests, all tests, listed in acceptance tests shall also be conducted.*	consignment. These records shall be traceable and verifiable.

Note: Supplier shall submit test certificate of parameters (Table-1 of clause 4) of specification for Type Tests, Routine Tests & Acceptance tests from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 of specification in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, any government's lab in India report will be acceptable.

Firm's comments:

(i) M/s G.S Industries,Jalandhar(CP-19):

ROUTINE TESTS: We believe that the "Routine test" requirement should be merged with acceptance test. this is because the tests outline under the "routine test" category are long duration test that require **6 months** to complete, making it impractical to conduct them during **the manufacturing process.**
The following tests, which are currently part of the **routine tests**, should instead be classified as part of the type test and should be repeated **every 36 months:**

1) Resistance to salt spray-3000Hrs
2) Protection against corrosion under condition of condensation-2500 Hrs
3) Resistance to distilled Water- 3000 Hrs
4) Durability Test (accelerated weathering test for 750 hours or Xenon test for 2000 hrs)

Reason for request:
The tests mentioned above are all long-duration tests that require significant time to complete, well beyond the typical manufacturing timeline. These tests cannot be realistically conducted during the manufacturing process, nor can they be completed in the short duration typically allowed for routine testing. By classifying these tests under type test and repeating them every 36 months, we can ensure that they are performed with the necessary thoroughness and accuracy while aligning with industry standards.

Firm comments:

Acceptance tests: textile painting test shall be part of type test and to be repeated after every 36 months.

Reason: We request that the **textile painting test** be classified as part of the **type test** and that it be repeated every **36 months**. The reasoning behind this request is as follows:

1. The **textile painting test** is specifically conducted on textile materials such as **rexine/pvc sheets**, and it is typically carried out in specialized textile laboratories.
2. Since the test requires the sample to be sent to a **textile lab** for testing each time, it is a **time-consuming** process. Given this complexity, it is not practical to perform this test frequently during the manufacturing process.
3. Therefore, it is more efficient and reasonable for this test to be included as part of the **type test** protocol, where it can be performed at the required intervals of every **36 months**.

MCF Decision:

(ii) M/s Nippon Paint (India)Pvt. ltd-Ranipet (CP-22):

As the testing time required is nearly 5 months for **Resistance to salt spray**, **Protection against corrosion under condition of condensation** and **Resistance to distilled water** test can be made as a type test by acceptance test reports once in a years and for Fire test 3 years as per clause 9.

(iii) M/s Merck performance material Pvt. Ltd-Mumbai(CP-26):

ROUTINE TESTS- "Routine test" should be either be deleted or merge with acceptance test as such test should be short duration tests so that testing can be done during manufacturing and record maintained for inspection. the tests which are mentioned in Routine test are all long duration test which takes 6-9 months to complete and cannot be carried out during the manufacturing process should be considered as part of type test and to be repeated after 36 months.

Reason: Long duration test mentioned below

1) Resistance to salt spray-3000Hrs
2) Protection against corrosion under condition of condensation-2500 Hrs
3) Resistance to distilled Water- 3000 Hrs
4) Durability Test (accelerated weathering test for 750 hours or Xenon test for 2000 hrs)

Acceptance tests: Textile painting test shall be part of type test and to be repeated after every 36 months.

Reason: Textile painting test shall be part of type test and to be repeated after every 36 months since it is a test for textile/fabric(to be conducted on Rexine/PVC sheet), which is generally carried out in textile laboratories.

Therefore, The OEM will need to send the sample to a textile lab each time for testing, which is a time consuming process. Hence this test should be included in the type test and should be repeated every 36 month.

MCF Decision: Accepted. Clause modified as under

- **Resistance to salt spray-3000Hrs,Protection against corrosion under condition of condensation-2500 Hrs, Resistance to distilled Water- 3000 Hrs and Durability Test (accelerated weathering test for 750 hours or Xenon test for 2000 hrs) & Textile painting are Type test. These type test and should be repeated every 36 months.**

- **ROUTINE TESTS should also be repeated every 36 months**

15. Clause no.10 {Process audit requirement(in every 3 years)CP-14/12}:

Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU in every 3 years.

It shall be responsibility of OEM to get audit done by M/s RITES or any agency authorized by concerned PU at its own cost. During audit, all tests except type test (Fire and smoke characteristics as per EN 45545-2, R1, HL 3) shall be conducted as per specification & shall be made part of the report. OEMs shall keep valid audit report & submit the valid audit report on demand. For type test, report not older than three (03) shall be submitted during audit.

At any stage of procurement i.e. tender opening date, Purchase order placement date & during supplies, valid process audit report shall be available with supplier/tenderer. However, in case, audit report validity of three (03) years has expired but the supplier/tenderer has applied for audit/re-audit to RITES/or agency authorized by concern PUs well in advance i.e. at least three (03) months before expiry date of last audit report, case of such supplier/tenderer shall be proceeded & shall not be rejected on this account. However, for such cases, it shall be responsibility of supplier/tenderer to submit valid audit report within three (03) months after expiry at validity of last audit report. In case of new suppliers, CCA report shall be considered first audit report.

Firm's comments:

(i) M/s Merck performance material Pvt. Ltd-Mumbai(CP-25 & 24):

Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU **in every 5 years.**

Reason: OEM audit should be done in 5 years as test mentioned in Routine test which should be considered as type test (Long duration) takes 6 to 9 months to complete. Also during audit, (Fire and smoke characteristic as per EN45545-2, R1, HL-3) fire test is a critical test & thus should be tested after 3 years or in case of change of design and change of manufacturing process or raw material.

In addition, our comments on process audit:

It has been observed that the current procedure for process audit conducted every three years lacks clarity regarding the **methodology to be followed during the audit**. While the document outlines responsibilities and timelines, **it does not specify critical details, such as:**

1. Whether the auditor will **oversee the manufacturing of a sample during the audit or he will just verify the existing test reports available** with the manufacturer.
2. Whether **any testing will be conducted in house under the auditor's supervision or if auditor will send a sealed sample to third party lab for testing.**

This lack of detail may be lead to **inconsistencies in audit practices** and reporting. It is recommended that the procedure explicitly defines these aspects to ensure transparency and uniformity.

We suggest updating the procedure to include clear steps for sample manufacturing, selection, testing, and documentation to strengthen the process audit frame work.

MCF Decision: **accepted. Clause modified as under:**

Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU in every 3 years.

It shall be responsibility of OEM to get audit done by M/s RITES or any agency authorized by concerned PU at its own cost.

Auditor will audit manufacturing & testing process at premises of the supplier. During audit, all tests **(facilities which are available in premises of supplier)** ~~**except type test (Fire and smoke characteristics as per EN 45545-2, R1, HL 3)**~~ shall be conducted as per specification & shall be made part of the report. **However, auditor shall pick & send sealed sample to labs as detailed in Note of Para 9 of this specification for testing of all parameters in Table-1.**

Reports of tests from labs shall also be made part of audit report. However, provisional audit report may be issued meanwhile, till receiving reports from labs.

OEMs shall keep valid audit report & submit the valid audit report on demand. For type test, report not older than three (03) shall be submitted during audit.

At any stage of procurement i.e. tender opening date, Purchase order placement date & during supplies, valid process audit report shall be available with supplier/tenderer. However, in case, audit report validity of three (03) years has expired but the supplier/tenderer has applied for audit/re-audit to RITES/or agency authorized by concern PUs well in advance i.e. at least three (03) months before expiry date of last audit report, case of such supplier/tenderer shall be proceeded & shall not be rejected on this account. However, for such cases, it shall be responsibility of supplier/tenderer to submit valid audit report within three (03) months after expiry at validity of last audit report. In case of new suppliers, CCA report shall be considered first audit report.

Name	Designation	Signature	Date	Level
Harikesh Kumar	SSE / Design			Prepared
Sh. A. K. Agnihotri	SME /Design/Fur			Agreed
Sh. Shobhit Pratap Singh	Dy. CME / Design-II			Reviewed
Sh. D.K. Singh	CDE			Approved

Revision/Amendment	Details of Changes	Date
Amendment-1	Clause-5 (SN-20) of the specification deleted	01.06.2021
Rev-01	Eligibility criteria (Clause-3) deleted.	14.11.2022
Rev-02	1. Exterior surface deleted from description of specification. 2. All: Organic Surface coating was Organic Surface painting in description of specification, scope. 3. Clause 1.1: application on "existing coaches" added and external part deleted from scope. 4. Clause 1.2: application on "taps, sink" and 'It should be suitable for application by Spray/dipping roller/wipes' added and '& reduce BOD below 100ppm' deleted from scope. 5. Clause 3: COMPOSITION: b) Organic polysilazane Si-N-Si and Si-O-Si structure base coating added. 6. Clause 4: • '100% invisible, 200% flexible' modified to 'transparent, colourless more flexible'. • Temperatures ranging from -10^{O} C to 60 ^{O}C was -90^{O} C to 120 ^{O}C. • Painting protects surface from, Dirt – Grim 'post complete curing time' added. • Organic Quartz sand SiO2 'or Organic polysilazane Si-N-Si and Si-O-Si structure' added in clause 4. 7. Clause 4 (table-1): have following changes. • Finish (Sr. no.3): 'matt' deleted • Colour (Sr. no.4): 'Colourless' added • DFT (Sr. no.5): '(≥5) micron' was '(3-6) microns'. • Textile Painting(Sr. no.6): b) Oleo phobic (Oil Repellence) test (on fabric &	01.01.2024

Rexine) as per AATCC 118 added.

- Scratch hardness (at 1.5 Kg. load)(sr. no.7):
  'No such scratch so as to show base metal' as per 'IS: 101-88 (Part 5/ Sec. 2), Reaffirmed 2019' added as optional test requirement.
- 'Keeping Properties' modified as 'Keeping Properties/Shelf life' (Sr.12): method of test changed to 'Appendix-II of RDSO specification no. M&C/PCN/127/2020'.
- Spreading & Covering surface area Capacity, min.(Sr. no.13): ≥ 5 microns, 60 sq. m /litre
- Storage Life at 27± 2ºC min. (Sr.15):
  Storage Life property deleted.
- Abrasion Resistance test (Sr. 18): Typographical error '1000 hours' changed to '1000 cycle'.
- Gloss at 60^{O} angle of incidence (Sr. no.20): Gloss value "even after 36 months from date of application" deleted.
- Anti-graffiti properties (Sr. no.21):
  Graffiti completely removed, and no marks of Edding 3000 should be left behind.
- Durability Test(Sr. no. 22) –
  Accelerated weathering test:
  QUV 4 hours and 4 hours Condensation alternatively, (750 hrs), Temp. 50 O C as per ASTM G154

  Or

  Xenon Test for 2000 hrs), Temp. 50 O C, as per DIN53387 modified.

8. Fire properties (Sr. no.23): Fire resistance test added
9. Clause 5: Documents to be submitted along with offer added.
10. Clause 6: have following changes:

Clause 6(i) : 'Tenderer shall submit test certificate of parameters(Table -1 of clause 4) of specification from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL or NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India or NTH/NPL, for some of the tests (with test method mentioned in the specification), in such cases, any

	government's lab in India report will be acceptable for those tests. These tests shall be done during initial approval, change of design and change of manufacturing process or raw material. The submitted test reports submitted during prototype approval shall not be more than Two (02) years old from the date of tender opening. In absence of any of above details for offered product, the offer would not be considered' modified. Clause 6(v): 'Hydrophobic and Oleophobic properties to be checked visually during application of coating at MCF' added. 11. **Clause 6:** (v) Hydrophobic and Oleophobic properties to be checked visually during application of coating at MCF added. 12. Clause (7): type tests and acceptance test added in clause7. 13. Clause (9): List of Machineries & plant and Material storage area added in clause 9. 14. Field trial requirement added as clause 10: Performance test plan added as Annexure-I. 15. All Clause numbering updated accordingly.	
Rev-03	1. **Clause 4**, Sr. 1 of table-1 : Modified as: Drying time at 25±2˚C: (a)Surface dry, Max. is 1 hrs in place of .50 hrs as per IS: 101-86 (Part 3/ Sec. 1), Reaffirmed 2017 or latest. 2. **Clause 4**, Sr. 5 of table-1 : Modified as: Drying film thickness: is >/=5 microns (Min.). **However, firm shall specify the minimum DFT required for their system to comply all the requirements of this specification. Such specified minimum DFT shall be applicable for testing as well as application by the firm.** 3. **Clause 4**, Sr. 9 of table-1 : Modified as: Flash point is above 25 C in place of 30 C as per IS: 101-87 (Part 1/ Sec. 6), Reaffirmed 2019 or latest. 4. **Clause 4**, Sr. 13 of table-1 : Modified as Spreading & Covering surface area Capacity is ≥ 60 sq. m /litre on DFT ≥ 5 microns (Min.). **However, Minimum Spreading & Covering surface area requirement shall change in direct proportion to minimum DFT specified by the suppliers against Sr. no.5 of this Table for their respective system for tests & application.**	

	5. **Clause 4**: Note added in Table-1. 6. **Clause 5**: Modified as: i. "Supplier/OEM as per Rev.02 or latest of this specification shall submit clause wise comments on the specification for compliance and deviation (if any)". (Sr. no. i) ii. Any **Government recognized lab** in India added in sr. no. ii (b) iii. "In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific test " added in clause no. 5, sr. no. ii(c). iii. The submitted test reports along with offer shall not be more than three (03) years old from the date of tender opening ~~except for type test (Fires and smoke test) (item no. 22 of table-1 of Para 4). Test report for Fire and smoke characteristics as per EN 45545/2 R1/HL3 Shall not be more than three (03) years older from date of tender opening~~.(Sr. No. iii) iv. clause 5, Sr. no. (iv) deleted. 7. **Clause 6**: PROTOTYPE APPROVAL: "In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific test" added in clause no. 6, sr. no. i(c). 8. **Clause 9**: Quality Assurance plan: Type test & Routen tests are merged and Resistance to salt spray, Protection against corrosion under condition of condensation, Resistance to distilled Water, Durability Test, and Textile painting testing are added in Type tests & these tests shall be carried out in every 36 month. 9. **Clause 9**: Quality Assurance plan "In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be	

	acceptable, subject to prior approval of the purchaser for such specific test " added in clause no. 9, note(c). 10. **Clause 10**: In Process audit requirement (in every 3 years) modified as : Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU in every 3 years. It shall be responsibility of OEM to get audit done by M/s RITES or any agency authorized by concerned PU at its own cost. **Auditor will audit manufacturing & testing process at premises of the supplier.** During audit, all tests **(facilities which are available in premises of supplier)** ~~**except type test (Fire and smoke characteristics as per EN 45545-2, R1, HL 3)**~~ shall be conducted as per specification & shall be made part of the report. **However, auditor shall pick & send sealed sample to labs as detailed in Note of Para 9 of this specification for testing of all parameters in Table-1.** **Reports of tests from labs shall also be made part of audit report. However, provisional audit report may be issued meanwhile, till receiving reports from labs.** OEMs shall keep valid audit report & submit the valid audit report on demand. For type test, report not older than three (03) shall be submitted during audit. At any stage of procurement i.e. tender opening date, Purchase order placement date & during supplies, valid process audit report shall be available with supplier/tenderer. However, in case, audit report validity of three (03) years has expired but the supplier/tenderer has applied for audit/re-audit to RITES/or agency authorized by concern PUs well in advance i.e. at least three (03) months before expiry date of last audit report, case of such supplier/tenderer shall be proceeded & shall not be rejected on this account. However, for such cases, it shall be responsibility of supplier/tenderer to submit valid audit report within three (03) months after expiry at validity of last audit report. In case of new suppliers, CCA report shall be considered first audit report.	

1. SCOPE:

1.1 This specification provides the general and technical requirement for supply and application of the Organic Surface Coating on Painted surface, Glass, non-painted surfaces, toilets, floors, walls and common areas including seats & berths for newly build & existing coaches (internal areas) in Indian Railways.

1.2 This specification covers requirements of Organic surface coating to be used on interior painted, non-painted surfaces (window glass, door, doors handle), internally on Toilets (wall panels, hand basin, mirrors, and floor area), sidewall panels, floor, partition wall, Gangway area, taps, sink and Seats & berths. The Organic surface coating provides an impermeable, hydrophobic & oleophobic barriers to prevent the coach structure from loss of Gloss, food safe protection, dust, corrosion, abrasion, paint fading, avoid accumulation of water dampness, assets saving, avoid water hardness damage. And at the same time provides aesthetically pleasing surface contributing to improve easy to clean property with huge water saving. Cleaning agent to be used for cleaning shall be pH neutral. The application of the organic surface coating in coaches is to be carried out by the supplier. It should be suitable for application by Spray/dipping roller/wipes.

2. PURPOSE:

Organic Surface Painting is to be used as anti-graffiti property & a protective hydrophobic & oleo phobic layers on all the **i**nterior coach surfaces. Also, while application there is no harm to the applicator and environments as the Organic Surface coating is human safe, inhalation safe, skin safe, Biodegradable, environment friendly.

3. COMPOSITION:

a) Organic Surface Painting schemes comprises of 3 sub system:

ii. Quartz Sand Based Organic Hard Surface Painting

iii. Quartz Sand Based Organic Painted Surface Painting

iv. Organic Textile/Soft Surface Painting

Or

b) Organic polysilazane Si-N-Si and Si-O-Si structure

4. Technical Specification of Organic Surface Painting (Interior):

General properties of the organic surface painting are that it should be transparent & colourless, more flexible, Water or any oil-based liquid is unable to penetrate the coated surface, should resists acid and alkali, withstand extreme temperatures ranging from -10^{O} C to $60\ ^{O}$C, abrasion resistant.

- Liquid layering is perfected for painting any surface: Hard, Soft, Absorbent & Non-absorbent.
- Painting protects surface from, Dirt – Grim post complete curing time.
- Organic Quartz sand SiO_2 or Organic polysilazane Si-N-Si and Si-O-Si structure forms the main basis.
- It should be 100% eco-friendly.
- It is human safe.

- It should be suitable for painting almost any surface like Plastics, Stone / Brick / Cement, Wood, Metal, Trains, Engine, Automobiles / Marine etc.

Table-1

SN	Characteristics	Requirements	Method of test
1.	Drying time at 25±2˚C a. Surface dry, max b. Curing time, max.	**1 hrs** 12 hrs.	IS: 101-86 (Part 3/ Sec. 1), Reaffirmed 2017 or latest
2.	Consistency	Smooth, uniform and suitable for sponge/air-less spray / spray/dipping roller /wipes.	IS: 101-89 (Part 1/ Sec.5), Reaffirmed 2019 or latest
3.	Finish	Smooth and glossy, free from sagging & wrinkling	IS: 101-87 (Part 3/ Sec. 4), Reaffirmed 2019 or latest
4.	Colour	Transparent & Colourless	IS: 101-89 (Part 4/ Sec. 2), Reaffirmed 2021 or latest
5.	**Dry film thickness per coat, min., by Spray /dipping roller/wipes**	(≥5) microns **However, firm shall specify the minimum DFT required for their system to comply all the requirements of this specification. Such specified minimum DFT shall be applicable for testing as well as application by the firm.**	IS: 101-89 (Part 3/ Sec. 2) Reaffirmed 2019 or latest/ ASTM D7091/ by DFT gauge
6.	Textile Painting a)Hydrophobic test b) Oleo phobic (Oil Repellence) test (on PVC and REXINE)	Pass Pass	a)ASTM D7017 (latest version) b) AATCC 118 (latest version) (PVC Sheet to be as per RDSO/2006/CG-12 ,latest version and REXINE to be as per RDSO/2008/CG-07, latest version)
7.	Scratch hardness (at 1.5 Kg. load)	No such scratch so as to show base metal AND	IS: 101-88 (Part 5/ Sec. 2), Reaffirmed 2014 or latest AND
		6-9H	Pencil hardness as per ASTM D3363 (latest version)
8.	Flexibility & Adhesion (6.25 mm mandrel)	No visible damage or detachment of film	IS: 101-88 (Part 5/ Sec. 2), Reaffirmed 2014 or latest/ ASTM D522

9.	**Flash Point**	**Above 25 °C**	IS: 101-87 (Part 1/ Sec. 6), Reaffirmed 2019 or latest
10.	Resistance to salt spray	No sign of corrosion & no sign of deterioration up to 3000 hours	ASTM B -117/2019 or (latest version)
11.	Protection against corrosion under condition of condensation	No sign of corrosion & no sign of deterioration up to 2500 hours	IS: 101-88 (Part 6 /Sec. 1), Reaffirmed 2015 or latest
12.	Keeping Properties/Shelf Life	Not less than 36 months	Appendix-II of RDSO specification no. M&C/PCN/127/2020
13.	**Spreading & Covering surface area Capacity, Min. ≥5 microns**	**≥ 60 sq. m /litre** **However, Minimum Spreading & Covering surface area requirement shall change in direct proportion to minimum DFT specified by the suppliers against Sr. no.5 of this Table for their respective system for tests & application.**	Appendix-I of RDSO specification no. M&C/PCN100/2018.
14.	Resistance to chemicals On 1) 25% caustic soda solution (w/v) 2) 30% (V/V) H_2SO_4	Shall not show any sign of cracking, dislocation, blistering, wrinkling and peeling or softening of paint film	For 24 hours, IS: 101-89 (Part 7 /Sec. 2) Reaffirmed -2020 or latest
15.	Mass in kg/10 litres, min.	10.9	IS: 101-87 (Part 1/ Sec. 7) Reaffirmed -2020 or latest
16.	Impact resistance test,	height 31 Inch, load 6.45 pound = (200 Inch pound load)- shall be free from cracking in the deformed painting by dropping the indenter on coated side of test panel	ASTM 2794-93
17.	Resistance to distilled Water	Shall not show any sign of blistering, wrinkling and peeling or softening of paint film	Resistance to tap or raw water for 3000 hrs, IS: 101-90 (Part 7/ Sec.2) Reaffirmed -2005 or latest
18.	Abrasion Resistance test	Shall be "Max. Loss=0.050 gms" with	ASTM D-4060 (latest version)

		1000 cycle with CS-17 wheel & 1 kg load shall be max. loss=0.050gms) As per ASTM D-4060	
19.	Gloss at 60^{O} angle of incidence	70-87 on painted metals/ maintained original gloss	IS: 101-88 (Part 4/ Sec.4) Reaffirmed -2020 or latest version
20.	Anti-graffiti properties	Graffiti completely removed, and no marks of Edding 3000 should be left behind.	ASTM D-6578/13 (latest version)
21.	Durability Test – Accelerated weathering test: QUV 4 hours and 4 hours Condensation alternatively, (750 hrs), Temp. 50 ^{O}C as per ASTM G154- (latest version) Or Xenon Test for 2000 hrs), Temp. 50 ^{O}C, as per DIN53387 (latest version)	Rating scale Chalking Checking Cracking Flaking Blistering Peeling Spotting	(0-10) 10 10 10 10 10 10 10
22.	Fire properties	R1, HL3	ISO: EN45545 part-II (latest version)

Note: All the tests shall be conducted on samples with minimum DFT specified by the supplier for their system. The same minimum DFT shall be applicable during application by the supplier.

5. Documents to be submitted along with offer:

i. Supplier/OEM as per Rev.02 or latest of this specification shall submit clause wise comments on the specification for compliance and deviation (if any).

ii. Supplier/OEM shall submit test certificate of parameters(Table -1 of clause 4) of specification from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, **report from** any Government's lab/any **Government recognized lab for such test** in India will be acceptable.

(c) **In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.**

In absence of any of above details for offered product, the offer would not be considered.

iii. The submitted test reports along with offer shall not be more than one (03) years old from the date of tender opening ~~except for type test (Fires and smoke test) (item no. 22 of table-1 of Para 4). Test report for Fire and smoke characteristics as per EN 45545/2 R1/HL3 Shall not be more than three (03) years older from date of tender opening.~~

~~iv. Valid audit report/CCA report except by bidder seeking developmental order based on availability of M&P & shall be subjected to CCA before placement of purchase order if its bid is acceptable.~~

6. PROTOTYPE APPROVAL:

The Firm shall supply a sample along with the following details at the time of prototype testing as per PO or as per applicable guideline:

i. Supplier shall submit test certificate of parameters(Table -1 of clause 4) of specification from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, **report from** any Government's lab/any **Government recognized lab for such test** in India will be acceptable.

(c) **In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.**

ii. Material and Safety date sheets.

iii. The samples supplied to be coated by Organic Surface coating and shall be visible to naked eye to determine the actual process of application.

iv. The bulk manufacturing shall be undertaken only after approval of Prototype. This clause of Prototype approval is applicable for the first supply by new firm as well as in case of change of design and change of manufacturing process or raw material.

v. Hydrophobic and Oleophobic properties to be checked visually during application of coating at MCF.

7. WARRANTY:

Coaches applied with Organic Surface Painting shall be deemed to bear warranty against defective material and painting shall withstand minimum period of 36 months (thirty-six months) from the date of application. Any sign of chalking, checking, cracking, flaking, blistering, peeling off, spotting etc would be considered as warranty failure.

8. List of Machineries and plant:

A. Machinery and Equipments :

1. Reaction Vessel
2. Intermediate vessel
3. Isolation equipment
4. Finished goods vessel
5. Filling & Packaging machine
6. Air Handling and filtering unit with humidity control
7. Heating & cooling media for reaction & intermediate vessels
8. Inert gases storage tank and cylinder.

B. Material storage area

1. Raw material storage area = Well ventilated & covered
2. Intermediate WIP (Work in Process) material storage area = Well ventilated, temperature controlled with HVAC.
3. Finished goods storage area = Well ventilated, temperature controlled with HVAC.
4. Inspection & Quality control well ventilated, temperature controlled with HVAC.

C. Testing facilities:

1. Dry time recorder
2. DFT gauge
3. Gloss meter
4. Weighing machine
5. Electronic balance
6. automatic scratch hardness testers
7. Flexibility & Adhesion apparatus
8. salt spray chamber
9. corrosion chamber
10. Impact tester
11. Abel flash point apparatus
12. Taber type abrasion tester
13. QAV/Xenon arc chamber

9. Quality Assurance, test & document:

Requirement description	Requirement detail	Remarks
Quality Assurance plan	The manufacturer shall have the detailed quality Assurance plan. The Plan shall be submitted for the approval by respective PU. The QAP document shall clearly document the following and control the test record formats. **1.** Control over outsourced products and processes **2.** Testing of raw material and establishing its traceability **3.** Sampling Plan **4.** Type Tests	The QAP shall be submitted in PDF as per MCF format (Annexure-A)

	5. Routine tests **6.** Acceptance tests **7.** Raw Materials	
Type Tests	These tests shall be done on a sampled lot of prototype. Such Tests are required only on initial approval, change of design and chance of manufacturing process or raw material. These tests are to be repeated after every 36 months or as specified. • **Resistance to salt spray** • **Protection against corrosion under condition of condensation** • **Resistance to distilled Water** • **Durability Test** • **Textile painting** • Fire and smoke characteristics as per EN 45545-2, R1, HL3 (item no. 22 of table-1 of Para 4). However, if the consignee or inspecting agency desires to do the type tests, before 36 months, the supplier should not deny the same. There are various circumstances when type tests may be needed on next supply before three (03) year of last supply /last type tests. eg: • In case of doubt in type test certificate. (Previous) • Complaint regarding type test certificates. • Failure of material attributable to any of the parameters covered in type tests, etc. Moreover, during type test, all tests, listed in ~~**routine tests &**~~ acceptance tests shall also be conducted.	The records of the type tests shall be maintained by the manufacturer and shall be made available upon demand. These records shall be traceable and verifiable.
~~Routine Tests~~	~~These tests are required to verify the functional working of the system. These may require simulated in puts for testing the operation under full range of inputs. These tests shall be done by the manufacturer during manufacturing and record maintained for inspection.~~ ~~**These tests are to be repeated after every 12 months or as specified.**~~ • ~~Resistance to salt spray~~ • ~~Protection against corrosion under condition of condensation~~ • ~~Resistance to distilled Water~~ • ~~Durability Test~~ •	~~The records of the routine tests shall be maintained by the manufacturer shall be made available upon demand.~~ ~~These records shall be traceable and verifiable.~~
Acceptance tests	These tests shall be done on all or samples of lot for bulk supply. Sampling shall be done as	These shall be conducted by the

	per IS:2500 Following tests shall be considered as acceptance tests: • Drying time • Consistency • Finish • colour • Dry film thickness ~~• Textile Painting~~ • Scratch hardness • Flexibility & Adhesion • Flash Point • Spreading & Covering surface area Capacity • Resistance to chemicals • Mass in Kg/10 litre • Impact resistance test, • Abrasion resistance • Gloss at 60^{o} angle of incidence • Anti graffiti test • All other parameters apart from Type test ~~& routine test~~ shall be checked as per Acceptance test. • Documents for ~~routine test &~~ type test with above detailed periodicity & validity shall also be checked during acceptance test & enclosed with acceptance test documents. ~~Moreover, during routine tests, all tests, listed in acceptance tests shall also be conducted.~~	consignee or their authorized agency prior to dispatch. All infrastructures required to enable acceptance tests shall be provided by the bidder / OEM. The records of the acceptance tests shall be enclosed along with the supply consignment. These records shall be traceable and verifiable.

Note: Supplier shall submit test certificate of parameters (Table-1 of clause 4) of specification for Type Tests, ~~Routine Tests~~ & Acceptance tests from:

(a) Any NABL accredited lab (in-house or outside) having tests & test method mentioned in Table-1 of clause 4 of specification in its scope of accreditation from NABL or report from NTH/NPL. Test report must contain NABL logo/seal, in case reports are submitted from NABL accredited lab.

(b) In case, there is no NABL accredited lab is available in India for some tests (with test method mentioned in the specification) and the test facility for same tests (with test method mentioned in the specification) are also not available with NTH/NPL, then for those tests, **report from** any Government's lab/any **Government recognized lab for such test** in India will be acceptable.

(c) **In rare case, when test facilities are not available as per (a) & (b) of this Para above, test certificate from NABL accredited lab not having tests & test method**

mentioned in Table-1 of clause 4 in its scope of accreditation from NABL shall be acceptable, subject to prior approval of the purchaser for such specific tests.

10. Process audit requirement(in every 3 years):

Audit of OEMs for manufacturing & testing activities of material will be done by M/s RITES or any agency authorized by concerned PU in every 3 years.

It shall be responsibility of OEM to get audit done by M/s RITES or any agency authorized by concerned PU at its own cost.

Auditor will audit manufacturing & testing process at premises of the supplier. During audit, all tests **(facilities which are available in premises of supplier)** ~~**except type test (Fire and smoke characteristics as per EN 45545-2, R1, HL 3)**~~ shall be conducted as per specification & shall be made part of the report.**However, auditor shall pick & send sealed sample to labs as detailed in Note of Para 9 of this specification for testing of all parameters in Table-1.**

Reports of tests from labs shall also be made part of audit report. However, provisional audit report may be issued meanwhile, till receiving reports from labs.

OEMs shall keep valid audit report & submit the valid audit report on demand. For type test, report not older than three (03) shall be submitted during audit.

At any stage of procurement i.e. tender opening date, Purchase order placement date & during supplies, valid process audit report shall be available with supplier/tenderer. However, in case, audit report validity of three (03) years has expired but the supplier/tenderer has applied for audit/re-audit to RITES/or agency authorized by concern PUs well in advance i.e. at least three (03) months before expiry date of last audit report, case of such supplier/tenderer shall be proceeded & shall not be rejected on this account. However, for such cases, it shall be responsibility of supplier/tenderer to submit valid audit report within three (03) months after expiry at validity of last audit report. In case of new suppliers, CCA report shall be considered first audit report.

11. Field Trial

1. Performance report from field is required as per annexure-I.

Annexure-I

Performance test plan for Biodegradable, Oleo phobic & Hydrophobic Organic Surface coating on Interior Surface of LHB coach.

Test parameters during the warranty period after coating (after 3 months, 12 months, 24 months basis) and location for testing is wash basin outside, wash basin & pan of lavatory in lavatory(both side), partition pillar, Floor, Mirror of sidewall , seat & berth (middle cabin) , Floor of doorway & Gangway(Both side):

S.N	Properties	Observation
1.	**Method of coating the surface(at time of 1st application):** I. The Coating must be spread evenly and smoothly, to get the layer of coating to settle accordingly. II. The layer of coating may be colourless and transparent appears on the surface which shows, that coating is stick to the surface and its curing. III. Test to be made immediately after 1 hour of the coating spread. The curing time is 24 hours after the coating and coach can move out. IV. **Hydrophobic** test can be done by dropping the water droplets on the coated surface, if the water droplets start running without leaving any mark behind, means the coating is start giving the required effect as claimed V. **Oleo phobic** test can be done by dropping the oil & grease on the coated surface, if the oil & grease cleaning with wet cloth without leaving any mark behind, Means the coating is Oleo phobic VI. **Colour Test:-** The applied coating should be Transparent and colourless (i.e. it should not acquire colour upon application on the surface)	
2.	**Test to be done after 3/12/24 months:**	**Observation (3/12/24months)**
I.	**Easy to clean test:** The dirt doesn't stick to the coated surface.	
II.	**Abrasion Test:** The coating should not crack or shrink.	
III.	**Anti-graffiti properties:** Graffiti completely removed and no marks left behind. • **Graffiti test shall be done with EDDING 3000.**	
IV.	**Durability test:** I. No cracking II. No blistering III. No spotting IV. No peel off	
V.	**Hydrophobic** test can be done by dropping the water droplets on the coated surface, if the water droplets start running without leaving any mark behind, means the coating is start giving the required effect as claimed	
VI.	**Oleo phobic** test can be done by dropping the oil & grease on the coated surface, if the oil & grease cleaning with wet cloth without leaving any mark behind, Means the coating is Oleo phobic	

MCF QAP format (Annexure-A)

Name of the firm

Head Office Address	Manufacturing Unit Addresses	
ABC XYZ STATE with PIN Telephone: Mobile: Email:	ABC XYZ STATE with PIN Telephone: Mobile: Email:	Add more columns if more required

PL Number of the item	
Description of the item	
Specification/Drawing number of the item	
Purchase order number with date	

Date of submission of QAP: DD.MM.YYYY

Approved by	Issued by	Page Number
Signature with date and stamp	Signature with date and stamp	1 of X

Prepared by **Agreed by**

ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

Index of QAP

Approved by	Issued by	Page Number
Signature with date and stamp	Signature with date and stamp	2 of X

ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

1. **Company Profile** (*Maximum 250 words*)

May include brief history, date of setup, founders, products/services, organization chart, article of association of the company as per companies act,1956.

2. **Certificates and Essential Documents**

Clear images/scans of factory license and ISO certifications (9001, 14001, others). Please ensure that the text is legible.

3. **Process Flow chart/Installation Flow Chart**

Description of manufacturing process

A. Process flow chart indicating various stages/activities of manufacturing process for an individual product, with quality control points
B. Details of manufacturing & testing processes to comply specification(s)

Sl. No.	Clause	Requirement of manufacturing process as per specification	Process details to comply the specification requirements

Note

(i) Process flow chart shall indicate all the operations involving procurement, handling, manufacturing, & testing of the product from raw material to finished product, including RDSO/RITES/Consignee inspection/dispatch.
(ii) There should be a separate flow chart for each item.

4. **Details of Procurement - Raw material/Components/Sub-assemblies**

A. Details of components/sub-assemblies manufactured in-house

Sl. No.	Item Name	Drawing No	Material Grade	Source of Raw Material

Approved by	Issued by	Page Number
Signature with date and stamp	Signature with date and stamp	3 of X

Prepared by **Agreed by**

ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

B. Details of components/sub-assemblies purchased from approved sources of ICF/MCF/RCF/RDSO

Sl. No.	Item Name	Drawing No	Material Grade	Source (Firm name & Address)

C. Details of outsourced/imported items

Sl. No.	Item Name	Drawing No	Material Grade	Source (Firm name & Address)

5. **Inspection Procedure**

Provide the inspection process followed at the firm for subject item(s). It may include stage inspections where critical parameters are inspected before sending to the next stage, material composition test when the material is received from an outside agency, inspection of material properties and critical dimensions at the time of final dispatch to Indian Railways units. Kindly provide details in the following format.

Sl. No.	Type of inspection Raw material or Incoming product/ Assembly or Stage/Final dispatch of the item to consignee	Sample Size & its Frequency of inspection	Inspection parameter	Mode of inspection/ Test equipment used	Criteria or limits of acceptance	Record of inspection maintained at Register No./Compute r file name & address

Note: Provide internal inspection dimensional/material checklists for raw material, stage assembly, final assembly, as annexure.

6. **Rejection Handling Plan**

Rejections are part and parcel of any manufacturing process and can occur at any stage. It is essential to have a clear plan to handle the rejections due to various reasons. In a few situations, rework may be done to correct the workpieces. In others it might not be feasible and/or recommendable. A rejection handling plan clarifies the rejection criteria and further required processing for rework or scrapping. Analyzing rejects is a key component to improve the efficiency and quality of the output.

Approved by	Issued by	Page Number
Signature with date and stamp	Signature with date and stamp	4 of X

ANNEXURE-I

QAP	PL Number & Item Description	Internal Doc. No.	Revision
Name of the firm		ABCD-1234	XX

Kindly provide the details of handling rejection of work-in-process (WIP) and recording such incidents.

7. **Tool and machine calibration plan**

The machines, tools, fixtures, jigs, gauges, and instruments used for manufacturing, testing, and inspection should be regularly calibrated to ensure that they are accurate for their intended use. A schedule of calibration for all the essential machines, tools, gauges, and instruments may be planned by taking into account both usage rate and that machine's particular maintenance needs. Kindly provide details in the following format.

Sl. No.	Name and ID of Tool/Machine/Gauge/ Instrument	Make and Model Number	Range/Capacity	Frequency of calibration	Due date of calibration	Record of calibration maintained at Register No./Computer file name & address

8. **Requirement of Qualified/Experienced Personnel as per Specification(s)**

Details of qualification/experience of the quality control personnel specified in the relevant STR/MDTS/ Specification for the items to be manufactured may be provided in the following format.

Sl. No.	Specified Requirements		Details of Personnel Employed			
	Clause number with specification details	Qualification/ Experience	Name	Designation	Technical Qualification	Experience

Note: Welding procedure specification **(WPS)**, Welding Procedure Qualification Record **(WPQR)** and Welder Qualification Test Certificate **(WTC)** to be submitted wherever applicable.

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Note: "This QAP does not have any deviation from Purchase order" will be written on front page of QAP.

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