

## **Reasoned Document for Draft of MMDTS 19041, Rev-2 (Uploaded for second time)**

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

### **1. Clause no. 1.1**

#### **Description draft of MMDTS19041, Rev-2:**

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

#### **Firm's comments:**

##### **(i) M/s Rickul India Pvt. Ltd, New Delhi:**

Adding "Organic Surface Painting on existing coaches may be also added in clause 1.1 of specification" may not make technically or to result any difference.

**MCF Decision:** Organic Surface Painting on existing coaches already added in clause 1.1 of specification

##### **(ii) M/s G.S. industries, Jalandhar:** We recommend deleting the mention of "floors," "seats & berths," and "mirrors." Our rationale is that these surfaces are exposed to constant rubbing, dragging of passenger clothes and luggage. Furthermore, the mention of "(both internal and external parts)" should be deleted, and only "internal" should be stated.

**MCF Decision:** Application area "floors," "seats & berths "and" mirrors" cannot be removed from specification because these areas are also exposed to oil, water, dirt, dust etc.

##### **(iii) M/s Vibgyor Paints & chemicals Pondicherry:** Floors, and communal areas including seats & berths, mirrors to mentioned

**Firm comments:** "Internal parts" only and may be deleted having constant rubbing of passengers.

**MCF Decision:** already replied at SN-II above.

##### **(iv) M/s Hemisphere Marketing Pvt. Ltd:**

This product can be applied on internal and external surfaces of Coaches, coaches can new or used and external coating saves the huge cleaning water up to 95%. Hydrophobic & Oleophobic nature and other properties prevents the interior of the coaches from dust, grim, microorganisms' growth, aggression, prevent from Acid based washing and cleaning agent. Bio Toilet friendly, human safe.

#### **MCF Decision:**

For exterior, there is already a specification for Anti- graffiti coating as per RDSO specification no. M&C/PCN/127/2020 exists. Hence, this specification will be only for interior of coach.

##### **(v) M/s AVEC, New Delhi :**

Floors, and communal areas including seats & berths, mirrors = To be deleted.

Floors, Seat & Berth should be deleted as it is exposed to constant rubbing, dragging of passenger clothes and luggage. Also it is recommended by RDSO for deletion at Point (1) vide RDSO letter no. M&C/PCN/I/64/Vol-IV dated.27.11.2020.

Also towards the end of this para it is mentioned as“(both internal and external parts)” = to be deleted and to mention only” internal

**MCF Decision:** already replied at SN-II above.

For exterior, there is already a specification for Anti- graffiti coating as per RDSO specification no. M&C/PCN/127/2020 exists. Hence, this specification will be only for interior of coach.

## 2. Clause no. 1.2

### **Description draft of MMDTS19041, Rev-2:**

This specification covers requirement of Organic surface painting 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 painting provides an impermeable, hydrophobic & oleophobic barriers to prevent the coach structure from Gloss maintain, 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 **& reduce BOD below 100ppm/ Cleaning agent to be used for cleaning shall be ph neutral**. The application of the Organic Surface Painting in coaches is to be carried out by the supplier. It should be suitable for application by Spray/dipping roller/wipes.

### **Firm's comments:**

#### **(i) M/s Rickul India Pvt. Ltd, New Delhi:**

The specification of organic surface coating/paint product have all the properties to safeguard the painted or non-painted surfaces externally and internally. The product may be applied by spraying/ wiping.

Anti-graffiti is one of the properties of this specification. Organic surface coating product have their own parameters to prevent the coaches internally and externally; and cannot be compared with Anti-graffiti coating as per RDSO specification no. M&C/PCN/127/2009 (This is chemical based products and cannot be compared by the MMDTS 19041 REV-2)

The property of product (RDSO specification no. M&C/PCN/127/2009) is specific to Anti-graffiti only, on the other hand MMDTS 19041 REV-2 have many valuable properties and Antigraffiti is one of them, in which the most important is water saving.

So, interference with existing specification (MMDTS 19041 REV-2) criteria may lead to a different or worsen results.

### **MCF Decision:**

- For exterior, there is already a specification for Anti- graffiti coating as per RDSO specification no. M&C/PCN/127/2020 exists. Hence, this specification will be only for interior of coach.
- No issue raised by firm.

(ii) **M/s G.S. industries, Jalandhar :**

The term "organic" in the specification seems to suggest that only organic materials are inherently safe for human use. However, this portrayal is not accurate. Coatings are categorized as either organic or inorganic based on the nature of their binder.

Presently, all paints utilized in Indian Railways and the open market, including Epoxy PU coatings, rely on organic chemistry.

**MCF Decision:** no new suggestion, so no comments.

(iii) **M/s Vibgyor Paints & chemicals Pondicherry :** Reduce BOD below 100ppm

This clause may be deleted as there is no relevance of reduced BOD in the specification.

**MCF Decision:** BOD clause will be deleted.

(iv) **M/s Hemisphere Marketing Pvt. Ltd :**

The product has properties to safeguard the painted or nonpainted surfaces externally and internally including Anti-graffiti.

Anti-graffiti coating as per RDSO specification no. M&C/PCN/127/2009 is a different product.

After Coating, the dirty coaches may be cleaned, without using any chemical base cleaner or just with water.

So, intervention with the existing specification (organic surface coating) will change the specification totally.

**MCF Decision:** For exterior, there is already a specification for Anti-graffiti coating as per RDSO specification no. M&C/PCN/127/2020 exists. Hence, this specification will be only for interior of coach.

Organic coating has already been included in the specification.

(v) **M/s AVEC, New Delhi :**

Reduce BOD below 100ppm = to be deleted. And to be mentioned as cleaning agent to be used for cleaning shall be pH neutral.

**Firm comments:** BOD also called Biochemical Oxygen Demand is the amount of dissolved oxygen needed i.e., demanded by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period.

BOD is a measure of the amount of oxygen required to remove waste organic matter from water in the process of decomposition by aerobic bacteria (those bacteria that live only in an environment containing oxygen) The calculation for BOD is based on the number of organisms present in the sample multiplied by their metabolic rate. Metabolic rate is the speed at which they consume oxygen.

To calculate BOD, multiply the number of organisms by their metabolic rate. This means that the BOD concentration is 39,000 mg/l.

As this coating is applied on the coach interiors, wherein the cleaning of the coach interiors is done by mopping / wet cloth which automatically uses minimal water if any.

We would like to further state that in specification M&C/PCN/100/2018 for the epoxy PU Paint for the Rail exteriors applications does not mention anything about the BOD, where extensive water is used and the same water goes into the sewer.

If water is used for cleaning on our Polysilazane based coating the main advantage of this coating is that the use of water will be very low as the coating would be Hydrophobic/Oleophobic and nothing will adhere to surface. Also once the coating is cured there is no Question of any disintegration of coating therefore no particles while cleaning would ever go and mix with water effecting BOD. In case there is any apprehension that while cleaning the particles would mix with the water and affect the BOD then the very effect of the coating would be nullified and such coating would not be able to fulfil the warranty of 36 months as specified in the specification.

Hence, there is no relevance of reduced BOD in this specification therefore this requirement in the specs should be deleted.

**MCF Decision:** BOD below 100ppm to be deleted and cleaning agent to be used for cleaning shall be pH neutral added.

### 3. Clause no. 2 (Purpose):

#### **Description draft of MMDTS19041, Rev-2:**

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

#### **Firm's comments:**

- (i) **M/s G.S. industries, Jalandhar:** We recommend removing the term "Biodegradable."

The concept of a biodegradable coating is not relevant in this context. Furthermore, biodegradable products naturally disintegrate over time. Applying such a coating to the specified areas, as outlined in this specification, would likely lead to degradation before the 36-month warranty period expires.

#### **MCF Decision:**

For biodegradable , Since, As per RB letter no. 2020/M(C)/142/4 dated 21.01.2021 & 2020/M(C)/142/4 dated 09.08.2021, "RSP work of Biodegradable, Oleo phobic & hydrophobic coating for LHB coaches". So Biodegradable cannot be deleted.

- (ii) **M/s Vibgyor Paints & chemicals Pondicherry:** Biodegradable may be deleted as the coatings need to be on the substrate for 3 years.

#### **MCF Decision:**

Since, As per RB letter no. 2020/M(C)/142/4 dated 21.01.2021 & 2020/M(C)/142/4 dated 09.08.2021, "RSP work of Biodegradable, Oleo phobic & hydrophobic coating for LHB coaches". So Biodegradable cannot be deleted.

- (iii) **M/s Hemisphere Marketing Pvt. Ltd:**

Covered above required no changes

**MCF Decision:** no comments by firm

(iv) **M/s AVEC, New Delhi :**

**a) Organic to be deleted:**

The way organic is pictured in the specs is showing as if only organic materials are human safe which is not true, Coatings are specified as organic or inorganic according to the nature of their binder. Organic coatings are those that have an organic binder. Inorganic coatings are those that have an inorganic binder such as a silicate. Organic compounds have carbonhydrogen covalent bonds. Inorganic compounds have ionic bonds, lack carbonhydrogen bonds, and rarely, if ever, contain any carbon atoms.

All Paints being used currently in Indian Railways and open market like Epoxy PU etc. are based on organic chemistry; Indian Railways are already using MDTs-118 REV-01 paint specification for interiors which is also based on organic chemistry. So therefore, there is no relevance to specially mention Organic word as the paint offered could be organic or inorganic but it should meet the parameters as mentioned in table -1, therefore this organic word should be deleted.

Further, we would also like to highlight that the specification "MDTS-118 REV01 Painting system for FRP" is being used for the interior coating on FRP and is also having Anti-Graffiti features. Therefore, technically it is impossible to coat any coating on the existing coating which has Anti-Graffiti feature. Therefore, the application on areas such as side walls etc. where MDTs-118 Rev-01 is used should be deleted from the scope of this specification

**b) Biodegradable to be deleted:**

When exposed to soil, Coatings undergo a natural decomposition process, breaking down into carbon dioxide and water. Such coatings are used on paper cups etc designed to leave minimal environmental footprint but also champions the very essence of sustainable living. Liquid and wet food applications require a water based biodegradable coating for paper to maintain product integrity. These coatings offer the waterproof barrier essential for such applications, ensuring products remain fresh and uncontaminated, all while adhering to the principles of sustainability. The term "biodegradable" is commonly associated with materials or substances that can be break down the chemical bonds by natural / biological processes, such as the action of microorganisms, into simpler, natural elements over time.

Since the desired coating is required to be put on vinyl, steel, FRP, LP sheets and the basic requirement is to have the coating, which displays Hydrophobic and Oleophobic properties and make the coating resistant to water / oil. Therefore, there is no relevance of Bio-degradable coating in this application. Further Bio-degradable products disintegrate naturally and If any such coating is applied on specified areas as mentioned in this specification, it will not be able to give 36 months of warranty as it will attain natural process of degradation much before the warranty period.

Further, referring to MCF/RBL letter no.RBL-MD46271 (Pt-IX) dated.01.06.2021, the Sr.No.20 of the Table under clause 5 has been deleted in the MMDTS 19041 Rev- Nil Dt 30.12.2020. This Sr.No.20 mentioned the testing for "Organic, Biodegradable, and Environment friendly, Hydrophobic, Oleophobic, Anti Grim, Human Safe, and Inhalation Safe"

Therefore, both these words "Organic" and "Bio Degradable" should be removed from the specification where ever mentioned.

**MCF decision:**

- **For Organic:** this is as per original specification requiring organic material as basis for coating.
- **For biodegradable:** As per RB letter no. 2020/M(C)/142/4 dated 21.01.2021 & 2020/M(C)/142/4 dated 09.08.2021, "RSP work of Biodegradable, Oleo phobic & hydrophobic coating for LHB coaches".

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

**Description draft of MMDTS19041, Rev-2:**

- 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 Rickul India Pvt. Ltd, New Delhi:**

The composition of the (MMDTS 19041 REV-2) product cannot be changed otherwise the main factor being organic surface coating will vanish. Silica sand, also known as quartz sand, white sand, or industrial sand, is made up of two main elements: silica and oxygen and is organic and natural god gifted. Specifically, silica sand is made up of silicon dioxide (SiO<sub>2</sub>). The most common form of SiO<sub>2</sub> is quartz. This base makes the products organic and human safe.

On the other hand, "Silicon nitride is a chemical compound of the element's silicon and nitrogen. They have an inorganic silicon-oxygen (Si-O) backbone and are defined as inorganic or hybrid substances." Which clear that the base compound cannot be changed otherwise the organic property of the specification based Organic surface coating will disappear.

The other points which clear that the proposed composition is inorganic. Polysilazanes is not organic and are a class of very heat stable inorganic polymers with a polymer backbone made up entirely of silicon-nitrogen bonds with either only hydrogen substituents attached to each silicon and nitrogen atom (perhydropolysilazanes PHPS, -NH-SiH<sub>2</sub>-) One is inorganic perhydropolysilazanes (PHPS) that feature H groups on both Si and N atoms, and the other is organic polysilazanes (OPSZ) that have organic functional groups grafted onto Si atoms. Polysilazanes are, high chemical and thermal stability, elevated hardness, and adhesion to many different substrates.

On the other hand, the proposed composition is from one of the existing products specifications which is purely a chemical compound based. "Specification no. M&C/PCN/127/2020 (Specification For Ant graffiti Coating System for Exterior Painting Of Railway Coaches Diesel And Electric Locomotives)" The product is Single Component ReadyMixed-(Si-N)<sub>n</sub>, (-Si-O-)"

So, it is clear that (RDSO specification no. M&C/PCN/127/2009) is specific to Anti-graffiti only, on the other hand MMDTS 19041 REV-1), both are different product and cannot be used as substitute.

**MCF Decision:** Organic Polysilazane is mentioned in the draft specification.

It is clear that (RDSO specification no. M&C/PCN/127/2009) is specific to Anti-graffiti only, on the other hand MMDTS 19041 REV-1), both Olephobic and Hydrophobic coating with **Organic base**.

**(ii) M/s Hemisphere Marketing Pvt. Ltd:**

Change of composition means change of product.

Silica sand is organic and natural god gifted, which is demand of the world at this particular time.

AND Si-N-Si and Si-O-Si “Silicon nitride is a chemical compound of the element’s silicon and nitrogen. They have an inorganic siliconoxygen (Si-O) backbone and are defined as inorganic or hybrid substances.”

**MCF Decision:** Organic Polysilazane is mentioned in the draft specification.

**5. Clause no. 4:**

**Description draft of MMDTS19041, Rev-1:**

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, Water or any oil-based liquid is unable to penetrate the coated surface, should resist acid and alkaline, withstand extreme temperatures ranging from **-10° C to 60 °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<sub>2</sub> 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.

**Firm’s comments:**

**(i) M/s Rickul India Pvt. Ltd, New Delhi:**

Your Draft specification, Clause no.5 - Both are same in meaning, may change to “transparent, more flexible” instead of 100% Invisible, 200% flexible.

The MMDTS 19041 Rev-1 product having property to withstand extreme temperature - 90° C to 102 °C, which covers the Fire property (Heat resistance test, Heat penetration test, Flame spread test, Limitation Oxygen Test & Invisible smoke test). As above mentioned, Organic Quartz sand SiO<sub>2</sub> or Organic Polysilazane Si-N-Si and Si-O-Si structure forms two different products and cannot be used as substitute of each other.

**MCF Decision:** both options mentioned in the specification is organic and has been included for broad basing the procurement.

**(ii) M/s G.S. industries, Jalandhar :** We recommend removing the phrase "should be based on the latest layering graphic technology, produced in its purest form as liquid."

The specification currently allows for a maximum coating thickness of 6 microns, achievable with a single layer of coating. Furthermore, the specification stipulates that the coating should be both "Transparent and Colorless," as outlined in Clause 4. The relevant testing parameters are provided in Sr.No.4 of Table 1. Additionally, criteria for "Flexibility & Adhesion" can be found in Sr.No.8 of Table 1.

**MCF Decision:** Phrase "should be based on the latest layering graphic technology, produced in its purest form as liquid." will be removed.

**(iii) M/s Hemisphere Marketing Pvt. Ltd:**

Makes no difference, it's a word to understand.

"It may be withstanding extreme temperatures ranging from -100 C to 90 OC" to avoid cracking, peeling, with no burning, no bubbles, and no peeling, and, at the same time, good heat insulation or melting on this temperature of the surfaces.

Changing properties means changing the products.

**MCF Decision:** already explain at sr. no.4

**(iv) M/s AVEC, New Delhi:**

Technical Specification of Organic Surface Painting (Interior): Should be based on latest layering graphic technology, produced in its purest form as liquid. = TO be deleted

In Multi-layer coating there is a simultaneous application of two or more layers of fluid to avoid multiple passes in a coating operation.

The maximum allowed thickness of this coating is 6 Microns in your specification which is attained with a single layer coating.

The coating should be "Transparent and Colourless" as mentioned in clause 4 and testing parameters are given at Sr.No.4 of Table 1. Also the parameters for "Flexibility & Adhesion" are given at Sr.No.8 of Table 1.

Hence this statement "Should be based on latest layering graphic technology, produced in its purest form as liquid" is not relevant and should be deleted.

**MCF Decision:** Phrase "should be based on the latest layering graphic technology, produced in its purest form as liquid." will be removed.

**6. Clause no. 4 (table-1):**

**Description draft of MMDTS19041, Rev-2:**

1. **Finish:** Smooth – matt and glossy, free from sagging & wrinkling as per IS: 101-87 (Part 3/ Sec. 4), Reaffirmed 2019 or latest

**Firm's comments:**

**(i) M/s Surface Paints Pvt. Ltd, Lucknow :**

Finish is given as smooth — Matt and Glossy while in S. No. 20 Gloss @60 angle is 70-87. Please clarify in the specification.

**MCF Decision:** Above parameters are different and test method for both are given in the specification.

Finish should be Smooth and glossy.

2. **Dry film thickness per coat, min., by sponge/ airless spray:** (3-6) 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:**

3-6 Micron coating thickness (DFT) which is min requirement as per this spec is not sufficient to withstand for 36 months of life as asked in this spec. no available technology can give 3 years life and performance on such low thickness.

We request to please look into this point and make min coating thickness to 30 Micron as per min protection coating thickness standard of coating industry.

All the substrates mentioned in the spec like wood, metals etc have surface roughness of more than 6 microns then how a coating of min 6 microns will perform.

MCF should re-consider the life of coating they want while finalising the coating thickness, generally in coating industry 10-15 Microns of coating thickness provide tentatively 1 year of life so for 3 years of Coating life Minimum 30 – 45 Micron coating thickness should be added.

Final Dry Film Thickness after 24 Hours of Coating: Min 30 Microns – Max 80 Microns also no thickness testing tool is available to measure 3-6 micron of coating thickness.

**MCF Decision:** The revised specification will allow for a minimum coating thickness of 6 microns.

**(ii) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar:**

DFT is 20-30 microns in 2 coats.

**MCF Decision:** The revised specification will allow for a minimum coating thickness of 6 microns.

**Textile Painting**

a) **Hydrophobic test:** Pass as per ASTM D7017

b) **Oleo phobic (Oil Repellence) test (on fabric):** Pass as per AATCC 118

**Firm's comments:**

**(i) M/s Rickul India Pvt. Ltd, New Delhi :**

Oil repellence test method may be used as ASTCC118.

**MCF Decision:** agreed with firm comments.

**(ii) M/s G.S. industries, Jalandhar :**

In the existing specification, at Sr.No. 06 for Textile Painting, a single test method was indicated for both Oleophobic and Hydrophobic properties. However, it is evident that a more precise approach has been adopted in the draft specification by incorporating separate relevant test methods for Oleophobic properties.

The primary objective of this specification is to imbue Oleophobic and Hydrophobic properties in the coating applied to diverse interior surfaces of the coach, including vinyl, steel, FRP, LP sheets, with the intention of facilitating easy cleaning and rendering the coating resistant to water and oil. To fulfill this requirement effectively, it is essential to provide comprehensive test parameters and specific panel preparation details for each surface application area intended for coating.

**MCF Decision:** Oleo phobic (Oil Repellence) test (on fabric) as per AATCC 118 has been already added. Other test parameters have already been included.

(iii) **M/s Vibgyor Paints & Chemicals, Pondicherry:**

To specifically mention on which product to be tested for lab.

**MCF Decision:** test method already given in the specification.

(iv) **M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

Can be used this method ASTCC118

**MCF Decision:** Oleo phobic (Oil Repellence) test (on fabric) as per AATCC 118 has been already added.

(v) **M/s AVEC, New Delhi:**

This specification's primary requirement is to provide Oleophobic and Hydrophobic properties when the coating is applied on various interior surfaces of the coach such as vinyl, steel, FRP, LP sheets, so that it becomes easy to clean and make the coating resistant to water / oil. Therefore, test parameters and panel preparation details should be given for each surface application areas that are desired to be coated.

In this specification at Sr. No. 06 for Textile Painting a common test method was mentioned for Oleophobic and Hydrophobic and it is then after highlighting, a separate relevant test method for Oleophobic now has been included in the draft specification.

Hence, both Hydrophobic and Oleophobic testing should be included for Upholstery, Glass, FRP, LP Sheet, Stainless Steel and any other surface which you wish to coat, it is very important to also give details of sample preparation for each of these application areas in order to give rightful information to the testing lab for conducting test as per relevant standards and also help in analyzing whether one single offered product is suitable to coated on various desired surfaces.

**MCF Decision:** Oleo phobic (Oil Repellence) test (on fabric) as per AATCC 118 has been already added.

3. **Scratch hardness (at 1.5 Kg. load):**

No such scratch so as to show base metal as per IS: 101-88 (Part 5/ Sec. 2), Reaffirmed 2019.

Or

6-9H as per Pencil hardness as per ASTM D3363

**Firm's comments:**

(i) **M/s Rickul India Pvt. Ltd, New Delhi:**

ASTM D3363 is a standard test method to determine the coating Film hardness by pencil test. In this test we are not evaluating the scratchiness, instead, evaluating the hardness of the Film. So, no change required.

**MCF Decision:** no comments required

(ii) **M/s Henkel (CP-):** Some Field testing should be added in the spec after application for adhesion strength check to ensure good product performance and life in actual on trains.

**MCF Decision:** no clear suggestion given. Adhesion test already given in the table-1 of clause 4.

- i. Hydrophobic and Oleophobic properties to be checked visually during application of coating at MCF.
- ii. Warranty clause already given in the specification (clause no.7)
- iii. Performance report from field is required as per annexure-I

**(iii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

ASTM D3363 is a standard test method evaluating the hardness of the film. no change required.

**MCF Decision:** no comments required

**4. 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 Rickul India Pvt. Ltd, New Delhi:**

This test is according to the required testing method, so, NO CHANGE required.

**MCF Decision:** agreed with firm comments

**(ii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

No change required.

**MCF Decision:** firm agreed on this point

**(iii) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar:**

Test should be conducted along with the base painted panel plus bio-degradable coating as a topcoat.

**MCF Decision:** Test should be conducted according to the required testing method.

**5. Protection against corrosion under condition of condensation test (CP-75/3):**

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 Rickul India Pvt. Ltd, New Delhi:**

This test is according to the required testing method, so, no change required.

**MCF Decision:** agreed with firm comments.

**(ii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

No change required.

**MCF Decision:** firm agreed on this point

**(iii) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar:**

Test should be conducted along with the base painted panel plus bio-degradable coating as a topcoat.

**MCF Decision:** Test should be conducted according to the required testing method.

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

**Firm's comments:**

**(i) M/s Surface Paints Pvt. Ltd, Lucknow:**

Keeping properties-not less than 36 Months while @ S No 15 Storage life 24 Months with same Specification i e Appendix II of M&C/PCN/127-2020. please clarify in the specification.

**MCF Decision:** Only keeping property has been kept in the specification.

**(ii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

OEM should decide.

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

**(iii) M/s Nippon paint (India) Pvt. Ltd-Kancheepuram:**

Keeping Properties & Storage life for same property two specifications should have any one. Both should not be kept in specification.

**MCF Decision:** Only keeping property has been kept in the specification.

**(iv) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar:**

It should be “Not less than 12 months” which is as per the Appendix-II of RDSO specification no. M&C/PCN/127/2020.

**MCF Decision:** Only keeping property has been kept in the specification.

7. **Spreading & Covering surface area Capacity, min. :** as per Appendix-I of RDSO specification no. M&C/PCN100/2018.

2-5 microns -80 sq. m /litre

3-6 microns -60 sq. m /litre

**Firm's comments:**

**(i) M/s Rickul India Pvt. Ltd, New Delhi:**

Spreading & Covering should be read as – External surface covering – 80 m<sup>2</sup> / Per Ltr (due to smooth and flush area) and 60 m<sup>2</sup> / Per Ltr for the internal area.

**MCF Decision:** It will be changed to spreading rate of min. 60 sq. m /litre at ≥6 microns DFT.

**(ii) M/s Henkel :**

The coverage of product used for application should be in ratio of the coverage mentioned in the specification as for application on field and thickness of different products may vary as per the performance life asked by Railways.

Also, if the tender is per Coach basis and area per coach is clearly defined in tender. Then the coverage of the product is of no use and can be removed, ultimately one who will coat the coach (as per Min-Max Coating DFT mentioned in the spec) with 3years of life and on lowest price will get it the order

**MCF Decision:** Not agreed with firm comments as all usage condition cannot be mentioned in the specification. As usage (area of application) may be different for different agencies. Hence, only test condition can be mentioned.

**(iii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

This is correct Spreading & Covering surface area Capacity, is to be read as follows; External covering - 80 square meter per ltr and 60 square meters per ltr.

**MCF Decision:** It will be changed to spreading rate of min. 60 sq. m /litre at  $\geq 6$  microns DFT.

**(iv) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar :**

- Coverage is 25-30sqm/ltr for DFT 20-30 microns for two coats.
- Test should be conducted along with the base painted panel plus bio-degradable coating as a topcoat

**MCF Decision:** It will be changed to spreading rate of min. 60 sq. m /litre at  $\geq 6$  microns DFT.

. Test should be conducted according to the required testing method.

8. **Resistance to chemicals On(CP-75/3):** Shall not show any sign of cracking, dislocation, blistering, wrinkling and peeling or softening of paint film as per For 24 hours, IS: 101-89 (Part 7 /Sec. 2) Reaffirmed -2015 or latest

- 1) 25% caustic soda solution (w/v)30% (V/V) H<sub>2</sub>SO<sub>4</sub>
- 2)30% (V/V) H<sub>2</sub>SO<sub>4</sub>

**Firm's comments:** no comment received from any firm.

9. **Storage Life at 27± 2°C min.:** 24 months as per Appendix-II of RDSO specification no. M&C/PCN/127/2020

**Firm's comments:**

**(i) M/s Rickul India Pvt. Ltd, New Delhi :**

Storage Life at 27± 2°C min. test required to submit by the OEM Lab test report, which should not be less than 24months from the date of supplying the product.

**MCF Decision:** only keeping property to be kept and not storage property.

**(ii) M/s Hemisphere Marketing Pvt. Ltd, New Delhi**

OEM to decide

**MCF Decision:** not agreed with firm comments  
only keeping property to be kept and not storage property.

**(iii) M/s Grindwell Norton Ltd – Permacel Division- Gautam Budh Nagar :**

- Shelf life is 12 months and Test should be conducted along with the base painted panel plus bio-degradable coating as a topcoat

**MCF Decision:** only keeping property to be kept and not storage property. Test should be conducted according to the required testing method.

10. **Mass in kg/10 litres, min.:** 10.9 as per IS: 101-87 (Part 1/ Sec. 7) Reaffirmed -2019 or latest

**Firm's comments:**

- (i) **M/s Surface Paints Pvt. Ltd, Lucknow :** The Mass in Kg per 10 Ltr, Given is of base component or of composite mixture of base and hardener please clarify in the specification.

**MCF Decision:** After application coating, 10 litre of coating on base metal/component, obtained mass will be 10.9Kg/10litre(Min.).

- (ii) **M/s Nippon paint (India) Pvt. Ltd-Kancheepuram :**

Should have a limit (higher and limit ) in specification and as it's a transparent coating should have range starting from 9.7 kg/ 10 liters to 10.3kg/10 lit.

**MCF Decision:** Minimum limit (10.9Kg/Litre) already defined in the specification.

11. **Abrasion Resistance test :** Shall be "Max. Loss=0.050 gms" with 1000 cycle with CS-17 wheel & 1 kg load shall be max. loss=0.050gms)as per ASTM D-4060.

**Firm's comments:**

- (i) **M/s Rickul India Pvt. Ltd, New Delhi:**

This is already covered in MMDTS19041 Rev.1

**MCF Decision:** firm agreed.

- (ii) **M/s Hemisphere Marketing Pvt. Ltd, New Delhi**

Already amended as per MMDTS19041 REV.01

**MCF Decision:** firm agreed.

12. **Gloss at 60° angle of incidence(CP-75/3/back side):** 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 Rickul India Pvt. Ltd, New Delhi**

This is already covered in MMDTS19041 Rev.1

**MCF Decision:** firm agreed.

- (ii) **M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

Already amended as per MMDTS19041 REV.01

**MCF Decision:** firm agreed.

13. **Anti-graffiti properties:** Graffiti completely removed, and no marks left behind as per ASTM-6578

**Firm's comments:**

(i) **M/s G.S. industries, Jalandhar:**

It is recommended to exclude the application of Hydrophobic/Oleophobic coatings in areas such as side walls, roof panels, etc., where MDTS-118 Rev-01 is being utilized, as it is not possible to apply any coating over the surface, where anti graffiti coating has been applied already. Such application areas should be removed from the scope of this specification.

**MCF Decision:** Not agreed as usage (area of application) may be different for different agencies. Usage areas to be decided by procuring agency.

(ii) **M/s Vibgyor Paints & Chemicals, Pondicherry:**

Anti-graffiti properties should be clearly mentioning the level of method or may be mentioned ASTM-6578 level-9 with mild detergent.

Further, there is no NABL Testing lab in India for Sr.No.21 "Anti Graffiti" which is having Anti-Graffiti in NABL scope of accreditation. Hence, Test Reports must be accepted from Government approved lab in India

**MCF Decision**

- Graffiti should be completely removed and no marks of EDDING 3000.
- If there is no NABL accredited lab available in India, then option of Government Lab (NTH) already given in the specification.

(iii) **M/s AVEC, New Delhi :**

We would like to highlight that Anti-graffiti coating is already an integral part of the specification "MDTS-118 REV-01" which is being used for FRP & other panel coatings, hence technically it is impossible to coat any coating on the existing coating which has Anti-Graffiti feature.

Therefore, Hydrophobic/ Oleophobic coating should not be applied on areas such as side walls, roof panels etc. or where ever MDTS-118 Rev-01 is being used. Thus such application areas should be deleted from the scope of this specification.

Further There is no NABL Testing lab in India for Sr.No.21 "Anti Graffiti" which is having Anti-Graffiti in NABL scope of accreditation.

Hence, Test Reports must be accepted from Government approved lab in India like the NTH (National Test House) which is a reputed Government lab established in the year 1912 in Calcutta by Railway Board to cater to the needs of the Indian Railways for import substitution and are capable of conducting this test.

**MCF Decision:**

- Specification only mentioned area/items. Application and procuring agency to be decide as per their requirement.
- If there is no NABL accredited lab available in India, then option of Government Lab (NTH) already given in the specification.

14. **Durability Test –**

**Accelerated weathering test:** Rating scale (0-10) (Chalking-10, Checking-10, Cracking-10, Flaking-10, Blistering-10, Peeling-10, Spotting-10)

QUV 4 hours and 4 hours Condensation alternatively, (750 hrs), Temp. 50 °C as per ASTM G154

Or

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

**Comments:**

(i) **M/s Rickul India Pvt. Ltd, New Delhi:**

Both tests should be done by the testing authority.

**MCF Decision:**

Any one of the tests should be done by NABL accredited lab.

(ii) **M/s Hemisphere Marketing Pvt. Ltd, New Delhi (CP- )**

Both test required.

**MCF Decision:**

Both tests are for Accelerated weathering test and any one of the tests should be done by NABL accredited lab.

15. **Fire properties:** R1, HL3, as per ISO: EN45545 part-II

**Comments:**

(i) **M/s Henkel :**

The substrates mentioned in the spec on which coating has to be done as itself not flame retardant like Wood, Leather etc then how a 3-6 micron coating will protect it or purpose of adding this testing is not clear.

Please look into this and request to please remove the point if not required as in past orders awarded by railways no such testing was asked or checked.

**MCF Decision:** Coating should comply to EN45545, part-II (R1, HL3).Material used in coach is also fire retardant as per individual specification. Also coating thickness will be updated as min. 6 microns DFT.

(ii) **M/s AVEC, New Delhi:**

It is very important that the coating should be applied on the materials / surfaces which are already meeting EN 45545-2. Therefore, in order to complete the testing as per R1 HL3 requirements you are requested to indicate the application areas, so that various samples in line to the application area is prepared for testing.

As currently there are hardly any coach interior products that are compliant to EN 45545-2, R1, HL3 and logically the coatings should not be flame propagating but on the other hand only a mere coating cannot make the base material compliant to EN 45545 HL 3. Therefore, EN 45545 requirement should be deleted and only added when the base material/application areas meets EN 45545-2 HL3.

**MCF Decision:** Coating should comply to EN45545, part-II (R1, HL3).Material used in coach is also fire retardant as per referred specification.

(iii) **M/s Nippon paint (India) Pvt. Ltd-Kancheepuram:**

Coating with 3 -5 micron thicknesses this specification may not be useful or relevant.



**MCF Decision:** Coating should comply to EN45545, part-II (R1, HL3). Material used in coach is also fire retardant as per referred specification. Also coating thickness will be updated as min. 6 microns DFT.

7. **Clause no. 4 (Documents to be submitted along with offer) :**

**Description draft of MMDTS19041, Rev-2:**

- i. Tenderer shall submit clause wise comments on the specification for compliance and deviation (if any).
- ii. Tenderer shall submit test certificate of parameters (Table -1 of clause 4) of specification from either NABL accredited lab or Government lab and should have scope of accreditation for the individual test mentioned in Table -1 .Lab test reports must contain logo/seal of NABL from NABL Lab. In absence of any of above details for offered product, the offer would not be considered.

**Firm's comments:**

- (i) **M/s vibgyor Paints & Chemicals , Pondicherry :** Tenderer shall submit test certificate of parameters (Table-1 of clause 4) of specification from either NABL accredited lab or Government lab and should have scope of accreditation for the individual test mentioned in Table-1. Test reports must contain logo/seal of NABL from NABL. In absence of any of above details for offered product, the offer would not be considered.

In case NABL accreditation is not individually available for particular test, government labs certificate may be considered.

**MCF Decision:**

Tenderer shall submit test certificate of parameters as mentioned in Table-1 of clause 4 of the 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. 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 of the tests with test method mentioned in the specification, in such cases, any government's lab in India (like NTH, NPH etc) report will be acceptable for those tests.

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

- (ii) **M/s AVEC, New Delhi:**

The NABL labs should have NABL Scope of accreditation for the individual test mentioned in Table -1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab. Whereas for Government Labs scope of accreditation for the individual test mentioned in Table -1 is irrelevant, as Government Labs are themselves an certifying body. However, we suggest you to mention NTH Lab which is a reputed Government lab. The National Test House [NTH], formerly known as Government Test House was established long way back in 1912 in Calcutta by Railway Board to cater to the needs of the Indian Railways

for import substitution. Its credibility can be verified at <https://www.nth.gov.in/service/nabl-accredited-calibration-facilities>. We also understand that RDSO, Lucknow sends paints samples to NTH Lab for testing.

NTH has all the testing facility for conducting tests as mentioned in Table -1 of this specification and which can also be verified with Shri Ajay A. Ukarande (Scientist-B (Chemical)) at OIC (Paint Laboratory) email id: [ois.paint.er@nth.gov.in](mailto:ois.paint.er@nth.gov.in); [aukarande@nth.gov.in](mailto:aukarande@nth.gov.in)

Hence request you to mention as follows “Tenderer shall submit test certificate of parameters as mentioned in Table-1 of clause 4 of the specification from Government approved lab in India like the NTH (NATIONAL TEST HOUSE) or at any NABL accredited lab, the NABL lab should have NABL scope of accreditation for the individual test mentioned in Table-1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab. In absence of any of above details for offered product, the offer would not be considered”.

**MCF Decision:** comment already given at SN-I above.

8. **Clause no. 5(PROTOTYPE APPROVAL):** The Firm shall supply a sample along with the following details at the time of prototype approval:

**Description draft of MMDTS19041, Rev-2 (CP-75/4):**

- i. Test certificates of Organic Surface Paintings indicating compliance to specified parameters of the specification shall be submitted from either NABL accredited lab or Government lab and should have scope of accreditation for the individual test mentioned in Table -1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab. In absence of any of above details for offered product, the offer would not be considered.

**Firm’s comments:**

**a. M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

The Firm shall supply a sample along with the following details at the time of prototype approval. RITES are Railway inspection agency, and they should choose the LAB for testing.

**MCF Decision:**

Tenderer shall submit test certificate of parameters as mentioned in Table-1 of clause 4 of the 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. 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 of the tests with test method mentioned in the specification, in such cases, any government’s lab in India (like NTH, NPH etc) report will be acceptable for those tests.

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

**b. M/s AVEC, New Delhi:**

Organic Surface Paintings =To be deleted and to mention as “Surface Paintings / Coating”.

**MCF Decision:** This is as per original specification requiring organic material as basis for coating.

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

**Firm’s comments:**

a) **M/s Hemisphere Marketing Pvt. Ltd, New Delhi:**

Require no Change

**MCF Decision:** firm agreed

b) **M/s AVEC, New Delhi :**

The Sample supplied should be coated on defined application areas to determine the actual process of application”.

**MCF Decision:** not agreed with firm comments as usage (area of application) may be different for different agencies. Hence only test condition can be mentioned.

- iii. 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.

**Firm’s comments:** no comment received from any firm.

**9. Clause no. 6(tests):**

**Description draft of MMDTS19041, Rev-2:**

**Acceptance Test (sr.6.1)-** Sr. No. 1 to 9, 13, 14, 16, 17, 19 to 21 of Table-1 of Clause 4 will be Acceptance Test and to be conducted by RITES during inspection at OEMs premise in case in-house test facility’s are available( **in-house lab should be NABL accredited for the parameters being tested**).However, in-case of non availability of in-house test facility within the OEM premise, then those test should be done from either NABL accredited lab or Government lab and should have scope of accreditation for the individual test mentioned in Table -1 and Also NABL test reports must contain logo/seal of the issuing NABL accredited Lab.

**Firm’s comments:**

**(i) M/s Rickul India Pvt. Ltd, New Delhi:**

Railways already authenticated its testing to RITES. So, interfering in the testing procedure of the RITES may delay the testing time. Secondly, refer to the recent report provided by RITES (Test Report No. NRL22116834 dated 22.04.2023- Organic surface Coating product), which proves that the testing procedure which is already adopted by the RITES as per the specification is correct and doable. So, no change required.

**MCF Decision:**

Tenderer shall submit test certificate of parameters as mentioned in Table-1 of clause 4 of the 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. 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 of the tests with test method mentioned in the specification, in such cases, any government's lab in India (like NTH, NPH etc) report will be acceptable for those tests.

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

**(ii) M/s G.S. industries, Jalandhar :**

Acceptance Test - Sr. No. 1 to 9, 13, 14, 16, 17, 19 to 21 of Table-1 of Clause 4 will constitute the Acceptance Test, which shall be conducted by RITES during inspection at the OEM's premises. If the OEM has an in-house test facility, these tests shall be performed there. The segment "in-house lab should be NABL accredited for the parameters being tested" should be omitted, as OEMs establish their in-house laboratories for both internal and RITES testing purposes. It's worth noting that OEMs typically do not pursue NABL accreditation for their internal labs.

**MCF Decision:** Comments already given at SN-I

**(iii) M/s vibgyor Paints& Chemicals , Pondicherry:**

- a) For Government approved Lab, explanation already given at Clause 4. Above "Documents to be submitted along with offer" Hence to be mentioned as "Acceptance Test- Sr.No. 1 to 9, 13, 14, 16, 17, 19 to 21 of Table-1 of Clause 4 will be Acceptance Test and to be conducted by RITES during inspection at OEMs premise, in case in-house test facility's are available. However, in-case of non availability of in-house test facility within the OEM premise, then those test should be done at Government approved lab in India like the NTH (NATIONAL TEST HOUSE) or at any NABL accredited lab, the NABL lab should have NABL scope of accreditation for the individual test mentioned in Table-1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab".
- b) For "(in-house lab should be NABL accredited for the parameters being tested)" should be deleted as OEM's setup their In-house lab for internal testing and RITES testing, However the OEM's do not take any NABL accreditation for their own in house lab. Hence "(in-house lab should be NABL accredited for the parameters being tested)" should be deleted from the specification

**MCF Decision:** Comments already given at SN-I

**(iv) M/s Surface Paints Pvt. Ltd, Lucknow :**

The Acceptance Tests shall be conducted by RITES during inspection at the OEMs Premises and shall not be outsourced from the other laboratory and the OEM shall have complete specification Testing Facility at its Premises including Type as well as Acceptance Tests. The OEM shall have following Equipments required for the testing of the product which are as given below:

- a) Dry Film Thickness Gauge
- b) Scratch Hardness Tester
- c) Pencil Hardness Tester
- d) Flexibility and Adhesion Mandrel 6.25 mm
- e) Abel's Flash Point Apparatus
- f) Resistance to salt Spray Cabinet
- g) Protection against Corrosion Chamber
- h) Mass in Kg per 10 Ltr Cup
- i) Impact Resistance test Apparatus
- j) Taber Abrasion Resistance Test Apparatus
- k) Gloss Meter of 60° Head
- l) QUV Weather o meter

**MCF Decision:** Comments already given at SN-I

**(v) M/s AVEC, New Delhi :**

- a) For Government approved Lab, explanation already given at Clause 4. Above “Documents to be submitted along with offer” Hence to be mentioned as “Acceptance Test- Sr.No. 1 to 9, 13, 14, 16, 17, 19 to 21 of Table-1 of Clause 4 will be Acceptance Test and to be conducted by RITES during inspection at OEMs premise, in case inhouse test facility’s are available. However, in-case of non availability of in-house test facility within the OEM premise, then those test should be done at Government approved lab in India like the NTH (National Test House) or at any NABL accredited lab, the NABL lab should have NABL scope of accreditation for the individual test mentioned in Table-1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab”.
- b) For “(in-house lab should be NABL accredited for the parameters being tested)” should be deleted as OEM’s setup their In-house lab for internal testing and RITES testing, However the OEM’s do not take any NABL accreditation for their own in house lab. Hence “(in-house lab should be NABL accredited for the parameters being tested)” should be deleted from the specification.

**MCF Decision:** Comments already given at SN-I

**10. Type test(Clause 6.2) are as under of Table-1 of Clause 4:**

- i. Resistance to salt spray (Sr. no.10),
- ii. Protection against corrosion under condition of condensation (Sr. no.11)
- iii. Resistance to distilled water (Sr. no.18)
- iv. Durability test (Sr. no.22)

These type tests shall be done during initial approval, change of design and change of manufacturing process or raw material. These tests are to be done initially and repeated after every 24 months or after every supply of 1000 litres which every is earlier. However, if consignee or inspecting agency desired to do type test, before 24 months, the supplier should not deny the same.

These test should be done from either NABL accredited lab or Government lab and should have scope of accreditation for the individual test mentioned in Table -1 and Also NABL test reports must contain logo/seal of the issuing NABL accredited Lab.

**Firm's comments:**

**i. M/s Rickul India Pvt. Ltd, New Delhi:**

**Type test-** required to submit by the OEM Lab test report, which should not be less than 24 months from the date of supplying the product.

**MCF Decision:** not agreed with firm comments.

These type tests shall be done during initial approval, change of design and change of manufacturing process or raw material. These tests are to be done initially and repeated after every 24 months or after every supply of 1000 litres whichever is earlier. However, if consignee or inspecting agency desired to do type test, before 24 months, the supplier should not deny the same.

**ii. M/s G.S. industries, Jalandhar:**

These type tests are essential during the initial approval process, as well as for design changes or modifications in the manufacturing process or raw materials.

We suggest that the 1000 liters quantity be either increased to 3000 liters or that each batch/lot size be limited to a maximum of 1000 liters. This adjustment would allow long duration testing once every 2 years, or more frequently if the batch/lot size increases beyond 1000 liters, and hence would smoothen the supply chain delivery.

**MCF Decision:** It will be revised as 'long duration testing should be done once in 2 years or if the batch /lot size increases 2000 ltrs'.

**iii. M/s Vibgyor Paints & Chemical, Pondicherry:**

These test are to be done initially and repeated after every 24 months or after supply of 1000 litres (i.e, 500 coaches) testing should repeat once in 2 years. This 500 ltrs will create ambiguity while executing the purchase order as the testing time is nearly 133 days minimum and need to supply the materials within 3 months maximum with required shelf life period. Hence the quantity of 500 coaches may not to be mentioned.

**MCF Decision:**

**a)** to to be as per clause 10 of specification.

**b)** comment already given at SN-I above (of Clause 9(i))

**iv. M/s AVEC, New Delhi :**

a) The test mentioned in Sr.No. i to iv above are all long duration test, the minimum number of days required is 180 days (6 months) for "Resistance to salt spray (Sr. no.10)", considering the consumption of 2 liters per coach the quantity of 1000 liters would be required for 500 coach sets only. Therefore, to complete one order of more than 500 coach sets would take a min of 10 to 12 months, wherein the Delivery

Period mostly is 6 months. Therefore, such orders would never be completed within the stipulated Delivery Period. Hence, it is recommended that this quantity of 1000 ltrs should either be extended to 3000 ltrs or each batch /lot size should be kept maximum 1000 ltrs. That means the long duration testing should be done once in 2 years or if the batch /lot size increases 1000 ltrs.

Note: In order to effectively maintain 2 years record it is important to do vendor approval by MCF for this specification.

- b) These test should be done from either Government approved lab in India like the NTH (NATIONAL TEST HOUSE) or at any NABL accredited lab, the NABL lab should have NABL scope of accreditation for the individual test mentioned in Table-1 and also NABL test reports must contain logo/seal of the issuing NABL accredited Lab.

**MCF Decision:**

- a) It will be revised as 'long duration testing should be done once in 2 years or if the batch /lot size increases 2000 ltrs'.  
b) comment already given at SN-I above (of Clause 9(i))

**v.M/s Hemisphere Marketing Pvt. Ltd:**

Type tests to be done by OEM and to be decided the batch numbers which supplied by them.

**MCF Decision:** comment already given at SN-I above (of Clause 9(i))

**11. Clause no. 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.

**Firm's comments:** no comments received from any firm

**12. List of Machineries and plant(Claue 8):**

**A. Machinery and Equipments :**

1. Reaction Vessel
2. Intermediate vessel
3. Isolation equipment
4. Finished good 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.

**Firm's comments:**

- (i) **Surface Paints Pvt. Ltd-Lucknow:** The Machinery and Equipments given are not appropriate and as per the requirement of this product

manufacturing, few of them like isolation Equipment and air handling unit with Humidity control are not clear, please clarify

**MCF Decision:** Firm has not suggested no new requirement for machine/equipment with explanation about their purpose. Isolation Equipment and air handling unit with Humidity control are climate control equipment.

#### **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 good storage area = Well ventilated, temperature controlled with HVAC
4. Inspection & Quality control well ventilated, temperature controlled with HVAC.

#### **Firm's comments:**

##### **(i) M/s Surface Paints Pvt. Ltd, Lucknow :**

**Material storage area:** the storage of Raw Materials shall be given as 'as per the instructions of the Raw Material Manufacturer'.

**MCF Decision:** No suggestion regarding changing the Material storage condition is given. Firm should comment, what are the requirements of the raw material manufacturer/supplies regarding storage of raw material, so the same can be scrutinised to make specification generic for all the suppliers.



## Annexure-I

### Performance test plan for Biodegradable, Oleo phobic & Hydrophobic Organic Surface coating on Exterior & 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.	<p><b>Method of coating the surface(at time of 1<sup>st</sup> application):</b></p> <p>I. The Coating must be spread evenly and smoothly, to get the layer of coating to settle accordingly.</p> <p>II. The layer of coating may be colorless and transparent appears on the surface which shows, that coating is stick to the surface and its curing.</p> <p>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.</p> <p>IV. <b>Hydrophobic</b> 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</p> <p>V. <b>Oleo phobic</b> test can be done by dropping the oil &amp; grease on the coated surface, if the oil &amp; grease cleaning with wet cloth without leaving any mark behind, Means the coating is Oleo phobic</p> <p>VI. <b>Gloss Test</b> (for Exterior surface only) can also be check of the coated coach, by using the gloss meter and maintained gloss as initial gloss value of painted surface.</p>	
2.	<p><b>Test to be done after 3/12/24 months:</b></p> <p>I. <b>Easy to clean test:</b> The dirt doesn't stick to the coated surface.</p> <p>II. <b>Abrasion Test:</b> The coating should not crack or shrink.</p> <p>III. <b>Anti-graffiti properties:</b> Graffiti completely removed and no marks left behind.  <ul style="list-style-type: none"> <li>• <b>Graffiti test shall be done with EDDING 3000.</b></li> </ul> </p> <p>IV. <b>Durability test:</b></p> <p style="margin-left: 20px;">I. No cracking</p> <p style="margin-left: 20px;">II. No blistering</p> <p style="margin-left: 20px;">III. No spotting</p> <p style="margin-left: 20px;">IV. No peel off</p>	<b>Observation (3/12/24months)</b>