RAIL COACH FACTORY KAPURTHALA

MD35131

Dated : 02.04.2016

Sub: Issue of specification no. MDTS-22282 Rev '01' of Single Component Water based Fire Barrier Intumescent Paint

Please find enclosed a copy of specification no. MDTS-22282 Rev '01' of Single Component Water based Fire Barrier Intumescent Paint for IR Coaches, for information and necessary action at your end.

02.4.16

(Suraj Praksah)
Dy CME/D-1

CQM, CPLE, CWE (Fur), CMM/HSQ, CMM/Tkj, Dy. CMM/Fur/LHB, CMT, DY.CPLE-III

SSE / LIB. Design

LSSE / Records

Copy for kind information to:

CDE

Designation	Name	Signature	Date	Level
SSE/Dev	Harish Kumar		31/3/16	Prepared
Dy.CME/D-1	Suraj Prakash		31.3.16	Agreed & Reviewed
CDE	A. K. Kathpal		1.4.16	Approved

Issue/Rev	Details of Changes	Date
Rev-01	In para 3.2, adhesion strength changed to 1.4 N/mm^2 and 4A to ASTM D 3359 deleted.	31-03-2016

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1. **SCOPE:**

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1.1. This specification covers the general & technical requirements for single component water based Fire Barrier Intumescent Paint for IR coaches suitable for internal and external applications. This paint may be coated on the coach side walls, end walls, fuel tanks of Power Car, Interior of Power Car and Pantry cars, etc. to provide fire barrier properties. The supplier shall apply the paint on the designated area of coach at Railway Premises.

1.2. **Purpose:**

Intumescent coatings/paint are required to be used as a passive fire resistance for integrity E, in accordance with the norm EN:1363-1, tested on Al thickness 4 mm for a period of 100 minutes the close standing materials will not reach temperature of self ignition and is required to be used on structural. The key feature of intumescents is that they expand can expand to more than 30-40 times the original thickness when exposed to high temperatures, such as those found in a case of fire. As the product expands it becomes much less dense, which makes it act as in insulator that keeps the high temperatures away from structural members or protected openings.

1.3. While quoting, the supplier shall submit the following details :

i Performance and areas of usage of the offered material in Indian Railway Passenger Coaches/ International Railways or any other Railway OEM for similar applications.
ii Technical data sheet of the offered product.
iii Clause-wise comments on the specification.
iv Deviation statements with respect to specification, if any.
v Credentials and performance of the OEM.
vi Test certificates from the reputed labs like LAPI, Crepim, Exova Warringtonfire or any other lab of International reputation.

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

2. **Material Base:**

2.1 Single component water based intumescent coating shall be visco-elastic spray-able liquid to provide corrosion prevention on properly primed surface and sound dampening properties in Railway coaches/ Sub-assemblies and shall be ready for use.

2.2 *Structure and surface of applied paint*: The dried paint's structure and surface shall be free of bubbles, foam etc.

2.3 *Chemical Base of paint*: Aqueous synthetic Resin dispersion and must be free from Isocynate and PVC.

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2.4 *Colour*: Beige/Grey, black or as per requirement

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3.0 Technical Requirements

3.1 *Spray coating*: A coating thickness of 1.5± 10% mm (DFT) is required in a double or triple times hand coating with Air Spray Gun/Airless equipment.

3.2 *Adhesion*: The paint coating shall have excellent adhesion to stainless steel surface sand-blasted to Sa 2½ of ISO:8501-1 and shall have minimum strength adhesion- 1.4 N/mm^2 when tested with ASTM D-4541.

3.3 *Chip Resistance:* Rating 10 when tested in accordance with (ASTM D 3170/SAE J400) for 2.0 mm thickness or gritting test.

3.4 *Drying time*: The drying time of paint coating shall be as per followings:

At ambient conditions	48 hrs
At 40° C convection	12 hrs
At 80° C convection	8 hrs

3.5 *Coverage*:
The paint formulation must give a minimum of 3.0 +/- 10% kg/sqm for coverage of 1.5 mm (DFT) coating on a flat surface.

3.6 *Cleaning thinner*: Water, before drying.

3.7 *Specific gravity (wet)*: 1.30 ± 10% g/ml at 23°C (ASTM D-1475)

3.8 *Volume solids*: 65% to 70%

3.9 *In service Temperature:* - 40° C to 120° C.

3.10 *Penetration test (Viscosity Indicator):*
It should be 30mm to 50mm, when tested as per DIN 51580 (Aluminium shell, cone-150 gm, 6 seconds, at 20°C).

3.11 *pH value*: 7.5 to 8.5.

3.12 ***Start of Intumescences***: The Intumescence characteristics shall start from **150^{0}C. - 200^{0}C**

4.0 Fire properties:

The dried paint coating when subjected to fire test must conform to following parameter laid down in Table-1:

Table-1

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S.No	*Properties*	*Values*	*Test Method*
S.No	*Properties*	*Values*	*Test Method*
1.	Fire rating	HL1-HL2-HL3	EN 45545-R1
2.	Integrity E	>100 min	EN 1363-1 on Al 4 mm sheet DFT 1.5 mm

5.0 **Sound insulation:**

The following sound insulation parameter shall be fulfilled when test sample is prepared as per EN ISO 6721-1 on steel bar.

Description	*Test Frequency*	*Loss Factor (min)*	*Test*
Dampening Loss factor at 20°C	200 Hz	**0.20**	DIN EN ISO 6721-3 (thickness ratio coating to steel 2:1 / ASTM E756-04

6.0 Other Parameters:

6.1 Corrosion prevention: No cracking or blistering shall occur after Humidity/Temperature aging (40°C 100% RH) for 96 hrs when tested in accordance with ISO 6270 and there shall be no loss of adhesion, cracking or blistering when subjected to 500 hrs of salt spray test according to ASTM B 117. The steel samples used for the above tests shall be primed with two component epoxy primer.

6.2 *Shelf life:* Shelf life should be 9 months from the date of manufacturing and available shelf life of the product, when supplied to Railway, shall be minimum of 6 months.

7.0 Testing & prototype approval:

7.1. Firm shall submit following for the prototype approval by CDE

7.1.1. Two test samples of minimum size 300X300 mm stainless steel plate coated with the paint.

7.1.2. Test certificates from the reputed labs like LAPI, Crepim, Exova Warringtonfire or any other lab of international reputation for fire properties, sound insulation, anti chip, integrity, adhesion strength, density/specific gravity and corrosion prevention properties, indicating compliance to all the test parameters.

7.1.3. Material safety data-sheets

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7.2. After getting approval of above from RCF, the supplier must demonstrate conformity of the paint formulation to the application process on exterior of one coach at RCF premises using standard equipment, prior to bulk supply of the paint.

7.3. The regular supply shall be undertaken only after the approval of application of paint on interior of prototype coach shell.

7.4. The clause of prototype is applicable for the first time supply of a supplier to RCF. However, RCF shall have the right to repeat prototype approval process in subsequent order also and RCF decision shall be final in this regard.

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