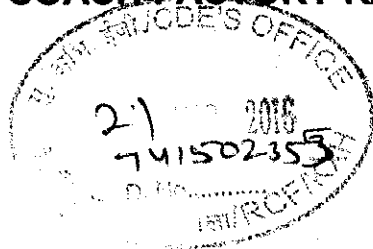


RAIL COACH FACTORY KAPURTHALA

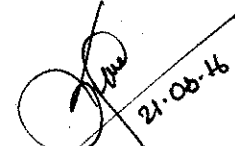
MD22141



Dated: 21-03-2016

Sub: Issue of specification no. MDTS-28001 Rev-'02', Schedule of requirements of thermal insulation for under frame and sidewall of Railway Coaches

Please find enclosed a copy of specification no. MDTS-28001 Rev-'02' for schedule of requirements of thermal insulation for under frame and sidewall of Railway Coaches, for information and necessary action at your end.


21-03-16
(Suraj Praksah)
Dy CME/D-1

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

SSE /LIB. DESIGN



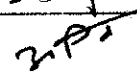
SSE / Records
SE / Design / RCF / TKJ

Copy for kind information to:

CDE


Sh. P. Bawa
1 D.
J.P.M.
22/3/16.

SPECIFICATION	SCHEDULE OF REQUIREMENTS OF THERMAL INSULATION FOR UNDER FRAME AND SIDEWALL OF RAILWAY COACHES	MDTS-28001 Rev -02 Page 1 of 4 Date: 21-03-2016
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NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
Harish Kumar	SSE/Dev		21/3/16	Prepared
Suraj Prakash	Dy.CME/DI		21.03.16	Agreed & Reviewed
A.K. Kathpal	CDE		21.03.16	Approved

Issue / Rev.	Details of changes	Date
01	1.0 Para 3.2, 3,3 & 7 Modified. Thickness changed from 30 & 60 mm to 25 & 50 mm respectively in para 4.v. 2.0 For fire & smoke characteristics, test method changed as per EN 45545-2 in para 4 of Table-1. 3.0 Water vapour transmission rate added in place of water vapour permeability & vapour transmission factor 4.0 Thermal insulation (Para-2), sound absorption/noise reduction coefficient(Para 3) & water absorption (Para 5) requirement of Table-I modified. Tensile strength & compression stress strain deflection requirement deleted.	22-01-2015
02	1.0 Eligibility criteria in Para 3.2 & 3.3 modified. 2.0 Hydrophobic melamine foam & sigle side foil added in para 4.i. Density & % water absorption, modified in Table -I accordingly. 3.0 Total volatile organic emission requirement in Table -I, deleted.	21-03-2016


Prepared by


Agreed by

SPECIFICATION	SCHEDULE OF REQUIREMENTS OF THERMAL INSULATION FOR UNDER FRAME AND SIDEWALL OF RAILWAY COACHES	MDTS-28001 Rev -02 Page 2 of 4 Date: 21-03-2016
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1.0 Introduction :

- a. This schedule covers the technical requirements / provision relating to material & tests and does not include all the necessary provisions of contract.
- b. This schedule draws reference to some of the relevant ASTM, DIN, BS, AS, ISO, UIC, JIS and other Indian Standard specification. The latest version of the relevant specifications should be taken as reference.

2.0 Scope:

This schedule covers requirements and methods of tests of thermal insulation for under frame and sidewall of Railway Coaches.

3.0 Eligibility Criteria:

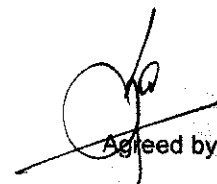
- 3.1. Tenderer shall be either OEM or an authorized dealer of OEM and shall submit the proof of authorisation certificate and contact details (address, phone no., fax no., e-mail) of OEM along with the offer.
- 3.2. The OEM of thermal insulation material shall be manufacturer of **offered (Part no./ Brand Name) material** and same should have been used in International Railways and/or automotive industries or similar HVAC application and shall submit proof of it along with the offer.
- 3.3. While quoting, the tenderer shall submit the following details along with the offer:
 - Part no./ Brand Name and OEM of offered product.
 - Technical and safety data-sheets of offered Part no./ Brand Name
 - Clause-wise comments on the specification.
 - Test certificates from Internationally Accredited Labs as per ISO/IEC-17025 from OEM for all the parameters for fire and smoke characteristics as per requirements laid down at S.No.4 of Table-I. For other parameters of Table I, test certificates from NABL/Internationally Accredited Labs shall be submitted. Authorized dealer is required to submit test certificates from OEM only. Test certificates submitted by authorized dealer after conducting test at their end/ any outside agency shall not be accepted.

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

4.0 General Requirements:

- i) The thermal insulation should be made from cross linked closed cells made of polyolefin foam or hydrophobic melamine foam. The foam should have factory applied reinforced heat bonded fused single side 9 µm aluminum foil. The material shall conform to the properties mentioned in Table-I.

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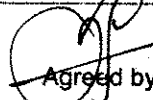
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- ii) The thermal insulation shall reduce the transmission of structural born noise and vibration. It shall have excellent chemical, biological and ozone resistance.
- iii) The thermal insulation should be odourless with no fibrous emission and shall be insoluble in water and organic solvents.
- iv) The thermal insulation should not contain and should not be produced with any of the substances mentioned as Class-I and Class-II in the "Montreal Protocol" of ozone depleting substances.
- v) Required thickness should be 15mm, 25mm and 50mm or as specified by the purchaser. Lamination process, if required, to achieve the desired thickness is to be carried out by OEM and it should not affect the desired properties of end product.
- vi) Material shall be available in sheet size of 2300mm x1200mm or supplier's product size range, if acceptable to the consignee.
- vii) Material shall be easily cut with an ordinary knife.

Table-I

S.No	Properties	Values	Test Method
1.	Density	25 ± 5 kg/m ³ (for polyolefin foam core only) 15 kg/m ³ (Max) (For melamine foam core only)	IS:7888 1976 Cl-4
2.	Thermal Insulation	Max. 0.036 W/m ⁰ K at 23 ⁰ C	ASTM C-518/ IS:3346
3.	Sound absorption/Noise reduction Coefficient	>0.20 (for 25 mm)	AS 1045 / ISO 354/ EN ISO 11654
4.	Fire & Smoke characteristics	R1, HL3	EN 45545-2 (Table 5)
	a) Lateral spread flame CFE (Minimum)	20 kW/m ²	ISO-5658-2
	b) Heat release rate (Cone calorimeter method) <i>MARHE</i> (Max.)	60 kW/m ²	ISO:5660-1 : 50 kW/m ²
	c) Smoke generation D _s (4) (Max)	150 dimensionless	EN ISO:5659-2 : 50 kW/m ²
	d) Smoke generation VOF ₄ (Max)	300 min	EN ISO:5659-2 : 50 kW/m ²

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SPECIFICATION	SCHEDULE OF REQUIREMENTS OF THERMAL INSULATION FOR UNDER FRAME AND SIDEWALL OF RAILWAY COACHES	MDTS-28001 Rev -02 Page 4 of 4 Date: 21-03-2016
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	e) Gas analysis in smoke chamber using FTIR technique CIT _G (4) (Max)	0.75 dimensionless	EN ISO:5659-2 : 50 kW/m ²
5.	Water absorption (%) (Max)	1.0 mg/cm ² (For 10 mm thickness)	JIS K6767
6.	Water vapour transmission rate (Max)	0.042 g/m ² /24 hrs (For 25 mm thickness)	ASTM E 96 (Foil face towards desiccant)
7.	Resistance to Fungi	Zero growth	ASTM G 21

5.0 Packing:

The material shall be packed in neat and dry condition. The material shall be securely packed so as to avoid damage in transportation.

5.0 Marking:

Before dispatch, each pack shall be legibly marked with indelible marking ink/paint showing the following details:

- Lot and serial number.
- Month and year of packing.
- Name and trade mark of the OEM.

6.0 Prototype approval:

Firm should submit prototype sample after placement of PO for approval by CDE/RCF before bulk supply along with following documents:

- Authorisation certificate from OEM in case the supplier is a authorised dealer of the OEM
- Technical and safety data-sheet offered Part no./ Brand Name .
- Test certificates from Internationally Accredited Labs as per ISO/IEC-17025 from OEM for all the parameters for fire and smoke. characteristics as per requirements laid down at S.No.4 of Table-I. For other parameters of Table I , test certificates from NABL/Internationally Accredited Labs shall be submitted. Authorized dealer is required to submit test certificates from OEM only. Test certificates submitted by authorized dealer after conducting test at their end/ any outside agency shall not be accepted.

The prototype approval is applicable on the first supply of material as per this specification from a supplier.

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