

Rail Coach Factory, Kapurthala

MD35131

Dated: as signed

Sub: Issue of corrigendum-1 to specification no. **MDTS-44388 Rev.- NIL** of “TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS COMPLYING FIRE CHARACTERISTICS AS PER EN-45545-2.”

Please find the corrigendum-1 to MDTS-44388 Rev. Nil as below for information and necessary action at your end:

S. No.	Para	Earlier	Modified
1.	S. No. 1 of Table 3 (Para 5.2)	Total thickness Outside layers: R1 HL3 fire characteristics as per EN-45545-2 Intermediate Layer- Fire retardant rigid structural foam	Total thickness Outside layers: Intermediate Layer-
2.	S. No. 14 of Table 4 (Para 5.7)	Fire Characteristics (Individually skin materials, intermediate layer material and composite materials)	Fire Characteristics of light weight composite in end use condition

This has approval of competent authority.

Jugal Kishor
Dy. CME/Des/Fur

SSE (LIB. Design) SSE (Records) SSE/FUR-III

Dy. CMM/Fur/LHB Dy CMM/G Dy.CPLE-III

CQM CPLE CWE (Fur) CWE/Shell CMM/HSQ CMM/TKJ CMT

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रेल कोच फैक्ट्री, कपूरथला

पत्र संख्या- MD35131

जारी करने की तिथि - 08/06/2023

विषय: विशिष्टता प्रकाशन संख्या MDTs-44388 Rev.- NIL ।

कृपया जानकारी और अन्य आवश्यक कार्रवाई के लिए निम्नलिखित विशिष्टताओं की संलग्न प्रति प्राप्त करें

S. No	Description	Specification No.
1.	TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS COMPLYING FIRE CHARACTERISTICS AS PER EN-45545-2	MDTS-44388 Rev -NIL

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Dy.CMM/LHB/HSQ Dy.CMM/G CMT Dy. CPLE-I,II Dy.CMM/Fur

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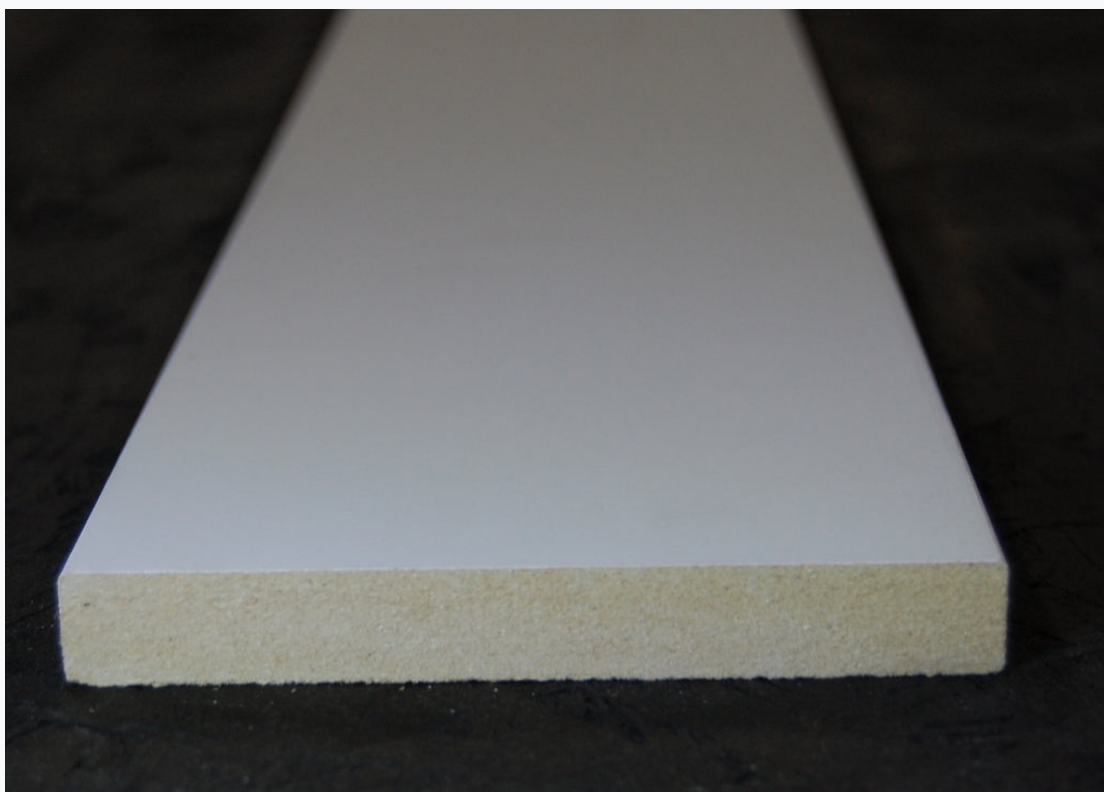
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KAPURTHALA

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हल्के वजन वाले समग्र विभाजन फ्रेम और छत पैनल
45545-2 अग्नि पात्रों का अनुपालन करने वाले

LIGHT WEIGHT COMPOSITE PARTITION
FRAME & CEILING PANEL COMPLYING FIRE
CHARACTERISTICS AS PER EN-45545-2



Specification Number	MDTS-44388		
Revision Number	Nil	Date of Issue	05/06/2023

Brief Description

Light Weight Composite partition frame & ceiling panel complying fire characteristics as per EN-45545-2

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FOREWORD

This technical specification laid down general / technical, testing requirements of light weight composite partition frame & ceiling panel complying fire characteristics as per EN-45545-2.

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**TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS
COMPLYING FIRE CHARACTERISTICS AS PER EN-45545-2****DOCUMENT CONTROL**

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LIST OF AMENDMENTS

SN	Amendment Date	Revision	Details
1.	05/06/2023	Nil	Specification issued

TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS COMPLYING FIRE CHARACTERISTICS AS PER EN-45545-2

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**TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS
COMPLYING FIRE CHARACTERISTICS AS PER EN-45545-2****1 Introduction:**

This specification covers the general and technical requirements of light weight composite partition frames & ceiling panels complying fire characteristics as per EN-45545-2 of Indian Railway passenger coaches.

2 Foreword & Scope:

2.1 This schedule is intended to cover the technical requirements/provisions relating to materials, constructions and tests and does not include all the necessary provisions of the contracts. This schedule draws references to some of the relevant ASTM, UIC and other Indian Standard specifications. Unless otherwise specified, the latest version of the relevant specifications shall be taken as reference.

2.2 The material shall be used for partition frame & ceiling area in order to impart light weight, better sustainability and smooth surface to the system. These are required to meet the following objectives:

- Excellent Fire retardant characteristics complies to EN45545-2
- Light weight material composite material approximately 50% lighter than sound insulation wooden panel
- Water proof
- Higher strength and impact resistant
- Performs well in continuous higher temperature

3 List of standards Referred:

SN	Standard	Title
1	EN45545-2	European Railway standard for fire safety
2	ISO 845	Determination of apparent density
3	ASTM D 1621	Standard Test Method for Compressive Properties of Rigid Cellular Plastics
4	ISO-844	Rigid cellular plastics — Determination of compression properties
5	ASTM C 365	Sandwich Core Compression Testing
6	IS : 11239 (Part2)	Methods of Test for Rigid Cellular Thermal Insulation Materials - Part 2 : Apparent Density
7	IS:12937-2005	Methods of Testing Straightness, Flatness and

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		Perpendicularity
8	RDSO-C-K-514	Decorative thermosetting synthetic resin bonded laminated sheets for use in coaching stock
9	IS:1734-2003	Methods of Test for Plywood
10	C-9407	Wood based impregnated compressed laminates
11	EN-438-2	High Pressure decorative laminates

Table 1: List of referred standards
4 Abbreviation/Terminology:

S.No.	Abbreviation /Terminology	Expansion/Explanation
1	QAP	Quality Assurance Plan
2	FAI	First Article Inspection
3	RCF	Rail Coach Factory
4	KXH	Indian Railways station code for Kapurthala
5	LHB	Linke-Hofmann-Busch the transfer of technology partner for RCF/KXH.

Table 2: Abbreviations & Terminology
5 Technical Requirements :

- 5.1. **Material Construction:** The material shall be light weight composite board having single inner layer of continuous rigid structural material without any concavity, sandwiched between two outer layers of rigid material with moisture resistance, chemicals resistance and corrosion resistance, non-porous material having uniform thickness throughout and shall be long lasting proven material. Steel inserts as per drawings are provided for mounting of accessories like magazine bags, coats hooks, head rest, reading light on partition frame/panels. Steel inserts are to provide for fixing as per applicable drawing of ceiling panels. Suitable corrosion protection of steel inserts is to be carried out.

5.2. Material requirements:

SN	Characteristics	Non-AC area false ceiling panel	Partition frames
1	Total thickness Outside layers: R1 HL3 fire characteristics as per EN-45545-2 Intermediate Layer- Fire retardant rigid structural foam material	15 mm 1.0 mm each Remainder thickness	20 mm 1.5 mm Remainder thickness

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2	Weight as per ISO-845/IS:11239 (Max)	6 Kg/m ²	7.5 Kg/m ²
3	Dimensions	As per drawing	As per drawing
4	Color scheme, finish & pattern	-do-	-do-

Table 3 –Physical Properties

5.3. Appearance: No surface defect.

5.4. Unless otherwise specified, the following tolerances on the nominal sizes of finished board shall be permissible:

- | | | | |
|----|---------------------------------|---|-------------------|
| a. | Length | : | +6.0 mm |
| | | : | -0.0 mm |
| b. | Width | : | 3.0 mm |
| | | : | -0.0 mm |
| c. | Thickness | : | ± 0.15mm |
| d. | Diagonally | : | less than 1.5mm/m |
| e. | Squariness of rectangular part: | | less than 1.5mm/m |

5.5. Material shall be easily cut with circular saw.

5.6. The outer layer materials shall be pasted with sandwich with white color structural adhesive.

5.7. The light weight composite board shall meets following parameters:

SN	Characteristics	Requirements	Method of test
1	Flexural Rigidity (Min)	700 Kg/m ²	IS :11239(Part-10)/1734-1983 (Part - 15)
2	Compressive strength (Min)	1.4 Mpa	ASTM D 1621/ ISO-844 /ASTM C-365 / IS :11239
3	Compressive Modulus (min)	70 Mpa	ASTM D 1621 / ISO-844 /ASTM C-365/ IS :11239
4	Resistance to impact	To pass the test	C-9407 Appendix – D/ RDSO-C-K-514
5	Flexural strength (Min)	100Mpa	IS:11239 -2008 Part-

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			10/IS:13411
6	Resistance to chemicals	To pass the test	C-9407 Appendix – E
7	Resistance to ageing	To pass the test	C-9407 Appendix - F
8	Water Absorption, Maximum	2.0%	IS:13411/ IS:11239/ C-9407 Appendix - B
9	Bending Strength (Min)	1200 kg/cm ²	IS: 1734-2003 (Part-11)
10	Tolerance Flatness	1.5 to 2 mm/m	IS:12937-2005
11	Resistance to Staining	Grade 4 to 5	EN-438/ IS:2046(Group-2 Annexure-M)
12	Resistance to colour change	Grade 4 to 5	EN-438/IS:2046
13	Surface Finish	10-12	EN -438
14	Fire Characteristics(Individually skin materials, intermediate layer material and composite material)	R1 HL3	EN-45545-2

Table 4 –Technical Properties
6 Quality Assurance, Tests & Documents:

The following table provides the overview of the system for quality assurance.

Requirement Description	Requirement Detail	Remarks
Quality Assurance plan	<p>The manufacturer shall have the detailed quality assurance plan. The Plan shall be submitted for the approval by RCF/KXH. The QAP document shall clearly document the following and control the test record formats.</p> <ol style="list-style-type: none"> 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 soft copy digitally signed by the head of Quality department of the manufacturer for approval.

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	5. Routine Tests 6. Acceptance tests 7. Raw Materials	
Type Tests	<p>These tests shall be done on a sampled lot of prototype. Such Tests are required only on initial approval, change of design and change of manufacturing process or raw material.</p> <p>These tests are to be repeated after every 36 months or as specified.</p> <ul style="list-style-type: none"> • Fire retardant characteristics as EN45545-2 	<p>The records of the type tests shall be maintained by the manufacturer and shall be made available upon demand.</p> <p>These records shall be traceable and verifiable.</p>
Routine Tests	<p>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.</p> <p>These tests are to be repeated after every 12 months or as specified.</p> <ul style="list-style-type: none"> • Resistance to chemicals • Resistance to ageing • Water Absorption, Maximum • Flexural Rigidity • Compressive strength • Compressive Modulus • Resistance to impact • Flexural strength • Tolerance Flatness • Resistance to Staining • Resistance to colour change • Surface Finish 	<p>The records of the type tests shall be maintained by the manufacturer and shall be made available upon demand.</p> <p>These records shall be traceable and verifiable.</p>
Acceptance tests	<p>These tests shall be done on all or samples of lot for bulk supply. Sampling shall be done as per IS:2500</p> <p>These tests shall normally consist of routine tests and additionally specified in the contract.</p> <p>These tests are to be carried out on each lot or as specified:</p> <ul style="list-style-type: none"> • Colour & pattern as per PO • Thickness 	<p>The records of the acceptance tests shall be enclosed along with the supply consignment.</p> <p>These records shall be traceable and verifiable.</p>

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	<ul style="list-style-type: none"> • Dimensional Checks • Weight 	
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Table 5: Quality Assurance, Tests & Documents

- 6.1 The fire retardant tests as per EN 45545 -2 shall be conducted by either NABL accredited Lab for these tests or Testing lab accredited as per ISO/IEC-17025 to perform/conduct fire test as per EN45545-2 (Proof of same shall be submitted).

7 Marking & packing:

Before dispatch, each packing shall bear following information:

- Nomenclature of the store
- Quantity packed. (total metrage).
- Lot and serial number.
- Month and year of packing.
- Name and trade mark of the manufacturer.
- Name and address of the consignee.

In order to prevent damage and deterioration in quality during storage, handling and transportation, the supplier should supply material with suitable packing.

8 Information to be provided by bidder / supplier:

The following information shall be provided by the bidder / supplier.

8.1 Information to be provided at the time of the bid:

The following information shall be included with the bid. These documents shall be used to determine suitability for placement of purchase orders.

S. No.	Information to be provided	Important Note
1.	Tender Specific authorisation letter of MOU with manufacturer of the light weight composite partition frames & ceiling panels. The document must have unambiguous authorization and address the warranty requirements specified in this specification.	This document is required in case the manufacturer is authorizing another entity to bid on their behalf.
2.	WTC, Technical data-sheet and safety data-sheet from OEM of light weight composite partition frames & ceiling panels along-with outer, inner skin materials & high strength adhesive & sealant.	
3.	Test certificates for parameters mentioned in para 6.0	
4.	ISO9001 / IRIS Certification as available.	

**TECHNICAL SPECIFICATION FOR LIGHT WEIGHT COMPOSITE PARTITION FRAMES & CEILING PANELS
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Table 6: Information to be provided with the bid
8.2 Information to be supplied upon release of letter of acceptance / purchase order:

The following information shall be supplied prior to the supply of the ordered material:

S. No.	Information to be provided	Important Note
1.	Copy of the detailed QAP for the self adhesive insulation material ordered.	The document must contain the details as specified in the clause on quality assurance in this specification.
2.	Test Certificates and technical data sheet of all parameters of light weight composite partition frames & ceiling panels mentioned in the spec.	The test certificates shall be traceable and verifiable.

Table 7: Information to be provided upon release of letter of acceptance / purchase order
8.3 Information to be supplied with the material consignment:

S. No.	Information to be provided	Important Note
1.	Copy of the detailed QAP for light weight composite partition frames & ceiling panels ordered.	The document must contain the details as specified in the clause on quality assurance in this specification.
2.	Test Certificates for type & routine tests (as detailed in the QAP) conducted by the manufacturer or third-party agencies as specified in para 6.0.	The test certificates shall be traceable and verifiable.
3.	Test Certificates for acceptance tests (as detailed in the QAP) conducted by the manufacturer or third-party agencies as specified in para 6.0.	
4.	WTC, Technical data-sheet and safety data-sheet from OEM of light weight composite partition frames & ceiling panels along-with outer, inner skin materials & high strength adhesive & sealant for light weight composite partition frames & ceiling panels	

Table 8: Information to be provided with material consignment