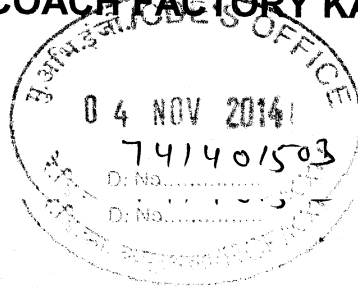


RAIL COACH FACTORY KAPURTHALA

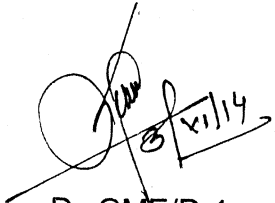
MD35131



Dated: 03-11-2014

Sub: Issue of specification no. MDT5-095 Rev 01, Schedule of requirements of aluminum composite panel

Please find enclosed a copy of specification no. MDT5-095 Rev 01, Schedule of requirements of aluminum composite panel, for information and necessary action at your end.


Dy CME/D-1

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

SSE / LIB. DESIGN

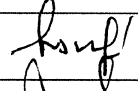

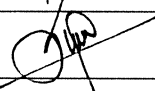
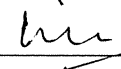
~~SSE / Records~~

SSE / Design / RCF / TKJ

Copy for kind information to:


CDE

SPECIFICATION	SCHEDULE OF TECHNICAL REQUIREMENTS ALUMINIUM COMPOSITE PANELS	MDTS 095 Rev-01 Dated 28.10.2014 Page 1 of 4
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NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
HARISK KUMAR	SSE/DEV		28/10/14	Prepared
JOGINDER SINGH	SME/DEV		28/10/2014	Agreed
SURAJ PRAKASH	DY.CME/D1		28.10.14	Reviewed
PARMANAND SINGH	CDE		03.11.14	Approved

Issue/Rev	Details of Changes	Date
Rev.01	Specification revised	28/10/2014


Prepared by


Agreed by

SPECIFICATION	SCHEDULE OF TECHNICAL REQUIREMENTS ALUMINIUM COMPOSITE PANELS	MDTS 095 Rev-01 Dated 28.10.2014 Page 2 of 4
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1. SCOPE:

- a. This specification covers the general & technical requirements of aluminium composite panels to be used for panelling particularly of the lavatory ceiling of ALSTOM-LHB design coaches.
- b. While quoting, the supplier shall submit the following details:
 - Technical data sheet of the offered product.
 - Clause-wise comments on the specification.
 - Deviation statements with respect to specification, if any.
 - Credentials and performance of the original supplier i.e. OEM
 - In case of an authorized dealer of OEM, letter of authorization from the OEM.
 - Test certificates from reputed test house for properties mentioned in the specification from the OEM lab or from authorized testing lab.

2. Material Base:

The composite aluminium panel consist of 0.5 mm thick aluminium sheets on both sides with an inner core of high quality mineral filled polymer (minimum 70% non-combustible mineral filler and balance polymer) forming a composite panel of 06 mm thickness.

3. Panel size:

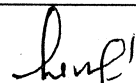
Panel size shall be 6mm x 1250mm x2500mm
Tolerance: ±6mm (in length), ±4mm (in width) & ±0.2mm (in thickness)


4. Mechanical Properties:

The panel should be rigid, resistant to blow breakage and pressure, high bending and buckling strength.

4.1 Properties of outer Aluminium Sheet:

SN	Description	Requirements
a	Sheet thickness	0.5 mm
b	Sheet material-Alloy & temper	Aluminium to grade EN AW5005A (AlMg1) H22/H42 to EN573-3 & EN-515 OR AA 5005 (AlMg1) H24 to ASTM-B-209 M
c	Tensile strength	Minimum tensile strength of aluminium cover sheet should be 130 N/mm ² tested as per IS:737-1986 OR EN-485-2 OR ASTM-E-8 EN-485-2 OR ASTM-E-8 tested as per IS:737-1986 OR EN-485-2 or ASTM-E-8


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d	Bending Strength	Minimum 53 N/mm ² with safety factor 1.7 tested as per IS:737-1986 or EN-485-2 or ASTM-E-8
e	0.2% proof stress	Minimum 90 N/ mm ² as per EN-485-2 or ASTM-E-8
f	Modulus of elasticity	Minimum 70,000 N/ mm ² as per EN-1999 1-1 or ASTM-E-8

4.2 Properties of Composite Panel:

SN	Description	Requirements
a	Thickness	6 mm ±0.20mm
b	Rigidity	5900 KNcm ² /m (minimum) as per DIN-53293.
c	Section Modulus	2.75 cm ³ /m (minimum) as per DIN 53293.
d	Weight	Maximum panel weight should be 10.8 Kg/m ²
e	Sound	Average sound transmission loss should be minimum 25 dB in a frequency range of 100 - 3200 Hz as per ISO-140-3 or ASTM E-90. Sound absorption (ISO-354) and vibration dampening value (ISO-6721) of the finished panels are to be indicated by the manufacturer.
f	Linear Thermal Expansion	Minimum linear thermal expansion of the composite panel should be 2.4mm/m at 100° C temperature difference as per EN-1999 1-1 or ASTM-D-696
g	Temperature resistance	Panel should be temperature resistant from -20°C to +80° C
h	Fire retardant characteristic	Grade B1 as per DIN 4102-1&7 OR Class B- s1, d0 as per EN ISO 13501-1: 2007
i	Bonding strength	Min 11 N/mm ² as per ASTM-1876
j	Heat transition coefficient	5.3 W/m ² K as per DIN-4108 or ASTM C-1363
	efficient	


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SPECIFICATION	SCHEDULE OF TECHNICAL REQUIREMENTS ALUMINIUM COMPOSITE PANELS	MDTS 095 Rev-01 Dated 28.10.2014 Page 4 of 4
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4.3 Coating on Aluminium composite panels:

Aluminium composite panel's outer sheet on one side (visible to passenger) should be lacquered with PVDF in light grey colour shade or as per general colour scheme to be indicated at the time of purchase. The interior sheets is coated with high durable Polyester (PE) or anodized for excellent looks.

SN	Description	Specification	Requirements
a	Lacquered	Chemical	PVDF
b	Coating thickness (1 coat primer+2 coat colour)	ASTM-D-7091	27µm (± 3 µm)
c	Gloss at 60°	ASTM-D-325	Minimum 25
d	Hardness pencil	ASTM-D-3363	HB-F

5. Packing:

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

6. Marking:

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

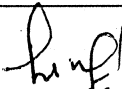
- Nomenclature of the store
- Quantity packed. (Total metrage).
- Lot and serial number.
- Month and year of packing.
- Name and trade mark of the manufacturer.
- Name and address of the consignee.

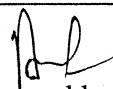
7. Eligibility criteria:

Tenderer shall be either OEM or an authorized dealer of OEM and shall submit the proof of authorisation and contact details (Phone no., fax no., e-mail id) of OEM representative along with the offer.

8. Prototype approval:

Tenderer shall submit one prototype sample of at least 60x 30 mm size for approval by CDE/RCF before bulk supply along with technical data sheet, test certificates from OEM or authorized laboratories regarding value mentioned in the specification, credentials and performance of the original supplier i.e. OEM and letter of authorization from the OEM, in case of an authorized dealer of OEM.


Prepared by


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