

RAIL COACH FACTORY KAPURTHALA

MD22131

DATE: 25.07.2013

Sub: Issue of specification no. MDTS 75 Rev-'3'.

Please find enclosed a copy of specification no MDTS 75 Rev-'3' for information and necessary action at your end.

Specification no. **MDTS 75** Rev.- 3

Schedule of requirements for Sound Insulation wooden Floor for flooring

Cut in immediate (safety/critical items etc.)/cut in for existing P.O./cut in point to be planned & advised/cut in point not required.:	Cut in point to be planned & advised
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25/7/13
Dy CME/D-1

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

✓ SSE / LIB. DESIGN
SSE / RECORD
SSE / DESIGN / RCF / TKJ

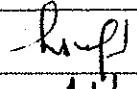
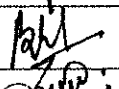
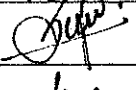
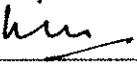
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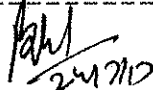
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SPECIFICATION	SCHEDULE OF TECHNICAL REQUIREMENTS FOR SOUND INSULATING WOODEN FLOOR PANELS FOR FLOORING OF ALSTOM-LHB DESIGN COACHES	MDTS: 075 Rev: 03
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Name	Designation	Signature	Date	Level
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B.K.Goyal	SME/D-I		24/7/13	Agreed
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Issues/Revision	Details of changes	Date
Rev-01	Specification modified	18.11.2005
Rev-02	Resistance to impact by sudden blows and sound insulation specified for composite wooden floor panel	24.02.2006
Rev-03	Specification modified and re-drafted	24.07.2013


Prepared by


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R.C.K.
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1.0 FOREWORD & SCOPE:

The flooring panel is designed to be sound insulating & lightweight. It is a composite board having one layer of cork sandwiched between two outer layers of special ply-board or wood based impregnated compressed laminate made of "Gurjan" wooden species for use in flooring of original LHB coaches. The cork layer absorbs the incoming acoustic vibration energy and avoids the emission of airborne noise by the panel itself.

This schedule is in two sections. Section -A intends to cover general and technical requirements/provisions relating to materials, constructions & tests. Section-B covers the infrastructural, testing and quality control facilities required for manufacturing the sound insulating wooden floor panels for flooring of ALSTOM- LHB design coaches.

This schedule draws reference from some of the relevant specifications. Latest versions of these specifications shall be taken as reference.

2.0 ELIGIBILITY CRITERIA

While quoting, the tenderer shall submit the following details along with the offer:

- 2.1 Infra-structural facilities must be available with the firm as mentioned in Section B. The firm should offer the details of the availability of infrastructure with them and same would be verified before placement of purchase order on new firm.
- 2.2 Clause-wise comments on the specification.
- 2.3 Deviation statements with respect to specification, if any.

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

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Section A

Schedule of General & Technical Requirements

3.0 CORK SANDWICH:

A cork sandwich of 4mm thickness is to be used as an intermediate layer. Special varieties of cork may be explored to have adequate sound insulating property in the composite board.

4.0 MECHANICAL PROPERTIES OF OUTER PLY-BOARD/WOOD BASED IMPREGNATED COMPRESSED LAMINATE :

The *outer layer* shall be special ply-board or wood based impregnated compressed laminate made of "Gurjan" wooden species. The properties of the outer plyboard should be as laid down in Table-I.

Table-I

SN	Characteristics		Requirements	Method of test
1	Compressive strength, Parallel to grain Minimum		54 N/mm ²	IS: 1734-83 (Part-10)
2	Water Absorption, Maximum		5.0%	C-9407 Appendix - B
3	Resistance to boiling water		To pass the test	C-9407 Appendix - C
4	Bending strength Minimum	Along the grain	1200 kg/cm ²	IS: 1658
		Across the grain	600 kg/cm ²	
5	Resistance to chemicals		To pass the test	C-9407 Appendix - E
6	Resistance to ageing		To pass the test	C-9407 Appendix - F

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5.0 PROPERTIES OF COMPOSITE BOARD:

The composite board shall be having one layer of cork sandwiched between two outer layers of special ply-board or wood based impregnated compressed laminates. The properties of the composite board as laid down in Table-II.

Table-II

SN	Characteristics	Requirements	Method of test
1	Total thickness Intermediate cork layer Outside layers	16 mm 4mm 6mm each	
2	Resistance to impact	To pass the test	C-9407 Appendix - D
3	Flexural Rigidity (minimum)	700 Kgf	IS 1734-1983 (Part - 15)
4	Sound Insulation factor R (minimum)	31 db	DIN-52210 Part-III
5	Resistance to spread of flame	Class A	Appendix - 4 of UIC-564-2 OR
6	Deterioration of visibility due to smoke	Class A	Appendix - 15 of UIC-564-2 OR
7	Limiting Oxygen Index	Minimum 28	IS: 13501
8	Toxicity	Less than 1	NCD - 1409

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

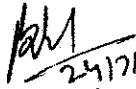
- a. Length : +6.0 mm
 : - 0.0 mm
- b. Width : +3.0 mm
 : - 0.0 mm
- c. Thickness : ± 5%
- d. Diagonally : less than 5mm

Anti-termite treatment must be given to the composite boards. The method of treatment and details of chemicals used shall be submitted in the form of a write-up. The treatment shall not affect the properties of the finished product in any manner.

6.0 IDENTIFICATION:

Each flooring panel shall be legibly and indelibly marked/stamped with the followings particulars:

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- (a) Manufacturer's name or trade-mark, if any
- (b) Month & Year of manufacture
- (c) Batch Number

All markings shall be done on the face of the board near one corner.

7.0 TESTS:


The type test and acceptance test shall be as per following:

- 7.1 *Type Test:* Type test shall be repeated every six month or earlier if so desired by the purchaser/inspecting agency. Test for resistance to ageing of outer layer shall be type test.
- 7.2 *Acceptance Test:* Acceptance test shall be carried out in two stages i.e. in-stage inspection of outer layer of plyboard/wood based impregnated compressed laminate and final inspection of finished composite board.
- 7.3 In-stage Inspection of outer layer: Following tests as specified in *Table-I* shall be carried out for each lot during in-stage inspection :
 - Compressive strength
 - Water Absorption
 - Resistance to boiling water
 - Bending strength
 - Resistance to chemicals

The supplier has to ensure in-stage inspection for each lot is carried out by the inspecting agency.

- 7.4 Final inspection of composite board: Following tests as specified in *Table-II* shall be carried out for each lot at the time of final inspection:
 - Dimensional check
 - Resistance to impact
 - Flexural Rigidity
 - Sound Insulation
 - Resistance to spread of flame
 - Deterioration of visibility due to smoke
 - Limiting Oxygen Index
 - Toxicity

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8.0 SAMPLING OF COMPOSITE BOARD

The number of samples for a lot size of 2000 nos. or part thereof is given below:

- 8.1 10% of the lot offered for inspection shall be visually examined.
- 8.2 Dimensional checks shall be carried out on 1% of the lot offered for inspection subject to a minimum of 5 boards.
- 8.3 For physical properties, the no. of samples to be selected for tests shall be minimum 3 or 0.25% of the lot offered whichever is more.
- 8.4 The sample shall conform to the requirements as laid down in this schedule of requirements. Should any of the sample selected as per clause 8.3 fail to meet any one of requirements, double the quantity of samples stipulated in clause 8.3 shall be selected for tests. The number of re-tests to be carried out will be double the number. Should any of the wood/ply-board panel or wooden floor composite board fail to meet the requirement of any one of the tests on re-test, the entire lot shall be rejected.
- 8.5 In the event of the rejection, the entire lot offered for inspection, shall be made un- useable in the presence of inspecting / purchasing authority.

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SECTION-B

SCHEDULE OF INFRASTRUCTURAL REQUIREMENTS

This section describes the requirement of infrastructure, testing and other manufacturing process of composite boards.

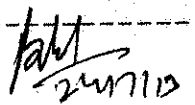
9.0 GENERAL & MANUFACTURING FACILITIES:

- 9.1 There should be a provision of covered area, with adequate space underneath for storage of raw material i.e. wooden logs, resin chemicals, etc. The covered area should have display board showing different colour shades nominated for different chemicals and raw materials to avoid mix-up of store.
- 9.2 The firm should have resin-manufacturing plant with at least one number of resin kettles of 1 ton capacity each.
- 9.3 The firm should have resin impregnation plant of adequate capacity.
- 9.4 The firm should have at least one boiler of adequate capacity with all accessories.
- 9.5 The firm should have at least one number of four daylight heavy-duty hydraulic press to manufacture sound insulation wooden floor panel of subjected size with adequate margin of trimming. The press should have heating and cooling facilities with temperature, pressure and time control.
- 9.6 The firm should have indirectly heated drying chambers for drying the veneer.
- 9.7 The firm should have heavy-duty saw.
- 9.8 The firm should have a well-equipped machine shop consisting of lathe, surface planner, drilling machine etc for making out test sample.

10.0 TESTING FACILITIES:

- 10.1 The testing lab should have facility for temperature and humidity control.
- 10.2 The firm should have hot air oven complete with thermostatic controller and thermometer. The controller should be calibrated once in three month.
- 10.3 The firm should have one universal-testing machine of 10t capacity.
- 10.4 The firm should have all testing facilities as required for testing of properties mention in Table-I and Table-II.
- 10.5 The firms should have facility for measuring the sound insulation value as per Para-4 of Table-II.


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10.6 The firm should have facilities for conducting following fire properties tests as per para 5 to 8 of Table-II:

- Resistance to spread of flame
- Deterioration of visibility due to smoke
- Limiting Oxygen Index
- Toxicity Index

10.7 The firm should have the following instruments :

- Vernier callipers with digital display
- Micro meters with digital display
- Thermometers with digital display
- Moisture meter with digital display
- Hydrometer
- Measuring scale
- Measuring tape

10.8 The firm should have arrangement for periodical calibration of all the gauges & instruments.

11.0 QUALITY CONTROL REQUIREMENTS :

11.1 There should be a system to ensure the traceability of the product from raw material stage to finished product stage. The system should also facilitate to identify the raw material composition from the finish product stage.

11.2 The firm must ensure that there is a QAP for the product detailing various aspects:

- Flow Process Chart
- Stage inspection details
- Various parameters and to ensure control over them

11.3 The firm should have ISO: 9000 series certification and it should be broadly covered in the scope of the certification for manufacture and supply of the product.

11.4 The firm must ensure that proper analysis is being done on monthly basis to study rejections at various internal stages and it is documented.

11.5 The firm should ensure that all the relevant specifications, IS standards etc are available with them.

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