

## RAIL COACH FACTORY KAPURTHALA

MD35131

DATE: 26.12.2023

**Sub: Amendment-1** for specification no. MMDTS-19021 Rev-4.

Following is the amendment-1 applicable to the specification no. MMDTS-19021 Rev-4.

**Fire Barrier cloth of 6 mm thickness with Weight (Max.) – 600 gm/m<sup>2</sup> is applicable with all other properties complying as per Sr. No. 3 to 9 of table-1 of spec. no. MMDTS-19021 Rev-4.**

Amendment Slip No. 1 for above modification is attached herewith for your information and necessary action please.

DY.CME/D2

CQM, CPLE, CWE (FUR), CMM, CMT, DY.CPLE-II

SSE / LIB. DESIGN

SSE / RECORD (With original specification)

SSE / DESIGN / RCF / TKJ

Copy for kind information to:

CDE

**Amendment slip No. 1 (December-2023)**

**Specification No. MMDTS-19021 Rev-4**

Fire Barrier Cloth for Seats and Berths meeting FST (Fire Smoke and Toxicity) properties to  
EN 45545 HL 3 for Passenger coaches


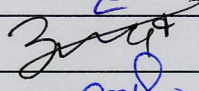
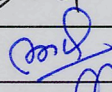

**Section-A :- Sr. No. 1 and 2 of Table-1 has been amended and shall be read as under.**

**Table-1**

S.No.	Property	Value	Tolerance	Unit	Test Method
1	Weight	250 (for 2 to 4 mm thick)	-----	gm/m <sup>2</sup>	ISO-9073-1
		600 (for 6 mm thick)			
2	Thickness	2 to 4	± 0.5	mm	ISO-9073-2
		6			

(DY.CME/D2)


<b>SPECIFICATION</b>	<b>Schedule of Technical Requirements for Fire barrier cloth for Seats and Berths meeting FST (Fire smoke and Toxicity) properties to EN 45545 HL3 for Passenger coaches</b>	<b>MMDTS 19021 REV-04</b> <b>Date: 05.08.2022</b> <b>Page 1 of 6</b>
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Name	Designation	Signature	Date	Level
Satyadeo	SSE / Design		19/09/22	Prepared
Abhinav Yadav	SME / Design-III		14.11.2022	Agreed
Lalit Kishore	Dy. CME / Design		14.11.2022	Reviewed
D.K.Singh	CDE		14.11.2022	Approved

#### Amendment History:

Issue/Rev	Date	Changes in brief.
Rev-01	10.10.2019	Complete specification revised.
Rev-02	20.11.2019	<ol style="list-style-type: none"> <li>Section A, Clause 2.5.1 Table 1, S.No.3,4 &amp; 5 Test values changed</li> <li>Section A, Clause 2.5.1 Table 1, Additional S.No. 9 added for Abrasion resistant</li> <li>Section A, Clause 7, The performance for tear &amp; loss in FST properties should not deteriorate from specified value during service of product.</li> </ol>
Rev-03	20.05.2020	<ol style="list-style-type: none"> <li>Section A, S. No.-9 of Table 1: Test method for Abrasion Resistance updated.</li> </ol>
Rev-04	05.08.2022	Eligibility criteria in clause 8 of section A deleted.

  
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## Foreword:

- 0.1 This schedule is intended to cover the technical requirements/provision relating to **Fire barrier cloth** for Seats & Berths. It also covers the tentative process and test protocol but does not include all the necessary provisions of the contract.
- 0.2 This schedule draws reference to some of the relevant ISO/EN/IS specifications. Unless otherwise specified, the latest version of the relevant specification shall be taken as reference.
- 0.3 For the purpose of deciding whether a particular requirement of this schedule is complied with the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with the IS:2-1960.
- 0.4 This schedule consist of two Sections i.e. Section-A and Section-B. Section-A covers the technical requirements, method of sampling and test of **Fire barrier cloth** for coaching stocks and Section-B covers infrastructure requirements for manufacture, testing and quality control at the works of the manufactures.

## Section-A

### 1. SCOPE:

This specification covers the technical requirements of **Fire barrier cloth** for Seats and Berths meeting FST (Fire Smoke and Toxicity) properties to EN 45545 HL3, to be necessarily used along with Flexible load bearing Polyurethane Foam cushions to **MMDTS 19020** (latest version) also separately meeting FST properties to EN 45545 HL3.

### 2. Technical Requirement & Physical Properties:

**2.1 Material:** The material of the Fire barrier cloth for Seats and Berths shall be light weight **Needle Felt of Aramid fibres** and thermostable fibre or Superior Preoxidised PAN material.

#### **2.2 Construction, Workmanship and Finish:**

**2.2.1** Fire barrier cloth shall be used for covering the PU foam of Seats and Berths as per relevant drawings of coaches. Upholstery shall be covered over the fire barrier-PU foam as per relevant drawings of the coaches.

#### **2.3 Colour:**

Unless otherwise specified the colour of Fire barrier cloth shall be of natural or black colour.


#### **2.4 Dimensions & Tolerance:**

The dimension and tolerance of the Fire barrier cloth shall be strictly as per the relevant drawing or as specified by the purchaser.

#### **2.5 Physical Properties:**

**2.5.1** Tests shall be conducted from the product as per the methods indicated for the respective tests shall conform to the following requirements:-

  
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**Table-1**

S. No.	Properties	Value	Tolerance	Unit	Test Method
1	Weight (Max)	250	-----	gm/m2	ISO-9073-1
2	Thickness	2 to 4	±0.5	mm	ISO-9073-2
3	Tensile strength	CD ≥ 150	Pass	N /5cm	ISO-9073-3
		MD≥ 100	Pass		
4	Tear resistance	CD≥100	Pass	N	ISO-9073-4
		MD≥70	Pass		
5	Elongation at 100 N	CD ≤ 80	Pass	%	ISO-9073-3
		MD≤80	Pass		
6	Heat Release Rate	R21-HL3 AS PER EN 45545-2			ISO-5660-1
7	Smoke Opacity				ISO-5659-2
8	Smoke Toxicity				ISO-5659-2 Annexe C
9	Abrasion resistance (9 kPa) cycle	70000	Pass	cycle	ISO-12947-2

**3. Approval of advance sample:**

The supplier shall be required to submit the details of manufacturing process and test certificates.

The testing shall be carried out as mentioned in above **Para 2.5.1 of Table-1**.

If the supplier is not OEM, firm should provide the test certification from approved fire barrier manufacturer.

**4. Sampling criteria for Fire barrier cloth unit :**

4.1 The test shall constitute type and acceptance tests. The testing charges, as applicable, shall be borne by the manufacturer.

**4.2 Acceptance Test:**


All the tests mentioned in Sr. Nos. 1 to 5 & Heat Release Rate test of Sr. No. 6 of **Table-1** will be an acceptance test.

**4.3 Type Test:**

Smoke density and Toxicity test for FST properties, as per Sr.no. 7 & 8 of **Table-1**, will be Type test for one year or earlier till a time sufficient laboratories in India as well as with firm's premises are developed. Fire property test shall be conducted at any laboratory which is assessed by "CERTIFER" Railway Certification Agency (list enclosed) , to perform test as per EN 45545-2 HL3 initially first time and after every 500 coach sets or if there is any change made to their tested formulation. In this regard report to be submitted to Consignee. The cost of testing will be borne by the manufacturer.

MCF reserves the rights to get FST property tested for any lot, for which charges will be borne by the firm. This type test has been provisional till a time sufficient laboratories are not available in the country.

  
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**5. Packing conditions:**

It should be ensured that mode of packing is such that possibility of damage, tearing etc. during transit & handling.


**6. Marking:**

Manufacturers name and lot number marking should be done on the inner side at appropriate place on the packaging.

**7. Warranty:**

Fire barrier cloth should necessarily have provision of 6 years warranty from the date of dispatch of coach from MCF, for any kind of performance related failure including tearing, loss in FST property etc and to be replaced with new Fire barrier cloth which shall again have warranty of 6 years from the date of replacement. The performance for tear & loss in FST properties should not deteriorate from specified value during service of product.

**8. Eligibility Criteria for Regular order: Deleted**

  
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## SECTION-B

### 1. SCOPE

This Section covers the infrastructural requirements for **manufacture** of Fire barrier cloth for Seats and Berths used in coaching stock.

### 2. REQUIREMENTS

All vendors seeking registration with MCF, shall comply all the requirements mentioned below.

### 3. PLANT, MACHINERY AND INFRASTRUCTURE REQUIREMENTS

3.1 The manufactures shall adequate space and a covered area with cemented floor to accommodate the following.

- a) Damp free place for storage of raw materials
- b) Independent manufacturing area for manufacturing of Fire barrier cloth.
- c) Inspection area.

3.2 The firm should have complete manufacturing facilities for Fire barrier cloth for Seats and Berths as per this schedule at their works. List of manufacturing facilities shall be provided.

### 4. TESTING FACILITIES:

The firm should have in-house testing facilities as suitable equipments for testing of parameters mentioned under Table-1 in Section- A or firm should submit test certificates of NABL accredited laboratory or of International Laboratory.

MOU with Reputed Raw material supplier for their support in setup of process and supplying the material .

### 5. QUALITY CONTROL REQUIREMENTS

5.1 The firm should have acquired ISO: 9001 certification and the product for which the approval is sought should be broadly covered in the scope of the certification for manufacture and supply.

5.2 The Quality manual of the firm for ISO: 9001 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.

5.3 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.

5.4 It should be ensured that there is a Quality Assurance Plan for the product detailing the following various aspects:

- Organization chart
- Process flow chart
- Stage inspection details from raw materials stage to finish product stage
- Various parameters to be checked and level of acceptance of such parameters indicated and method to ensure control over them.
- Disposal system of rejected raw material and components.

5.5 There should be at least one full time technologist having a minimum bachelor's degree in relevant field with experience of at least 5 years or a person with diploma in relevant field with 12 Years experience. He should be free from day-to-day production, testing and quality control responsibilities. He should be mainly responsible for development of a product, analysis of products, control over raw material, and corrective action in case of difficulties in achieving the parameters.

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- 5.6 Ensure that the in charge of the Quality Control Section is having a Qualification of minimum bachelor's degree in the relevant field and has a minimum of 5 years experience Alternatively he should be a diploma holder with minimum of 12 years experience. He should be actively involved in day-to-day activities of quality control/ stage inspection/ compliance of QAP etc.
- 5.7 The firm must ensure that proper analysis is being done on monthly basis to study the rejections at various internal stages and it is documented.
- 5.8 The firm should ensure that latest version of all the relevant specifications, IS standards are available with them.

#### 6. DOCUMENTATION

Firm shall maintain following documents/records:

- 6.1 A well documented Quality Plan.
- 6.2 Stage inspection results including finished products results.
- 6.3 Records of final products inspection by external agencies, Non-conformity reports and case analysis as well as action taken thereof.
- 6.4 Records for maintenance of M&Ps.
- 6.5 Ensure that proper systems are available for dealing with customer complaint.

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