

RAIL COACH FACTORY KAPURTHALA


0741700661

MD35131

Dated: 27-06-2017

**Sub: Issue of specification no. MDTs-25305 Rev-Nil Schedule of requirements of PVC based film for coach Interior**

Please find enclosed a copy of specification no. MDTs-25305 Rev-Nil Schedule of requirements of PVC based film for coach Interior, for information and necessary action at your end.

  
(D K Singh) 27/06/17  
Dy CME/D-2

CQM, CPLE, CWE (Fur), CMM/HSQ, CMM/Tkj, Dy. CMM/Fur/LHB, Dy CMM/G CMT, Dy.CPLE-III ,

SSE /LIB. Design

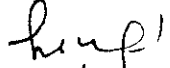

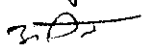
✓ SSE / Records

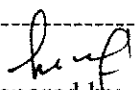
Copy for kind information to:


CDE

Dr. Pappal Sharma  
1  
27/06/17

Specification No. MDTS 25305 Rev-NII	Specification for PVC Based Film for Coach Interiors	Date 20.04.2017 PAGE 1 OF 5
---	---	--------------------------------

Name	Designation	Signature	Date	Level
Harish Kumar	SSE/Dev		20.4.17	Prepared
Suraj Prakash	Dy.CME/D-II		20.4.17	Agreed & Reviewed
A. K. Kathpal	CDE		21.4.17	Approved

  
Prepared by

  
20.4.17  
Agreed by

Specification No. MDTS 25305 Rev-NII	Specification for PVC Based Film for Coach Interiors	Date 20.04.2017 PAGE 2 OF 5
---	---	--------------------------------

**Technical Specification of Laminating Strip**

**1. General Requirements:**

The item should be durable, multi-layered PVC based film having pressure sensitive adhesive backing. It should adhere to laminates and metals and should be flexible enough to facilitate easy application.

The film shall be used to enhance the aesthetics and replace natural materials texture & finish. It should be able to withstand natural abrasion and impacts. It should be easy to clean using detergent (between pH 3 and 11) and water.

The film should be applied using pressure with appropriate tools without the use of any glue or fluid. The application of the film is to be carried out by OEM trained personnel. Use of primer for surface preparation and to increase adhesion shall be permitted.

**2. Service temperature**

After application the film should be able to perform satisfactorily between a temperature range of -10°Celsius to +60°Celsius.

**3. Physical and Chemical Properties:**

**a) Physical Characteristics:-**

<i>Characteristic</i>	<i>Description</i>
Material	Vinyl (PVC)
Thickness with adhesive	200 microns (typical)
Adhesive type	Acrylic pressure sensitive with air release, channels.
Liner	Polyethylene coated paper
RoHS Compliance	The film should be RoHS compliant

**c) Dimensional Stability:**

The film should be have a shrinkage of less than 0.5mm in both machine and non machine directions using test method given below

**Test method :-**

- Substrate:-Aluminum plate
- Size of film applied :- 150 x 150 mm (1mm thickness preferred)

*[Signature]*  
Prepared by

*[Signature]*  
Agreed by 20.4.17

<b>Specification No.</b> <b>MDTS 25305 Rev-NII</b>	<b>Specification for</b> <b>PVC Based Film for Coach Interiors</b>	<b>Date 20.04.2017</b> <b>PAGE 3 OF 5</b>
---	---	--

Cut:- "X" gash of length 100 mm x 100 mm

- Aging - 24 hours at 65 degree C
- Test result -The maximum gap on the strip shall be below 0.5mm

**d) Heat Resistance:**

The films should not change appearance of lose adhesion significantly after performance of this test

**Test method:-**

- Substrate:-Aluminum plate (1mm thickness preferred)
- Aging:- 15 days at 65 degree C
- Test result:-The adhesion and appearance of the strip should not change.

**e) Humidity Resistance:**

The film should not get affected by humidity thereby causing it to warp or disorient

**Test method:-**

- Substrate:-Aluminum plate (1mm thickness)
- Aging:-28 days at 40 degree C, 90%RH
- Test result:-The adhesion and appearance of the strip should not change.

**f) Impact Resistance:**

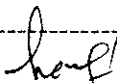
The film should be able to take some amount of impact and should not dent or tear because of the impact.


**Test method:-**

- Substrate:-Aluminum plate (1mm thickness)
- Testing machine:-Gardner Impact Tester
- Height of dropping : 5 ins.
- Weight of bob : 2 lbs.
- Temperature : 0 degree C
- Test result:-No effect on the surface of the strip.

**g) Chemical and Stain Resistance:**

This test is required to determine that the film is resistant to chemicals that it will be normally exposed to. At the end of the test the agents used should be easily removed without affecting the appearance of the film using water.

Prepared by 

Agreed by  20.4.17

Specification No. MDTS 25305 Rev-Nil	Specification for PVC Based Film for Coach Interiors	Date 20.04.2017 PAGE 4 OF 5
---	---	--------------------------------

**Test method:-**

- Substrate:- Aluminum plate (1mm thickness)
- Size of strip applied:- 50 x 50 mm
- Aging before testing:-72 hours at 23 degree C
- Test result:-

<i>Chemical Agent</i>	<i>Exposure Time</i>	<i>Results</i>
i. Coffee & Tea	5 hours	No effect
ii. Isopropyl alcohol;	5 hours	No effect
iii. Water	7 days	No effect
iv. Salt spray(5%)	7 days	No effect
v. Vegetable oil	1 day	No effect
vi. Tomato ketchup	1day	No effect

**h) Weather-ability:**

This test will determine the durability of the film

**Test method:-**

- Substrate:- Aluminum plate (1mm thickness)
- Testing machine:- Sunshine weather meter
- Black panel temp : 60-66 degree C
- Humidity : 40-50%
- Exposure time:-250 hours
- Test result:- No significant discoloration of the film

**i) Adhesion:**

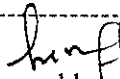
This test is performed to find out how well the film will stick to the surface on which it is applied.

**Test method:-**

- Testing machine : Tensile Tester
- Crosshead speed : 300mm/min.
- Condition : 25°Celcius
- Aging : 48 hours at 40°Celcius, 65%RH
- Substrate : Painted metal panel
- Result should be :- greater than 0.5kg/inch

**4. Fire Properties :**

Film should meets R1 HL3 classification as per EN 45545-2 .

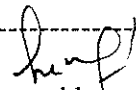
Prepared by 


Agreed by  20.4.17

Specification No. MDTS 25305 Rev-NII	Specification for PVC Based Film for Coach Interiors	Date 20.04.2017 PAGE 5 OF 5
---	---	--------------------------------

**5. Guarantee and replacement:**

- 5.1 The time period of guarantee should be 2 years for un-stuck film.
- 5.2 The time period of guarantee shall be 5 years from the date of application. The supplier shall replace all the films rejected on final acceptance due to their non-compliance with the requirements and those product that show deficiencies during the time period of guarantee by products complying with the requirements within a period of six weeks.

Prepared by 

  
Agreed by 20.4.17