

RAIL COACH FACTORY, KAPURTHALA


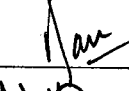


(MECHANICAL DESIGN DEPARTMENT)

TECHNICAL SPECIFICATIONS FOR WINDOW ARRANGEMENT MODULES FOR ALSTOM-LHB DESIGN COACHES

MDTS 087

REV.- 02

DATED : 30-05-2019

NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
Ashok Prajapati	SSE/Design		30.05.19	Prepared
Ravi Ranjan	ADE/Furnishing		30.5.19	Agreed
Abhey Priya Dogra	DY.CME/D-II		30.5.19	Reviewed
M.Bhimte	CDE		7.6.19	Approved

Issue /Rev	Details of Changes			Date
Rev-02	S.No.	Clause no.	Description	30.05.2019
	1.	2(4)	Incorporation of lavatory window with fixed louvers in lieu of hopper window	
	2.	4(1) & 4(2)	Three drain slots are provided on aluminium frame.	
	3.	4(3)	Aluminium frame & fixed louvers are black anodised	
	4.	4(7)	The exterior of window arrangement Shall align with exterior surface of the car body.	
	5.	6.0	72 months of warranty period instead of 36 months.	
	6.	4(8)	Note regarding replacement of glass unit deleted	
	7.	4(10)	Properties of aluminium profile deleted as these are covered in it drawings	
	8.	8(3B)	Note referring hopper window deleted	

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1.0 Scope:

This specification covers the general and technical requirements of window arrangement for ALSTOM-LHB Design Coaches.

2.0 Applicability:

These window arrangements are to be fitted in LSTOM-LHB design AC coaches. Following types of window arrangements are required.

1. window
2. Emergency window
3. Fixed Fixed small Window
4. Lavatory window

No. of windows required for various coaches shall be described by the purchaser at the time of placement or order.

3.0 Functional Requirements:

1. The window arrangement shall be of a modular unit and all windows shall be of same design.
2. The final finish & design of the window arrangement assembly should be such as to give an aesthetic appearance to the interior & exterior of the coach.
3. Mounting of the window assembly shall be possible only from inside the windows.

4.0 Description & Technical Requirements:

1. **Fixed Window:** The Aluminium frame shall be black anodised to ISO-7599 AA 20. The glass pane shall be fitted in the aluminium frame with a rubber profile. It should be possible to change the glass pane from inside of the coach. The frame shall be provided with three drain slots in the bottom part.
2. **Emergency Openable Window:** The Aluminium frame shall be black anodised to ISO-7599 AA 20. The glass pane shall be fitted in the aluminium frame with a rubber profile. It should be possible to change the glass pane from inside of the coach. The frame shall be provided with three drain slots in the bottom part. The rubber profile should be removable by pulling a red handle

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in the upper part of the window. The glass pane shall also be fitted on the inside with a small red handle to enable easy removal.

3. **Lavatory Window:** The Aluminium frame & fixed louvre frame shall be black anodised to ISO-7599 AA 20. The glass pane shall be fitted in the aluminium frame with a rubber profile. It should be possible to change the glass pane from inside of the coach. The frame shall be provided with two drain slots in the bottom part
4. **Fixed Small Window:** The Aluminium frame shall be black anodised to ISO-7599 AA 20. The glass pane shall be fitted in the aluminium frame with a rubber profile. It should be possible to change the glass pane from inside of the coach. The frame shall be provided with two drain slots in the bottom part.
5. **Emergency openable window:** The force for pulling out the emergency window shall not be more than 150N ($\pm 15\%$).
6. Window glass unit shall be as per MDTs 089.
7. The exterior of the window arrangement shall align with exterior surface of the car body.
8. The rubber profile shall be as per MDTs 030 and have following characteristics:

Property	Unit	Demand
Hardness	Sh	70 \pm 5
Tensile Strength	MPa	Min 7
Elongation at break	%	Min 200
Compression Set 22h/100°C	%	Max 50
Volume change oil nr 3 70h/100°C	%	Max +80
Oxygen Index	%	Min 30
Color	-	Black
Change after ageing 70h/100°C		
Hardness	Sh	Max ± 15
Tensile Strength	%	Max ± 30
Elongation at break	%	Max -50

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5.0 Mechanical Strength Requirement

1. The mechanical strength of the window arrangement has to meet the requirements para 4.2.2. of UIC 566.
2. The passenger coaches running on Indian Railway are designed for a service life of 30 years. The window arrangement are to be developed and assembled accordingly.
3. Resistance to Vermin: The section of materials (Insulation, Sealant, Rubber ,etc.) should be done with due consideration to their resistance to vermin (e.g. termites).

6.0 Warranty:

The supplier shall give warranty for the complete or part of window arrangement for failing or proving unsatisfactory in service due to defective design, material or workmanship within 72 months from the date of regular supply and shall replace the same at his own cost and risk.

7.0 Documents to be submitted by supplier for prototype approval:

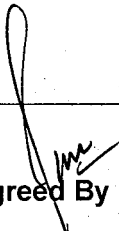
The following documentation for the assembly of the window arrangement are to be prepared by the supplier for submission along with the prototype assembly.

1. A set of drawings consisting of drawing and parts lists.
2. Clearly organised instructions for mounting and adjusting the window arrangement, changing the window arrangement and wearing parts.
3. Maintenance and repair instructions.
4. Technical description of the window arrangement.

8.0 Testing of Prototype & Regular production assemblies:

1. The supplier shall supply one porotype of the each window arrangement along with the documents indicated above for approval before commencing bulk supply. These prototype and drawings shall be examined from all viewpoints.


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2. Testing of window shall be done as per para 4.2.2. of UIC-566 and UIC-564 and the supplier shall submit a test certificate of successful testing from a reputed firm / laboratory in this regard.
3. Type test shall include the following.

a) Fixed Window large, small and Lavatory Window:

Classification of glass to IS:2553 Pt-1

Marking of glass

Surface treatment of Aluminium frame to ISO:7599 AA20

Measurement of Dimensions

Measurement of Weight

b) Emergency Openable window

In addition to type test for fixed windows, checking of the force for opening the openable window.

4. Supplier shall incorporate changes suggested by RCF in the prototype as well as bulk supply. The bulk manufacturer shall be undertaken only after the approval of prototype.
5. This clause is applicable for the first supply of a supplier. However, RCF shall have the right to repeat prototype approval process in subsequent order also, and in this regard RCF decision shall be final.

9.0 Upgradation of design:

Supplier may offer alternate design of window for all the above or any of the above clauses with a view to upgrade the design. Clause wise justifications shall be given by the supplier in such case. Windows having lower weight shall be preferred. Specification details may be deviated from those specified above, if sufficient technical justification is available. However, RCF's decision on all such matters shall be final.

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