

R.C.F.

Rail Coach Factory, Kapurthala

DTU/200400

MD35131

Dated: 24.05.2012

Sub: Issue of specification no. **MDTS 089 REV-03**

Ref: **CDE'S approval on NP-3 of loose case no MD46161 dated 22.05.2012**

With reference to above, please find enclosed a copy of specification or it's related information as dealt point wise below, for kind information and necessary action at your end.

Specification no. **MDTS-089**

rev.-03

● **"Schedule of Technical requirements for Sealed Window Glass unit for ALSTOM-LHB Design Coaches"**


SME/Dev-I

● CQM, CEE, CPLE, CWE/FUR, CWE/SHELL, CMM, CMT, CME/MP

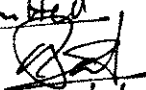
SSE/Lib. Design (with original specification)

✓
SSE/Records, SSE/DESIGN/RCF/TKJ

Copy for kind information to:

CDE

Dy CME/D1, Dy CME/D2, Dy CME/D3,

Submitted

26/5/12



R.C.F.

RAIL COACH FACTORY, KAPURTHALA

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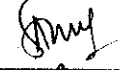


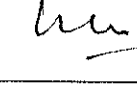
(MECHANICAL DESIGN DEPARTMENT)

SCHEDULE OF TECHNICAL REQUIREMENTS FOR SEALED WINDOW GLASS UNIT FOR ALSTOM-LHB DESIGN COACHES

MDTS 089

REV.- 03

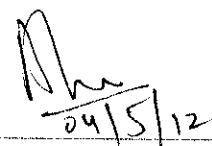
DATED : 02.05.2012

NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
AJAY PARSHAD	SSE/FD		21/5/12	Prepared
PARDEEP SHARMA	SME/DEV-1		04/5/12	Agreed
SURAJ PRAKASH	DY.CME/D-1		05/05/12	Reviewed
PARMANAND SINGH	CDE		22/5/12	Approved

Issue/Rev	Details of Changes	Date
Rev-03	<ol style="list-style-type: none">1. Clause 3.1 modified :<ol style="list-style-type: none">i) Dark colour anodizing of Aluminium spacer replaced with natural/black colour.ii) Minimum thickness of 4 microns for anodic coating specified.iii) Single joint Aluminium spacer specified2. "Optima Glass " replaced with "Float glass" for laminating glass , "Toughened clear glass" replaced with "Toughened glass"and Argon gas specified as an alternative to Krypton gas in clause no 2.3. Clause 3.7 added.4. Clause 6 deleted.5. Clause 7.1 leakage test revised.. Corresponding annexure-A deleted.6. Clause 7.3 added.	02.05.2012



PREPARED BY


04/5/12

AGREED BY

5

SPECIFICATION	<p style="text-align: center;">Technical Specifications for Sealed Window Glass Unit for ALSTOM-LHB design Coaches</p>	<p style="text-align: right;">MDTS:089 REV:03 Page 1 of 3</p>
		<p style="text-align: right;">Dated: 02/05/12</p>

1.0 Scope:

This specification covers the general and technical requirements and method of sampling and testing of sealed window glass unit to be used in the ALSTOM-LHB Design Coaches.

2.0 Applicability:

The panel shall be of the following configuration:

Outer laminated glass 8.38 mm thick (4 mm Float glass + 0.38 foil(PVB) + 4 mm Float glass).

Gap -6 mm Filled with Krypton/Argon gas.

Inner glass - 4 mm toughened glass.

Quantity per coach required and drawing applicable shall be described by RCF at the time of placement of order depending upon feasibility of the sealed window glass unit on the type of coach used.

3.0 Material Requirements:

3.1. The Aluminium frame (spacer) between the glasses shall be anodized in natural/black colour. The acceptable limit of thickness of anodic coating on aluminium frame is to be minimum 4 microns. Firm should submit WTC along with supply from OEM of Aluminium frame (spacer). Only perforated aluminium spacer filled with suitable desiccant having single joint should be provided. Uniform and smooth bending of Aluminium spacer should be ensured at the corners using suitable technique.

3.2. Butyl rubber based and polysulphide adhesive shall be used for hermetically sealing of the unit (Two sheets of glass separated by a metal spacer). This should not age with time and it should remain flexible to withstand the normal temperature variations expected on AC coaches.

3.3. The window glass unit shall meet the following characteristics as per EN410,EN673:-

Light Transmittance	$\geq 42\%$
Reflection	$\leq 30\%$

3.4. For lavatory/hopper type windows, the outer laminated glass shall be provided with non transparent layer e.g. white layer.

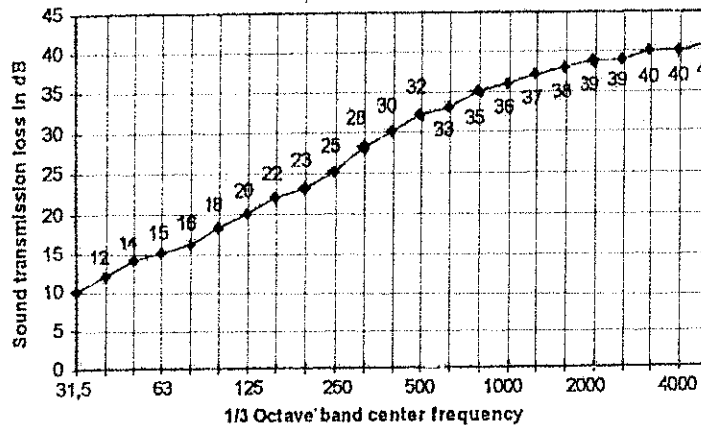

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SPECIFICATION	Technical Specifications for Sealed Window Glass Unit for ALSTOM-LHB design Coaches	MDTS:089 REV:03 Page 2 of 3
		Dated: 01/05/12

- 3.5. Outer edge of the sealed windows glass unit shall be smooth.
- 3.6. Sound transmission loss R for window in dB per 1/3 octave band is to be higher than or equal to the following values



- 3.7. Tolerances on overall thickness of sealed window glass unit assembly is to be taken as +1 and -0.5 mm.

4.0 Approval of advance sample:

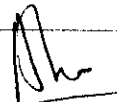
- 4.1. The supplier shall be required to submit the details of manufacturing process and test certificates. Testing shall generally be carried out as per clauses 7. In addition, tests as specified in IS:2553 Pt-1 shall also be carried out
- 4.2. The supplier shall be required to furnish following information along with the sample submitted for inspection.
- The expected life of sealed window unit.
 - Life of desiccant.

5.0 Sampling of sealed window unit:

- 5.1. Five per cent but not less than 5 units shall be selected at random from each lot. Each of units selected from a lot shall be inspected for dimensional tolerances, thickness, cracks, warp and finish.


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SPECIFICATION	<p style="text-align: center;">Technical Specifications for Sealed Window Glass Unit for ALSTOM-LHB design Coaches</p>	<p style="text-align: right;">MDTS:089 REV:03 Page 3 of 3</p>
		<p style="text-align: right;">Dated: 02/05/12</p>

5.2. The samples from lots selected in clause 5.1 passing inspection as mentioned in clause 5.1 shall be tested as per procedure laid down in clause 7.

5.3. If any sample passes inspection/testing as per clauses 5.1 and 5.2 the whole lot shall be accepted. If any of the sample does not pass the requirement of either of these clauses, the whole lot shall be rejected.

7.0 Test for sealing of unit:

The following tests shall be carried out on the sealed window unit.

7.1. Place the sealed window glass unit inside the water in fully submerged condition. Leave it for one hour. Take out and observe for presence of water in the air gap area of the glass unit. There should not be any leakage of water inside. If any leakage is found, the test sample shall not be subjected to further tests.

7.2. Take a small cup of copper having 60 mm diameter at base. Fill it with mixture dry ice and acetone. Place it with over the top of sealed window glass unit for about 8-10 minutes. Remove the cup and observe the formation of moisture on the unit. No condensation should be observed after the cup is removed. This test may be carried out at 4-5 different locations. The temperature of dry ice and acetone mixture should be within -35 to -45 degree C.

7.3. The testing of anodising on aluminium frame between glasses (spacer), if required, is to be carried out as per IS:8375-1977.

8.0 Packing conditions:


8.1. Sealed window unit is a fragile material. It should be ensured that mode of packing is such that possibility of breakage during transit & handling is eliminated.

9.0 Marking:

9.1. Manufacturer's name should be indelibly marked on the upper right hand corner of toughened glass on each window glass unit.


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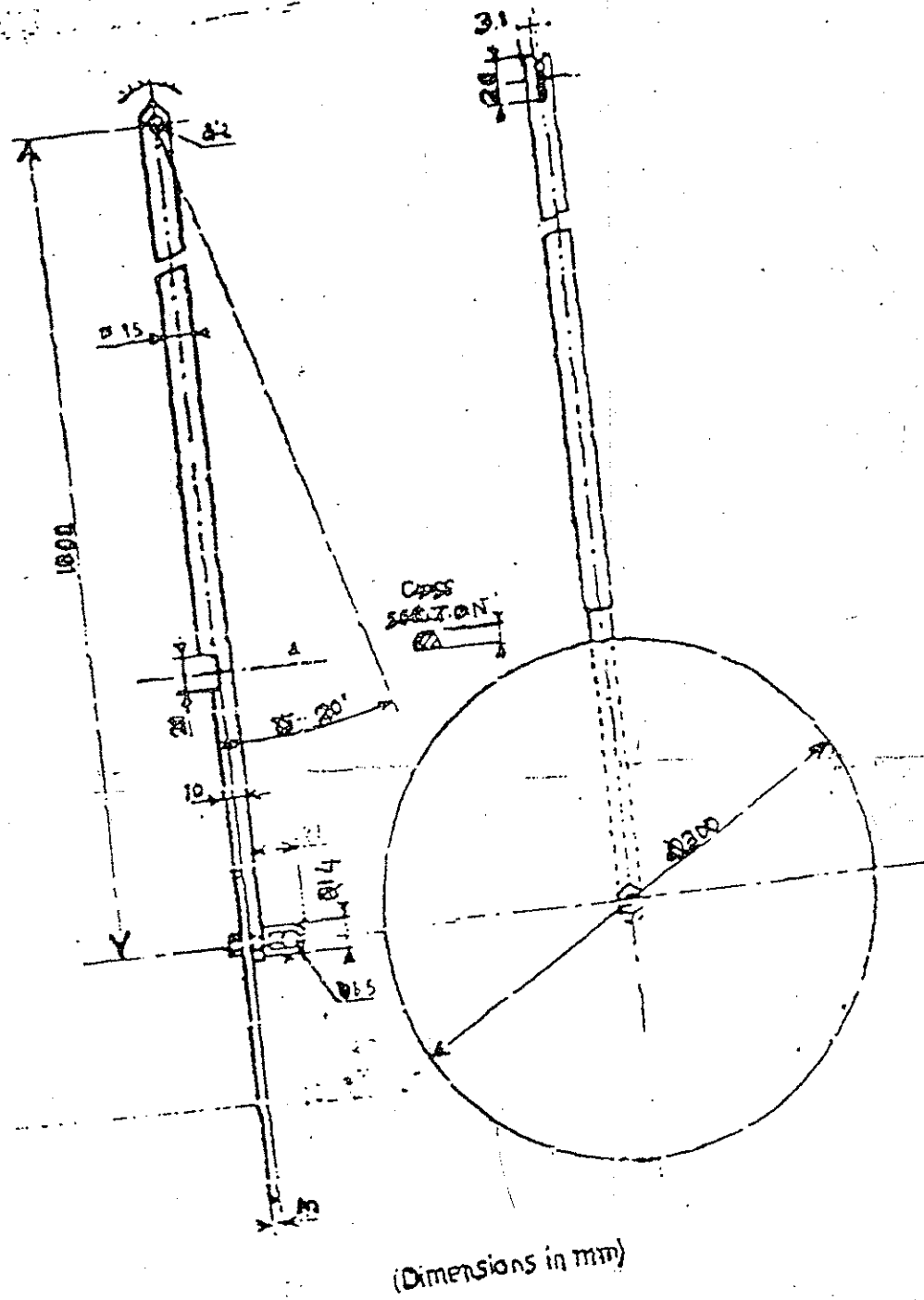


Fig.1

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