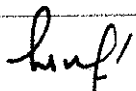





Specification	Schedule of Infrastructural Requirements for Manufacture and testing of Window Unit of LHB-AC Coaches	MDST: 138, Rev: 01 Page 1 of 3 Date:06/03/2017
---------------	---	--

Name	Designation	Signature	Date	Level
Harish Kumar	SSE/Dev		6/3/17	Prepared
Balwant Singh	SME/ Design		6/3/17	Agreed
Lalit Kishore	Dy. CME/D-I		6/3/17	Reviewed
A.K. Kathpal	CDE		6/3/17	Approved

Issue / Rev.	Details of changes	Date
01	Para 2.2.3, 2.2.5, 2.2.7 & 2.2.14 modified.	06.03.2017

  
Prepared By

  
Agreed By

Specification	Schedule of Infrastructural Requirements for Manufacture and testing of Window Unit of LHB-AC Coaches	MDST: 138, Rev: 01 Page 2 of 3 Date:06/03/2017
---------------	---	--

**1. General**

This section covers the infrastructural requirements for manufacture and testing of window unit of LHB-AC coaches.

**2. Eligibility Criteria:**

2.1 The tenderer must submit clause-wise comments on the specification. In absence of clause-wise comments, offers shall be deemed as incomplete and may not be considered.

2.2 The manufacturer shall have following infrastructure facility in-house for manufacturer and testing of window unit of LHB-AC coaches:

2.2.1 Adequate space and covered area, cemented floor for storage of raw material required for manufacture of window including bought out items, finished assembly and inspection area with proper ventilation system.

2.2.2 At least one power hacksaw/chop saw to cut Aluminium extrusions of window to required lengths.

2.2.3 At least one no's of *manual bending machine with suitable fixture* to bend the Aluminium extrusion into required angle and shape. In case of manual bending machine, the firm shall have all required gauges to check and control the required radius and to maintain integrity of bending.

2.2.4 At least one portable and one pedestal-drilling machine to drill different sized hole in window units.

2.2.5 At least one no's of vertical drilling machine with compound sliding table to machine drain slots on Aluminium extrusion of the window.

2.2.6 The firm shall have anodizing facility for different sized windows.

2.2.7 The firm should have in-house facility to manufacture sealed glass unit **OR** have tie-up with reputed vendor for manufacture of sealed glass unit which should have all the facilities for manufacture of sealed glass unit such as:

2.2.7.1 Castor table

2.2.7.2 Spacer bar snip-cutting machine and spacer bar bending machine

2.2.7.3 Manual/automatic desiccant dispenser.

2.2.7.4 Automatic multi-gas filling station with digital display.

2.2.7.5 Poly-isobutyle sealant (PIB) application machine

2.2.7.6 Pneumatic hot melt adhesive applicator with adhesive guns to apply the Polysulphide/Silicon (secondary sealant) to seal the window units.

2.2.7.7 Adequate cutting tools, brushes, etc.

*[Signature]*  
Prepared By

*[Signature]*  
Agreed By

Specification	Schedule of Infrastructural Requirements for Manufacture and testing of Window Unit of LHB-AC Coaches	MDST: 138, Rev: 01 Page 3 of 3 Date:06/03/2017
---------------	---	--

- 2.2.8 The firm shall have proper palletization system to store glasses before manufacture of glass units.
- 2.2.9 The firm shall have facility to wash glasses with demineralized water before assembly into a unit.
- 2.2.10 The firm shall have all measuring instruments like measuring tapes, steel scales (300, 600 & 1000 mm) and Vernier calipers (0-300 mm).
- 2.2.11 The firm shall have Digital Gloss Meter with 45° and 60° to measure gloss value of the anodized surface of aluminium extrusion of window.
- 2.2.12 The firm shall have at least one number of DFT meter.
- 2.2.13 The firm shall have Test sample preparation facilities like vice, cutter, polishing files etc. for preparation of various samples for test for tensile strength, hardness, specific gravity etc.

**2.2.14 Testing facilities:**

- a. The firm shall have following testing facilities in-house:

- 2.2.14.1 Water leakage testing facility to test sealed window glass unit against any leakage.
- 2.2.14.2 Leakage testing facility with dry ice and acetone.

- b. Testing facilities: The firm either shall have testing facilities in-house OR have tie-up with NABL accredited test house OR their OEM shall have in-house/ tie-up with NABL accredited test house for following:

- 2.2.14.3 Non-destructive testing apparatus for checking the thickness of anodic coating.
- 2.2.14.4 Testing facility for checking properties on anodic coating viz. abrasion resistance, fastness to light, quality of sealing, corrosion resistance, etc.
- 2.2.14.5 Light transmittance, reflectance, infrared radiation transmittance, etc. of sealed window glass unit.

- 2.3 The manufacturer shall be an ISO: 9001 certified company.

**3. Identification Marking:**

Each window and glass unit should have manufacturer's identification mark, serial number and date of manufacturing to facilitate identification/correlation with the inspection/ test result.

-----X-----

*[Signature]*  
Prepared By

*[Signature]*  
Agreed/By