

Rail Coach Factory, Kapurthala

MD46231

Dated: 18.12.2018

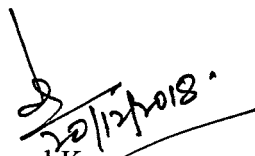
Subject: Issue of specification No. MDTS 21323, Rev.-Nil .

Please find enclosed a copy of specification No. MDTS 21323, Rev-Nil for information and necessary action at your end.

Specification No. **MDTS 21323, Rev-Nil .**

Schedule of Technical Requirements for Supply and Manufacture of Stainless Steel Roof Assembly for LHB coaches.

Records to be updated accordingly.


Kamal Kumar
(DY. CME/D-1)

CQM, CPLE, CWE(SHELL) CMM/HSQ, CMT, DY. CPLE-III

SSE/RECORD (with original specification)

SSE/LIB. DESIGN

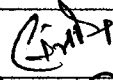
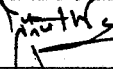

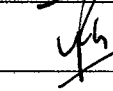
SSE/DESIGN/RCF/TKJ

copy for kind information to:

CDE

**Schedule of Technical Requirements For supply and manufacture
of Stainless steel Roof Assembly for LHB Coaches**


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Name	Designation	Signature	Date	Level
Sanjeev Kumar	SSE/Roof/Design		15.11.2018	Prepared
Pardeep Luthra	ADE/Shell & Bogie Design		15.11.2018	Agreed
Kamal Kumar	Dy. CME/D-1		15.11.2018	Reviewed
Manish Bhimte	CDE		15.11.18	Approved

Issue/Rev.	Detail of changes	Date



Prepared by


15.11.2018

Agreed by

Schedule of Technical Requirements For supply and manufacture of Stainless steel Roof Assembly for LHB Coaches

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1.0 GENERAL :

This schedule covers infrastructure requirements for manufacture, testing and supply of completely finished fabricated Roof Assembly for LHB coaches.

2.0 SCOPE OF SUPPLY :

Manufacture of stainless steel Roof Assembly for LHB coaches is to be supplied in all respect conforming to the relevant drawing & schedule of requirement of tender schedule.

3.0 CERTIFICATIONS & OTHER REQUIREMENT :

3.1 The tenderer shall have valid ISO 9001-2008 series certification.

3.2 It is desirable that the tenderer is accredited with ISO-3834 certificate.

3.3 The tenderer shall provide list of M&P 's and past performance documents.

3.4 The tenderer shall have adequate manufacturing facilities mentioned in Para 5.

Complete Roof Assembly shall be manufacture as per specified drawings and specification mentioned in purchase order.

4.0 AVAILABILITY OF INFRASTRUCTURE FACILITY AT MANUFACTURER PREMISES IN WORKING ORDER:-

4.1 ESSENTIAL M&P REQUIREMENT :

4.1.1 Straightening machine for Straightening sheet before laser profile cutting and fabrication work..

4.1.2 Firm should have at least one CNC Laser cutting machine in working order. Availability of CNC laser cutting machine is must for 'approved vendors for regular order'. However, development order can be placed on a form having valid tie-up in the form of MoU with the agency having CNC laser cutting machine in-house in working order. A copy of MoU is to be submitted along with the tender in absence of above, offers shall be deemed as incomplete and may not be considered.

4.1.3 Firm should have Cold roll forming machine or valid MoU with OEM's having Cold Roll Forming machine with suitable capacity for forming of roof assembly.

4.1.4 Spot welding machine of suitable capacity with adequate clear space to handle 18 mtr. long sub assemblies with handling arrangement ((automatic/robotic machine preferably)

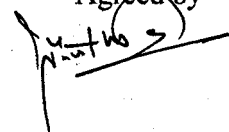
4.1.5 CNC Press brake of at least 100t capacity and suitable width for forming of roof components.

4.1.6 At least one shearing machine of cutting capacity up to 5 mm.

4.1.7 Adequate machining facility comprising universal milling machine ,drilling

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- machine, lathe with pipe threading facility etc. should be available.
- 4.1.8 Roll bending machine/ Tool & die for Roof Arch profile bending.
- 4.1.9 Minimum two hand grinders for removal of fibs & burrs shall be available. Grinding wheels shall be free from iron , iron oxide, zinc or other undesirable materials that may cause contamination on the surface.
- 4.1.10 Tenderer should have TIG and MIG welding machine. TIG with only Argon Gas and MIG welding shall be used only with tri mixture gas 90% argon+5% O₂+5 %CO₂ gas.
- 4.1.11 Level surface table of size 2m x 3m.
- 4.1.12 Suitable degreasing/de-rusting facilities for items other than Stainless Steel.

5.0 RAW MATERIAL, CONSUMABLES AND WORKING AREA :

- 5.1 Procurement of raw material/sheets should be done from the reputed stainless steel producer in country such as 1. M/S Sail, 2. M/s Jindal. For any other reputed material source, approval of RCF is required.
- 5.2 Proof of procurement of raw material from OEM or from his authorized distributor along with material test certificate confirming to specified grade of steel shall be submitted from OEM along with supply.
- 5.3 Separate covered area approx. 2000 sq.mtr. for manufacturing only stainless steel required to avoid iron contamination and also having adequate space underneath for storage of raw material e.g. sheets, billets, round corner squares, rounds etc.
- 5.4 The covered area should have display board showing different material grade's color shades/codes nominated to different grades of steel to avoid mix up of materials. Evidence for the above shall be submitted along with tender document.
- 5.5 Electrodes , hardware should be procured with test certificate from the authorized distributor of RDSO approved sources / manufacturers only.

6.0 MATERIAL HANDLING EQUIPMENTS :-

- 6.1 Firm should have two nos. Overhead crane of 2 t (Min) capacity and one no. Fork-lift for handling assemblies. Handling equipment such as nylon slings, hooks and lift truck fork should be protected with clean wood/plastic/nylon to eliminate contact with the iron surface.
- 6.2 Manipulators for carrying out down hand welding.
- 6.3 Firm shall have necessary jigs and fixtures to ensure geometrical tolerances & dimension as specified in the drawing.

7.0. MEASURING AND INSPECTION AND TESTING EQUIPMENTS :

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- 7.1 Firm should have calibrated measuring instruments like Vernier caliper, Micrometer, Measuring tape, Steel scale, welding gauges, thread gauges and straight edge etc.
- 7.2 Dye penetration testing for welding joints.
- 7.3 Macro etch test for fusion of fillet weld.
- 7.4 Peel test and Chisel test of spot weld as per DIN 8.1.M.2007.
- 7.5 Root bend , Face bend test for butt welds.
- 7.6 Each completed assembly of the roof shall be tested for water leakage at the works of the manufacturer. Approximate test scheme and rig may be devised for the same to the satisfaction of RCF design representative.
- 7.7 The manufacturer shall have in house/ tie-up arrangement for carrying out spectro and mechanical analysis of the material with NABL accredited labs at their own expense as and when required.

8.0 Working instruction:

Coach Wise process planning fabrication working instructions to be followed for fabrication of Roof Assembly.

9.0 PRECAUTIONS :

The firm shall take the following precautions during manufacture / supply of stainless steel assemblies.

- Joint area to be welded must be clean. Use only stainless steel wire brush.
- Joint area must be free of grease, oil, water, dirt, finger marks.
- Use good commercial solvent cleaner to clean the weld area before welding.
- Arc strikes adjacent to weld must be avoided.
- Avoid excessive heat input.
- Grind the weld flush.
- Size of Spot weld shall be chosen as Per DIN 8.1.M.2007. Spot size shall not be less than 6 mm for 2 mm or less thickness and not less than 9mm for above 2mm upto 3mm thick sheets.

10.0 FINISH :

- 10.1 Exterior of roof panels shall be without bulges or depression that could be visible after painting. Concavity or convexity shall be less than 1.5mm in a length of 2.5 meters and in this proportion for shorter length. The indices of concavity or convexity should be taken as guidance for manufacturing. A prototype sample (2Nos.) as per [P.O. drawing should be submitted to RCF by any New vendor seeking approval for supply of these sub assemblies for demonstrating the

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surface finish achieved by the firm and for prior approval before bulk manufacturer of sub assemblies.

- 10.2 Post welding stainless steel wire brush cleaning using mechanised wire brush should be done for roof sub assemblies. Roof (on either side of each) would require to be provided with suitable primer as approved by RCF, on both sides, leaving 50 mm strip along the edges that are required to be further integrated with other sub assemblies by welding.

11.0 MAN POWER :

Only qualified welders with ITI or equivalent shall be deployed. Supervisors with minimum qualification of diploma in mechanical engineering, Industrial engineering and production technology shall be deployed for monitoring of production and quality control respectively.

12.0 QUALITY CONTROL REQUIREMENTS :-

- 12.1 There shall be a system to ensure traceability of the product from raw material stage to finished product stage. Quality Assurance Plan (QAP) for the following aspects shall be ensured and approved by CDE/RCF.
- 12.2 Process flow chart.
- 12.3 Stage wise inspection details from raw materials stage to finished product.
- 12.4 Check list for critical monitoring of stages to be prepared and followed
- 12.5 Various parameters to be checked and level of acceptance of such parameters indicated and method to ensure and control over them.
- 12.6 Disposal system of rejected raw material and components.

13.0 DOCUMENTATION :

Following documentation should be maintained:

- i) Incoming raw material register.
- ii) Stage inspection results including finished products results as per QAP.
- iii) Record of internal rejection and its analysis vis-à-vis action plan.
- iv) Record of final products inspection by external agencies.
- v) Record of maintenance schedule of machinery and plant.
- vi) Record of training imparted, Quality assurance, safety parameters and maintenance of machinery etc.

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14.0 PROTOTYPE INSPECTION :

Prototype inspection will be done by RCF or its authorized agency in stages. Successful tenderer would be required to submit quality assurance plan (QAP) and stage wise inspection plan (SWIP) before prototype manufacture is undertaken. Bulk supply will be made after prototype sample approved by CDE/RCF.

15.0 ROUTINE INSPECTION :

Routine inspection of each finished item shall be carried out as follows for spot welds :

A. Paper test :- A stiff white paper shall be passed at random locations (at least two locations in each window bay) between spot welded members to ensure that the welding took place and there is no gap. If paper passes freely then the item stands rejected.

B. Chisel test :- A chisel should be driven between two spot welds until one or both welds break. The fractured nugget should form cup and cone shaped fracture and size of nugget should be approx. to the size of spot weld. This test is to be done at two random locations to ensure fusion of spot weld. If the result is not satisfactory, the item stands rejected. If the result is satisfactory, the tested area should be levelled by tinkering and TIG welded.

16.0 MARKING :

The tenderer name or initial with month and year of manufacture shall be marked in the finished products unless otherwise specified in the relevant drawings.

17.0 PACKING INSTRUCTION :

The supplier to ensure the safe transit and delivery of material up to consignee by adopting suitable mode of transport and handling transit damage if any shall be the cost of supplier.

The surface shall be properly protected against rubbing /impact/ scratches during transportation via wagon / truck / trailers by wooden blocks / rubber pads at suitable locations in the transportation fixtures.

Due care should be taken to avoid mechanical damage during loading / transit / unloading. The packing should be such that while un packing the consignment at RCF there should be no damage / dent mark to the finished products. As far as possible recyclable material to be used in packing of sub assemblies.

Transit insurance shall be in the scope of supplier.

Prepared by

Agreed by

No.MP51003/LHB

Dated: 02.11.2018

Sub: MDTS for LHB roof.

Ref: Inspection Note of MRS dt.23.10.18.

In view of inspection note of MRS, the target of coaches is likely to be increased to 1500. In order to meet the targets, the off-loading of LHB roof for ACCN, SCN & LS (Deen Dayalu) is under consideration. Design is requested to provide: -

1. MDTS
2. Applicable drawings for AC & Non-AC LHB Coaches for procurement from trade.
3. Eligibility criteria to be followed.
4. Likely sources
5. Estimated rate

Matter may be treated as most urgent.

B. J. 2.11.18
Dy.CPLE-III

Dy.CME/D1

Copy for kind information to:

CDE
✓ CPLE

CDE

To be done on
work footing.

[Signature]

3.11.18