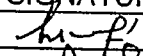
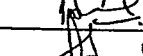




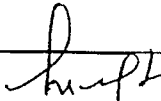
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SCHEDULE	SCHEDULE OF INFRASTRUCTURAL REQUIREMENTS FOR MANUFACTURING & TESTING OF NATURAL FIBRE THERMOSET COMPOSITE (NFTC) SHEET FOR ROOF PANELLING TO SPEC. NO. C-9511	MDST:03 Rev:NIL PAGE 1 OF 4
		Dated 09.11.2005

SCHEDULE OF INFRASTRUCTURAL REQUIREMENTS FOR MANUFACTURING & TESTING OF NATURAL FIBRE THERMOSET COMPOSITE (NFTC) SHEET

NAME	DESIGNATION	SIGNATURE	DATE	LEVEL
Harish Kumar	SSE/TOY		9/11/05	Prepared
Jegadev Suresh	AD/ENV		9/11/05	Agreed
Amitabh Sinha	Dy. CME/TOY		14/11/05	Reviewed
S. K. Aggarwal	CDE		27/11/05	Approved

Issue/Rev	Details of Changes	Date


Prepared By


Agreed By

SCHEDULE	SCHEDULE OF INFRASTRUCTURAL REQUIREMENTS FOR MANUFACTURING & TESTING OF NATURAL FIBRE THERMOSET COMPOSITE (NFTC) SHEET FOR ROOF PANELLING TO SPEC. NO. C-9511	MDST:03 Rev:NIL PAGE 2 OF 4
		Dated 09.11.2005

1. SCOPE

- 1.1 This schedule covers the infrastructural requirements for manufacture & testing for natural fiber composite (NFTC) sheet for roof paneling for passenger coaches to RDSO specification C-9511.


2. REQUIREMENTS

- 2.1.1 The vendor seeking approval shall comply with the under mentioned requirements from para 3 to 6.

3. GENERAL AND MANUFACTURING FACILITIES

- 3.1 Manufacturers should have adequate storage space for raw material and finished products. Storage of the raw material as well as finished product should be in covered area.
- 3.2 The Weighing facilities for measuring various raw materials constituents should be available. The following facilities are required:
- Electronic weighing balance of minimum 5 kgs capacity.
 - Mechanical spring balance of the capacity of minimum 50 kgs.
- 3.3 It should be ensured the weighing machine are calibrated regularly and the frequency of the calibration is specified
- 3.4 Manufacturer should have a suitable capacity of resin mixing machine.
- 3.5 The firm shall have adequate no. of moulding press of adequate capacity and necessary infrastructure for required for making of NFTC sheets of finish size 1525 x 3050 mm. The presses should be fully equipped with temperature indicator along with timer, heating and cooling system to maintain the uniform properties.
- 3.6 Suitably designed dies and moulds for the product (min. 2 no's) should be available.
- 3.7 Manufacturer should have a minimum infrastructure for maintenance and polishing of dies and moulds.
- ## 4. TESTING FACILITIES:
- 4.1 Tensile testing machine capable to read the load and elongation as per the requirement of the product should be available.
- 4.2 Minimum two numbers air ovens should be available to facilitate testing in accordance


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with specification C-9511.

4.3 At least one number viscosity cup should be available.

4.4 Below mentioned instruments in adequate number should be available :

- Micrometers
- Dial Gauges
- Vernier caliper
- Digital temperature indicator
- Pressure gauge
- Deep Throat micrometer
- Digital micro Ohm meter

4.5 Suitable facilities for cutting the test specimen from the product should be available.

4.6 The firm should have facilities for conducting flexibility test in accordance with specification no. C-9511.

4.7 Manufacturer should have facilities for conducting test for drop impact in accordance with specification C-9511.

4.8 Manufacturer should have facilities for conducting break load test in accordance with specification C-9511

4.9 Manufacturer should have facilities for conducting test for resistance to spread of flame in accordance with specification C-9511.

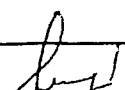
5. QUALITY CONTROL REQUIREMENTS

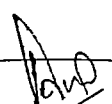
5.1 The manufacturer shall have their own valid ISO9000 series certification for the product for which approval is sought.

5.2 There should be a system to ensure the traceability of the product from raw material stage to finished product stage.

5.3 The vendors seeking approval must ensure that their QAP for the product details various aspects as follows :

- Organisation chart
- Process flow chart
- Stage inspection details from raw material stage to finish product stage.


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- Various parameters to be checked and level of acceptance of such parameters and method to ensure control over their-in.
- Disposal system of rejected raw materials and product.

5.4 There shall be atleast one graduate degree holder in relevant technology and with field experience of atleast 5 years or a diploma holder with experience of 10 years in relevant field technology for regular production and quality control.

5.5 Latest version of all relevant specification, IS, ASTM and RDSO standards and drawings with latest alteration should be available with the firm.

5.6 It should be ensured that proper analysis is being done on monthly basis to study the rejection at various stages of production and the same should be documented.

6. DOCUMENTATION

Firm shall maintain following documents/records:

6.1 A well documented Quality Plan.

6.2 Incoming raw material register should be checked as per approved QAP.

6.3 Maintenance of stock register for use and balance of raw materials, bought out items etc.

6.4 Stage inspection results including finished product results, as per approved QAP.

6.5 Records of internal rejection and its analysis vis-a-vis action plan.

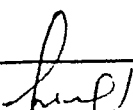
6.6 Records of final product inspection by external agencies (like RDSO), NCR and case analysis as well as action taken thereof.

6.7 Records for maintenance of dies/moulds.

6.8 Ensure that proper system is available for dealing with customer complaints.

7. TRAINING

7.1 Training needs should be identified for all concerned officials and regular training shall be organised and imparted on maintenance of machines, quality assurance, safety parameters etc.


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