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सत्यमेव
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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE & SUPPLY OF GLASS BACKED UNIFORM MICA SHEET GUA –CN-3 FOR HITACHI TM (HS-15250A) OF ELECTRIC LOCOMOTIVES

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1. SCOPE

This Schedule of Technical Requirement (STR) mentioned here under is being issued to serve as a guidelines to manufacturers (called the "firm" hereafter) for manufacture Glass Backed Uniform Mica Sheet GUA –CN-3 , format of quality assurance plan to be followed ,minimum machinery and plant, testing facility and measurement facility required . This STR should be read in conjunction with the relevant CLW/Hitachi specification. The firm should satisfy themselves having complied with the requirements of the specification and STR. This material shall be used in Class 200 insulation system used in Hitachi Traction Motor Type HS-15250 A.

2. REFERENCE :- Hitachi Specification No. A 0270

3. GENERAL REQUIREMENTS

3.1 The firm should be certified to ISO: 9001 by an agency accredited by NABCB and the concerned item is included in the scope of this certification.

3.2 A system of regular submission of rejection details of material giving rejection rate, cause of rejection, corrective action taken etc. on quarterly basis should be followed by the firm.

3.3 The firm shall have a system of documentation in respect of rejection at customer end, warranty replacement and failure of item supplied by them during service.

3.4 The firm shall have a system of recording the plant, machinery and control equipments remaining out of service, nature of repairs done etc.

3.5 The testing and measuring equipment shall be duly calibrated and the validity of calibration should be current and calibration certificate issued by the Calibration Agency should be maintained.

3.6 The firm shall have a system of easy traceability of the Input materials from manufacturing stage to finished product stage. From the finished product it should be possible to back trace the input materials details eg: lot no , suppliers name and record of tests carried out for acceptance etc. Stamped identification marking with serial number should be used for this purpose.

4.0 QUALITY ASSURANCE PLAN (QAP)

The firm shall prepare a Quality Assurance Plan (QAP) for the item for which approval is sought and submit the same as part of compliance of this STR. The QAP shall be a comprehensive document covering the following aspects:

1) Quality assurance plan should consists of all activities from raw material to finished product for manufacturing the item for which approval is sought.

i) Details of Quality Control Organisation of the firm along with key personnel engaged in the QC function.

ii) Quality Assurance Process of incoming materials, manufacturing processes used for the subject items. Including type of tests, sampling criteria, governing specification, acceptance norms, agency of test, format of records etc.

iii) Detailed process Flow Chart indicating process of manufacture for an individual product.

iv) Quality Assurance System – Inspection & Testing Plan including the on line and stage inspection.

v) Calibration scheme and status of calibration of equipments used in the quality process.

vi) The quality assurance plan covering all the above information must be in the form of single document indicating the name of the firm and page no. 'X' of 'Y' on each page. Each page should be signed by QC in charge

5.0 QUALITY CONTROL ORGANISATION

5.1 The complete organizational setup of the Quality control key personnel and officials along with their qualification and experience should be furnished.

5.2 The Quality Control organization should be headed by a senior level official having adequate technical qualification who shall directly report to plant in-charge.

6.0 INCOMING MATERIAL

6.1 A complete Bill of Material indicating all input material items required for manufacturing of the product, governing specification and their sources of supplies as approved by the firm in accordance with Clause 7.4.1 of ISO-9001 (2000) should be furnished.

6.2 The manufactures shall procure all the raw materials from RDSO/CLW approved sources along with test certificates and same should be available as & when asked for.

6.3 Test results of all incoming raw materials with reference to Test Certificates issued by the suppliers and the results of internal tests carried out by the firm for verification may be submitted as part of QAP.

7.0 PROCESS OF MANUFACTURE

7.1 Complete Process Flow Chart covering all steps of process of manufacture for an individual product shall be clearly enlisted as a part of QAP.

7.2 Details of Jigs and fixtures used during manufacture should be furnished along with the manufacturing process wherever used.

7.3 List of typical M & P required for manufacture is furnished in **Annexure- I.** The list is for general guidance only and actual manufacturing operations shall be submitted and got approved by the firm as a part of QAP.

8.0 QUALITY ASSURANCE PROCESS- INSPECTION AND TESTING PLAN

8.1 Complete Inspection and testing Chart covering all steps of process of manufacture for an individual product including final inspection should be clearly enlisted as a part of QAP.

8.2 The following details of measuring instruments/equipments/jigs/fixtures used for all the steps of measurement operations should be included:

- Make and model of the measuring equipment
- Accuracy
- Quantity to be measured.

8.3 Stage inspection detailing inspection procedure, inspection parameters, and method of testing/test procedure including sample sizes for destructive and non-destructive testing. Record of test results of stage inspection should be available and furnished.

8.4 The list of Testing and Measuring instruments are furnished in **Annexure-I** for general guidance only. However the specific Testing & measuring instruments, gauges used by the firm will also form part of QAP, which shall be submitted and got approved by the firm.

ANNEXURE-I

A- MACHINERY & PLANT (M& P) FOR MANUFACTURING

The following is the indicative list of M&P facilities to be available with the firm:

1. Mixer (Varnish preparation unit which consisting pre heating device & agitator)
2. Air Drier (Steam Boiler or any other heating unit)
3. Impregnating and Laminating machine having proper controlled heating zone.
4. Cutting / Shearing Machine
5. Winding machine
6. Air Conditioned Room for storage of raw material and finished product

B- LIST OF TESTING FACILITIES:

1.0 Calibration of the Testing / Measuring Equipments should be done at least once in a year unless stated otherwise.

2.0 Inspection Staff conducting all testing shall be adequately trained and qualified and shall have adequate experience.

3.0 Staff conducting tests like High Voltage and High frequency test shall have adequate skill & competence and shall have under gone sufficient training.

Following testing facilities should be available with the firm:

1. High voltage tester (up to 5 kv)
2. Laboratory oven (up to 250 ^{0}C)
3. Muffle furnace (up to 600 ^{0}C)
4. Thermo gravity analyzer (optional , the firm can avail the facility of National Laboratories/ NABL approved labs)
5. Dummy Hitachi Traction Motor MP Coil (Dimn.of Approx.43 x 73mm,corner Dia 2.5mm) or CP coil (Dimn.of Approx.35 x 82mm,corner Dia 3.2mm)
6. Tensile strength tester
7. Ford B 4 Cup

C- LIST OF MEASURING INSTRUMENTS

Calibration of the Testing / Measuring Equipments should be done at least once in a year unless stated otherwise.

1. Micrometer
2. Scale
3. Vernier caliper
4. Electronic Balance(up to 3 digit measuring)

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