Page No. 1 of 7	Issued on February-2024	STR No. CLW/2023/ELDO/STR/0191	Rev '0'

SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURING AND SUPPLY OF FIRE RESISTANCE CEMENT FOR WAG-9, 3-PHASE A.C. FREIGHT LOCOMOTIVES AS PER SPECIFICATION No. - CLW/ES/3/0168 ALT.03.

ISSUED BY

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SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE AND SUPPLY OF FOLLOWING FOR THREE PHASE ELECTRIC LOCOMOTIVES: -

1.0 NAME OF ITEM

Fire Resistance Cement for WAG-9, 3-Phase A.C. Freight Locomotives.

2.0 APPLICATION

Used in Three Phase (WAG9H / WAG9 / WAP7 / WAP5) Electric Locomotives in Indian Railways. The items are to be manufactured as per relevant drawings and specifications.

3.0 SCOPE

The Schedule of Technical Requirements (STR) is issued to serve as a guide to manufactures (called the "firm" hereafter) and should be read in conjunction with the relevant drawings and specifications with latest Revisions / Alterations. The technical requirements are meant to serve as guidelines only and are not exhaustive. The firm should satisfy themselves having complied with the requirements of drawings and STR. List of relevant Drawings / Specifications is listed below.

Wherever lacking, existing CLW approved sources must also upgrade their facilities to fulfill the requirements of this STR within a period of One year from date of issue of this STR.

4.0 GENERAL REQUIREMENTS

4.1 The firm should have currently valid ISO-9001:2015 certification issued by an approved agency of the International Accreditation Forum (IAF) with the activity desired clearly mentioned in the scope of certification.

4.2 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 firm.

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

4.3 The firm shall have all latest relevant Standards like IS, DIN, BS etc. pertaining to product specification.

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

4.5 The testing & measuring equipment shall be duly calibrated and the validity of calibration should be current and verified by physically checking the calibration certificate issued by Calibration Agency from whom it was calibrated. Calibration shall be done by NABL accredited labs whose accreditation is valid on the date of calibration.

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4.6 Firm should have adequate trained personnel and service after sales network.

4.7 Whenever there is any change with respect to approved QAP, the same shall be promptly submitted to CLW for approval.

5.0 QUALITY ASSURANCE PLAN (QAP)

The firm shall prepare a Quality Assurance Plan (QAP) before approval is sought and submit the same as part of compliance of this STR. The standard format of QAP is available at CLW website https://clw.rcil.gov.in/QAPFormat.docx

5.1 QUALITY CONTROL ORGANISATION

5.1.1 The complete organizational setup of the Quality Control Key personnel and official along with their qualification and experience should be furnished.

5.1.2 The Quality Control Organization should be headed by a senior level official having degree in engineering who shall directly report to plant in charge.

5.2 INCOMING MATERIAL

5.2.1 A complete bill of material indicating all input material items required for manufacturing of the products, governing specification and their sources of supplies as approved by the firm should be furnished.

5.2.2 Raw material shall be procured from Railway (CLW/RDSO/BLW/ICF/MCF/RCF) approved sources wherever applicable or from any other reputed OEM with product data sheet if no CLW/RDSO source is specified. Documentary proof of purchase and test certificate of each component shall be maintained and produced.

5.2.3 Record of each sub-supplier clearly showing the quantity purchased and rejected as well as cases of late delivery, if any shall be kept.

5.2.4 Incoming raw material shall be 100% inspected by Quality Control Department of the firm for any defect and deviation. The test results of incoming raw material with references to test certificate issued by the supplier and the results of internal tests carried out by the firm for verification may be submitted as part of QAP.

5.3 PROCESS OF MANUFACTURE

5.3.1 Complete process flow chart covering all steps of process of manufacture for an individual product (or for a family of product if the process is same), including the process flow of outsourced activities along with its integration with main process, shall be clearly enlisted as part of QAP.

5.3.2 The following details of machine used for all the steps of machining operations should be included.

a. Make, model and commissioning date of the machine.
b. Accuracy.
c. Details of machining operations.

5.3.3 Vague language like available or will install is not acceptable.

5.3.4 Details of jigs and fixtures if necessary used during manufacture should be furnished along with the Manufacturing process wherever used.

5.3.5 List of typical Machinery & Plant, testing and measuring instruments required for manufacture is mentioned in Annexure – II. The list is for general guidance only and manufacturing operation shall be submitted and got approved by the firm as a part of QAP.

5.4 INSPECTION AND TESTING PLAN

5.4.1 Testing setup should be available in the firm's own premises capable of testing the equipment as specified in the relevant technical specification.

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

5.4.3 The following details of Testing / measuring instruments / equipment / tools / jigs / fixtures used for all the steps of measurement and testing operations should be included:

- Make and Model of the equipment

- Name of the manufacturer
- Accuracy
- Capacity or Range
- Date of Calibration
- Due date of calibration
- Agency of Calibration

Vague language like available or will install is not acceptable.

5.4.4 The accuracy and capacity of the testing and measuring equipment shall be adequate to meet the requirements of the specification and drawing.

5.4.5 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.

5.4.6 List of typical Testing and measuring instruments required for manufacture is mentioned in Annexure – II. The list is for general guidance only. However, the specific Testing & measuring instruments, gauges used by the firm will also form part of QAP and shall be submitted.

STORAGE FACILITY

- Adequate Dust free, clean and non - humid environment for storage of raw material and finished product separately.
- Adequate Dust free, clean and non-humid environment for product assembly area.
- Adequate Stacking / Handling tables and racks in above storage area.

LIST OF DRAWINGS, SPECIFICATIONS AND STANDARDS

1. Specification No. CLW/ES/3/0168 ALT.03.
2. Standard: Relevant Indian/International Standards for Inspection and testing.

ANNEXURE – I

LIST OF MACHINERY AND PLANT

Sl. No.	Name of Machine with size	Capacity/ Rating	Purpose	Essential / Optional **
1.	OVEN/FURNACE	Up to 350 degree and min. Volume 20 Ltrs.	Essential for heating fire retardant material.	Essential
2.	INDUSTRIAL STIRRER	50 Ltrs	Essential for stirring the liquids.	Essential
3.	SIGMA MIXER	100 Liters	Essential for mixing of materials.	Essential
4.	ELECTRONIC WEIGHT BALANCE	Min. 50 Kgs	Used for weighing the raw material.	Essential

** Optional activity or Machinery & Plant facility may be outsourced.

ANNEXURE – II

LIST OF MEASURING AND TESTING EQUIPMENTS

Sl. No.	Name of Measuring & Testing	Capacity / Rating	Purpose	Essential / Optional **
1.	HOT AIR OVEN	Range: - Up to 320 °C	Used for temperature resistance test to observe crack	Essential
2.	BURNER	Standard	Used for fire exposure test of final product to check spreading of fire	Essential
3.	DIGITAL MOISTURE/ HUMIDITY METER	Standard	Used for checking water content in raw material to ensure adhesion	Essential
4.	DIGITAL THERMOMETER	Range: Up to 350 °C	Used for measuring temperature	Essential
5.	SPECIFIC GRAVITY CUP	Standard	Used for finding specific gravity of sample	Essential
6.	LABORATORY DIGITAL WEIGHT BALANCE	Range:- up to 500 gms	Used for weight measurement	Essential
7.	PH METER	Range: - 0-14	Used for finding PH value of sample	Essential

- Optional activity or measuring & testing facility may be out sourced. However, the sub-Vendor is also to be assessed.
- Measuring and Testing facilities as per relevant Indian/International Standards, which are not available with the firm may be done from National test house or any NABL /RDSO approved laboratory.

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