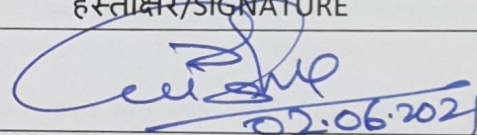


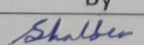
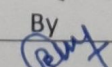
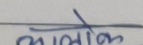
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**SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURING AND SUPPLY OF
"F S ALL STEEL LOCK NUT (M-TYPE & V-TYPE) FOR 3-PHASE ELECTRIC LOCOMOTIVES"**

**जारी कर्ता
ISSUED BY
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ELECTRIC LOCO DESIGN OFFICE
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CHITTARANJAN-713331
WEST BENGAL**

अनुमोदन कर्ता/APPROVED BY	हस्ताक्षर/SIGNATURE
प्रधान.मु.वि.अभि./PCEE	 02.06.2021

सिफारिश कर्ता/RECOMMENDED BY	हस्ताक्षर/SIGNATURE
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 JE/DRG.	 SEE/Design	 DY.CEE/D-I

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SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE AND SUPPLY OF F S ALL STEEL LOCK NUT (M-TYPE & V-TYPE) REQUIRED FOR THREE PHASE ELECTRIC LOCOMOTIVES :-

1.0 NAME OF THE ITEM:

F S ALL STEEL LOCK NUT (M-TYPE & V-TYPE) for 3-Phase Electric Locomotives.

2.0 APPLICATION:

Used in 3-Phase Electric Locomotives in Indian Railways. The item is to be manufactured as per relevant drawings and specifications.

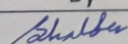
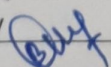
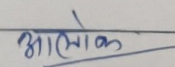
3.0 SCOPE:

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 as per Annexure -I.

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-9000 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.
- 4.3 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.
- 4.4 The firm shall have all latest relevant Standards like IS, DIN, BS etc. pertaining to product specification.
- 4.5 The firm shall have system of recording the plant, machinery and control equipments remaining out of service, nature of repairs done etc.

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4.6 The testing & measuring equipments 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.

4.7 Firm should have adequately trained personnel and service after sales network.

4.8 QAP to be made as per the online format of CLW. The format can be obtained from http://clw.ggn.rcil.gov.in/help_vendor.htm.

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

5.0 INCOMING MATERIAL:

5.0.1 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.

5.0.2 Raw material shall be procured from forging sources. Documentary proof of purchase and test certificate of each component shall be maintained and produced.

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

5.0.4 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.

5.1 PROCESS OF MANUFACTURING:

5.1.1 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.

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

- Make, model and commissioning date of the machine.
- Accuracy.
- Details of machining operations.

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5.1.3 Machining process should be such that all critical dimensions are final. Vague language like available or will install is not acceptable.

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

5.1.5 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.

5.2 INSPECTION AND TESTING PLAN:

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

5.2.2 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.

5.2.3 The following details of Testing/measuring instruments/equipments/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.

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

5.2.5 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.

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5.2.6 List of typical Testing and measuring instruments required for manufacture is mentioned in Annexure – III. 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.

ANNEXURE – I

LIST OF DRAWINGS, SPECIFICATIONS AND STANDARDS

Sl. No.	Item	Drawing/Specification No.
1.	F S ALL STEEL LOCK NUT (M-TYPE & V-TYPE) for 3-phase locomotives	Drg. No. – 182-00493 (Alt. 3) Specification: CLW/MS/3/089 (Alt.3)

- All Specification of Raw Materials and Testing should be as per latest version.

ANNEXURE – II

LIST OF MACHINERY AND PLANT

Sl. No.	Name of Machinery & Plant	Capacity/ Rating	Purpose	Essential/ Optional**
1.	Nut forming m/c	Standard	For forming of nut	Essential
2.	Nut tapping m/c	Up to M24	For machining internal thread	Essential
3.	CNC Turning Centre	Standard	For machining as per drg. (If required)	Optional**
4.	Surface coating m/c	Standard	For surface coating	Essential
5.	Heat treatment arrangement	Standard	For surface or sub-surface treatment	Essential
6.	Deforming arrangement	As per DIN 980 or latest as applicable	For V-type locking arrangement	Essential
7.	Metal insert locking arrangement	Standard	For M-type locking arrangement	Essential

** Optional activity or Machinery & Plant facility may be outsourced. However, the sub-vendor is also to be assessed.

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ANNEXURE – III

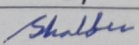
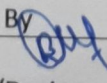
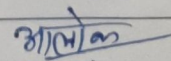
LIST OF MEASURING & TESTING EQUIPMENTS

Sl. No.	Name of Measuring & Testing	Capacity / Rating	Essential/ Optional **
1.	Inside micrometer & outside micrometer	Different sizes	Essential
2.	Vernier caliper	Different sizes	Essential
3.	Coating thickness gauge	Standard	Essential
4.	Electronic or Dial Torque wrench	0 to 100 Nm	Essential
5.	Surface roughness testing m/c	Standard	Essential
6.	Universal Testing m/c	Standard	Optional**
7.	Ultrasonic testing m/c	Standard	Optional**
8.	Vibration testing m/c / Self lock vibration test (Ref. IEC 61373)	Standard	Optional**
9.	Thread pitch gauge	Standard	Essential
10.	Chemical & physical testing lab	Standard	Optional**
11.	Hardness testing m/c	Standard	Essential
12.	Prevailing torque test setup	As per DIN 980 or latest as applicable	Essential
13.	Go & No Go thread gauge	For M10 to M24 Nut	Essential
14.	Proof load test setup	Standard	Essential
15.	Widening test facility (as per IS 15569-2005)	Standard	Essential

* Optional measuring & testing facility may be outsourced but outsourced firm should be Govt. Approved / RDSO Approved Lab.

QUALITY REQUIREMENTS

1. Input Raw Material - Chemical/Metallurgical test is to be done & Source of raw material to be specified.
2. Stage -Wise inspection are to be done & Check List for the same is to be made.
3. Final Inspection is to be done and Check List for the same is to be made.
4. ISO certification
5. NSIC / SSIC registration.
6. Firm should have adequate covered floor area.

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