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**SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURING AND SUPPLY OF  
"AIR BRAKE CYLINDER 8" x 8" FOR ELECTRIC LOCOMOTIVES"**

**जारी कर्ता  
ISSUED BY  
विद्युत इंजन अभिकल्प कार्यालय  
चिरेका/चितरंजन  
ELECTRIC LOCO DESIGN OFFICE  
CHITTARANJAN LOCOMOTIVE WORKS  
CHITTARANJAN-713331  
WEST BENGAL**

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प्रधान.मु.वि.अभि./PCEE	<b>R YADAV</b> <small>Digitally signed by R YADAV DN: cn=West Bengal, 2.5.4.20=c301f162189a2c486700406547eb0e9ed2c999b656e84bb c57160977c5e87, postalCode=713331, street=306M, CVO OFFICE ADMIN BUILDING CLW CHITTARANJAN, pseudonym=97651d2ebae4791b669a5f73850w0E2c serialNumber=491d432f0d4264cb2772ca5b03bae5ca4d8ebc33e439 c25a479995c783a1e1d5, ou=GENERAL ADMINISTRATION, cn=CHITTARANJAN LOCOMOTIVE WORKS, cn=R YADAV Date: 2023.04.13 17:26:22 +05'30'</small>

सिफारिश कर्ता/RECOMMENDED BY	हस्ताक्षर/SIGNATURE
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Signature Not  
Verified

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Date: 2023.04.15  
08:31:06 +05'30'

Reason: IRPS-CRIS  
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**SCHEDULE OF TECHNICAL REQUIREMENTS FOR 'AIR BRAKE CYLINDER 8" × 8" FOR ELECTRIC LOCOMOTIVES':-**

**1.0 NAME OF THE ITEM:**

AIR BRAKE CYLINDER 8" × 8" FOR ELECTRIC LOCOMOTIVES.

**2.0 APPLICATION:**

Used in 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.
- 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 Firm should have QAP of the item. Whenever there is any change with respect to approved QAP, the same shall be promptly submitted to CLW for approval.

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## 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 RDSO/ ISO/ International std. Certified 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.
- 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 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.

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## 5.2 INSPECTION AND TESTING PLAN:

- 5.2.1 Testing setup should be available in the firm's own premises/ may be out-sourced 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.
- 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.	AIR BRAKE CYLINDER 8" × 8"	CLW Drg. No. 01/3/19/56

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

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## ANNEXURE – II

### LIST OF MACHINERY AND PLANT

Sl. No.	Name of Machinery & Plant	Capacity/ Rating	Purpose	Essential/ Optional**
1.	Centre Lathe	Standard	For machining operation	Essential
2.	Drilling Machine	30 mm capacity	For drilling operation	Essential
3.	Tapping Machine	up to 20 mm capacity	For tapping operation	Essential
4.	Surface Grinder	Min 20" x 10" table	For grinding operation	Essential
5.	Shaper Machine	Suitable capacity	For shaping operation	Essential
6.	Portable Grinder	02 nos.	For grinding operation	Essential
7.	Bore Grinding Machine	Suitable size	For grinding of cylinder bore	Essential
8.	Painting Facility	Standard	For painting operation	Essential
9.	Phosphating Unit	Standard	For Phosphating of cylinder body	Optional**
10.	Casting Facility	Standard	For casting operation	Optional**
11.	Forging Facility	Standard	For forging operation	Optional**
12.	Rubber Moulding Machine	Standard	For manufacturing various rubber items	Optional**
13.	Spring manufacturing facility	Standard	-	Optional**
14.	Cutting/Shearing Machine	Standard	For Cutting work	Optional**

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

**Note:** i) Suitable substitute /combined machine if any to be indicated for acceptance.  
ii) Source of rubber components should be from RDSO approved vendor.

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### ANNEXURE – III

#### LIST OF MEASURING & TESTING EQUIPMENTS

Sl. No.	Name of Measuring & Testing Equipments	Capacity / Rating	Essential/ Optional **
1.	Vernier Calipers	Standard	Essential
2.	Pneumatic Testing set up with Compressor and Pressure Gauges etc.	Up to 12 kg/cm <sup>2</sup>	Essential
3.	Steel tape & Scale	Different sizes up to 1000 mm	Essential
4.	Micro meter (Inside & Outside)	Standard	Essential
5.	Height Gauge/Depth Gauge	Suitable size	Essential
6.	Surface Roughness Tester	Standard	Essential
7.	Gauge for Thread/Tap	Standard	Essential
8.	Shore Hardness Tester	Standard	Optional**
9.	Facilities for Raw Material Testing	Standard	Optional**

\*\* Optional measuring & testing facility may be outsourced but outsourced firm should be Govt.

Approved / RDSO Approved Lab.

**Note:** Suitable substitute /combined machine if any to be indicated for acceptance.

#### QUALITY REQUIREMENTS

1. Input Raw Material - Chemical/Metallurgical test is to be done & Source of raw material is 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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