



**Government of India
Ministry of Railways**

**QMS-43:2009
(Revision 0)**

**Schedule of Infrastructure Requirements for Manufacturing & Testing
facilities and Quality Control requirements**

For

**Axle End High Tensile Cap Screw
(Specn. AB/RB-39/2002 Rev.3)**

**Inspection & Liaison Directorate
Research Designs & Standards Organisation
Manak Nagar Lucknow – 226011**

March'2009

Rs. 400/-

1. SCOPE

- 1.1 This schedule covers the infrastructural requirements for manufacture of Axle End High Tensile Cap Screw of size 1"UNC for CTRB, M-22 for 20.3t & 16t Cylindrical R.B. and M-16 for 20.3 & 16t Cylindrical R.B. axle boxes.

2. REQUIREMENTS

- 2.1 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 Suitable bar processing plant with adequate number of wet processing unit, fully automatic spheradized wire drawing bull blocks should be available.
- 3.3 One annealing furnace with automatic temperature recording arrangement with digital indicator should be available.
- 3.4 Adequate number of horizontal automatic transfer type cold forging machines should be available.
- 3.5 To form the threads, either heavy duty flat thread rolling or circular thread rolling machine with proper tooling like thread rolling dies and thread checking facilities should be available.
- 3.6 For heat-treatment of the products, a fully automatic conveyor type hardening & tempering furnace, with programmable logic control should be available.
- 3.7 For surface treatment, fully automatic programmable logic control based phosphating plant with automatic heating control system should be available.

4. TESTING FACILITIES:

- 4.1 A fully furnished metallurgical & chemical laboratory for monitoring the chemical composition of raw material as well as finished products should be available. Chemical laboratory should also be capable of monitoring the phosphating system, chemical & solution strength. The lab should have controlled atmosphere.
- 4.2 Minimum one No. Rockwell hardness tester should be available.
- 4.3 Minimum one No. Metallurgical microscope with photographic attachment and accessories for preparation of specimen for checking microstructure should be available.

- 4.4 Minimum one No. Tensile testing machine should be available.
- 4.5 Minimum one No. Izod impact testing machine should be available.
- 4.6 Minimum two nos. torque wrench with capacity 400 lbs ft. should be available.
- 4.7 Minimum one set of Head soundness testing gauges should be available.
- 4.8 One unit of magnetic crack detection facility should be available.
- 4.9 Minimum one no. of surface coating thickness tester should be available.
- 4.10 Minimum two nos. digital vernier (0-150mm) and outside micrometers (0-50mm) should be available.
- 4.11 Minimum two nos. thread pitch micrometer (0-25mm) should be available.
- 4.12 Minimum two nos. screw ring gauge should be available.
- 4.13 Minimum one Optical profile projector should be available.

5. QUALITY CONTROL REQUIREMENTS

- 5.1 There should be a system to ensure that traceability of the product from raw material stage to finished product stage. The system should also be able to identify the raw material composition from the finished product stage..
- 5.2 The vendors seeking approval must ensure that their QAP for the product details various aspects as follows :
 - Organisation chart
 - Process flow chart
 - Detail of stage inspection
 - Product and process control plan
- 5.3 There should be atleast one full time Technologist having a minimum Bachelor's degree in relevant field with at least five years of experience, or a person with Diploma in relevant field with minimum 12 years experience. He should be free from day to day operations/production, testing and quality control activity. He should be mainly responsible for development of a product, analysis a product, control over raw material, corrective action in case of difficulties in achieving the parameters.
- 5.4 The firm should have acquired certification and the product for which approval is sought should be covered in the scope of certification for manufacture and supply. ISO:9000:1994 version is acceptable upto 14.12.2003 and only ISO:9001:2000 version will be acceptable thereafter.

- 5.5 The quality manual of the firm for ISO:9001:2000/ISO:9000:1994 (as applicable) should clearly indicate the control over manufacturing at every stage and testing of the said Railway product.
- 5.6 The firm seeking approval must be in possession of the relevant technical specification.
- 5.7 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.
- 5.8 Latest version of all the relevant specification IS, ASTM and RDSO standards and drawings with latest alterations should be available with the firm.
- 5.9 It should be ensured that a minimum of one No. GO and NO-GO gauges are available for checking the dimensional accuracy of the products and these gauges are being calibrated at regular frequency.

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 products 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 complaint.

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.
