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**Government of India
Ministry of Railways**

**QMS-34:2009
(Revision 0)**

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

Snubber Assemblies for locomotive

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

March'2009

(Price Rs. 400/-)

1. SCOPE

- 1.1 The Schedule of Infrastructural requirements for manufacturing & testing facilities and Quality Control requirements covers the norms for manufacture of snubber assemblies for locomotive.

2. GENERAL & MANUFACTURING FACILITIES

- 2.1 Ensure that in addition to the covered area for housing of manufacturing & testing facilities, adequate space for storage of raw material/bought out components i.e. springs and forged components, is available.
- 2.2 Ensure that the firm is having adequate forging facilities for manufacturing of forged components required for snubber assembly. In case the forging components are sub-letted, the sub-letted firm shall have adequate forging facilities and the system should exist to ensure that these components are purchased from the vendors approved by the firm and inspection is carried out as per the stipulated and laid down procedure. The procedure should be included in the QAP of the firm manufacturing snubber assembly.
- 2.3 Ensure that atleast one number furnace for heat treatment without any flame impeachment on the product is available. The furnace should be equipped with temperature controllers, recorders and indicator. The furnace should have multiple thermo couples to facilitate measurement of temperature in the furnace at different locations.
- 2.4 Ensure that a heat treatment cycle is pre-determined product-wise and is ensured during heat treatment.
- 2.5 Ensure that gas carburising of adequate size, annealing, tempering & shot blasting facilities of reputed make are available.
- 2.6 Ensure that case carburising cycle is pre-determined product-wise and is ensured during case carburising.
- 2.7 Ensure that the workshop with machining, grinding to achieve surface finish of 100 to 150 rms and welding facilities are available.
- 2.8 Ensure that a hydraulic press with fixture is available for the assembly of snubber assembly components.
- 2.9 There should be a proper facility for painting of the snubber assembly. The paint booth should be specially nominated and it should be free from dirt and dust. The handling of snubber assembly during painting and after painting should be such that the dirt and dust does not get embedded with the paint.
- 2.10 Ensure that suitable system is available for drying of the paint.
- 2.11 Ensure that adequate number of pallets are available for storing/handling of snubber assembly at various intermediate stages of manufacturing and the snubber assemblies are transported using pallets only.

3. TESTING FACILITIES

- 3.1 Ensure that adequate no. of gauges and measuring instruments (atleast two sets) for checking of various parameters of different type of snubber assembly are available.
- 3.2 A minimum one number load deflection testing machine upto a load of 20 t capacity with a least-count of load measurement of 5 kg. And the accuracy of $\pm 1\%$ which is calibrated against standard proving ring should be available. The machine should have an inbuilt arrangement to draw the chart/graphs for load deflection characteristics of the snubber assembly. The facility to measure the deflection of the snubber assembly using digitalmeter should be available. The machine should be capable of tensile test & necessary fixtures for the purpose should be available. Alternatively vendor can have a separate tensile testing machine.
- 3.3 A full fledged chemical laboratory equipped suitably to conduct analysis of all types of carbon and alloy steels required as per IS:228 should be available. Instrumental analysis will be permitted. However, in case of dispute, methods given in IS:228 will be resorted to.
- 3.4 Ensure that the facilities for preparation of Metallographic specimen as per IS:7739 are available.
- 3.5 Atleast one number Metallographic Microscope with minimum magnification of 100 and photographic attachment to meet the requirement of IS:4163, IS:6396 and IS:2853 should be available.
- 3.6 Ensure that minimum 2 nos. Brinnel hardness testing machine and facility for magnetic particle test, dye penetrant test to find surface flaws and ultrasonic/radiographic testing for the detection of internal flaws, should be available. These two machines should be located one each in the laboratory and on the shop floor keeping in mind the specification and drawings.
- 3.7 Adequate number of Eye pieces/low power microscopes (minimum three) of low magnification upto (2-5) and magnifying lenses for surface inspection should be available.
- 3.8 A suitable place equipped with adequate illuminations, large size surface table (6'x8'), one set of gauges duly calibrated shall be nominated for purchase inspection.
- 3.9 Ensure that facilities are available for checking of weld quality of welding joints of shear check with the friction sleeve cap and welding of friction sleeve cap with friction sleeve by dye penetrant test.

4. QUALITY CONTROL REQUIREMENTS

- 4.1 There should be a system to ensure the traceability of the product from raw material stage to finished product stage. The system should help in identifying

- the raw material/bought-out items details – heat no. supplier, inspection details from the finish product stage.
- 4.2 Ensure that the system exists for proper stacking of raw material heat wise and the record is available detailing Despatch Memo No., Quantity, Heat No., Inspection, the P.O. details of the products against which the raw material is to be used.
 - 4.3 Ensure that there is a Quality Assurance Plan for the product detailing various aspects
 - Organisation Chart
 - Flow Process Chart
 - Stage Inspection details
 - Various parameters and to ensure control over it
 - 4.4 There should be at least one full time technologist having a minimum bachelor's degree in relevant field with 5 years experience or a person with diploma in relevant field with 12 years experience. He should be free from day-to-day production, testing & quality control responsibility. He should be mainly responsible for development of a product, analysis of products, control over raw material, capable to take corrective action in case of difficulties in achieving the parameters.
 - 4.5 Ensure that the in-charge of the Quality Control Section is having a qualification of minimum bachelor's degree in the relevant field & have min. 5 years experience or a diploma holder with min. 12 years experience. He should be actively involved in day-to-day activities of quality control/stage inspection/compliance of QAP etc.
 - 4.6 The firm should have acquired ISO:9000 series certification and the product for which an approval is sought should be broadly covered in the scope of the certification for manufacture and supply.
 - 4.7 The Quality manual of the firm for ISO:9000 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.
 - 4.8 Ensure that proper analysis is being done on monthly basis to study the rejection at various internal stages and it is documented.
 - 4.9 Ensure that all the relevant specifications, IS standards are available with the firm.
 - 4.10 Ensure that adequate covered area for storage of final product, awaiting inspection is available and earmarked.
 - 4.11 Ensure that proper record of complaints received from users (Railways) is being maintained and corrective action is taken.