



**Government of India
Ministry of Railways**

**QMS-38:2009
(Revision 0)**

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

For

**Lubricated Taper Plug Valve
(Specn. WD-06TPV-93)**

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

MARCH'2009

Price Rs. 400/-

1.0 Scope

The Schedule of Technical requirements covers infrastructure, manufacturing, testing and quality control requirements, for manufacture and supply of 100mm Cast Iron Lubricated Taper Plug Valve with integral flanges to be used for bottom discharge Railway Tank Wagons to Drg. No. WD-93066-S-01 for transport of petroleum and other liquid products.

2.0 Requirements

The vendors seeking approval shall comply with all the below mentioned requirements :

General & Manufacturing facilities

- 2.1 The valve castings should be cast in a well equipped foundry having melting furnace and production/testing facilities of the required standard IS:210 Grade FG:200.
- 2.2 Test pieces along with the castings @ of one from every heat shall be cast for determining the physical properties of the material (tensile strength 200 Mpa).
- 2.3 After the castings have been taken out of the mould, they should be properly fettled and the superfluous material should be chipped off.
- 2.4 The castings should be cleaned by sand blasting.
- 2.5 Adequate facilities for machining of valve components, lapping and reliable source for application of PTFE coating should be available.
 - (a) For machining
 - (i) Centre lathes with adequate capacity and dimensions.
 - (ii) Attachment for taper turning of plug.
 - (iii) Drilling machines of adequate capacity.
 - (iv) Power driven Hack Saw and grinders.
 - (v) Special purpose lapping machine.
 - (b) For PTFE coating
 - (i) Plug shall be coated with Poly Tetra Fluoro Ethylene (PTFE) to a thickness of 20-35 microns.
 - (ii) The formulation shall have extremely low co-efficient of friction, good abrasive resistance and good corrosion/chemical resistance.
 - (iii) The process of PTFE coating shall be as per RDSO approved one.

2.6 Bought out items like hard wares, compressed asbestos, packing, brass shim, rubberized asbestos packing should be procured from high reliability sources.

2.7 The adequate painting facilities of the valve should be available.

3.0 Testing facilities

3.1 Ensure that adequate measuring equipments like Micrometers, Dial Gauges, Vernier Calipers and GO NO-GO gauges for all important dimensions of the products.

3.2 To ensure the quality of parts procured from outside parties, necessary test certificates to confirm should be produced.

3.3 For checking PTFE coating, the following facilities should be available :

- (a) Micro processor based digital PTFE coating for thickness gauges.
- (b) Magnifying glass not less than 30 to check defects on coating like unevenness, cracks, pin holes, blisters etc.
- (c) Facility to check adhesion of coating by cross hatching method and scrapper blade both before and after immersion in hot oil.
- (d) Elcometer for checking PTFE coating thickness.

3.4 A test rig to conduct shell test with hydro static pressure of 17.58 kg/cm² on valve assembly.

3.5 A test rig to conduct seat test with hydro static pressure of 10.5 kg/cm² on valve assembly.

3.6 A test rig to conduct seat with test with air pressure of 6.5 kg/cm² on valve.

3.7 Facility to open and reassembly of valve assembly to check the correctness of the assembly and effectiveness of lubricating system.

3.8 Testing of ball check valve for its proper functioning.

3.9 Endurance test rig to conduct 1000 operations under simulated service conditions.

3.10 Facility to check lubricating grease sticks for their resistance to petrol and other solvents as per RDSO procedure.

3.11 A Brinell Hardness Tester to measure BHN upto 240 BHN along with calibrated test specimen. Hardness test shall be conducted on the castings (160-220 BHN).

4.0 Quality Control Requirements

- 4.1 There should be a system to ensure the traceability of the product from casting stage to finished product.
- 4.2 Quality assurance plan for the product detailing various aspects like
- (a) Organisation Chart
 - (b) Flow process Chart
 - (c) Stage inspection details
 - (d) Various parameters to be maintained to ensure control.
 - (e) Policy of disposal of rejected casting should be implemented and record is maintained for documentary evidence.
- The QAP shall be available as per the requirements detailed in “Vendor Approval Guidelines and Application form IL-03:2000”.
- 4.3 Ensure that the in-charge of the Quality control section is having a qualification of minimum Bachelor’s Degree in Mechanical/Metallurgical with 5 years experience of Diploma in relevant field with 12 years experience. He should be actively involved in day-to-day activities of the Quality control stage inspection/compliance of QAP etc.
- 4.4 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 certification for manufacture and supply.
- 4.5 The Quality Manual of the firm for ISO:9000 should clearly indicate at any stage of control over manufacturing and testing of the said railway product.
- 4.6 Ensure that there exists a system of documentation in respect of rejection at customer end, warranty replacement.
- 4.7 Ensure that proper analysis is being done on monthly basis to study the rejection at various internal stages and it is documented.
- 4.8 Ensure that a system exists for analyzing of internal rejection by statistical quality control technique and corrective action is taken.
- 4.9 Ensure that all the relevant specifications, IS standards are available with the firm.
- 4.10 System should exist for documentation of the following items :
- (a) Incoming raw material with TC reference of supplier, as well as internal test/audit checking from outside agency.
 - (b) Stage inspection and test results.
 - (c) Calibration records.