

MANUFACTURING OF BOILERS

Boiler is a closed chamber where steam is generated from water by application of heat. It mainly consists of shell/drum, network of tubes, pipes, mountings and fittings water enters in a boiler from one end and steam comes out from the other end.

Considering safety of human life and property, detailed guide lines are provided in Indian Boiler Regulation and other International codes. Raw materials used for manufacturing of boiler are plates, tubes, pipes, pipe fittings, valves etc. Different materials like carbon steel, creep resistance alloy steels, stainless steels etc. are used for this purpose. Those raw materials are also certified by Boiler Directorate during manufacturing process.

Manufacturing of boiler involves a variety of skill and unique manufacturing methods. It requires facilities for metal removing, forming, casting, joining of metal by welding, heat treatment, different destructive and non-destructive testing.

In West Bengal, different boiler manufacturers are manufacturing variety of boilers from small industrial boiler to supercritical boiler under supervision, inspection and certification of the Boiler Directorate. Several boiler component manufactures, tube maker, steel makers, valve and fittings makers, forgers etc. are manufacturing boiler quality raw materials and boiler components under supervision, inspection and certification of the Boiler Directorate.

At first, the manufacturer, prepares detailed drawings of a boiler according to the requirements of user and submit to Boiler Directorate for scrutiny and approval. After approval of drawings, manufacturing process starts with raw materials inspection and verification of material certificates. Some percentage of materials are select for physical and chemical check test if it is not directly purchased by the manufacturer. Inspections are carried out in different stage of operation like forming, post forming heat treatment, fit up prior to welding, visual inspection after completion of welding, PWHT, different non-destructive tests like radiography, ultrasonic, MPI, LPI etc. Prior to welding WPS and PQR are approved after satisfactory non-destructive and destructive testing on welded test pieces. Only certified welders and certified welding consumables are used for welding. In this state, different welding processes like SMAW, GTAW, SAW, MIG, Orbital welding etc. are used for manufacturing of boiler. After completion of the above stages, hydraulic test which is carried out at a pressure of 1.5 times of design pressure of the boiler are witnessed by this Directorate. Final inspection is carried out after hydraulic test. Boiler components are only allowed for despatch if found satisfactory in all stages, otherwise it is suggested for rectification. Manufacturing certification in Form –II, III, IV, IIIC etc. are issued by this Directorate after satisfactory completion of all manufacturing stages.