

The laps shall be held closely in position substantially metal to metal, by stitch-riveting or other sufficient means. The brazing shall be done by placing the flux and brazing-material on one side of the joint and applying heat until this material comes entirely through the lap and shows uniformly along the seam on the other side. Sufficient flux must be used to cause the brazing-material to so appear promptly after reaching the brazing-temperature. The brazing-material shall be such as to give a joint which has a shearing-strength of at least 10,000 lb. per square inch.

End plates shall be driven into the shell with a tight driving fit, and shall be thoroughly brazed in approximately the same manner as the longitudinal seam for a depth or distance from the end of the shell equal to at least four times the thickness of the shell plate.

36. *Air-pipes.*—Air-pipes may be made of wrought iron or wrought steel, and may be solid-drawn or lap-welded.

The process of welding the seams shall be such that it is done by hammering or rolling the joint.

On completion of any work which involves heating, whether for welding the joint, welding on flanges, hot-bending the pipe, or for any other purpose, the pipe shall be carefully annealed. Mild steel for lap-welded pipes shall have a tensile breaking-strength not exceeding 28 tons per square inch, with a minimum elongation of 25 per cent. on a standard test piece with a gauge length of 8 in. All iron or steel pipes prior to being fitted in place shall be subjected to an hydraulic test of at least twice the working-pressure for working-pressures up to 1,000 lb. per square inch, and of at least a pressure equal to the working-pressure plus 1,000 lb. for higher working-pressures.

The maximum working-pressure allowed on pipes shall be determined by the following rules:—

Solid-drawn cold-finished pipes (up to 28 tons tensile):—

$$\text{W.P.} = \frac{120(t-10)}{D}$$

Solid-drawn hot-finished pipes (up to 28 tons tensile):—

$$\text{W.P.} = \frac{120(t-12)}{D}$$

Welded pipes of iron or steel, whether with or without covering straps:—

$$\text{W.P.} = \frac{90(t-12)}{D}$$

where W.P. is the working-pressure in pounds per square inch ;

D is the internal diameter of the pipe in inches ;

t is the thickness in one hundredths of an inch.

37. *Hydraulic Tests of New Air-receivers.*—All new air-receivers shall be tested by hydraulic pressure, as follows:—

Riveted or brazed receivers: Hydraulic test pressure = W.P. + 50 lb. for working-pressures not exceeding 100 lb. per square inch ; = one and a half times the W.P. for working-pressures exceeding 100 lb. per square inch.

For forge-welded or seamless receivers the hydraulic test pressure shall be twice the working-pressure.

Autogenous welded receivers shall be subjected to a hammer test over the welds whilst under hydraulic pressure of one and a half times the working-pressure. The hammer-blows shall be as hard as can be given without denting the plate. After the welds have been hammer-tested, the hydraulic-test pressure shall be raised to two and a half times the working-pressure. No air-receiver shall be passed which has not withstood satisfactorily the prescribed hydraulic test.

It should be noted that the testing of receivers by air-pressure which exceeds the working-pressure is dangerous.

38. *Installation.*—Air-receivers shall be installed with sufficient clearance round them so that they can be conveniently inspected internally and externally. They shall be supported so that the shell plates will not be subjected to undue stresses due to the weight of the receiver.

The bottom end of an air-receiver which is to stand vertically shall, if dished, be dished outward, and not inward, so that the receiver can be properly drained.

39. *Lubrication.*—Air-compressing plants shall be lubricated only with oils which can be specially recommended for this purpose. As many accidents to air-receiver plants can be accounted for by the use of an excessive amount of lubricant, care should be taken that the quantity of lubricant used is the smallest possible for efficient working. The use of an excessive quantity of oil can usually be detected by opening the receiver drain-cock, and this check should be frequently employed.