IPSS	SPECIFICATION FOR WELDED STEEL PIPE FOR GENERAL USE (*FIRST REVISION*)	IPSS:1-06-013-97
	Based on IS 3589:1991 & IS 5504:1969	Formerly 1-06-013-84

0. FOREWORD

0.1 This Inter Plant Standard prepared by the Standards Committee on Pipes, Fittings, Valves and Piping Layout, IPSS 1:6 with the active participation of the representatives of all the steel plants and associated organizations in the field was adopted in JULY 1997.

0.2 This standard was first published in the year 1984 and covered the requirement of the pipe size upto 2000 mm. The revision incorporates pipe size from 200 - 3500. The Table 1 related to dimensions of the pipes have been modified.

1. SCOPE

1.1 This Inter Plant Standard covers welded steel pipes from nominal size 200 mm to 3500 mm diameter for conveying water, gas (excluding oxygen and acetylene gas) used in the steel plant.

2. PROCESS OF MANUFACTURING

2.1 Pipes shall be made from plates or strips rolled/formed to a cylindrical shape of desired diameter and by electric butt welding longitudinally or spirally.

3. MANUFACTURING METHODS

3.1 Pipes shall be manufactured by any of the following methods:

a) Electric resistance welding (ERW) or Electric Fusion Welding (EFW) in accordance with IS 3589:1991 'Specification for electrically welded steel pipes for water, gas and sewage (150 to 2000 mm nominal size, second revision).

b) Spiral welding (SFW) in accordance with IS 5504:1969 'Specification for spiral welded pipes' (nominal size 500-1600 mm.

c) Shop welded (SW) with automatic submerged arc welding or any other suitable method for size 800-3500 mm.

3.2 **Edge Preparation** - Bevel end shall be as per requirement. Before forming/rolling the edges shall be prepared by machine or gas cutting and grinding thereafter. The bevel angle is shown in Fig-2.

4. MATERIAL

4.1 Plates and strips used for the manufacture shall conform to IS 2062:1992. The grade shall be specified by the purchaser. For moist fuel gas pipeline material shall be as per IPSS:1-06-014-95. For installation

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where corrosion resistance and higher life expectancy is the requirement, the copper based material is preferable and should be specified by the purchaser.

5. PIPE LENGTH

5.1 The pipe length shall preferably be in random length of 6-12 m or as agreed between purchaser and supplier.

6. DIMENSIONS

6.1 The outside diameter and minimum thickness of the pipes shall be as given in **Table-1**. Pipes are manufactured in different thicknesses. However, users shall indicate the thickness required to suit their requirement.

6.2 *The thickness of the pipe shall be increased by 1.5 mm over minimum thickness for handling corrosive/errosive fluid like scale water, slurry, ash water etc and for underground laying.*

7. DESIGNATION

7.1 Designation of pipe shall give manufacturing process, outside diameter (OD) x thickness for e.g. ERW pipe of size 1100x10 mm shall be designated as

ERW pipe 1100x10

8. TOLERANCE

8.1 **Straightness** - The finished pipe shall not deviate in straightness by more than 0.2% of the total length.

8.2 **Outside Diameter** - The tolerance on outside dia shall be

± 0.75% upto ND 500 mm
± 1% for sizes above ND 500 mm.

8.3 **Wall Thickness** - For all sizes : ±10%.

9. TEST

9.1 The pipes shall be tested hydraulically at the manufacturers works before the pipe is coated, wrapped or lined.

9.2 The maximum permissible working pressure shall be 50% of the hydraulic test pressure followed at manufacturers test stand. The hydraulic test pressure (P) for ERW/EFW pipes shall be the pressure calculated from the following formula except that the maximum test pressure shall not exceed 5 MPa at the manufacturing premises:

$$P = 2st/D$$

Where **s = 40% of the specified minimum tensile strength**
t = thickness of pipe in mm
D = outside dia of pipe in mm
P = Test pressure

9.3 The pressure shall be maintained for a minimum of 10 seconds. It shall not show any sign of cracking, failure or leakage.

9.4 SFW pipe shall be tested as per IS 5504:1969.

9.5 In case of shop welded pipes (SW), the pipe shall undergo 'K' oil test for all weld joints.

10. SAMPLING

10.1 The sampling shall be done according to IS 4711:1974 'Methods for sampling of steel pipes, tubes and fittings (first revision)'.

11. PROTECTIVE COATING

11.1 After testing, the pipes shall be externally painted by manufacturer with two coats of red-oxide paint conforming to IS 2074:1992 'Specification for ready mixed paint, air drying, red-oxide zinc chrome, priming (first revision)'

Internal painting shall be optional, on requirement of purchaser.

12. WORKMANSHIP

12.1 All pipes shall be clean finished free from visible imperfections, cracks, laminations and all other defects.

In case of shop welded pipes, inside root welding run shall be ensured.

For shop manufactured pipes, if bevel ends are required, it should be clearly mentioned while specifying the pipes.

13. MARKING

13.1 Each pipe shall be legibly marked with the following details:

a) Manufacturer's name or trademark
b) Designation
c) IPSS No.

14. PIPE JOINTS

14.1 When two or more pieces of ERW or SW pipes are jointed together the longitudinal joints shall be staggered at an angle of 45° from the vertical in one quadrant as shown in the **Fig-1**. While joining the pipes, care shall be taken to ensure that all the longitudinal welded joints occupy the upper quadrant, for ease of maintenance. The ends of the pipe to be welded shall be chamfered as shown in **Fig-2** and weld metal shall be deposited uniformly without blow holes, slag inclusions, cracks, undercutting etc. The faces of the pipes shall be cut clean perpendicular to the longitudinal axis of the pipe and the ends chamfered and welded externally.

14.2 Stiffeners to be provided as per the structural requirement provided by purchaser & suiting application requirement.

TABLE 1

(Based on Table 2, IPSS:1-06-014-95)

Dimensions of Welded Steel Pipes

Nominal Bore mm	O.D. mm	Minimum Thickness mm	Nominal Bore mm	O.D. mm	Minimum Thickness mm
200	219	6	1400	1422	10
250	273	6	1500	1524	10
300	324	6	1600	1626	10
350	355	6	1800	1820	10
400	406	6	2000	2020	10
500	508	8	2200	2220	10
600	610	8	2400	2420	10
700	711	8	2600	2620	10
800	813	8	2800	2820	10
900	914	10	3000	3020	10
1000	1016	10	3200	3220	10
1100	1118	10	3400	3420	10
1200	1219	10	3500	3520	10
1300	1321	10			

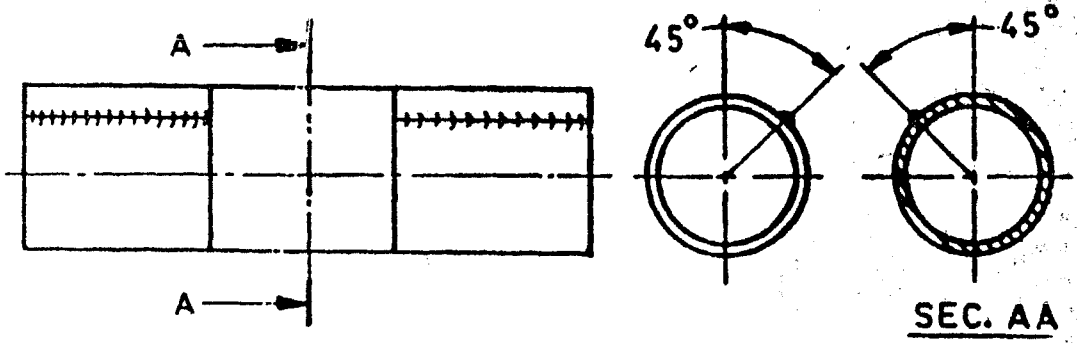

FIG. 1 STAGGERING OF PIPE JOINTS

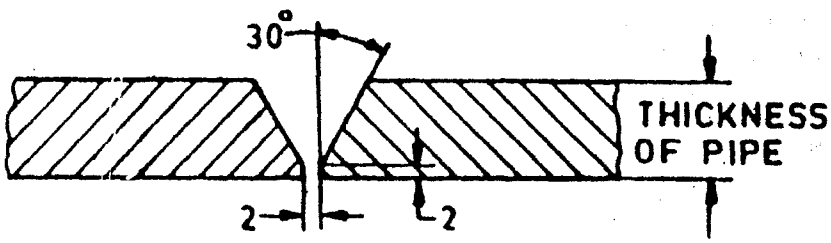

FIG. 2 CHAMFERING OF EDGES