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MCWD is ISO 9001 Certified

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**MCWD TECHNICAL STANDARDS AND SPECIFICATIONS FOR
STEEL-BLACK AND HOT-DIPPED ZINC-COATED
(GALVANIZED IRON) LONGITUDINALLY WELDED STEEL PIPES,
Ø15 mm THROUGH Ø300 mm FOR POTABLE WATER SUPPLY**

MCWD TECHNICAL STANDARDS AND SPECIFICATIONS FOR STEEL-BLACK AND HOT-DIPPED ZINC-COATED (GALVANIZED IRON) LONGITUDINALLY WELDED STEEL PIPES, Ø15 mm THROUGH Ø300 mm FOR POTABLE WATER SUPPLY

A. GENERAL

This standard specifies requirements for the heavy gauge, black and hot-dipped zinc-coated (galvanized) longitudinally welded steel pipes with sizes ranging from Ø15 mm through Ø300 mm for ordinary use in water service and supply lines, but is not intended for close coiling or bending, or high temperature service.

The pipe under this standard shall be in accordance with PNS 26:2003 (Philippine National Standard for Steel-Black and Hot-dipped Zinc-Coated Longitudinally Welded Steel Pipes), or of its latest edition.

B. MATERIALS AND MANUFACTURING PROCESS

The steel for welded pipes shall be made from hot rolled carbon steel strips conforming to the requirements of PNS 33, latest edition. The pipes shall be made by the electric resistance welding or furnace-butt-welding process.

For the threaded pipe, both ends shall be provided with taper threads, and a socket shall be screwed into one of the threaded ends and each provided with caps or a cap on one end and coupling on the other end. Both the pipe and coupling shall be galvanized before threading. The threaded portion of the pipe shall be coated with zinc-rich, lead-free, food grade primer to protect it from corrosion.

C. PIPE REQUIREMENTS

- 1. Workmanship.** The pipe shall be straight and both ends of the pipe shall be at right angle to the axis of the pipe. The inside and outside surfaces of the pipe shall be free from grooves, cracks, pinholes and other defects.
- 2. Dimensions.** The pipes shall be furnished in standard laying lengths of 6 meters (+6 mm tolerance), unless otherwise agreed on at time of purchase. The dimensions, mass and tolerances of the pipe shall conform with the requirements listed in Table 1 when measured as specified in PNS 26 : 2003 or of its latest edition.
- 3. Zinc Coating.** The pipe shall be zinc coated (galvanized) in a hot-dipped process in accordance with ASTM A120. The mass of zinc coating shall not be less than 550 g/m² of the total coated surface, as determined by the average results of the two specimens taken for test and not less than 490 g/m² for either of the specimens.

Table 1. Dimensions, Mass, and Tolerances Based on Heavy Gauge Pipes

Nominal Size (mm) (in)	Outside Diameter (mm)	Min. - Max. O.D.		Wall Thickness (mm)	Thickness Tolerance (mm)	Min. Mass (kg/m) Plane end	Tolerance on Mass (kg/m)
		(mm)	(mm)				
15 (1/2)	21.3	20.5	21.7	2.8	±0.28	1.28	±0.128
20 (3/4)	26.7	25.9	27.1	2.9	±0.29	1.70	±0.170
25 (1)	33.4	32.6	33.8	3.4	±0.34	2.52	±0.252
32 (1 ¼)	42.2	41.4	42.6	3.6	±0.36	3.43	±0.343
40 (1 ½)	48.3	47.5	48.7	3.7	±0.37	4.07	±0.450
50 (2)	60.3	59.7	60.9	4.0	±0.40	5.55	±0.555
65 (2 ½)	73.0	72.3	73.7	5.2	±0.52	8.70	±0.750
80 (3)	88.9	88.0	89.8	5.5	±0.55	11.31	±1.131
100 (4)	114.3	113.2	115.4	6.0	±0.60	16.02	±1.602
125 (5)	141.3	139.9	142.7	6.6	±0.66	21.92	±1.750
150 (6)	168.3	166.6	170.0	7.1	±0.71	28.22	±2.822
200 (8)	219.1	216.9	221.3	8.2	±0.82	42.65	±4.265
250 (10)	273.0	270.3	275.7	9.3	±0.93	60.50	±6.050
300 (12)	323.8	320.6	327.0	10.3	±1.03	79.63	±7.960

- 4. Threads.** The pipe shall be threaded in accordance with Table 2. Each length of threaded pipe shall be provided with one coupling of which thread shall be in accordance with Table 2.

Table 3. Thread requirements on pipe and coupling

PIPE		THREADS					COUPLING		
NPS Designator	Outside Diameter, mm	Number of Threads per 25.4 mm	End of Pipe to Hand Tight Plane, mm	Effective Length, mm	Total Length, mm	Pitch Dia. at Hand Tight Plane, mm	Outside Diameter, mm	Length, mm	Hand Tight Stand-off (No. of Threads)
			L1	L2	L4	E1	W	N _L	
15	21.3	14	8.1	13.6	19.9	19.8	27.0	39.7	5
20	26.7	14	8.6	13.9	20.2	25.1	33.4	41.3	5
25	33.4	11.5	10.2	17.3	25.0	31.5	40.0	50.8	5
32	42.2	11.5	10.7	18.0	25.6	40.2	48.3	52.4	5
40	48.3	11.5	10.7	18.4	26.0	46.3	55.9	52.4	5.5
50	60.3	11.5	11.1	19.2	26.9	58.3	69.9	54.0	5.5
65	73.0	8	17.3	28.9	39.9	70.2	82.6	79.4	5.5
80	88.9	8	19.5	30.5	41.5	86.1	101.6	82.6	5.5
100	114.3	8	21.4	33.0	44.0	111.4	127.0	88.9	5
125	141.3	8	23.8	35.7	46.7	138.4	159.9	95.3	5
150	168.3	8	24.3	38.4	49.4	165.3	187.7	101.6	6
200	219.1	8	27.0	43.5	54.5	215.9	244.5	133.4	2
250	273.0	8	30.7	48.9	59.9	269.8	298.5	146.1	2
300	323.8	8	34.5	54.0	65.0	320.5	355.6	155.6	2

DIMENSION OF HAND TIGHT ASSEMBLY FOR USED WITH TABLE

- 5. Bend.** Pipes shall be capable of being bent cold, without cracking at any portion and without opening of the weld, through 90 degrees round a former having a radius at the bottom of the groove equal to six times the outside diameter of the pipe as given in Table 1.
- 6. Flattening.** No opening shall occur by fracture in a weld until the distance between the plate is less than 75 percent of the original outside diameter of the pipe and no

cracks or breaks in the metal elsewhere than in a weld shall occur until the distance between the plate is less than 60 percent of the original outside diameter. The test rings may have their inner and outer edges rounded.

- 7. Hydraulic.** All pipes shall withstand to the hydraulic pressure required in Table 3. prior to zinc coating. The Hydraulic test shall be carried out using a hydrostatic tester with the standard values to be used as criteria for this test specified in Table 3.

Table 3. Hydraulic Pressure Requirement

Nominal Pipe Size (mm)	Hydraulic Test Pressure	
	mPa	Meter Water Column (MWC)
15 - 25	4.90	(500)
32 - 80	6.86	(700)
100 - 300	8.30	(850)

D. SAMPLING AND TESTING

Sampling and testing of the GI Pipes manufactured/purchased under this Standard shall be in accordance with the requirements and procedure prescribed in PNS 26 and this Standard.

E. MARKINGS

Each pipe shall be properly marked by rolling, stamping or stenciling to contain the following information:

- a. Name of the Product
- b. Nominal pipe size, mm
- c. Schedule number and/or Nominal pressure, mPa
- d. Manufacturer’s name and/or its recognized trademark and production record code.
- e. Seal, or mark, of the testing agency, that certified the compliance of the pipe in accordance with PNS 26:2003 or of its latest edition.

F. PRODUCT WARRANTY

The manufacturer/dealer shall guarantee the purchaser that the G.I. pipes furnished are new and of current manufacture, free from defects in materials, design, and workmanship, and shall work best within a minimum period of one (1) year starting from the date of acceptance of the products by the purchaser. During the warranty period, if the G.I. pipes furnished are found to be defective due to materials, design, and workmanship under normal condition, operation and use, the manufacturer/dealer at his own option shall either replace or repair the defective product/s to its original condition. A Certificate of Warranty is required to this effect

G. AFFIDAVIT OF COMPLIANCE

The manufacturer shall furnish the purchaser with an affidavit stating that the pipes furnished conform to all applicable requirements of this standard and the purchaser’s specifications, and that all test specified herein have been performed and all test requirements have been met.

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Prepared and submitted by the Technical Standards Committee:

Project Mgt. Dept. Date _____
Engineering Dept. Date _____
Construction Dept. Date

P.M.D.- North Date _____
P.M.D.- South Date _____
P.D.D. Date

S.C.I.D. Date _____
M.M.D. Date _____
M.S.S.D. Date

Recommending Approval:

Approved:

RAUL E. TABASA _____
Chairman, Tech'l. Stds. Comm. Date
Manager, Engineering Dept.

ARMANDO H. PAREDES _____
General Manager Date