



AWWA C202-64

American Water Works Association

AWWA STANDARD
for
MILL-TYPE STEEL WATER PIPE

First Edition approved Apr. 25, 1940; Second Edition approved as "Tentative" May 15, 1960;
Third Edition approved as "Standard" Jun. 5, 1964.

AMERICAN WATER WORKS ASSOCIATION

Incorporated

2 Park Avenue, New York, N.Y. 10016



Documents

Document Sharing Hub

Prepared by
AWWA Committee 8310 D—Steel Pipe

H. ARTHUR PRICE, *Chairman*
WILLIAM W. HURLBUT, *Consultant*
User Members

H. KENNETH ANDERSON
R. E. BARNARD
MORRIS BECKER
ABRAHAM BROWN
GRAYDON E. BURNETT
CHARLES H. CAPEN
EDWARD E. ERICKSON
C. J. GINDER
S. LOGAN KERR

VANCE C. LISCHER
GEORGE B. McCOMB
DONALD P. PROUDFIT
JOHN J. ROSSBACH JR.
GUY R. SCOTT
ROLLAND W. SIMPSON
O. W. TORNROSE
JAMES W. TRAHERN
CHARLES W. WILSON

Producer Members

RUSSELL C. BEAM
WALTER H. CATES
DONALD N. CHAMBERLIN
H. J. EASTER

G. H. GARRETT
B. F. HUGHES
GEORGE D. KISH
J. E. REVELLE

© Copyright 1965 by the American Water Works Association, Inc.
Made in USA

Table of Contents

	Section		Section
Section 1—General		Section 5—Circumferential Welding of Straight Pipe Lengths	
Scope	1.1	Method	5.1
Definitions	1.2	Workmanship	5.2
Supplementary Details to Be Specified by Purchaser	1.3	Section 6—Manual Metallic-Arc Repair Welding	
Inspection	1.4	Procedure	6.1
Workmanship	1.5	Procedure Tests	6.2
Affidavit of Compliance	1.6	Repair Welder's Performance Tests ..	6.3
Section 2—Chemical Properties and Tests		Section 7—Tolerances	
Chemical Properties	2.1	Diameter	7.1
Tests	2.2	Wall Thickness	7.2
Section 3—Mechanical Properties and Tests		Weight	7.3
Mechanical Properties	3.1	Length	7.4
Tensile Tests	3.2	Straightness	7.5
Flattening Tests	3.3	Section 8—Pipe Ends	
Bend Tests for Butt-Welded Pipe	3.4	Ends for Mechanical Couplings	8.1
Fusion Weld Tests	3.5	Ends for Field Butt Welding	8.2
Section 4—Hydrostatic Tests		Bell-and-Spigot Ends With Rubber Gasket	8.3
Mill Inspection Hydrostatic Tests	4.1	Threaded Ends	8.4
Special Sections	4.2	Ends for Other Types of Joints	8.5
		Section 9—Marking and Delivery	
		Marking	9.1
		Delivery	9.2

Latest Revisions to C202

This standard includes a number of revisions, affecting primarily Sec. 1.3 and 1.6, that were approved by the AWWA Board of Directors on Jun. 5, 1964.

Designation. As a result of these revisions, the designation has been changed from "C202-60T" to "C202-64."



Documents

Document Sharing Hub



AWWA C202-64

AWWA Standard for Mill-Type Steel Water Pipe

Section 1—General

Sec. 1.1—Scope

This standard covers mill-type steel pipe intended for the conveyance of water. It covers pipe in all sizes; in single or double random lengths or specified laying lengths; in straight sections or other special sections required for closures, curves, or changes in alignment or grade to meet special conditions; and with ends prepared for the type of joint specified. For the purpose of this standard, mill-type pipe is defined as furnace-welded, electrically welded, or seamless steel pipe of any size produced to meet finished-pipe specifications. The types of pipe covered by this standard shall be limited by the following provisions:

1.1.1. *Furnace-welded pipe.* Furnace-welded pipe shall be continuous butt welded or furnace butt welded.

1.1.2. *Electrically welded pipe.* Electrically welded pipe shall be of Grade A, B, or X42,* as specified by

* Grades A and B under this standard are similar to grades A and B for pipe under American Petroleum Institute API 5L (Specifications for Line Pipe). Grade X42 is similar to Grade X42 for pipe under API 5LX (Specifications for High-Test Line Pipe). The purchaser need not make reference to the API specifications in using this standard, however.

the purchaser, and shall be induction butt welded; spiral- or straight-seam resistance butt welded; or spiral- or straight-seam fusion butt welded. Fusion-butt-welded pipe shall be manufactured by automatic submerged-arc or automatic shielded-arc welding.

1.1.3. *Seamless pipe.* Seamless pipe shall be of Grade A, B, or X42, as specified by the purchaser.

Sec. 1.2—Definitions

Under this standard, the following definitions shall apply:

1.2.1. *Purchaser:* The person, firm, corporation, or governmental subdivision entering into a contract or agreement for the purchase of any materials or work to be performed under this standard

1.2.2. *Manufacturer or supplier:* The person, firm, or corporation executing the contract or agreement with the purchaser to furnish any material or perform any work

1.2.3. *Inspector:* The duly authorized representative of the purchaser qualified by training and experience in the manufacture of steel pipe of the character covered by this standard

1.2.4. *Bevel:* An angle applied on the end of a pipe and measured from a line perpendicular to the axis

1.2.5. Butt weld: A weld whose throat lies in a plane disposed approximately 90 deg with respect to the surfaces of at least one of the parts joined (The size of a butt weld is expressed in terms of its net or unreinforced throat dimension in inches. A double-welded butt joint is one in which the filler metal is added to both sides. A single-welded butt joint is one in which the filler metal is added to one side only.)

1.2.6. Fillet weld: A weld of approximately triangular cross section whose throat lies in a plane disposed approximately 45 deg with respect to the surfaces of the parts joined (The size of the fillet weld is expressed in terms of the width, in inches, of one of its adjacent fused legs, the shorter if unequal.)

1.2.7. Flame cutting: The process of severing metal by means of a gas flame

1.2.8. Furnace-welded pipe: Either bell-welded or continuously welded pipe

1.2.9. Bell-welded pipe: Pipe produced in individual lengths from cut-length skelp, having its longitudinal butt joint forge welded by the mechanical pressure developed in drawing the furnace-heated skelp through a cone-shaped die (commonly known as a "welding bell") which serves as a combined forming and welding die

1.2.10. Continuously welded pipe: Pipe produced in continuous lengths from coiled skelp and subsequently cut into individual lengths, having its longitudinal butt joint forge welded by the mechanical pressure developed in rolling the hot-formed skelp through a set of round-pass welding rolls

1.2.11. Fusion welding: The process of welding metals in the molten or molten and vaporous state, without

the application of mechanical pressure or blows

1.2.12. Girth weld: A circumferential welded seam lying in one plane, used to join sections into lengths of straight pipe or to join pieces of mitered pipe to form fabricated special sections and fittings

1.2.13. Grade or class of material: The designation of material as to chemical analysis or physical properties

1.2.14. Ladle analysis: The chemical analysis taken at the time the steel is cast into ingots

1.2.15. Manufacturing process: The designation of pipe in accordance with the method of manufacture (see Sec. 1.1)

1.2.16. Mill-type pipe: Seamless, furnace-welded, electrically welded, or furnace-butt-welded steel pipe of any size produced to meet finished-pipe specifications

1.2.17. Nominal outside diameter: The commercial name or given dimension for pipe in sizes up to 12 in., as distinguished from the actual or measured dimension

1.2.18. Nominal size: The commercial name or given dimension for pipe in sizes up to 12 in., as distinguished from the actual or measured dimension

1.2.19. Nominal wall thickness: The named or given thickness as distinguished from the actual or measured thickness

1.2.20. Nominal weight per foot (for uncoated and unlined pipe): The theoretical weight per foot, as shown in published tables, as distinguished from the actual or measured weight per foot of the finished pipe

1.2.21. Plain-end pipe: Pipe cut off to random or exact lengths, but not threaded and not beveled unless specified

1.2.22. Resistance-butt-welded pipe: Pipe having a longitudinal or spiral butt joint in which coalescence is produced by the heat obtained from resistance of the pipe to the flow of electric current in a circuit of which the pipe is a part, and by the application of pressure

1.2.23. Root: The zone at the bottom of the cross-sectional space provided to contain the deposited filler metal

1.2.24. Seamless pipe: Pipe without welds made from solid ingots, blooms, billets, or round bars which have been hot pierced and then brought to the desired size by hot rolling, hot drawing, or a combination of both

1.2.25. Specified lengths: Sections of finished pipe whose length dimensions do not vary from a fixed figure specified by the purchaser by more than the tolerance set forth in this standard

1.2.26. Spiral-seam fusion-welded pipe: Pipes in which the line of the fusion seam forms a helix on the barrel of the pipe

1.2.27. Straight-seam fusion-welded pipe: Pipe in which the line of the fusion seam parallels the axis of the pipe

1.2.28. Throat: The thickness of deposited weld metal, not including reinforcing, along a straight line passing through the root

1.2.29. Handling-tight coupling: A threaded coupling sufficiently tight that a wrench is necessary to loosen it

1.2.30. Power-tight coupling: A threaded coupling sufficiently tight that it cannot be loosened by the application of a manual wrench alone.

Sec. 1.3—Supplementary Details to Be Specified by Purchaser

When purchasing pipe under this standard, the purchaser shall provide

specific supplementary information in his specifications regarding the following details:

1.3.1. Standard used—that is, AWWA C202-64

1.3.2. Affidavit of compliance (Sec. 1.6.), if required

1.3.3. A description or drawings, naming the total quantity of pipe required for each diameter, wall thickness, grade, and so forth

1.3.4. Outside diameter

1.3.5. Wall thickness

1.3.6. Grade and type designation (Sec. 1.1)

1.3.7. Minimum mill hydrostatic test pressure (Sec. 4)

1.3.8. Type of field joints (description or drawings) (Sec. 8)

1.3.9. Length—that is, a specified cut length, single random (average length 17½ ft), double random (average length 35 ft), or some other average length (Sec. 7.4)

1.3.10. The maximum number of longitudinal and girth seams permitted in each length

1.3.11. All special sections and special fittings with dimensions, type of field joint, length tolerances, and so forth for each component part.

Sec. 1.4—Inspection

1.4.1. All work done and material furnished under this standard may be inspected by the purchaser, but such inspection shall not relieve the manufacturer of his responsibility to furnish material and perform work in accordance with this standard. If the inspector desires to inspect the pipe or witness the tests, reasonable notice shall be given of the time at which the inspection is to be made.

1.4.2. At all times while work on the contract is being performed, the inspector shall have free entry to all



those parts of the manufacturer's work that concern the manufacture of the pipe ordered. The manufacturer shall afford the inspector, without charge, all reasonable facilities to satisfy him that the pipe is being manufactured in accordance with this standard. All inspections shall be made at the place of manufacture prior to shipment and shall be so conducted as not to interfere unnecessarily with the operation of the works.

1.4.3. The inspector may reject any or all pipe sections or special sections that do not conform to the prescribed test results, conditions of pipe, and tolerances set forth in this standard, the approved drawings, and in the purchaser's supplementary specifications.

Sec. 1.5—Workmanship

1.5.1. *Defects.* The finished pipe shall be free from injurious defects. Defects in seamless pipe or in the parent metal of welded pipe shall be considered injurious when the depth of defect is greater than 12.5 per cent of the tabulated wall thickness. All cracks, sweats, and leaks in welds shall be considered injurious. All end welding of longitudinal seams of fusion-welded pipe, if not done by automatic submerged-arc or automatic shielded-arc welding, shall be done by a procedure and a welder qualified in accordance with Sec. 6.

1.5.2. *Repair of defects.* The repair of injurious defects shall be permitted at the discretion of the manufacturer, except that the repair of defects in seamless pipe or in the parent metal of welded pipe shall not be permitted if the depth of defect exceeds one-third of the tabulated wall thickness of the pipe and the length of that portion of the defect in which the depth exceeds 12.5 per cent is greater than 25 per cent of the tabulated outside diameter of the pipe, or if more than one repair is required in any length equivalent to ten times the tabulated outside diameter of the pipe. Repairs shall conform to the following requirements:

a. The defect shall be completely removed and the cavity thoroughly cleaned.

b. The repair weld shall be made by either automatic or manual welding, by a procedure and a welder qualified in accordance with Sec. 6.

c. Each length of repaired pipe shall be tested hydrostatically in accordance with Sec. 4.1.

Sec. 1.6—Affidavit of Compliance

The purchaser may require, in his supplementary specifications, that the manufacturer or supplier furnish an affidavit that all pipe, specials, and fittings furnished under the purchaser's order do, in fact, comply with the applicable requirements of this standard.

Section 2—Chemical Properties and Tests

Sec. 2.1—Chemical Properties

The steel furnished for pipe under this standard shall be of good welding quality and shall conform to the chemical requirements shown in Table 1 for the grade of pipe ordered. Steel may be made by any of the following processes, in accordance with the method

of pipe manufacture: open hearth, electric furnace, basic oxygen, killed deoxidized acid, or basic bessemer.

Sec. 2.2—Tests

2.2.1. *Ladle analysis.* When requested by the purchaser, the manufacturer shall furnish a report giving the