UDC 621.774.1

ASA A21.2-1953
(AWWA C102-53)

THIS STANDARD WITHDRAWN JUNE 1967
FOR REFERENCE USE ONLY

AMERICAN STANDARD

for

CAST IRON PIT CAST PIPE FOR WATER OR OTHER LIQUIDS

PUBLISHED BY AMERICAN WATER WORKS ASSOCIATION, INC.

SPONSORS

American Gas Association
American Society for Testing Materials
American Water Works Association
New England Water Works Association

First Edition: A21.2-1939; Revised Edition: A21.2-1953

Approved by American Standards Association Jan. 13, 1953

AMERICAN WATER WORKS ASSOCIATION
Incorporated
2 Park Avenue, New York, N.Y. 10016

AVA Documents
Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

© Copyright 1939 by the American Water Works Assn.
as part of the December 1939 Journal AWWA
Made in USA

Documents
Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

American Standard for

Cast Iron Pit Cast Pipe For Water or Other Liquids

This standard covers cast iron pit cast pipe for water or other liquids. Pit cast pipe are pipe cast vertically with dry sand molds and cores.

Sect. 2-1. Description of Pipe. The pipe shall be made with bell and spigot ends, plain ends or such other type of ends as may be agreed upon at the time of purchase. Pipe with bell and spigot ends shall conform accurately to the dimensions given in Table 1. Pipe with other types of ends shall comply with the dimensions agreed upon but in all other respects shall fulfill the requirements hereinafter given. Pipe shall be straight and shall be true circles in section, with their inner and outer surfaces concentric. They shall be at least 12 ft. in nominal laying length, except as provided for cut pipe in Sect. 2-10.

Sect. 2-2. Casting of Pipe. The pipe shall be cast in dry sand molds in a vertical position. Pipe 16 inches or less in diameter shall be cast with the bell end up or down as specified in the proposals. Pipe 18 inches or more in diameter shall be cast with the bell end down. The pipe shall not be stripped or taken from the pit while showing color of heat, but shall be left in the flasks for a sufficient length of time to prevent unequal contraction by subsequent exposure.

Sect. 2-3. Quality of Iron.

(a) All pipes shall be made of cast iron of good quality, and of such character and so adapted in chemical composition to the thickness of the pipe to be cast, that the iron in the pipe shall be strong, tough, resilient, of even grain and soft enough for satisfactory

AVA Documents
Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

drilling and cutting and it shall comply with the physical specifications given in Sect. 2-16, 2-17 and 2-18. The metal shall be remelted in a cupola or other suitable furnace.

(b) The iron in the pipe shall not contain more than 0.90 per cent of phosphorus nor more than 0.12 per cent of sulphur. Samples for chemical analysis shall be taken by drilling completely through from skin to skin each of the acceptance test specimens; but not to exceed three specimens per heat.

Sect. 2-4. Quality of Castings. The pipe shall be smooth, free from scales, lumps, blisters, sand holes and defects of every nature which unfit them for the use for which they are intended. No plugging, filling, burning-in or welding will be allowed except as permitted by the purchaser.

Sect. 2-5. Foundry Records. A record of the following tests shall be made and retained for at least one year. Upon request, such record will be available to the purchaser at the foundry. If written transcripts of any of these tests are desired, this fact shall be noted in the order for pipe, naming the tests of which transcripts are desired.

(a) *Chemical Analyses.* Chemical analyses of each iron mixture used directly in pouring of pipe, obtained as in Sect. 2–3(b), shall be made for silicon, sulphur, manganese, phosphorus and total carbon during the first hour and at intervals not to exceed three hours throughout the heat. If pipe is poured directly from the cupola, chemical analyses shall be made of iron from the first and from the last ladle. If the mixture is changed one or more times during a heat in order to produce a different iron, the time of taking samples shall be varied in such a way as to obtain representative tests of iron at least at the beginning and end of each period during which the iron is intended to be constant in quality.

(b) *Pouring Temperature.* The pouring temperature of the iron shall be taken at the casting ladle for each size of pipe at least once each hour.

(c) *Test Bar Tests.* See Sect. 2–17.

(d) *Ring Tests and Talbot Strip Tests.* See Sections 2–17(d) and 2–18.

(e) *Full-Length Bursting Tests.* See Sect. 2–19.

Sect. 2-6. Marking Pipe. Every pipe shall have distinctly cast upon it the initials of the maker's name. When cast especially to order, each pipe larger than 4-inch may also have cast upon it figures showing the year in which it was cast and a number signi-

AVA Documents Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

fying the order in point of time in which it was cast, the figures denoting the year being above and the number below, thus:

1940	1940	1940
1	2	3

etc., also any initials, not exceeding four, which may be required by the purchaser. The letters and figures shall be cast on the outside and shall have dimensions as indicated below.

Diameters of Pipe, Inches, Inclusive	Height of Letter, Inches	Relief, Inch
3 to 10	$\frac{3}{4}$	$\frac{3}{32}$
12 to 20	$1\frac{1}{4}$	$\frac{3}{32}$
24 & larger	$1\frac{3}{4}$	$\frac{1}{8}$

The weight and the class shall be conspicuously painted in white in the inside or outside of each pipe after the coating has become hard.

Sect. 2-7. Inspection by Purchaser.

(a) *Definition of Word "Purchaser."* Wherever the word "Purchaser" is used herein it shall be understood to mean the actual purchaser of the pipe or his authorized agents acting within the scope of the duties entrusted to them.

(b) *Power of Purchaser to Inspect.* The purchaser shall have free access at all times to all parts of any manufacturing plant which concern the manufacture of articles to be made for him. He may inspect the material, the pattern work, molding, casting, coating and lining of the pipe. The forms, sizes, uniformity and conditions of all pipe herein referred to shall be subject to his inspection and approval, and he may reject, without subjection to hydrostatic test, any pipe which is not in conformity with the specifications or drawings. Any pipe rejected shall be marked "rejected" and any marks pertaining to the purchaser shall be chipped or erased from such pipe.

(c) *Manufacturer to Furnish Men and Material.* The manufacturer shall provide all tools, testing equipment, materials, labor and facilities necessary for the required testing, inspection and weighing of the pipe at the foundry.

(d) *Report of Purchaser's Inspection.* The purchaser shall make written report daily at the foundry office of all pipe rejected, noting causes for rejection.

Sect. 2-8. Inspection and Certification by Manufacturer. Should the purchaser have no inspector at the works, the manufacturer shall, if required by the purchaser, furnish a sworn statement that

AVA Documents Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

the inspection and all of the tests have been made as specified, this statement to contain the results of all specified tests.

Sect. 2-9. Pipe to Be Delivered Sound. All the pipe must be delivered in all respects sound and comformable to these specifications. The inspection shall not relieve the manufacturer of any of his obligations in this respect, and any defective pipe which may have passed the purchaser at the works or elsewhere shall be at all times liable to rejection when discovered, until the final completion and adjustment of the contract; provided, however, that the manufacturer shall not be held liable for pipe found to be cracked after they have been accepted at the agreed point of delivery, unless there shall be unmistakable evidence that the casting was originally defective or damaged before acceptance. Care shall be taken in handling the pipe not to injure the coating or lining and no pipe or other material of any kind shall be placed in the pipe during transportation or at any other time after they have received the coating or lining.

Sect. 2-10. Cut Pipe. Defective spigot ends on pipe may be cut off in a manner which will produce a square end. Cut pipe shall be shipped with plain ends or shall have an iron or steel band shrunk into a groove or welded securely on the pipe, as may be agreed upon at time of purchase. Not more than 8 per cent of the total number of pipe of each size shall be cut, and no cut pipe shall be furnished which is less than 11 ft. 0 in. in laying length, unless it has been used by purchaser's order for strip and ring tests in which case a length of not less than 10 ft. 0 in. shall be accepted.

Sect. 2-11. Tolerances or Maximum Permitted Variations from Standard.

(a) *Tolerances in Diameter of Pipe and Sockets.* Outside diameters of pipe barrels and spigot beads and diameters of sockets shall be kept as nearly as practicable to the specified dimensions. They shall be tested with circular gauges. Tolerances or maximum permitted variations from standard dimensions are listed below:

Nominal Diameter in Inches	Tolerance, Plus or Minus, in Inches
3 to 16	.06
18, 20 & 24	.08
30, 36 & 42	.10
48	.12
54	.15
60	.15

AVA Documents Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

(b) *Tolerances in Thickness.* The tolerances, or maximum permitted variations from standard in thickness of pipe and in dimensions of bells are listed below:

Nominal Diameter in Inches, inclusive	Tolerance, Plus or Minus, in Inches
3 to 8	.07
10 to 24	.08
30 to 60	.10

NOTE: In pipe barrel thickness, tolerances .02 inch greater than those listed above shall be permissible over areas not exceeding 8 inches in length in any direction.

(c) *Allowable Percentage of Variation in Weight.* The weight of no single pipe shall be less than the nominal tabulated weight by more than 5% for pipe 16 inches or less in diameter, and 4% for pipe more than 16 inches in diameter. The total excess weight to be paid for on orders of 25 tons or more shall not exceed 2% of the nominal weight, and on orders less than 25 tons shall not exceed 5% of the nominal weight. An order is hereby defined as including all the pipe ordered under the terms of a specific contract or purchase order or a single order placed under the terms of a standing contract.

Sect. 2-12. Cleaning and Inspecting. All pipe shall have gates, fins and other roughnesses chipped or ground off and shall be thoroughly cleaned, checked as to dimensions and also subjected to a careful surface inspection and a rolling test before being coated or lined.

Sect. 2-13. Hydrostatic Test. Each pipe shall be subjected to a hydrostatic proof test. This test may be made either before or after the tar dip or the priming coat for bituminous enamel has been applied but shall be made before the cement mortar lining, bituminous enamel lining, or any other special lining has been applied to pipe for which such a lining is specified.

The pipe shall be under the test pressure for at least one-half minute. Any pipe showing defects by leaking, sweating, or otherwise, shall be rejected. The test pressures shall be in accordance with the table on the following page.

Sect. 2-14. Weighing. Each length of pipe shall be weighed and the weight and class plainly marked on the outside or inside of the bell or spigot end. Pipe which is to be lined with cement mortar or coated on the inside or outside, or both, with bituminous enamel or other special material shall be weighed before the application of such

AVA Documents Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan

TABLE OF PRESSURES FOR HYDROSTATIC TESTS

Nominal Diameter of Pipe, Inches	Barrel Thickness, Inches From	To	Test Pressures, Lb. per sq.in.
3 to 12	All Thicknesses		400
14	.50	.70	300
14	.71	.85	350
14	.86	1.20	450
16	.55	.75	300
16	.76	.95	350
16	.96	1.25	450
18	.60	.80	300
18	.81	1.00	350
18	1.01	1.35	450
20	.65	.85	250
20	.86	1.05	350
20	1.06	1.45	450
24	.70	.90	200
24	.91	1.00	300
24	1.01	1.60	400
30	.85	1.05	200
30	1.06	1.30	300
30	1.31	1.75	400
36	.95	1.15	200
36	1.16	1.45	300
36	1.46	1.95	350
42	1.05	1.35	200
42	1.36	1.60	300
42	1.61	1.75	350
48	1.15	1.50	200
48	1.51	1.90	300
48	1.91	2.05	350
54	1.30	1.55	200
54	1.56	1.80	250
54	1.81	2.05	300
54	2.06	2.25	350
60	1.35	1.75	200
60	1.76	2.05	250
60	2.06	2.30	300
60	2.31	2.40	350

Note: Unless otherwise arranged between the manufacturer and the purchaser, pipe thicker than those listed in the above table shall be tested at the highest pressures listed for the given diameter.

Documents
Document Sharing Hub

Full document details: AWWA C102-53 (ASA A21.2-1953) scan