

SAN ANTONIO WATER SYSTEM
SPECIFICATIONS FOR AWWA C-905 POLYVINYL CHLORIDE (PVC)
WATER TRANSMISSION PIPE
DIAMETERS 14 IN. THROUGH 36 IN.
REVISED March 2013

1. **SCOPE**

This product specification covers 14-inch diameter through 36-inch diameter polyvinyl chloride (PVC) potable water transmission pipe with integral bell and spigot joints. The pipe shall be extruded from Class 12454-A or 12454-B PVC compound as defined in ASTM D-1784 and provide for a hydrostatic design basis (HDB) of 4,000 psi (27.58 MPa). The pipe outside diameters shall conform to dimensions of cast iron pipe (CI). All pipe furnished shall be in conformance with American Water Works Association (AWWA) Standard C905-97, or latest revision thereof.

Pipe shall be homogenous throughout. It shall be free from voids, cracks, inclusions, and other defects. It shall be as uniform as commercially practical in color, density, and other physical properties. Pipe surfaces shall be free from nicks and scratches. Joining surfaces of spigots and joints shall be free from gouges and imperfections that could cause leakage.

2. **DEFINITIONS**

All definitions are defined according to AWWA C905-97 Section 1.2 Definitions.

- a. Dimension Ratio (DR) - The ratio of the pipe outside diameter to the minimum wall thickness. The quotient is rounded to the nearest 0.5 when necessary.
- b. Pressure Rating (PR) - The nominal pressure rating of transmission pipe is determined from formulas in Section 5: Transmission-Pipe Ratings of AWWA C905-97 using a safety factor of 2.0. There is no allowance for surge pressure in the pressure rating.

3. **GENERAL REQUIREMENTS**

- a. Except as noted on the plans or procurement specifications for specific jobs, all C-905 PVC pipe shall have a pressure rating of 235 PSI and a dimension ratio of 18 or have the highest pressure rating available for each size of pipe.

C-905 PVC WATER TRANSMISSION PIPE
SPECIFICATION NUMBER 819-01

- b. Dimensions and tolerances for each nominal pipe size shall be in accordance with Table 2 Dimensions for PVC Transmission Pipe with CI Outside Diameter of Section 3 Pipe Requirements in AWWA C905-97. All pipes shall be suitable for use as a pressure conduit.
- c. Pipe shall be gauged full length and furnished in standard laying lengths of 20 feet plus or minus 1 inch (6.1 m +/- 25 mm) unless otherwise noted. Each pipe shall have an integral bell formed on the pipe end, and be designed to be at least as strong as the pipe wall.
- d. An elastomeric gasket shall be designed with a retainer ring, which locks the gasket into integral bell groove and shall be installed at the point of manufacture. The dimensions and design of the gasket joint provided for the PVC transmission pipe shall meet requirements provided in ASTM D3139 and ASTM D2122. The gasket shall be reinforced with a steel band and shall conform to ASTM F477.
- e. Each length of pipe furnished shall bear identification markings that will remain legible after normal handling, storage, and installation. Markings shall be applied in a manner that will not weaken or damage the pipe. Markings shall be applied at intervals of not more than 5 ft. (1.5 m) on the pipe. The minimum required markings are given in the list below. Marking requirements shall be in conformance with Section 4.7 Marking Requirements of AWWA C905-97.
 - 1. Nominal size and OD base (for example, 36 CI).
 - 2. PVC.
 - 3. Dimension Ratio (for example, DR 25)
 - 4. AWWA pressure rating (for example, PR 165)
 - 5. AWWA designation number for this standard (AWWA C905).
 - 6. Manufacturer's name or trademark.
 - 7. Manufacturer's production code, including day, month, year, shift, plant, and extruder of manufacture.
- f. Pipe shall be bundled in pallets for ease of handling and storage. Pipe bundles (Units) shall be packaged to provide structural support to insure that the weight of upper units shall not cause deformation to pipe in lower units. No pipes bundles shall be accepted which show evidence of ultraviolet radiation "sunburn" on exposed pipe as may be caused from extended unprotected storage conditions.

C-905 PVC WATER TRANSMISSION PIPE
SPECIFICATION NUMBER 819-01

- g. The manufacturer shall take adequate measures during pipe production to assure compliance with AWWA C905-97 by performing quality-control tests and maintaining results of those tests as outlined in Section 4: Inspection and Testing of that standard. Submission of product shall constitute certification of compliance with AWWA C905-97 Section 4: Inspection and Testing.
- h. The pipe is intended for use as an underground, direct bury pressure pipe for transport of potable water. The expected life of the pipe system, after installation, is 25 to 50 years.
- i. A one-year warranty shall be provided for all materials sold and delivered for use and incorporated into the San Antonio Water System distribution system. Such warranty shall take effect on the date that the pipe is received and accepted by an authorized representative of the San Antonio Water System.
- j. User references and a claims history shall be provided for further investigation, prior to rendering a final decision on the acceptance of the product to be furnished.

4. **TESTS**

The manufacturer shall pressure test all pipe, including the joint, that is marked with the designation number of AWWA C905-97 at 73.4 Deg. F. +/- 3.6 Deg. F. (23 Deg. C. +/- 2 Deg. C.). Each length of pipe shall be proof tested at twice the pressure rating listed in Table 3 Transmission-Pipe Pressure Rating of AWWA C905-97 Sec. 4.6 Pressure Strength and Hydrostatic Proof Testing.

5. **RANDOM TESTS**

The San Antonio Water System may, at no cost to the manufacturer, subject random lengths of pipe to testing by an independent laboratory for compliance with this specification. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

C-905 PVC WATER TRANSMISSION PIPE
SPECIFICATION NUMBER 819-01

6. **REFERENCES**

The documents listed below are referenced in this specification.

1. AWWA C905-97; Polyvinyl Chloride (PVC) Water Transmission Pipe Diameters 14 In. Through 36 In.
2. ASTM D1784; Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
3. ASTM D2122; Standard Method of Determining Dimensions of Thermoplastic Pipe and Fittings.
4. ASTM D3139; Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
5. ASTM F477; Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

Approved Manufacturer List

Diamond Plastics Corporation
North American Pipe Corporation
JM Eagle
Northern Pipe Products Inc.

Previous Specification Dates

Jan 2008
April 2004
August 1998
Dec 2011 RNC