

**INTERNATIONAL ASSOCIATION OF PLUMBING
AND MECHANICAL OFFICIALS**

**IAPMO GUIDE CRITERIA
FOR**

**HDPE PLASTIC VALVES FOR COLD WATER DISTRIBUTION SYSTEMS
OUTSIDE A BUILDING**

IAPMO IGC 151-99 (R2013)

1 PURPOSE

- 1.1** The purpose of this IGC is to establish an acceptable standard for verification of performance and material toxicity for HDPE (high-density polyethylene) plastic valves for use in potable cold water systems inside or outside a building. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users; to promote understanding regarding materials, manufacture, and installation; and to provide a means for identifying HDPE plastic valves that comply with this IGC.
- 1.2** The provisions of this IGC are not intended to prevent the use of any alternate material or method of construction, provided any such alternate meets or exceeds the intent of this IGC.

2. SCOPE

- 2.1** This IGC covers materials, testing, dimensional, and performance requirements for HDPE plastic valves sizes 1/2 through 12. (Valve Size equates to Nominal Pipe Size in inches).

3. GENERAL REQUIREMENTS

3.1 Materials.

- 3.1.1** HDPE plastic compound used to make HDPE valves shall meet the requirements of class PE-345434-C as listed in ASTM D 3350. All HDPE resin used to manufacture valves must have Plastic Pipe Institute listed 100,000 hr strength value (HDB) and pressure rating.
- 3.1.2 Rework Material.** Clean rework HDPE material shall only be used provided it is generated from the molded item manufacturer, has not been mixed in any way with other materials, and has not been subjected to processing sufficient to lower any of the minimum properties required by the cell classification given in 3.1.1. Materials containing contaminants from other base materials or elastomerics shall not be used in the manufacture of valves or appurtenances under this standard.

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3.1.3 Material Toxicity. All materials that will contact potable water shall comply with ANSI/NSF 61.

4.1 Design

4.1.1 Working Pressure. The working pressure of HDPE valves shall be established according to an SDR rating. The formula $P_{\max} = HDB/(SDR-1)$ shall be used to calculate ultimate working pressure. Minimum burst pressure of the HDPE valves shall be 5 times the valve rated working pressure when tested according to ASTM D 1599. When burst tested with commercially available HDPE pipe of equivalent SDR, the valves shall not experience any failure prior to failure of the pipe. The currently accepted HDB (hydrostatic design basis) for HDPE pipe operating at 73°F and lower is 1600 psi. Appropriate HDB reduction shall be made for temperatures above 73°F.

4.1.2 Working Temperature. The HDPE valves shall be designed for use in cold water applications at temperatures from non-freezing to 110° F (43° C). Valves shall not experience damage due to freezing water, but are not expected to be operable during such conditions.

4.1.3 Installation. All HDPE valves shall be provided with stub ends of equivalent diameter and wall thickness as the pipe to which they are attached. The stub ends shall be of length suitable to allow installation by means of butt fusion, socket fusion (using commercially available couplings), or electrofusion (using commercially available couplings) and by mechanical couplings (using commercially available couplings). Valves shall be designed to allow for buried installation. Valves may also be installed above ground if required, and shall be designed such that they are resistant to ultra violet light in the same manner as the HDPE pipe system into which they are installed.

4.1.4 Seals. O-ring seals and gaskets shall be of such design and quality to assure leak-proof joints and be capable of providing satisfactory field service. O-ring and gasketed joints shall provide for external leak tightness up to the minimum burst pressure of the valves.

4.1.5 Sealing. Valves shall be designed for bi-directional, drop tight sealing capability at any pressure up to the full rated working pressure of the valve.

4.1.6 Operating Nut. Valves shall be provided with an operating nut operable with a 2" square socket wrench. Additionally, valves smaller than Size 2 shall be operable with curb-key type wrenches in addition to 2" square socket wrenches. Lever wrench handles shall be available for use with the valves when installed above ground.

5. TESTING REQUIREMENTS

5.1 Testing. Each production valve larger than Size 6 and larger shall be shell tested at 200% of its 73°F rated working pressure and seat tested at 150% of its 73°F rated working pressure. Seat testing shall verify bi-directional sealing performance. No leakage shall be allowed during any test. (Valve Size equates to Nominal Pipe Size in inches).

6. MARKING AND IDENTIFICATION

6.1 Markings. Each valve shall be legibly marked with following information:

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