

**INTERNATIONAL ASSOCIATION OF PLUMBING
AND MECHANICAL OFFICIALS**

**IAPMO GUIDE CRITERIA
FOR**

**DUAL CONTAINMENT PIPING SYSTEMS
FOR
ACID WASTE AND SPECIAL WASTE APPLICATIONS**

IGC 164-2003 (R2013)

1. PURPOSE

- 1.1** The purpose of this standard is to establish a generally acceptable standard for dual containment piping systems intended to convey acid waste or other special wastes. Due to the nature of the liquid waste materials disposed of in acid waste and special waste systems, 40 CFR §264.193, as well as many local jurisdictions require that piping used to convey such systems be protected by providing secondary containment and leak detection around the carrier (product) piping system. A solution often used by architects and engineers involves specifying a pipe within a pipe arrangement where the carrier pipe is concentrically housed within a protective containment pipe housing. The space between the two pipes can then be monitored for leaks by various manual or automatic methods. It is intended to serve as a guide for producers, distributors, architects, code officials, contractors, installers and end users; to promote understanding regarding materials, manufacture, installation and performance, and to provide a means for identifying devices complying with this standard.
- 1.2** The provisions of this standard are not intended to prevent the use of any alternate material or method of construction provided that any such alternate meets the intent of this standard.

2. SCOPE

- 2.1** This standard serves to supplement the provisions of the Uniform Plumbing Code, Section 811.0 "Chemical Wastes", as well as standards ASTM F 1412, F 1673, and D 3311 referenced in Chapter 14 of the Uniform Plumbing Code and ISO 4065 of the International Organization for Standardization. This standard does not address continuous ribbed (unitary extruded) dual containment piping systems. These systems are covered in IAPMO IGC 185.
- 2.2** This standard covers minimum standards for materials used in the construction of carrier (product) piping systems and secondary containment housings, and serves to prescribe minimum test requirements for the performance of fitting and pipe joints, together with marking and identification requirements.

3. REFERENCED STANDARDS

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ASTM F 1412	Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems
ASTM F 1673	Standard Specification for Polyvinylidene Fluoride [PVDF] Corrosive Waste Drainage Systems
ASTM D 3311	Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fitting Patterns
ISO 4065	Thermoplastic Pipes – Universal Wall Thickness Table

4. DEFINITIONS

- 4.1** Dual Containment Piping - a pipe within a pipe arrangement where the carrier pipe is concentrically housed within a protective secondary containment pipe housing.
- 4.2** Secondary Containment Piping - the outer pipe of a dual containment piping system, also referred to as the containment piping.
- 4.3** Carrier Piping - the inner pipe of a dual containment piping system also referred to as primary, product, or interior.
- 4.4** Continuous Ribbed (Unitary Extruded) Pipe - one-piece double-walled pipe that is extruded simultaneously. The materials of construction are the same for both the inner and the outer piping. The primary (inner) pipe shall be integrally with the secondary (containment) pipe via connecting ribs, which are continuous down the entire length of each section of pipe. No centralizing clips, spiders, disks, or supports are included in the manufacture of the pipe.
- 4.5** Unitary Force Restraint Coupling - A one-piece fitting used to control thermal stresses, and that can also be used to terminate the containment pipe, by locking the inner and outer pipes together.

5. GENERAL REQUIREMENTS

- 5.1** Carrier piping systems shall consist of listed polyolefin or PVDF piping systems (manufactured in compliance with the requirements of sections 5.1.1, 5.1.2, 5.1.3, or 5.1.4 of this standard.
- 5.1.1** The requirements of ASTM F 1412.
- 5.1.2** The requirements of ASTM F 1673.
- 5.1.3** The performance requirements of ASTM F 1412 and the dimensional requirements for PP or PE piping systems of ISO 4065. The performance requirements of ASTM F 1412 include sections 6.2.9 Traps, 6.3 Chemical Resistance, 6.4 Water Absorption, 6.5 System Integrity, 6.7 Sealing Rings, 6.8 Flattening, 6.9 Impact Resistance, and 7. Workmanship, Finish, and Appearance.
- 5.1.4** The performance requirements of ASTM F 1673 and the dimensional requirements for PVDF piping systems of ISO 4065. The performance requirements of ASTM F 1673 include sections 6.1.2.8 Traps, 6.2 Chemical Resistance, 6.3 Water Absorption, 6.4

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System Integrity, 6.5 Stainless Steel Parts, 6.6 Sealing Rings, 6.7 Flattening, 6.8 Impact Resistance, and 7. Workmanship, Finish, and Appearance.

- 5.2** Secondary containment piping shall be two nominal pipe sizes larger than the corresponding carrier pipe size for each respective diameter, or shall provide a minimum overall annular clearance, of 1/2 inch taking into account all carrier fitting hubs, and other annular restrictions including weld beads.
- 5.3** Secondary containment piping systems shall use listed pipe and fittings. For other elements of the secondary containment system that must use modified, or fabricated fitting arrangements, the elements shall be fabricated from pipe manufactured in compliance with the requirements of section 5.1 of this standard.
- 5.4** The carrier system shall be supported and centralized within the secondary containment system according to the values shown in Table 1. The supports shall be attached to the carrier pipe system prior to the secondary containment piping system being installed, and shall have a minimum overall diametrical clearance* of 1/16 inch to allow insertion of the carrier pipe system into the secondary containment (or installation of the containment pipe system over the carrier) without resulting in undue stresses to the carrier or containment pipe systems during operation of the pipe system. The carrier system shall comply with the requirements of Section 6.5 of this standard for strength of attachment and clearance of the centralizing supports.
- * Measured from the minimum pipe internal diameter according to the tolerances as described in ASTM F 1412, F 1673 or ISO 4065.

TABLE 1

MAXIMUM† SUPPORT SPACING BETWEEN SUPPORTS FOR CARRIER PIPES
(for systems with carrier fluid temperatures up to 120°F)

Carrier Pipe Size (inches)	Schedule 40 PP (feet)	Schedule 80 PP (feet)	SDR 11 PP (feet)	SDR 33 PP (feet)	Schedule 40 PVDF (feet)	Schedule 80 PVDF (feet)	SDR 33 PVDF (feet)
1-1/2	4	4	3.2	3	4.5	4.5	4
2	4	4	4	3	5	5 4	
3	5	5	5	3	5.5	5.5	5
4	6	6	5.4	3.2	6	6	5.5
6	6	6	6.3	3.5	7	7 6	
8	6	6	6.75	3.5	7	7	6.75
10	7	7	7.7	4	8	8	7.5
12	7	7	8.5	4.5	8	8	8.5

† Values shown are maximum values. Actual spacing can be closer.
All support spacing shall be based on a maximum 0.1" deflection between supports.

- 5.5** All interstitial elements (e.g. internal centralizing supports, internal anchors, etc.) of the dual containment assembly shall allow for an unobstructed leak path for the leaking fluid