

IAPMO IGC 301-~~2013~~^{e3}2018

PUBLIC REVIEW DRAFT

Flexible Continuous
Wastes for Lavatories
and Sinks



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Flexible Continuous Wastes for Lavatories and Sinks

1 Scope

1.1 Scope

This Standard covers flexible continuous wastes intended for connecting lavatories and sinks to the sanitary drainage system and specifies requirements for materials, physical characteristics, performance testing, and markings.

1.2 Alternative Materials

The requirements of this Standard are not intended to prevent the use of alternative materials or methods of construction provided such alternatives meet the intent and requirements of this Standard.

1.3 Terminology

In this Standard,

- (a) “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy to comply with the Standard;
- (b) “should” is used to express a recommendation, but not a requirement;
- (c) “may” is used to express an option or something permissible within the scope of the Standard; and
- (d) “can” is used to express a possibility or a capability.

Notes accompanying sections of the Standard do not specify requirements or alternative requirements; the purpose of those notes is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and can be written as requirements.

1.4 Units of Measurement

SI units are the primary units of record in global commerce. In this Standard, the inch/pound units are shown in parentheses. The values stated in each measurement system are equivalent in application, but each unit system is to be used independently. All references to gallons are to U.S. gallons.

1.5 Amendments

Proposals for amendments to this Standard will be processed in accordance with the standards writing procedures of IAPMO.

1.6 Patents

The user’s attention is called to the possibility that compliance with this Standard might require use of an invention covered by patent rights. By publication of this Standard, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith.

If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details can be obtained from IAPMO.

2 Reference Publications

This Standard refers to the following publications, and where such reference is made, it shall be to the current edition of those publications, including all amendments published thereto.

ASME A112.18.2/CSA B125.2	Plumbing waste fittings
ASME B1.20.1	Pipe Threads, General Purpose (Inch)
ASTM D1784	Standard Specification for Rigid Poly (Vinyl Chloride)(PVC) Compounds and Chlorinated Poly (Vinyl Chloride)(CPVC) Compounds
ASTM D2287	Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
ASTM D3965	Standard Classification System and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings
ASTM D4101	Standard Specification for Polypropylene Injection and Extrusion Materials
ASTM F409	Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings

3 Definitions and Abbreviations

3.1 Definitions

The definitions in ASME A112.18.2/CSA B125.2 shall apply in this Standard.

3.2 Abbreviations

The following abbreviations apply in this Standard:

ABS	— acrylonitrile-butadiene-styrene
NPSM	— National Pipe Straight Mechanical
PE	— polyethylene
PP	— polypropylene
PVC	— polyvinylchloride

4 General Requirements

4.1 Materials

4.1.1 Plastic Tubular Fittings and Connectors

Plastic tubular drain fittings shall be made of

- (a) ABS complying with or exceeding the properties of cell classification 20211 specified in ASTM D3965;
- (b) unreinforced PP complying with or exceeding the properties of cell classification
 - (i) PP0110B55140 specified in ASTM D4101; or
 - (ii) 55230 specified in Table B of ASTM D4101; or
- (c) PVC complying with or exceeding the properties of cell classification 12454 or 14333 specified in ASTM D1784.

4.1.2 Flexible Hoses

Flexible hoses shall be made of flexible PVC complying with or exceeding the properties of cell classification

- (a) 4140000 specified in ASTM D2287; or
- (b) 13353 specified in ASTM D1784.

4.2 Connections

Flexible drain connectors shall have means for

- (a) connecting to traps or the drainage system; and
- (b) establishing a seal against the fixture to which they are fastened.

4.3 Union Nut Threads

Threads for union nuts shall

- (a) be at least 2.5 threads long;
- (b) have at least one thread engagement;
- (c) be NPSM threads; and
- (d) have a form that complies with Table 6 of ASME B1.20.1.

4.4 Dimensions

4.4.1 Outlet Size

The nominal outside diameter of outlets of flexible drain connectors intended to be used with

- (a) lavatories, shall be 1-1/4 in; and
- (b) sinks, laundry tubs, and bar sinks, shall be 1-1/2 in.

4.4.2 Slip Joints

The inside diameter of slip joints shall fit with tubing of the same nominal size. Slip joints located on the inlet of a trap shall be at least 13 mm (0.5 in) above the trap weir. See Figure 1 of ASME A112.18.2/CSA B125.2.

4.4.3 Trap Seals

Traps seals shall be at least 50 mm (2.0 in). See Figure 1 of ASME A112.18.2/CSA B125.2.

4.4.4 Tubing stops

Tubing stops shall be

- (a) integral to the flexible drain connector; and
- (b) designed in such way that the insert tubing does not obstruct the flow.

4.4.5 Wall Thickness

Minimum wall thickness of

- (a) plastic tube and tubular components shall be 1.58 mm (0.062 in); and
- (b) flexible hoses shall be 0.89 mm (0.035 in).

4.5 Interior Finish

The inside (i.e., interior finish) of flexible hoses shall be smooth.

4.6 Factory-Supplied Tube and Tubular Fittings

Factory-supplied tube and tubular fittings shall comply with ASTM F409, as applicable.

4.7 Illustrations

Figures 1 and 2 illustrate flexible drain connectors.

5 Testing Requirements

5.1 General

5.1.1 Test Specimens

Test specimens shall consist of flexible drain connectors selected from the manufacturer's daily production and at least 8 h old, assembled in accordance with the manufacturer's installation instructions.

5.1.2 Preconditioning

Before testing, test specimens shall be conditioned at ambient laboratory conditions for at least 12 h.

5.1.3 Test Apparatus

The test apparatus shall consist of a lavatory and a single or double sink arranged in a regular layout, which may include a food waste grinder.

5.1.4 Installation for testing

For testing purposes, test specimens shall be installed in accordance with the manufacturer's installation instructions.

5.1.5 Testing Sequence

Two test specimens shall be tested in accordance with the following sequence:

- (a) thermal cycling test specified in Section 5.2;
- (b) [Displacement Test for Flexible Hoses 5.3](#);
- ~~(b)~~(c) flow rate test specified in Section ~~5.3~~[5.4](#);
- ~~(c)~~(d) thread torque strength test specified in Section ~~5.4~~[5.5](#); and
- ~~(d)~~(e) hydrostatic pressure test specified in Section ~~5.5~~[5.6](#).

5.2 Thermal Cycling Test

5.2.1 Test Procedure

The thermal cycling test shall be conducted as follows:

- (a) Assemble a flexible drain connector in accordance with the manufacturer's installation instructions.
- (b) Subject the test specimen to a flow of 7.5 ± 0.8 L/min (2.0 ± 0.2 gpm) using water at 60 ± 2 °C (140 ± 3 °F) for 90 s, followed immediately by water at 21 ± 2 °C (70 ± 3 °F) for another 90 s. This shall be one cycle.
- (c) Continue the test for six more cycles without pausing between cycles, for a total of seven cycles.

5.2.2 Performance Requirements

There shall be no leakage, deformation, or signs of cracking.

5.3 Displacement Test for Flexible Hoses

5.3.1 Test procedure

The displacement test shall be conducted as follows:

- (a) Assemble the flexible drain connector in the horizontal position with all of its component parts in accordance with the manufacturer's installation instructions.
- (b) Ensure that the flexible hose is installed in the horizontal position with a 10.4 to 20.8 mm/m (1/8 to 1/4 in/ft) slope.
- (c) Block the outlet and fill the system with water at room temperature.
- (d) Repeat Step (b and c) for each branch of multiple-inlet test specimens.

5.3.2 Performance Requirement

The flexible hose shall have a maximum vertically displacement of no more than 25.4 mm (1 in) from its original position.

~~5.3~~5.4 Flow Rate Test

~~5.3.1~~5.4.1 Test procedure

The flow rate test shall be conducted as follows:

- (a) Assemble a flexible drain connector with all of its component parts in accordance with the manufacturer's installation instructions.
- (b) With the outlet open to the atmosphere, apply a sustained water head of 150 mm (6.0 in) above the inlet using water at 10 ± 6 °C (50 ± 10 °F).
- (c) Repeat Step (b) for each inlet of multiple-inlet test specimens.

~~5.3.2~~5.4.2 Performance Requirement

The minimum flow rate shall be 27 L/min (7.0 gpm).

5.4.5.5 Thread Torque Strength Test

5.4.15.5.1 Test Procedure

The thread torque strength test shall be conducted as follows:

- (a) Assemble the threaded joint(s).
- (b) Subject the joint(s) to a torque of 10 N•m (7.5 lbf•ft).
- (c) Disassemble the joint(s).
- (d) Examine the joint(s) for evidence of stripping, cracking, or thread damage. If no such evidence is found, proceed with Step (e).
- (e) Reassemble and retighten the joint(s) with a torque of 10 N•m (7.5 lbf•ft).
- (f) Subject the joint(s) to the static pressure of a 500 mm (20.0 in) column of water at 10 ± 6 °C (50 ± 10 °F).
- (g) Maintain the pressure for 5 min.

5.4.25.5.2 Performance Requirements

There shall be no leakage, evidence of stripping, cracking, or thread damage.

5.5.5.6 Hydrostatic Pressure Test

5.5.15.6.1 Test Procedure

The hydrostatic pressure test shall be conducted as follows:

- (a) Assemble a flexible drain connector in accordance with the manufacturer's installation instructions.
- (b) Subject the test specimen to a hydrostatic pressure of 34 kPa (5.0 psi) using water at 60 ± 2 °C (140 ± 3 °F).
- (c) Maintain the pressure for at least 1 min.

5.5.25.6.2 Performance Requirements

There shall be no leakage, cracking, or permanent deformation.

5.6.5.7 Bending Test for Flexible Hoses

5.6.15.7.1 Test Procedure

The bending test for flexible hoses shall be conducted as follows:

- (a) Assemble the test specimen in accordance with the manufacturer's installation instructions.
- (b) Bend 135° one flexible hose segment (see Figure 3).
- (c) Conduct the flow rate test specified in Section 5.3.

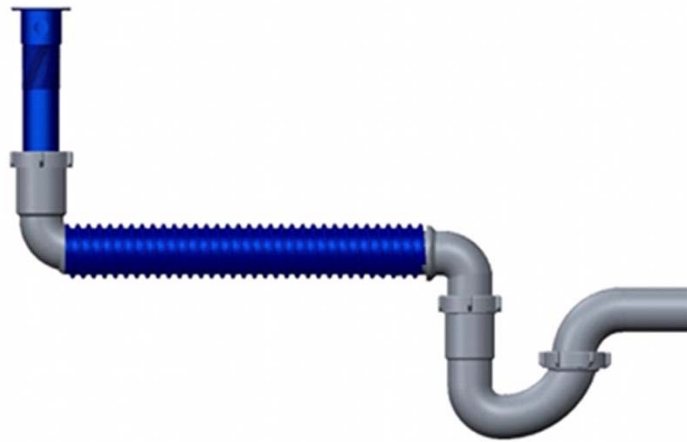
5.6.25.7.2 Performance Requirements

The test specimen

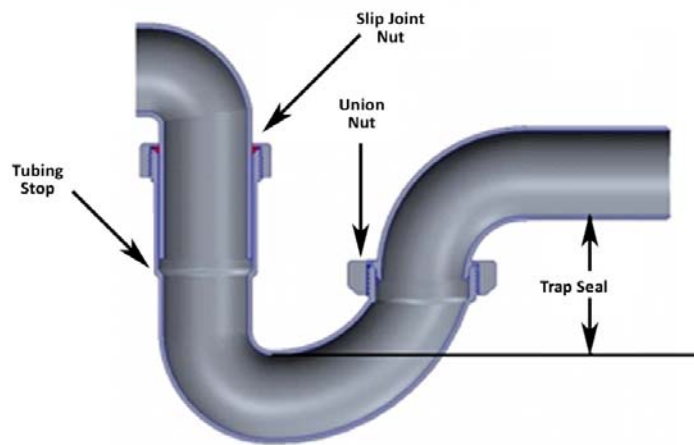
- (a) shall not collapse when bended 135° as shown in Figure 3; and
- (b) minimum flow rate shall be 27 L/min (7.0 gpm).

6 Markings, packaging and installation instructions

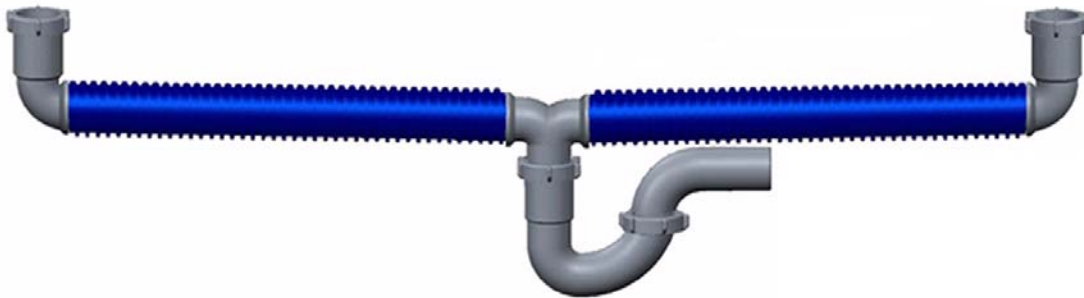
- 6.1** Flexible drain connectors complying with this Standard, and their packaging, shall be marked with the manufacturer's name or trademark or, in the case of private labeling, the name or trademark of the customer for whom the product was manufactured.
- 6.2** Markings shall be permanent, legible, and visible after installation. A permanent adhesive label on the product shall be acceptable.
- 6.3** Flexible drain connectors shall be accompanied by instructions for their installation, specifying at least the following:
- (a) a list of components;
 - (b) the sequence of installation; and
 - (c) types of plumbing fixtures suitable for installation of flexible drain connectors.



(a) Single Flexible Drain Connector



(b) Detail



(c) Double Flexible Drain Connector

Figure 1
Typical Flexible Drain Connectors
(See Section 4.7)

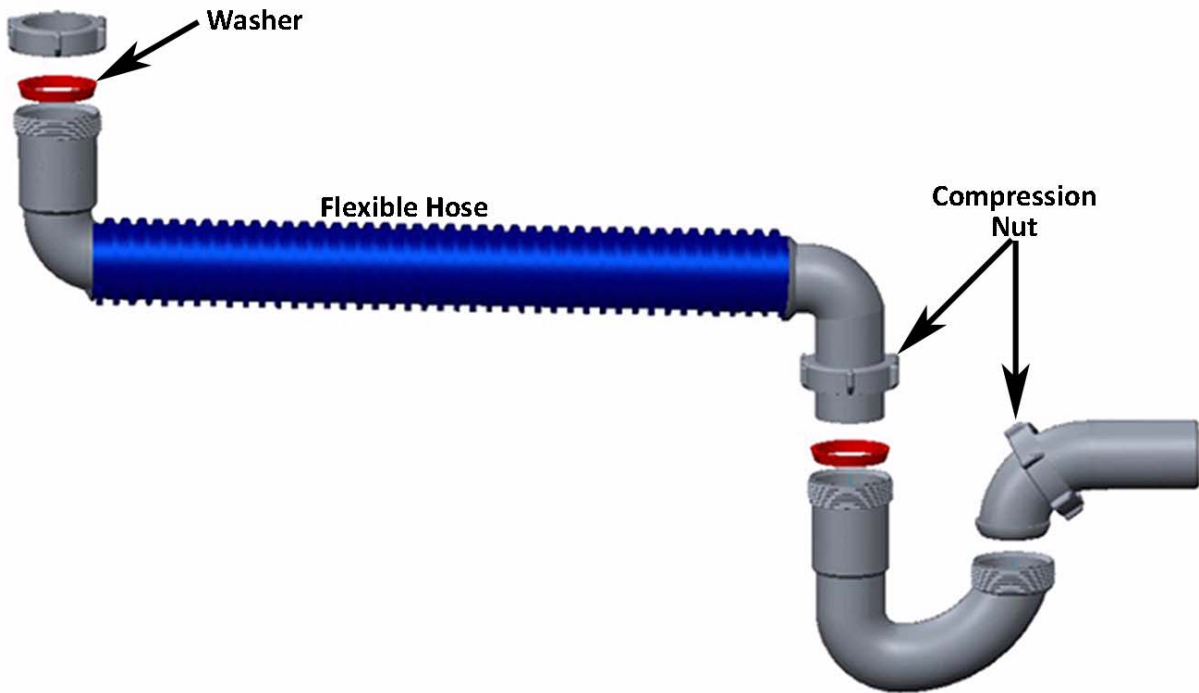


Figure 2
Flexible Drain Connector Components
(See Section 4.7)

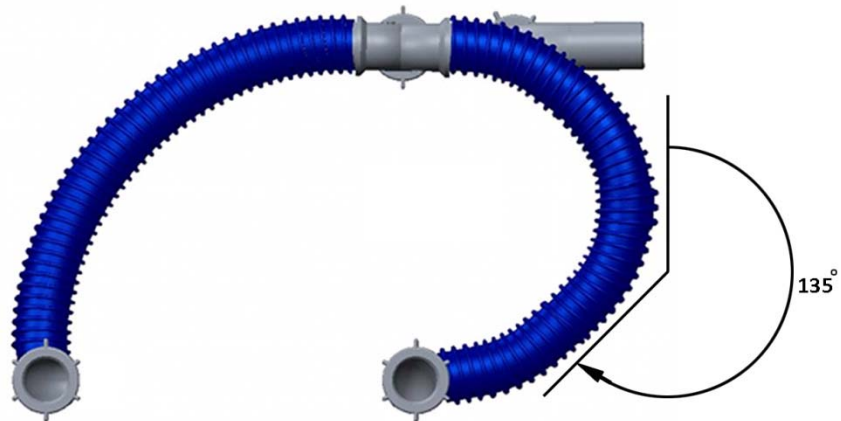


Figure 3
Bending Test for Flexible Hoses
(See Section 5.6)