

IAPMO PS 52-2019

Pump/Dose, Sumps and Sewage Ejector Tanks with or without a Pump.



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IAPMO Standard

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1 Scope

1.1 General

1.1.1 This Standard covers pump/dose, sumps and sewage ejector tanks with or without a pump intended for commercial and residential applications and specifies requirements for materials, physical characteristics, performance testing, and markings.

1.1.2 Pumps covered by this standard include the following features:

- (a) Are intended for use when gravity drainage is impossible or impractical.
- (b) The design of the tank shall be of sufficient volume to allow for the proper operation of the pump and the switch assembly.

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; their purpose is to separate explanatory or informative material from the text. 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.

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.

ASTM C1613	Standard Specification for Precast Concrete Grease Interceptor Tanks
ASTM D1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D2000	Standard Classification System for Rubber Products in Automotive Applications
ASTM D2661	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D2665	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D2949	Standard Specification for 3.25-in. Outside Diameter Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
ASTM D3311	Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns
ASTM D4819	Standard Specification for Flexible Cellular Materials Made From Polyolefin Plastics
ASTM D2584	Standard Test Method for Ignition Loss of Cured Reinforced Resins
ASTM D618	Standard Practice for Conditioning Plastics for Testing
ASTM E96	Standard Test Methods for Water Vapor Transmission of Materials
ASTM F409	Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
ASTM F628	Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D790	Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
CSA B66	Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks
IAPMO/ANSI Z1000	Prefabricated Septic Tanks

IEC 60529	Degrees of protection provided by enclosures (IP Code) CONSOLIDATED EDITION
NFPA 70	National Electrical Code (NEC)
NSF/ANSI 46	Evaluation of Components and Devices Used in Wastewater Treatment Systems
NEMA 250	Enclosures for Electrical Equipment (1000 Volts Maximum)
UL 778	Motor-Operated Water Pumps
UL 508A	Industrial Control Panels
UL 698A	Industrial Control Panels Relating to Hazardous (Classified) Locations

3 Definitions and Abbreviations

This section is reserved for later use.

4 General Requirements

4.1 Purpose

The device shall be of such a design to collect sewage and waste water for the purpose of ejecting this material to public or private sewers.

4.2 Covers

The device shall be provided with substantial covers having a resealable manhole or equivalent to permit access for inspection, repairs and cleaning. Penetration to the tank and or access opening shall be properly sealed.

4.3 Inlet and Outlet Pipe Sizes

Inlet, outlet and vent pipe shall be in accordance with Chapters 7 and 9 of the Uniform Plumbing.

4.4 Installation Instructions

Written installation instructions shall be provided with the product to allow for proper assembly, which addresses the maximum recommended depth of earth cover for underground installation. When installing in a hazardous location, equipment including pump(s), controls, piping disconnects, etc., installation shall be in accordance with NFPA 70.

4.5 Means of Access

The tank and the pump shall be accessible for inspection, cleaning and repair via a cover opening. The pump shall be removable for servicing and repair.

4.6 Pumps

4.6.1 Tanks with Pumps

When pump is supplied with tank, the pump shall comply with the applicable UL Standard.

4.6.2 Grinder-Pump Devices

Devices used with grinder pumps including, controls, piping disconnects, tank, etc., shall comply with Appendix C in this standard or Section 9, Grinder Pumps and Related Components of NSF/ANSI 46.

4.7 Pump/Dose Tanks

Tanks shall comply with Section 11.5 of this standard and shall be sized in such a way as to discharge a predetermined amount of effluent through the use of a siphon or sewage effluent pump. Tanks with a siphon shall comply with the requirements in Section 4.3.2, Siphon Materials and 4.3.3, Siphon Flush Rate and Cycles of CSA B66.

Note: A pumping/dosing tank is a chamber designed to receive sewage effluent from a septic tank. The pump/dose tank can be an integral part of the septic tank (separated by a partition) or an independent unit separate from the septic tank. In either case, the volume contained within the pump/dose tank does not form part of the working capacity of the septic tank.

4.8 Venting

Tanks shall be vented to allow air to enter the tank during pumping. Venting can be accomplished either through an access opening or piping. No openings, drains, or access ways shall be below the level of the invert of the inlet on a pumping/dosing tank. Tanks shall be able to accommodate an alarm system that warns when the pump or siphon fails or malfunctions. Appropriate tank tie downs or buoyancy collars should be employed for pumping/dosing tanks based on known permanent or periodic high ground water conditions as determined by the system designer.

5 Precast Concrete Tanks

Precast-concrete tanks shall comply with the materials and manufacturing requirements of ASTM C1613.

6 Fiber-Reinforced Polyester Tanks

Fiber-reinforced polyester used for manufacturing tanks and components shall comply with Section 6, Fiber-Reinforced Polyester Septic Tanks of IAPMO Z1000.

7 Thermoplastic Tanks

Thermoplastic tanks shall comply with Section 7, Thermoplastic Septic Tanks of IAPMO Z1000.

8 Structural Foam Tanks

The raw structural foam material used shall comply with the requirements of Section 11.2 of this standard and the Melt Index Test in ASTM D1238

9 Steel Tanks

Steel tanks shall comply with Section 8, Steel Septic Tanks of IAPMO Z1000.

10 Alternate Materials

Wooden tanks are prohibited.

11 Testing Requirements

11.1 Glass-Fiber-Reinforced Polyester Tanks Testing

11.1.1 Specimens

11.1.1.1 Tests shall be made on specimens cut from waste areas when possible; otherwise, the specimens shall be cut from flat laminates prepared in the same construction and by the same techniques as the process equipment. In all cases, the average value of the indicated number of specimens shall be used to determine conformance with the detailed requirements.

11.1.1.2 The test specimens shall be conditioned in accordance with Procedure A of ASTM D618.

11.1.2 Glass Content Determination

The glass content shall be determined in accordance with ASTM D2584, Tentative Method of Test for Ignition Loss of Cured Reinforced Resins, except that the specimens tested shall be approximately 645 mm² (1 in²) in area and low temperature pre-ignition prior to placement in muffle furnace is recommended. The average for five specimens shall be considered to be the glass content.

11.1.3 Tensile Strength Determination

11.1.3.1 Tensile strength shall be determined in accordance with ASTM D638, (Tentative) except that the specimens shall be the actual thickness of the fabricated article and the width of the reduced section shall be 25 mm (1 in).

11.1.3.2 Other dimensions of specimens shall be as designated by the ASTM D638 standard for Type I specimens for materials over 1/2 inch to inch inclusive. Specimens shall not be machined on the surface. Tensile strength shall be the average of five specimens tested at 5 – 6.35 mm/min (0.2 – 0.25 in/min). speed.

11.1.4 Flexural Strength Determination

Flexural strength shall be determined in accordance with Procedure A and Table 1 of ASTM D790, except that the specimens shall be the actual thickness of the fabricated article and the width shall be one inch. Other dimensions of specimens shall be as designated by the ASTM D790 standard. Specimens shall not be machined on the surface. Test shall be made with the inner side in compression using five specimens.

11.1.5 Flexural Modulus Determination

The tangent modulus of elasticity in flexure shall be determined in accordance with ASTM D790.

11.1.6 Hardness Determination

The Barcol Impressor (Model GYZJ 934-1) shall be used for determining hardness. Calibration of the Barcol instrument shall be verified by comparing with a blank specimen having a known reading of 85-87. Ten readings on the clean resin- rich surface shall be made. After eliminating the two high and two low readings, the average of the remainder shall be the reported hardness reading.

11.2 Structural Foam Tanks Testing**11.2.1 Brittleness Test****11.2.1.1 Test Procedure**

During manufacturing the manufacture needs to perform a brittleness test at least once every shift. Pull a part hot off the press and place a sticker with the date, time and pallet number on it. This is to allow you to find the appropriate skids in event the part fails the Impact Dart Test. The brittleness test shall be conducted as follows:

- (a) Verify that the correct dart is being used. The dart should be 4.5 Kg (10 lb) with a rounded head;
- (b) The part must have cooled for one hour and the dart temperature should be $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($73.4^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$) before testing;
- (c) Position the Basin, bottom up, under the impact tube with the tube resting in the middle of the basin bottom;
- (d) Hook the 4.5 Kg (10 lb) dart to the clip. Raise the 4.5 Kg (10 lb) Dart to the premarked 1.5 m (5 ft) drop line making sure the bottom of the dart lines up with the line on the tube and allow dart to fall onto part; and
- (e) After the impact inspect both the inside and outside of the part for any cracks or splits. Basin.

11.2.1.2 Performance Requirements

The part shall show no evidence of shattering, cracking or breaking.

11.2.2 Drop Test**11.2.2.1 Test Procedure**

The drop test shall be conducted as follows:

- (a) The part temperature must be $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($73.4^{\circ}\text{F} \pm 3.6^{\circ}\text{F}$) after being removed from the mold before performing the Impact Dart / Drop Test procedure;
- (b) Hold the basin, bottom down, approximately 1.5 m (5 ft) from the bottom of the unit, in the air and drop the part onto a concrete floor; and
- (c) Inspect each part after testing was performed.

11.2.2.2 Performance Requirements

The part shall show no evidence of shattering, cracking or breaking.

11.3 Water Tightness Test for Sump or Sewage Ejector Tank**11.3.1 Test Procedure**

The water tightness test shall be conducted as follows:

- (a) Assemble the device according to manufacturer's instructions;
- (b) Plug all openings except for the vent opening;
- (c) Fill the tank with water until it approaches overflow at the vent opening;
- (d) The vent opening pipe shall extend ten 3 m (10 ft) above the cover during testing; and
- (e) Leave the tank full of water for up to 60 min and check for leaks.

11.3.2 Performance Requirements

There shall be no leakage visible.

11.4 Stack Test for Sump or Sewage Ejector Tank**11.4.1 Test Procedure**

The stack test shall be conducted as follows:

- (a) Assemble the tank according to manufacturer's instructions;
- (b) plug all openings and attach stack pipe to one opening; and
- (c) Fill stack pipe to a height of ten feet. Leave tank full of water for up to 20 min and evaluate for leaks.

11.4.2 Performance Requirements

There shall be no leakage visible.

11.5 Leakage/Water Tightness Test for Pump/Dose Tank

Tanks shall comply with the requirements in Section 9, Testing Requirements and Performance Criteria of IAPMO Z1000.

12 Marking and Accompanying Literature

12.1 Markings

Tanks complying with this Standard shall be marked with the:

- (a) Manufacturer's name or trademark;
- (b) Model or catalog number;
- (c) Year of manufacture;
- (d) Above or Below ground installation; and
- (e) "Wasteholding Tank" or "Pump/Dose Tank".

12.2 Visibility

Each tank shall be plainly and permanently marked on the top. Each pump shall be plainly and permanently marked with the appropriate marking requirements specified within the UL Standard the pump complies with.