IAPMO PS 63-202X

PUBLIC REVIEW DRAFT

Industry Standard for

Plastic Leaching Chambers

IAPMO Standard

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~~**Plastic Leaching Chambers**~~
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Preface

This is the tenth edition of IAPMO PS 63, Plastic Leaching Chambers. This Standard supersedes IAPMO PS 63-2019, Plastic Leaching Chambers. The previous editions of this standard are 2019, 2014, 2013, 2005, October 2004, 2004, 2002, 1999, 1997, 1993.

This Standard was developed by the IAPMO Standards Review Committee (SRC) in accordance with the policies and procedures regulating IAPMO industry standards development, Policy S-001, Standards Development Process. This Standard was approved as an IAPMO Industry Standard on July 8, 2024

Notes:

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(4) During its development, this Standard was made available for public review, thus providing an opportunity for additional input from stakeholders from industry, academia, regulatory agencies, and the public at large. Upon closing of public review, all comments received were duly considered and resolved by the IAPMO Standards Review Committee.

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(a) standard designation (number);

(b) relevant section, table, or figure number, as applicable;

(c) wording of the proposed change, tracking the changes between the original and the proposed wording; and

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(8) Requests for interpretation should be clear and unambiguous. To submit a request for interpretation of this Standard, you may send the following information to the International Association of Plumbing and Mechanical Officials, Attention Standards Department, at standards@IAPMOstandards.org or, alternatively, at 4755 East Philadelphia Street, Ontario, California, 91761, and include "Request for interpretation" in the subject line:

(a) the edition of the standard for which the interpretation is being requested;

(b) the definition of the problem, making reference to the specific section and, when appropriate, an illustrative sketch explaining the question;

(c) an explanation of circumstances surrounding the actual field conditions; and

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(12) Proposals for amendments to this Standard will be processed in accordance with the standards-writing procedures of IAPMO industry standards development, Policy S-001, Standards Development Process.

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~~(9) Attention is drawn to the possibility that some of the elements of this Standard may be the subject of patent rights. IAPMO is not to be held responsible for identifying any or all such patent rights. Users of this Standard are expressly advised that determination of the validity of any such patent rights is entirely their responsibility.~~

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IAPMO PS 63-202X
Plastic Leaching Chambers

1 Scope

1.1 Scope

This Standard covers leaching chambers made of high-density polyethylene, polypropylene, or polyethylene terephthalate intended for infiltrating Stormwater or wastewater (hereafter referred to "water") into the soil 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; 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.

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.

AASHTO	LRFD Bridge Design Specifications
AASHTO	Standard Specifications for Highway Bridges
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity

3 Definitions and Abbreviations

3.1 Definitions

The following definitions shall apply in this Standard:

End cap (End plate) — a piece intended to be an integral part of or attach to the end of a leaching chamber.
Note: *End caps typically have a provision for an opening for installing the inlet pipe.*

Leaching chamber — an enclosed space or compartment with an open bottom intended to temporarily store ~~waste~~water and infiltrate it into the soil.
Note: *Leaching chambers are typically used in lieu of conventional pipe-and-gravel leaching fields and trenches.*

3.2 Abbreviations

The following abbreviations apply in this Standard:

HDPE — high-density polyethylene
LRFD — load and resistance factor design
PET — polyethylene terephthalate
PP — polypropylene

4 General Requirements

4.1 Materials

4.1.1 Resins

Leaching chambers covered by this Standard shall be made of

(a) high-density polyethylene (HDPE) complying with or exceeding the following properties:
  (i) density: 940 kg/m^3 (58.7 lb/ft^3);
  (ii) melt flow index: 5.0 g/10 min; and
  (iii) flexural modulus of elasticity: 655 MPa (95,000 psi).

(b) ~~unreinforced~~ polypropylene (PP) complying with or exceeding the following properties:
  (i) density: 900 kg/m^3 (56.2 lb/ft^3);
  (ii) melt flow index: 9.0 g/10 min;
  (iii) Izod: 53.4 J/m (1.0 lbf●ft/in); and
  (iv) flexural modulus of elasticity: 965 MPa (140,000 psi).

(c) ~~unreinforced~~ polyethylene terephthalate (PET) complying with or exceeding the following properties:
  (i) density: 1,150 kg/m^3 (71.8 lb/ft3);
  (ii) intrinsic viscosity: 0.60 dL/g; and
  (iii) flexural modulus of elasticity: 1,725 MPa (250,000 psi).

4.1.2 Reworked Materials

Reworked materials shall

(a) be clean; and

(b) comply with the requirements in Section 4.1.1 and other applicable requirements of this Standard.

4.1.3 Geotextiles

When provided, fabrics (i.e., geotextiles or filters) shall have a permeability of at least 6,100 L/min●m^2 (150 gal/min●ft^2) when tested in accordance with ASTM D4491.

4.2 Molding Process

4.2.1 Leaching Chambers

Plastic leaching chambers shall be molded using

(a) a structural-foam process;

(b) an injection-molding process; or

(c) a vacuum-thermoforming process.

4.2.2 End Caps (End Plates)

End caps may be molded using

(a) a structural-foam process;

(b) an injection-molding process;

(c) a blow-molding process; or

(d) a vacuum-thermoforming process.

4.3 Dimensions

4.3.1 Wall Thickness

The minimum average nominal wall thickness shall be

(a) 6.4 mm (0.25 in) for chambers and end caps manufactured using a structural-foam process;
(b) 1.2 mm (0.05 in) for chambers and end caps manufactured using an injection-molding process;
(c) 3.2 mm (0.13 in) for end caps manufactured using blow-molding injection; and
(d) 1.0 mm (0.04 in) for chambers and end caps manufactured using a vacuum-thermoforming process.

4.3.2 Footprint

Leaching chambers designed using AASHTO

(a) H-20 highway live loads shall have a bearing footprint of at least 0.06 m^2/m (28 in^2/ft); and
(b) H-10 highway live loads shall have a bearing footprint of at least 0.04 m^2/m (20 in^2/ft).

Notes:

(1) The AASHTO H-20 highway live load assumes two 7,258 kg (16,000 lb) concentrated loads applied in accordance with the AASHTO LRFD Bridge Design Specifications or the AASHTO Standard Specifications for Highway Bridges.

(2) The AASHTO H-10 highway live load assumes one 7,258 kg (16,000 lb) concentrated load applied in accordance with the AASHTO LRFD Bridge Design Specifications or the AASHTO Standard Specifications for Highway Bridges.

4.3.3 Bottoms

Bottoms of leaching chambers shall have

(a) at least one third of their area open; and
(b) an average width of at least 356 mm (14 in).

4.3.4 Sidewalls

Leaching chamber sidewalls shall

(a) have side openings extending to the top of the sidewalls;
(b) be designed to maximize infiltration of ~~waste~~water and minimize intrusion of fines;
(c) have an invert elevation located at least 152 mm (6 in) above the bottom elevation; and
(d) have a side-opening soil-contact area below the invert elevation of at least 0.10 m^2/m (48 in^2/ft) when measured by the ~~waste~~water-to-soil contact surface, as defined by the design soil angle of repose within the side opening.

Note: *The angle of repose for a typical chamber sidewall design is illustrated in Figure 1.*

4.4 Structural Dividers

Leaching chambers may have structural dividers.

4.5 Joints

Leaching chambers shall have interlocking joints or another suitable method for connecting individual chambers. Such sections and connections shall prevent intrusion of the surrounding backfill material and shall be capable of carrying the full design load of the chambers.

4.6 Access Ports

Leaching chambers shall have access ports capable of connecting pipes at least NPS-2.

4.7 Workmanship and Finish

Finished parts shall be free from visible cracks, gouges, foreign inclusions, blisters, unintended holes and voids, or other injurious defects visible to normal or corrected-to-normal vision that would impair their performance in service or their integrity. In addition, the chemical composition of materials used to manufacture plastic leaching chambers shall be homogeneous throughout.

5 Testing Requirements

5.1 Load Test

5.1.1 AASHTO H-10 Load Test Procedure

The AASHTO H-10 load test for leaching chambers shall be conducted as follows:

(a) Install (i.e., bury) three leaching chambers in accordance with manufacturer's installation instructions and with the following:
   (i) The backfill cover shall be 300 mm (12 in) or manufacturer's recommendation for cover whichever is greater.
   (ii) The backfill material shall be clean soil, free of large stones, boulders or other materials that could damage the test specimens.
   (iii) One end of the test assembly shall ~~be left open~~have an opening for observation.

(b) Load the middle test chamber using a vehicle loaded in increments of approximately 900 kg (2,000 lb), as follows:
   (i) At each load increment, pass the vehicle once over the test specimens, ensuring that the front end and load bearing wheels of the vehicle pass directly over the center point of the test specimens.
   (ii) Continue the procedure until the axle load of 7,258 kg (16,000 lb) is attained.
   Note: *Any starting vehicle weight may be used.*

(c) Remove the load.

(d) Expose the test specimens for inspection.

5.1.2 AASHTO H-20 Load Test Procedure

The AASHTO H-20 load test for leaching chambers shall be conducted in accordance with Section 5.1.1, except that the:

(a) backfill cover shall be 460 mm (18 in);

(b) load increments shall be of approximately 1,600 kg (3,500 lb); and

(c) test shall be continued until an axle load of 14,516 kg (32,000 lb) is attained.

5.1.3 Performance Requirements

The joints and center of the test specimens shall not separate, collapse, fracture, or break.

5.2 Impact Test

5.2.1 Test Apparatus

The following test apparatus or its equivalent shall be used:

(a) a tup (falling mass) with a
  (i) 2.7 kg (6 lb) mass; and
  (ii) rounded head with a 12.7 mm (0.5 in) diameter;
(b) a supporting metal ring with a 51 mm (2 in) diameter; and
(c) a guide tube or guide rails, to ensure that the tup strikes the test specimens at the top of a vertical diameter.

Note: *Auxiliary equipment may be used for supporting the test specimens and releasing or elevating the tup.*

5.2.2 Test Procedure

The impact test shall be conducted

(a) on three separate test specimens (i.e., full-length chambers);
(b) using the test apparatus described in Section 5.2.1; and
(c) by dropping the tup from a height of 500 mm (20 in).

5.2.3 Performance Requirements

There shall be no evidence of shattering, cracking, or splitting of the test specimens.

6 Markings and Accompanying Literature

6.1 Plastic leaching chambers complying with this Standard shall be marked with the following:

(a) the manufacturer's name or trademark; and
(b) the load rating (i.e., H-10 or H-20).

6.2 Markings shall be permanent, legible, and visible after installation.

6.3 Installation instructions for plastic leaching chambers complying with this Standard shall be available from the manufacturer. Such instructions shall contain detailed information on the type of allowable backfill materials and the backfilling methods.

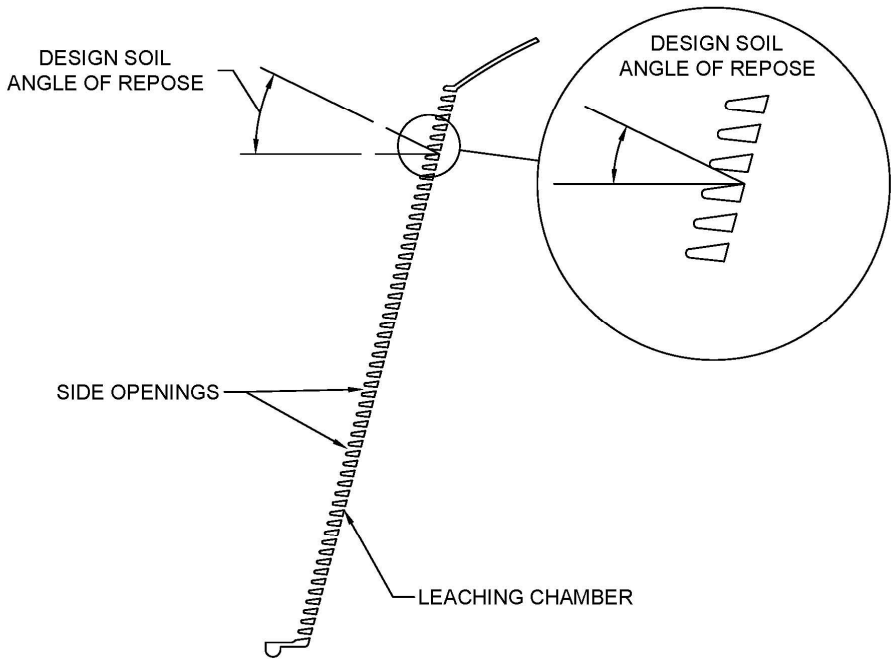

Figure 1
Illustration of a Typical Angle of Repose
(See Section 4.3.4)