

IAPMO PS 67-~~2010~~2019

PUBLIC REVIEW DRAFT

**Early-Closure
Replacement Flappers
or Early-Replacement
Flapper with
Mechanical Assemblies**



IAPMO Standard

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Early-Closure Replacement Flappers or Early- Replacement Flapper with Mechanical Assemblies

1 **Purpose**Scope

1.1 General

1.1.1 ~~The purpose of~~This standard ~~is to establish a generally acceptable performance standard for~~ covers early-closure replacement flappers or early-closure replacement flapper with mechanical assemblies. ~~Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, installers and inspectors; to promote understanding regarding materials, manufacture and installation; and to provide for identifying products that conform to this standard. and specifies requirements for materials, physical characteristics, performance testing, and markings.~~

2-1.1.1.2 The standard covers physical and sanitary performance requirements, and test methods pertaining to early-closure replacement flappers or early-closure replacement flappers with mechanical assemblies for three and one-half (3-1/2) gallons (13.2 liters)13.2 L (3.5 gal) and larger water closet, which are installed within water closet tanks.

NOTE: This standard does not cover dual-flush assemblies.

1.2 Alternative Materials

The ~~provisions~~requirements of this standard are not intended to prevent the use of ~~alternate~~ alternative materials or methods of construction ~~or design~~, provided ~~any~~ such ~~alternate~~ alternatives ~~meets~~ the intent and requirements of ~~this document and changes are amended to~~ 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~~ Scope

~~2.1 The standard covers physical and sanitary performance requirements, and test methods pertaining to early-closure replacement flappers or early-closure replacement flappers with mechanical assemblies for three and one-half (3 1/2) gallons (13.2 liters) and larger water closet, which are installed within water closet tanks.~~

~~NOTE: This standard does not cover dual flush assemblies.~~

32 Reference ~~Standards~~Publications

~~3.1 All standards referenced herein shall be the current edition of that standard as published.~~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 A112.19.2/CSA B45.1	Ceramic Plumbing Fixtures
ASME A112.19.5/ <u>CSA B45.15</u>	Trim for Water Closets, Bowls, Tanks and Urinals <u>Flush Valves and Spuds for Water Closets, Urinals, and Tanks</u>

43 Definitions

~~4.1~~ Definitions applicable to early-closure replacement flappers shall be as follows:

~~4.1.1~~ **Early-Closure Replacement Flapper.** — A flapper which is installed in a gravity flush tank which will close over the flush valve to stop the flow of water from the tank after siphonic action has been created in the bowl, but before a normal flapper would have closed.

~~4.1.2~~ **Flush Cycle.** — Begins when the flush release device is tripped and the flush valve starts discharging water from the tank and ends at the moment the tank is refilled to its beginning level and the ballcock stops operation.

5.4 General Requirements

5.14.1 Functional Operation

When designed for installation in a gravity type flush tank, the early-closure replacement flapper or early-closure replacement flapper with mechanical assemblies shall mount to the flush valve, with or without an adapter, and shall have restricted movement so that no part will interfere with any part within the tank.

5.24.2 Durability

The product shall meet the performance requirements of cycle testing in Section ~~6.1~~5.1.

5.34.3 Hydraulic Performance

The early-closure replacement flapper or early-closure replacement flapper with mechanical assemblies shall meet the performance tests as set forth in Section ~~6.2~~5.2, [Hydraulic Performance Test](#). Sampling shall be in accordance with Table 1. The device shall be installed and adjusted in accordance with the manufacturer's installation instructions in the product sample selected for the test. The flapper shall be independently operated to evaluate freedom of parts to move. Parts shall not bind or seize when operated.

Table 1		
No. of Samples Submitted/Selected	Tested	Retest
6	5	1

~~Notes:~~

- ~~1. Manufacturer shall submit device and water closets used for testing. A minimum of 3 different water closet manufacturers shall be represented in sample lot.~~
- ~~2.1. Samples shall be a minimum of 3.5 gallons (13.2 liters) that comply with ASME A112.19.2/CSA B45.1.~~
- ~~3.1. Samples shall be randomly selected by test lab. One water closet from a minimum of 3 different manufacturers shall be selected for testing.~~
- ~~4.1. Devices shall fit in selected sample water closets per Section 5.1.~~
- ~~5.1. Devices shall pass all five samples tested. If it fails one, the sixth sample shall be used. If it fails a second time, then it shall be rejected.~~

65 Testing Methods Requirements

6.1.5.1 Cycle Testing

6.1.5.1.1 Test Method Procedure

The cycle test shall be conducted as follows:

- (a) Install the product selected in a tank which contains a steady supply of water to a manufacturer's recommended water level-;
- (b) Begin cycle testing by flushing the water closet selected for a period of 20,000 cycles for early-closure replacement flapper and 75,000 cycles for early-closure replacement flapper with mechanical assemblies-;
- (c) Upon completion of the cycling period, remove the tank from the water closet and place over supports to expose the underside of the tank and flush valve-;
- (d) Fill the tank with water to recommended fill line in the tank-;
- (e) Allow to stand with supply water off, and with a container placed under the flush valve, for 60 ± 3 minutes and measure any volume of water which may leak from the flush valve outlet-; and
- (f) For this test, water temperature shall not be less than ~~61°F (16°C)~~16°C (61°F) and no more than ~~80°F (27°C)~~27°C (80°F).

6.1.5.1.2 Performance Requirements

Not more than 2% of the total measured volume of water in the tank shall have leaked from the tank's flush valve outlet after 60 ± 3 minutes; any and all adjustable components used to determine the water level at which the early-closure replacement flapper with or without mechanical assemblies closes shall not have changed position or setting; and no components of the early-closure replacement flapper with or without mechanical assemblies shall bind, seize or catch on any of the internal tank hardware.

6.2.5.2 Hydraulic Performance Test

6.2.5.2.1 Test Method Procedure

The hydraulic performance test shall be conducted as follows:

- (a) Early-closure replacement flappers with or without mechanical assemblies shall be installed in the water closet tanks and adjusted to the manufacturer's installation instructions-; and
- (b) ~~and tested to comply with~~ Conduct the test in accordance with the applicable testing requirements of ASME A112.19.2/CSA B45.1.

6.2.5.2.2 Performance Requirements

The water closet which is equipped with the early closure replacement flapper with or without mechanical assemblies shall successfully ~~perform to comply with~~ all the applicable test requirements of ASME A112.19.2/CSA B45.1. Failure to perform shall be cause of rejection. There shall be a minimum water savings of ~~thirty (30) percent~~ % as average over the five water closets tested.

6.3.5.3 Accelerated Chemical Resistance Test**5.3.1 Test Procedure**

The Early-closure replacement flappers with or without mechanical assemblies shall be tested in accordance with Section ~~4.4.2.2~~5.5, Leak rate and accelerated chemical resistance tests of ASME A112.19.5/CSA B45.15.

~~6.3.15.3.2~~ Performance Requirements

Leakage through the flapper after the accelerated test shall not exceed 0.008 oz (0.25 mL/hr).

76 Markings and Identification Accompanying Literature

~~7.1~~ — Early-closure replacement flappers with or without mechanical assemblies shall be marked with as follows:

- (a) Manufacturer's name or trademark;
- (b) Model number; and
- (c) Any other required marking.

Table 1
Hydraulic Performance Sampling
(see Section 4.3)

<u>No. of Samples Submitted/Selected</u>	<u>Tested</u>	<u>Retest</u>
<u>6</u>	<u>5</u>	<u>1</u>

Notes:

1. Manufacturer shall submit device and water closets used for testing. A minimum of 3 different water closet manufacturers shall be represented in sample lot.
2. Samples shall be a minimum of ~~3.5 gallons (13.2 liters)~~13.2 L (3.5 gal) that comply with ASME A112.19.2/CSA B45.1.
3. Samples shall be randomly selected by test lab. One water closet from a minimum of 3 different manufacturers shall be selected for testing.
4. Devices shall fit in selected sample water closets per Section ~~5.14.1~~.
5. Devices shall pass all five samples tested. If it fails one, the sixth sample shall be used. If it fails a second time, then it shall be rejected.