



**Summary of Substantive Changes
between the 2013 and the 2018 editions of
ASME A112.3.4/CSA B45.9 “Macerating Toilet Systems and Waste Pumping
Systems for Plumbing Fixtures”**

Presented to the IAPMO Standards Review Committee on December 10, 2018

General: The standard was substantively restructured, and multiple sections were moved to new locations or revised for clarification. The changes to this standard may have an impact on listed products. The significant changes are:

- Expanded the scope of the general requirements to include stainless steel water closets; terrazzo, concrete, natural stone, glass, aluminum and copper lavatories and sinks; and, terrazzo, concrete, natural stone, aluminum and copper bathtubs; and terrazzo, concrete, natural stone, aluminum and copper showers (see Section 4.3)
- Changed the check valve hydrostatic test procedure and performance requirements as (see Section 5.3 and Table 1)

The title of the standard was changed as follows: ~~Plumbing fixtures with pumped waste and Macerating toilet systems~~ and Waste Pumping Systems for Plumbing Fixtures

Section 1, Scope: Moved former Sections 1.3 through 1.5 to the general requirements in Section 4, revised the scope and removed the allowable use of alternate materials as follows:

1 Scope

~~1.1 This Standard establishes physical~~ specifies requirements for materials, construction, performance, testing, and markings for macerating toilet systems ~~and related components and waste-pumping systems for plumbing fixtures~~. Such systems are intended to collect, grind, and pump, or collect and pump waste from a fixture (e.g., a water closet, lavatory, shower, or bathtub) and pump the waste to ~~to~~ some point in the sanitary drainage system.

~~1.2 The purpose of this Standard is to establish a generally acceptable performance standard for pumped waste systems, macerating systems and related components for directly affixed water closets and other fixtures designed for above the floor or in-floor installations.~~

~~1.6 The use of alternate materials or methods is permitted, provided it can be demonstrated that such alternatives comply with the performance requirements of this Standard.~~

~~1.7~~ 1.2 In this Standard, “shall” is used to express a requirement, i.e., a provision ...

~~1.8 Units of measurement~~ 1.3 SI units are the units of record in Canada. In this Standard ...



Section 2, Referenced Publications: The referenced publications were added, revised or deleted as follows:

2 Reference publications

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

ASME (The American Society of Mechanical Engineers)/CSA Group

ASME A112.19.3-~~2008~~[2017](#)/CSA B45.4-~~08~~[17](#)

Stainless steel plumbing fixtures

ASME (The American Society of Mechanical Engineers)

A112.19.15-2012 ([R2017](#))

Bathtubs/whirlpool bathtubs with pressure sealed doors

CSA Group

CAN/CSA-B602-~~10~~[16](#)

Mechanical couplings for drain, waste, and vent pipe and sewer pipe

CAN/CSA-C22.2 No. 108-~~01~~(~~R2010~~)[14](#)

Liquid pumps

CSA Group/IAPMO (International Association of Plumbing and Mechanical Officials)

CSA B45.5-~~11~~[17](#)/IAPMO Z124-~~2011~~[2017](#)

Plastic plumbing fixtures

[CSA B45.8-13/IAPMO Z403-2013](#)

Terrazzo, concrete, and natural stone plumbing fixtures

[CSA B45.11-17/IAPMO Z401-2017](#)

Glass plumbing fixtures

[CSA B45.12-13/IAPMO Z402-2013](#)

Aluminum and copper plumbing fixtures

UL (Underwriters Laboratories)

778-~~2010~~[2016](#)

Motor-Operated Water Pumps

Section 4.1, General: Clarified the description of maceration toilet systems, removed the access requirements for holding tanks formerly in Section 4.2.3 and moved Sections 1.3 through 1.5 to 4.1.1 through 4.1.3 as follows:

4.24.1 General requirements

~~**1.34.1.1** A water closet connects to a macerating toilet system. Macerating toilet systems collect the in a holding tank and grind waste from a single water closet, plus a lavatory, shower, bathtub, or a combination of these in the same room. Macerating systems grind and pump these macerated wastes to some point in the waste to the sanitary drainage system. Waste-pumping systems collect waste from a fixture (e.g., a water closet, lavatory, shower, or bathtub) and pump it to the sanitary drainage system.~~



~~1.5~~ **4.1.2** Macerating toilet systems comprise the following three major components:

- a) a container that houses the operating mechanisms;
- b) a pressure chamber that activates and deactivates the induction motor; and
- c) an induction motor that drives the shredder blades and pump assembly.

Note: The induction motor and shredder blades can be combined into a single unit.

~~1.4~~ **4.1.3** Waste-pumping systems comprise the following three major components:

- a) an automatic activation mechanism;
- b) a drainage connection to the pump; and
- c) a pump ~~that pumps the waste to the gravity drainage system.~~

~~4.2.3~~ **Accessibility**

~~The holding tank shall allow access to the internal working components.~~

Section 4.2 Electrical Requirements: Clarified that electrical components are required to comply with the electrical requirements as follows:

~~4.1.3~~ **4.2** Electrical requirements

~~The~~ Electrical systems ~~in the~~ and components of macerating ~~unit~~ toilet systems shall comply with the applicable CSA Group or UL electrical standards.

Section 4.3, Plumbing Fixtures: Changed the section title, expanded the scope to include stainless steel water closets; terrazzo, concrete, natural stone, glass, aluminum and copper lavatories and sinks; terrazzo, concrete, natural stone, aluminum and copper bathtubs; and terrazzo, concrete, natural stone, aluminum and copper showers; and, removed field fabricated showers as follows:

~~4.3 Pumped-waste components~~ **Plumbing Fixtures**

~~4.1.4~~ **4.3.1** Water closets

Water closets intended to be connected to macerating toilet systems shall

- a) comply with the applicable requirements of ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, or CSA B45.5/IAPMO Z124, except for the drain line carry test;
- b) be tested before connection to the macerating toilet system; and
- c) be tested as a system, when the water closets have integral grinders or pumps.

~~4.1.5~~ **4.3.2** Lavatories and sinks

Lavatories and sinks that are a part of or are intended to be connected to a waste-pumping or macerating toilet system shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, CSA B45.5/IAPMO Z124, CSA B45.8/IAPMO Z403, CSA B45.11/IAPMO Z401, or CSA B45.12/IAPMO Z402, except for the drainage opening area and drain diameter requirements.

~~4.1.6~~ **4.3.3** Bathtubs

Bathtubs that are a part of or are intended to be connected to a waste-pumping or macerating toilet system shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.3/CSA B45.4, ASME A112.19.15, CSA B45.5/IAPMO Z124, CSA B45.8/IAPMO Z403, or CSA B45.12/IAPMO Z402, except for the drainage opening area and drain diameter requirements.



4.1.7 4.3.4 Showers

Showers that are a part of or are intended to be connected to a waste-pumping or macerating toilet system shall comply with ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, CSA B45.5/IAPMO Z124, or CSA B45.8/IAPMO Z403, or CSA B45.12/IAPMO Z402, ~~Showers may also be field fabricated in accordance with the applicable plumbing code.~~ except for the drainage opening area and drain diameter requirements.

Section 4.4, Holding tanks: Changed the section title from macerating system housing to holding tanks, and removed reference to the hydrostatic pressure test as follows:

~~4.1.8 Macerating system housing~~ 4.4 Holding tanks

~~The housing tank assembly~~ Holding tanks shall

- a) be watertight and leak-proof;
- b) be protected from ~~backflow of sewage flow reversal~~;
- c) be free from cracks, porosity, chips, flash, or other significant defects that affect the performance, appearance, or serviceability of the system; ~~The tank assembly shall be capable of withstanding a hydrostatic pressure as described in Clause 5.4.~~ and
- d) comply with the resistance to staining, the wear and cleanability, and the chemical resistance tests specified in CSA B45.5 ~~10~~/IAPMO Z124. ~~10~~

Section 4.7, Maintenance and repair: Added requirements for maintenance and repair as follows:

4.7 Maintenance and repair

Operating mechanisms shall be accessible for maintenance and repair.

Section 5.3, Check valve hydrostatic pressure test: Changed the check valve hydrostatic test procedure and performance requirements as follows:

~~5.3.1 Test method procedure~~

~~The holding tank or pumped waste system shall be installed in accordance with the manufacturer's instructions. The check or non-return valve for either the tank or pumped waste system shall be subjected to a 3.7 m (12 ft) column of water head pressure.~~

The check valve hydrostatic pressure test shall be conducted as follows:

- a) Install a macerating toilet or waste-pumping system in accordance with the manufacturer's installation instructions.
- b) Affix, to the check valve outlet, a source of water capable of supplying water at 35.8 kPa (5.2 psi).
- c) Supply water at 1.7 kPa (0.25 psi) and maintain the pressure for 10 min ± 15 s.
- d) Increase the supply water pressure to 35.8 kPa (5.2 psi) in steps, as follows:
 - i) 3.4 kPa (0.5 psi);
 - ii) 6.8 kPa (1.0 psi); and
 - iii) 35.8 kPa (5.2 psi).
- e) Maintain the pressure for 10 min ± 15 s during each increment specified in Item d).
- f) Collect, measure, and record the volume of any water emitted from the inlet side of the check valve during any of the pressure increments.



5.3.2 Performance requirement

~~The check or non-return valve shall not leak~~ The pump shall not activate during the test, and leakage from the check valve shall not exceed the volumes specified in Table 1.

Table 1, Maximum leakage volumes-check valve hydrostatic pressure test: Table 1 was added for the maximum leakage volume from the check valve hydrostatic pressure test as follows:

Table 1
Maximum leakage volumes — Check valve hydrostatic pressure test
(See Clause 5.3.2.)

<u>Check valve nominal size</u>	<u>Maximum volume of water collected, mL (fl. oz.)</u>
<u>3/4</u>	<u>70 (2.4)</u>
<u>1</u>	<u>95 (3.2)</u>
<u>1-1/4</u>	<u>130 (4.4)</u>
<u>1-1/2</u>	<u>160 (5.4)</u>
<u>2</u>	<u>280 (9.5)</u>
<u>3</u>	<u>640 (21.6)</u>
<u>4</u>	<u>1140 (38.5)</u>