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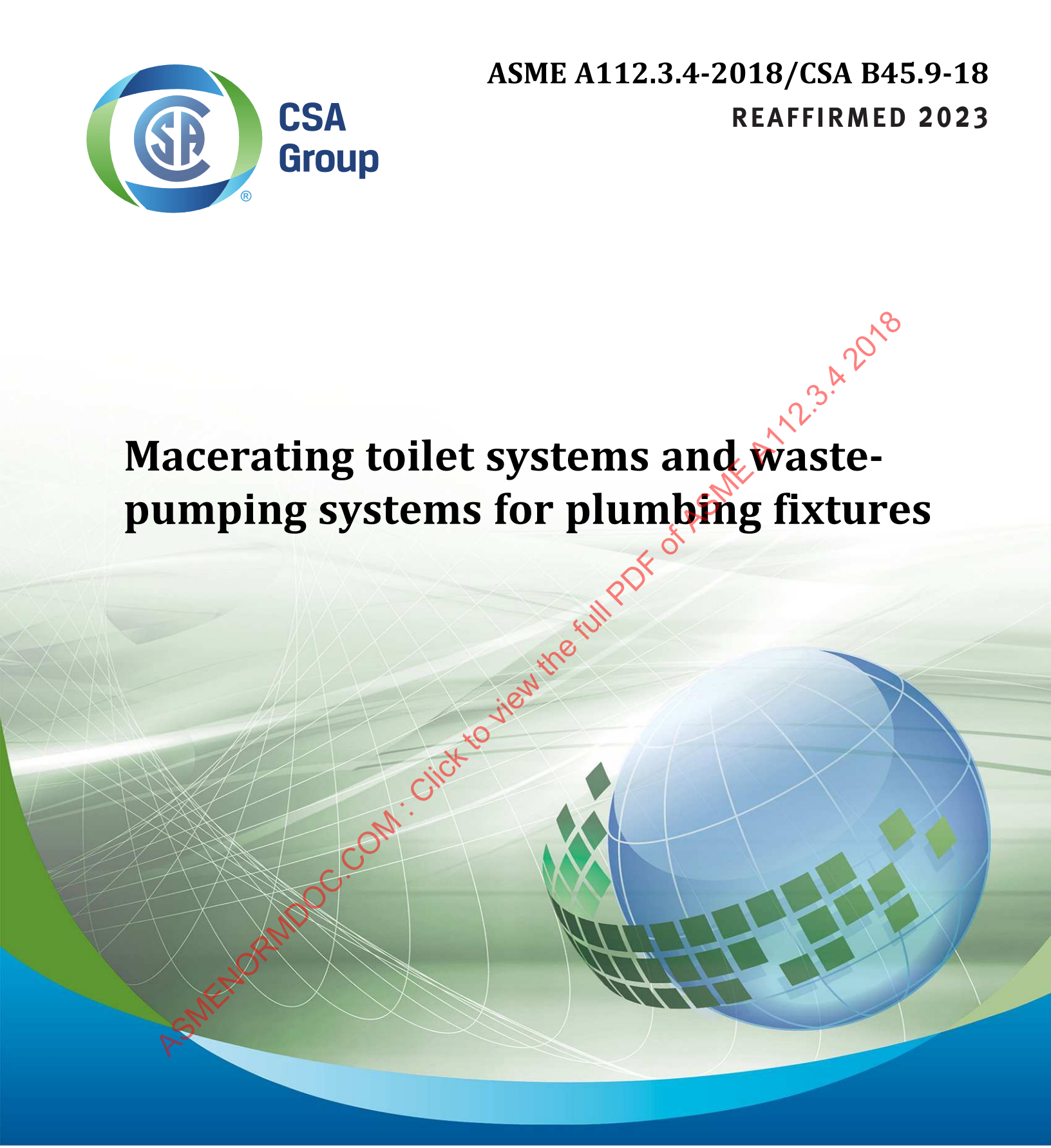
Macerating toilet systems and waste-pumping systems for plumbing fixtures



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Preface

This is the second edition of ASME A112.3.4/CSA B45.9, *Macerating toilet systems and waste-pumping systems for plumbing fixtures*. This Standard supersedes ASME A112.3.4-2013/CSA B45.9-13, *Plumbing fixtures with pumped waste and macerating toilet systems*.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the ASME/CSA Joint Harmonization Task Group on Plumbing Fixtures, under the jurisdiction of the ASME Standards Committee on Plumbing Materials and Equipment and the CSA Technical Committee on Plumbing Fixtures. The CSA Technical Committee operates under the jurisdiction of the CSA Strategic Steering Committee on Construction and Civil Infrastructure. This Standard was formally approved by the ASME Standards Committee and the CSA Technical Committee This Standard was approved as an American National Standard by the American National Standards Institute on May 31, 2018.

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ASME A112.3.4-2018/CSA B45.9-18
Macerating toilet systems and waste-pumping systems for plumbing fixtures

1 Scope

1.1
This Standard specifies requirements for materials, construction, performance, testing, and markings for macerating toilet systems 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 the sanitary drainage system.

1.2
In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; "should" is used to express a recommendation or that which is advised but not required; "may" is used to express an option or that which is permissible within the limits of the standard; and "can" is used to express possibility or capability.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.3
SI units are the units of record in Canada. In this Standard, the inch/pound units are shown in parentheses.

The values stated in each measurement system are equivalent in application; however, each system is to be used independently. Combining values from the two measurement systems can result in non-conformance with this Standard.

All references to gallons are to U.S. gallons.

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 A112.19.1-2013/CSA B45.2-13
Enamelled cast iron and enamelled steel plumbing fixtures

ASME A112.19.2-2013/CSA B45.1-13
Ceramic plumbing fixtures

ASME A112.19.3-2017/CSA B45.4-17
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-B602-16
Mechanical couplings for drain, waste, and vent pipe and sewer pipe

CAN/CSA-C22.2 No. 108-14
Liquid pumps

CSA Group/IAPMO (International Association of Plumbing and Mechanical Officials)
CSA B45.5-17/IAPMO Z124-2017
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

ASTM International (American Society for Testing and Materials)
C1173-10
Flexible Transition Couplings for Underground Piping Systems

UL (Underwriters Laboratories)
778-2016
Motor-Operated Water Pumps

3 Definitions and abbreviations

3.1 Definitions

The following definitions shall apply in this Standard:

Fixture — a device that receives water, waste matter, or both and directs these substances into a drainage system.

Integral — a cast or formed part of a fixture, e.g., a trap, seat, or tank.

Lavatory — a washbowl or basin.

Pressure —

Flowing pressure — the pressure in a water supply pipe at the inlet to an open valve.

Static pressure — the pressure in a water supply pipe at the inlet of a closed valve.

Sanitary — an aesthetic condition of cleanliness (not the state of being microbiologically clean).

Water closet — a fixture with a water-containing receptor that receives liquid and solid body waste and on actuation conveys the waste through an exposed integral trap into a drainage system.

Dual-flush water closet — a water closet incorporating a feature that allows the user to flush the water closet with either a reduced or a full volume of water.

Electro-hydraulic water closet — a water closet with a non-mechanical trap seal incorporating an electric motor and controller to facilitate flushing.

High-efficiency water closet (high-efficiency toilet) — a water closet with an average water consumption of 4.8 Lpf (1.28 gpf) when tested in accordance with ASME A112.19.2/CSA B45.1.

Note: *Dual-flush water closets with a maximum average water consumption of 4.8 Lpf (1.28 gpf) when tested in accordance with ASME A112.19.14 are also considered high-efficiency water closets.*

Low-consumption water closet — a water closet with an average water consumption of 6.0 Lpf (1.6 gpf) or less when tested in accordance with this Standard.

3.2 Abbreviations

The following abbreviations shall apply in this Standard:

gpf — gallons per flush

Lpf — litres per flush

4 Components and general requirements

4.1 General

4.1.1

Macerating toilet systems collect 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, and pump 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.

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.*