

AS/NZS 5328:2022



Australian/New Zealand Standard™

# Flushable products



AS/NZS 5328:2022

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- New Zealand Plumbers Gasfitters and Drainlayers Association
- Water Industry Operators Association
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## Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS-041, Service activities – water supply and wastewater systems.

The objective of this document is to provide test methods and criteria for determining if products are suitable for disposal by flushing them down a toilet. It also provides guidance on and requirements for the labelling and marking of products that are likely to be disposed via the toilet. This document is for manufacturers of such products, as well as managers and other stakeholders involved with wastewater transport and treatment systems.

The framework set out in this document is based on the International Nonwovens and Disposables Association (INDA) and the European Disposables and Nonwovens Association (EDANA) flushability guides (2018) and supplementary guidance. The document structure is based on ISO/TR 24524:2019, *Service activities relating to drinking water supply, wastewater and stormwater services — Hydraulic, mechanical and environmental conditions in wastewater transport systems*.

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The terms “normative” and “informative” are used in Standards to define the application of the appendix to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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## Introduction

The test criteria set out in this document for determining whether a product is suitable for toilet flushing derive from an evidence-based assessment of whether the product causes a negative impact on wastewater transport and treatment systems (collectively referred to as “wastewater systems”) or the environment. The criteria take into account the typical hydraulic, mechanical and environmental conditions generally found in wastewater systems, based on information that was available at the time of publication.

Wastewater systems have been and are designed to treat sanitary waste streams from toilets and urinals — comprising faeces, urine and toilet paper — along with other sanitary waste streams from bathing, laundry and kitchen activities. Most also treat industrial and commercial discharges containing chemicals. In recent years, a number of products have been introduced in the marketplace that are claimed to be compatible with sanitary objectives, which are then either identified as being toilet flushable or which by their location of use and usage, are likely to be flushed down the toilet as the means of disposal. Some of these products are not compatible with current infrastructure and resource recovery objectives.

As new and different types of sanitary wipes become available, it is increasingly becoming more important to ensure that consistent labelling is provided for consumers so that those wipes which are compatible with wastewater infrastructure and objectives be clearly labelled flushable, and those which are likely to cause operational issues to be clearly labelled “Do Not Flush”.

The principle objective of wastewater systems management is to protect public health, the environment, the work health and safety of workers, and sustainable development. Management also involves considering the impact on any outputs arising from wastewater treatment. There are many factors that contribute to the successful operation of wastewater systems. One of these is the prevention of blockages. When blockages occur, there is an unacceptable risk that wastewater may spill from the system and create public health and environmental risks along with otherwise unnecessary expenditure in rectifying the issues.

This document outlines a framework of test methods with requirements for assessing whether products are compatible with wastewater systems and the downstream environment (therefore suitable for toilet flushing). It provides labelling guidance for products which are likely to be flushed and either meet or do not meet the requirements.

This document is especially relevant for products designed and marketed for use in a bathroom setting and suitable for toilet flushing. Appropriate labelling of products will enable greater public education and awareness of the types of products that are suitable for toilet disposal and reduce the burden on the wastewater systems and the environment.

This document can also assist stakeholders in communicating with consumers and communities about the compatibility of products flushed via the toilet.

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# Australian/New Zealand Standard

## Flushable products

### Section 1 Scope and general

#### 1.1 Scope

This document sets out a framework, test methods and criteria for determining if products are suitable for disposal by flushing them down a toilet. This document applies to products that are intended for toilet flushing. It excludes toilet paper, liquids and soluble products.

This document also provides guidance on and requirements for the labelling and marking of products that are likely to be disposed via the toilet.

#### 1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents for informative purposes are listed in the Bibliography.

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

ASTM E11, *Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves*

Method 2540B, *Standard Methods for the Examination of Water and Wastewater — Total Solids Dried from 103 to 105 °C*

Method 2540D, *Standard Methods for the Examination of Water and Wastewater — Total Suspended Solids Dried from 103 to 105 °C*

#### 1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- (a) IEC Electropedia: available at <https://www.electropedia.org/>
- (b) ISO Online browsing platform: available at <https://www.iso.org/obp>

##### 1.3.1

##### **discharged material**

material deposited into a toilet as a means of disposal

[SOURCE: ISO/TR 24524:2019, 3.1]

##### 1.3.2

##### **flushable product**

product considered suitable for disposal through sewer networks and wastewater collection and treatment systems, including onsite treatment systems because it will not materially adversely impact those systems or be recognisable in effluent leaving onsite and municipal wastewater treatment systems or in the post-treatment products of treatment sludge

[SOURCE: ISO 24513:2019, 3.2.6]

**1.3.3****may**

indicates the presence of an option

**1.3.4****plastic**

solid material which contains, as an essential ingredient, one or more synthetic organic high polymers and which is formed (shaped) during either manufacture of the polymer or the fabrication into a finished product by heat and/or pressure

[SOURCE: ISO/TR 24524:2019, 3.4]

**1.3.5****screen**

device of rigid bars, mesh, perforated plate or other configurations installed in wastewater systems

Note 1 to entry: Screens are used to collect and remove objects such as rags, paper, plastics and metals from wastewater systems to prevent damage and clogging of downstream equipment, piping and appurtenances.

[SOURCE: ISO/TR 24524:2019, 3.6, modified — Text added to Note 1 to entry]

**1.3.6****shall**

indicates that a statement is mandatory

**1.3.7****should**

indicates a recommendation

**1.3.8****toilet****water closet pan****WC pan**

receptacle in the form of a bowl incorporating a water seal used in conjunction with a flushing device for the disposal of human wastes

[SOURCE: AS/NZS 3500.0:2021]

**1.3.9****wastewater**

water arising from any combination of domestic, institutional, commercial or industrial activities, surface runoff and any accidental sewer inflow/infiltration water and which can include collected stormwater discharged to the environment or sewer

Note 1 to entry: Wastewater can flow in separate or combined sewer systems.

[SOURCE: ISO 24513:2019, 3.2.2.2]

**1.3.10****wastewater network**

system of conduits used to remove and transport human waste and wastewater

Note 1 to entry: A system typically begins with connecting pipes from buildings to one or more levels of larger sewer pipes, which terminate at a wastewater treatment plant.

Note 2 to entry: Flow in sewer pipes can be gravity flow, pumped flow or a combination of the two.

Note 3 to entry: A wastewater conveyance system can also transport stormwater.

[SOURCE: ISO 24513:2019, 3.5.12.3.1]

## Section 2 Framework

### 2.1 General

The key elements of a wastewater system that need to be considered in developing a specification for products suitable for toilet disposal are described in ISO/TR 24524 and reproduced with permission in this document in [Clauses 2.2 to 2.7](#).

The key elements are —

- (a) toilets;
- (b) drain lines;
- (c) wastewater transport systems;
- (d) screening;
- (d) treatment processes; and
- (e) environmental considerations.

### 2.2 Toilets

The purpose of a toilet is to dispose of human excreta (i.e. urine, menses, vomit and faeces) by using water to flush it through a drain line to another location for disposal, thus maintaining a separation between humans and their excreta.

Any material discharged via a toilet should not adversely affect the intended operation of the toilet. The typical flush volume for new toilets in Australia and New Zealand is 3.0 L and 4.5 L. The ability of material to be removed from the toilet bowl is determined by a toilet clearance test.

[SOURCE: ISO/TR 24524:2019 Clause 4.1, modified. Copyright ISO. All rights reserved.]

### 2.3 Drain lines

Drain line design, configuration, construction and maintenance may impact the ability of waste to pass through a drain line. Typically, material flushed from a toilet into a drain line moves along the drain line with water from toilet flushing. Failure of flushed material to exit the drain line may result in blocked plumbing, the generation of unacceptable odours or allow material to dry out and adhere to the pipe surface.

The length of a drain line and number of connections can vary significantly based on the building type and purpose. Requirements for drain line design configurations for Australia and New Zealand are specified in AS/NZS 3500.2. The ability of material to move down the drain line is determined by a drain line clearance test.

When material moves down the drain line, it may occasionally become snagged on a pipe imperfection. Snagged material should either self-release, tear off the snag or break up within a certain number of flushes. When such material does not release, tear off or break up, then it may result in issues for the drain line. Material intended to be discharged via a toilet should clear the drain line and reach the sewer without adversely affecting the operation of the drain line. The ability of a product to tear or self-release is determined by the disintegration test.

[SOURCE: ISO/TR 24524:2019 Clause 5.1, modified. Copyright ISO. All rights reserved.]

## 2.4 Wastewater transport systems

The design, layout and configuration of wastewater transport systems vary significantly depending on the municipality served, its geographic and topographic features and climatic conditions.

Pipes are required to convey the wastewater from a drain line to a wastewater treatment plant. The wastewater transport system includes pipes of various diameters, as well as maintenance holes and other hydraulic structures. Wastewater may flow through the pipes by gravity or under pressure from a pump.

Pumps are required where there is a need to overcome an elevation difference to pump to a level at which gravity can then be used to facilitate the transport of flows. This can occur anywhere from the end of the drain line to any point within the transport system.

Screens or grinders may be installed ahead of the pumps or other downstream infrastructure, including overflow outlets and immediately before the influent point of the treatment system to protect them from becoming blocked with inappropriately discharged material.

To ensure a product is compatible with the wastewater transport system, it needs to lose strength and disintegrate to avoid blockages of pumps and screens. The disintegration test and the two pump tests are used to evaluate a product for these properties.

Sewers are designed to maintain a velocity necessary to transport solids to prevent deposition and decomposition in the sewer. Modelling estimates the transit time from a property line to a screen or pump is typically considered to be between 30 min and 6 h. A minimum velocity in a sewer of 0.3 m/s will stop settling of suspended solids and velocity when flowing full of 0.6 m/s will facilitate self-cleaning of the sewer via resuspension of settled solids.

[SOURCE: ISO/TR 24524:2019 Clauses 6.1 and 6.3, modified. Copyright ISO. All rights reserved.]

## 2.5 Screening

Screens are designed to protect pumps and downstream infrastructure from issues such as clogging and blocking. Materials greater than a certain size can foul screens, resulting in an elevated load of solid waste to landfill, increased maintenance or potential blockages leading to sewer overflows and flooding.

[SOURCE: ISO/TR 24524:2019 Clause 7, modified. Copyright ISO. All rights reserved.]

## 2.6 Treatment processes

### 2.6.1 General

Material that enters a wastewater treatment plant should not unduly affect the ability of that plant to meet legislated or licence conditions.

[SOURCE: ISO/TR 24524:2019 Clause 8.1, modified. Copyright ISO. All rights reserved.]

### 2.6.2 Settling

The majority of solids that enter a wastewater treatment plant may be removed through settling. The rate of settling within a wastewater treatment plant is measured by the settling velocity. The settling rate of a material is affected by particle size and density, along with system design, operation and capacity. A settling rate should be at least 1 mm/s. A settling test is used to confirm the settling rate for materials.

[SOURCE: ISO/TR 24524:2019 Clause 8.2, modified. Copyright ISO. All rights reserved.]