SLOVENSKI STANDARD
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Straniščne školjke in straniščna oprema z integriranim sifonom

WC pans and WC suites with integral trap

WC-Becken und WC-Anlagen mit angeformtem Geruchverschluss

Cuvettes de WC et cuvettes à réservoir attenant à siphon intégré

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91.140.70	Sanitarne naprave	Sanitary installations

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This European Standard was approved by CEN on 14 April 2018.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 997:2018) has been prepared by Technical Committee CEN/TC 163 “Sanitary appliances”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2019 and conflicting national standards shall be withdrawn at the latest by July 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 997:2012+A1:2015.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

For relationship with EU Construction Products Regulation, see informative Annex ZA, which is an integral part of this document.

This standard is one of a series of standards for sanitary appliances. Supporting standards are those for flushing devices and connecting dimensions.

The main changes introduced in EN 997:2012+A1:2015 were the following:

a) introduction of a new Annex ZA in accordance with the latest template (in the format of TF N 687 rev1 of 2015-06-02);

b) modification of the marking of products;

c) editorial modifications as agreed between representatives of EU/DG Growth, CEN/TC 163 and FECS on 2016-07-07 in Brussels for citation of standard in OJEU.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies constructional and performance characteristics together with test methods for close-coupled suites, one-piece and independent WC pans with integral trap used for personal hygiene manufactured from glazed ceramics or stainless steel.

This European Standard does not apply to squatting toilets, WC pans without integral trap or flushing cisterns as separate appliances.

In the case of independent WC pans, the associated flushing cisterns and pressure valves are covered by other standards and the reference to cisterns in this standard is related only to the definition and requirements of flushing volume.

In the case of close-coupled suites and one-piece WCs, this standard also specifies design, performance characteristics and the test methods for designated flushing cisterns with flushing mechanisms, inlet valves and overflows. For these products, this standard covers flushing cisterns designed to be connected to drinking water installations inside buildings.

Before installation of WCs, EN 12056-2 and national requirements need to be taken into consideration.

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. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1717, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*

EN 12056-2, *Gravity drainage systems inside buildings - Part 2: Sanitary pipework, layout and calculation*

EN 14124, *Inlet valves for flushing cisterns with internal overflow*

AS 1172-1, *Water closets (WC) - Pans*

BS 1212-2:1990, *Float operated valves. Specification for diaphragm type float operated valves (copper alloy body) (excluding floats)*

BS 1212-3:1990, *Float operated valves. Specification for diaphragm type float operated valves (plastics bodied) for cold water services only (excluding floats)*

BS 1212-4:2016, *Float operated valves. Specification for compact type float operated valves for WC flushing cisterns (including floats)*

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:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

Note 1 to entry: Drawings are diagrammatic only.

3.1
glazed ceramic
ceramic material for sanitary appliances with all visible surfaces glazed when installed

3.2
WC pan
bowl-shaped appliance for reception and flushing away of human solid and liquid excrement

3.3
pedestal WC pan
floor-mounted WC pan that has an integral foot

3.4
wall-hung WC pan
WC pan cantilevered clear of the floor

3.5
back-to-wall WC pan
pedestal WC pan whose back is in contact with the wall

3.6
wash-out WC pan
WC pan in which excrement falls first into a shallow water filled bowl, before being removed by the flushing water

3.7
wash-down WC pan
WC pan in which excrement falls directly into the trap before being removed by the flushing water

3.8
siphonic WC pan
WC pan in which excrement is removed by siphonage induced by the flushing water

3.9
close-coupled suite
combination of a WC pan and flushing cistern directly coupled into a functional unit

3.10
one-piece WC pan
WC pan manufactured with an integral flushing cistern

3.11
independent WC pan
WC pan suitable for the connection with a flushing cistern or a pressure flush valve

3.12
WC suite
WC pan combined with either a flushing cistern with integral warning pipe connection – or a device deemed to be a no less effective device – and inlet/outlet devices, or a pressure flush valve, with WC and flushing device installed as a functioning unit

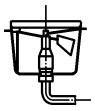
3.13
children WC pan
WC pan with a front edge between 300 mm and 380 mm high

3.14
baby WC pan
WC pan with a front edge below 260 mm high

3.15
flushing device
device fitted to a cistern to provide controlled measured volume(s) of water to a WC pan or suite for flushing

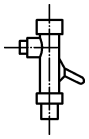
Note 1 to entry: A flushing device can be a siphon, drop valve, flap valve or pressurized cistern, etc. For the purposes of this standard, the flushing device includes the activator (e.g. handle, button, linkages etc.) and all seals, pistons, or other integral components.

3.16
valve-type flushing cistern



cistern with integral valve outlet device for the storage and discharge of a defined volume(s) of flushing water for the removal of excrement from a WC pan

3.17
pressure flush valve



valve directly connected to the water supply which delivers a pre-determined volume of flushing water for the removal of excrement from a WC pan

3.18
water trap
water seal that prevents backflow of foul odour from a drain

3.19
inlet valve
valve that controls and shuts off the flow of water into a flushing cistern, usually by an arm connected to a float

3.20
outlet valve
mechanism for opening and closing the outlet orifice of the flushing cistern

3.21
flush pipe
connecting pipe between a flushing cistern's outlet and a WC's inlet

3.22
overflow
device enabling release of excess water from a flushing cistern when water reaches a pre-determined level

3.23
overflow level
water level corresponding to the upper edge of the overflow or to the lower edge of the overflow notch

3.24
flush volume
volume of water discharged from the flushing device during a flush cycle

3.25
after-flush volume
volume of flush water remaining after the last test specimen has left the outlet of the bowl

3.26
warning level
level of spill over of a vertically mounted warning pipe connection or the invert of a horizontally mounted warning pipe connection, or the level at which an equally effective (warning) device would operate

3.27
meniscus level
level resulting from surface tension of water during overflowing

3.28
nominal water level
water level when a cistern is filled to the nominal flush volume, e.g. 4 l, 5 l, 6 l, 7 l or 9 l

3.29
nominal flush volume
volume of water indicated, when a flushing cistern is filled to the nominal water level

3.30
maximum water level
highest water level reached after flow stabilization, in the event of continuous supply, as a result of malfunction of the inlet valve

3.31
critical water level
highest water level in any part of the appliance, 2 s after the supply is cut-off

3.32
residual water level
water level, after a full flush is completed

3.33

adjustable residual water level

residual water level in a cistern, after (uninterrupted) flushing, which can be altered by adjusting the outlet mechanism

3.34

short-term leak test

leak test consisting of a 15 min wait after flushing then positioning paper designed to change colour when wet, under the flushing device for 10 min

Note 1 to entry: A leak is defined as being visible discharge of water amounting to more than three separate drops.

3.35

long-term leak test

leak test consisting of a 2 h wait after flushing then positioning paper designed to change colour when wet, under the outlet for 15 min

Note 1 to entry: A leak is defined as being visible discharge of water amounting to more than three separate drops.

3.36

safety margin — dimension *c*

distance between the nominal water level determined by the manufacturer, and the overflow level

3.37

impact force

force of the flushing water at the outlet of the flush pipe

3.38

test height

distance between the seat of the flushing device and the horizontal axis of the flush pipe

3.39

flush rate

volume of water flowing out of a flushing cistern as a function of time

3.40

product type

set of representative performance levels or classes of a construction product, in relation to its essential characteristics, produced using a given combination of raw materials or other elements in a specific production process

Note 1 to entry: The definition is taken from Regulation (EU) No. 305/2011.

4 Classification

WC pans and suites are classified as described below:

Type 1: WC pans and suites designed for use with and tested using a nominal full flush volume of either 4 l, 5 l, 6 l, 7 l or 9 l and in case of a reduced flush not less than those in accordance with Table 2 and Table 3. The requirements of type 1 are given in Clause 5.

Type 2: WC suites designed for use with a pressure flushing valve or a flushing cistern incorporating some other flushing device, and tested as described in Clause 6, using a maximum flushing volume of 6 l, or a dual-flush combining a maximum flush of 6 l and a reduced flush not greater than two-thirds of the maximum flush volume. The requirements of type 2 are given in Clause 6.

5 Functional characteristics and test methods for type 1 products

5.1 Depth of water seal

When tested in accordance with 5.7.1, the depth of the water seal shall be not less than 50 mm.

5.2 Flushing characteristics

5.2.1 General

Table 1 correlates the flushing characteristics to the WC pan sub-type and flushing volume.

Table 1 — Flushing characteristics

Sub-type of WC pan in accordance with Table 2 and Table 3	Wash of bowl (5.2.2)	Flushing of toilet paper (5.2.3)	Flushing of 50 plastic balls (5.2.4)	Oversplashing (5.2.5)	After-flush volume (5.2.6)
9	X	X	X	X	
7	X	X	X	X	
6	X	X		X	X
5	X	X		X	X
4	X	X	X	X	

The efficiency of flushing is demonstrated by the following characteristics.

5.2.2 Wash of bowl

When tested in accordance with 5.7.2.3, the arithmetic average of any unflushed area below the rim and above the surface of the water in the trap shall not be more than 50 cm^2 after five flushing operations.

In case of rimless WCs, the surface to be tested is the area between the water surface and a horizontal line 85 mm below the top edge of the bowl.

5.2.3 Flushing of toilet paper

When tested in accordance with 5.7.2.4, 12 sheets of toilet paper shall be flushed out of the WC pan a minimum of 4 times out of five tests.

For baby WC pans, 6 sheets of toilet paper shall be flushed out of the WC pan a minimum of 4 times out of five tests.

5.2.4 Flushing of fifty small plastic balls

When tested in accordance with 5.7.2.5 after five tests, each with 50 balls, a minimum of 85 % of the balls shall be flushed out of the WC pan.

5.2.5 Oversplashing

When tested in accordance with 5.7.2.6, flushing water shall not splash beyond the rim of the bowl and wet the floor. Only a few small drops are permissible.

5.2.6 After-flush volume

When tested in accordance with 5.7.2.7, an after-flush volume of 2,5 l or 2,8 l as appropriate is required.

5.3 Water absorption

When tested in accordance with 5.7.3, the arithmetic average for water absorption of glazed ceramic WC pans shall not exceed 0,5 % by mass.

5.4 Static load

When tested in accordance with 5.7.4, wall-hung and non-ceramic WC pans and WC suites shall withstand a force of (4,00 ± 0,05) kN without showing any evidence of cracking or permanent deformation.

Experience has shown that pedestal ceramic WC pans and WC suites comply with this characteristic.

5.5 Additional characteristics of flushing cisterns for close-coupled suites and one-piece WCs

5.5.1 General

If close-coupled suites and one-piece WCs comprising a flushing cistern and a WC pan supplied or specified by the manufacturer as a unit, the following characteristics shall be fulfilled.

5.5.2 Inlet valve of the flushing cistern

Flushing cisterns shall have an inlet valve complying with EN 14124.

5.5.3 Supply piping

All materials of the supply piping which could be in contact with drinking water shall not be danger to health. They shall not change the taste, aroma or visual appearance of the drinking water.

The use of elastomeric flexible supply hoses complying with EN 13618 is permissible inside the assembly.

5.5.4 Flush volume(s) of the flushing cistern

The flush volume(s) for one-piece and close-coupled flushing cisterns supplied with a WC pan shall conform to the value(s) specified by the manufacturer according to Table 3, when measured as described in 5.7.5.1.

Flushing cisterns or their components shall be marked to allow the correct volume(s) of flush to be achieved.

5.5.5 Leak-tightness between flushing cistern and bowl

When tested in accordance with 5.7.5.2, there shall be no leakage between the WC pan and the flushing cistern.

5.5.6 Outlet valve leak-tightness

When tested in accordance with 5.7.5.3, the outlet shall not show any leakage greater than three drops within 15 min.

5.5.7 Outlet valve reliability

When tested in accordance with 5.7.5.4, the outlet mechanism functions shall be ensured.

The flushing device shall not show any failure or permanent distortion of any component including linkages that prevents normal operation of the mechanism.

The outlet of the flushing device shall not show leakage greater than three drops within 15 min.

5.5.8 Overflow

When tested as described in 5.7.5.5, the overflow shall meet the requirements specified below (see Figure 1):

a) the distance between the maximum water level and the overflow level shall be ≤ 20 mm;

b) the distance between the critical water level and the overflow level shall be ≤ 10 mm;

c) the distance between the meniscus level and the overflow level shall be ≤ 5 mm.