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WC and urinal flushing cisterns

Spülkästen für WC-Becken und Urinale

Réservoirs de chasse d'eau pour WC et urinoirs

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WC and urinal flushing cisterns

Réservoirs de chasse d'eau pour WC et urinoirs

Spülkästen für WC-Becken und Urinale

This European Standard was approved by CEN on 16 October 2010 and includes Amendment 1 approved by CEN on 6 April 2015.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 14055:2010+A1:2015 (E)**Foreword**

This document (EN 14055:2010+A1:2015) 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of an identical text or by endorsement, at the latest by December 2015, and conflicting national standards shall be withdrawn at the latest by March 2017.

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

This document includes Amendment 1 approved by CEN on 6 April 2015.

This document supersedes EN 14055:2010.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

A1 This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Construction Products Regulation.

For relationship with EU Construction Products Regulation, see informative Annex ZA, which is an integral part of this document. **A1**

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies design, performance requirements and the test methods for WC and urinal flushing cisterns with flushing mechanism, inlet valve and overflow.

This document covers flushing cisterns designed to be connected to drinking water installations inside buildings.

This standard does not cover automatic valveless siphon flushing cisterns for flushing urinals.

NOTE Flushing cisterns for one-piece WCs and close-coupled suites are covered by EN 997.

2 Normative references

The following referenced documents are indispensable for the application 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 997:2003, *WC pans and WC suites with integral trap*

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

EN 13407:2006, *Wall-hung urinals — Functional requirements and test methods*

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

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 1212-4:1991, *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.

3.1

valve-type flushing cistern

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

3.2

valveless-type flushing cistern

cistern with integral syphonic actuated outlet device, for storage and discharge of a defined volume of flushing water for removal of excrement from a WC pan

NOTE Both types of flushing cisterns are available, as detailed below:

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Wall-hung independent low-level

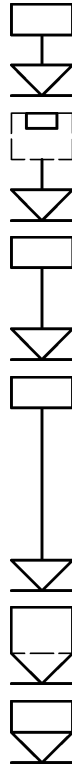
Built-in independent

Wall-hung independent mid-level

Wall-hung independent high-level

One-piece integral (with WC pan)

Close-coupled



3.3 close-coupled multiple use flushing cistern

close-coupled flushing cistern for use with different WC pans

3.4 independent flushing cistern

flushing cistern mounted separately from a WC pan or urinal

3.5 outlet valve

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

3.6 operating mechanism

mechanism to open, and if applicable, close the outlet valve

3.7 flush pipe

connecting pipe between a flushing cistern's outlet and a WC's or urinal's inlet

3.8 overflow

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

3.9 inlet valve

valve that controls and shuts off the flow of water into a flushing cistern

3.10 overflow level

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

3.11**maximum water level**

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

3.12**critical water level**

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

3.13**residual water level**

water level after a full flush is completed

3.14**adjustable residual water level**

water level in a cistern, after (uninterrupted) flushing, when an outlet mechanism can be adjusted to the elevated residual water level

3.15**meniscus level**

level resulting from surface tension of water during overflowing

3.16**nominal water level**

water level when a flushing cistern is filled to the nominal flush volume

3.17**nominal flush volume**

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

3.18**flush volume**

volume of water discharged from the flushing cistern during a flush cycle

3.19**safety margin**

c

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

3.20**flush rate**

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

3.21**test height**

distance between the seat of the outlet valve and the horizontal axis of the flush pipe

3.22**impact force**

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

3.23**flushing device**

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

3.24**water-saving device**

flushing device that permits a part of the total flush volume to be delivered, e.g. acting as double-action mechanisms (interruptible) or double-control mechanisms (dual control or dual flush)

EN 14055:2010+A1:2015 (E)**3.25****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

3.26**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 A leak is defined as being visible discharge of water amounting to more than three separate drops.

3.27**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 A leak is defined as being visible discharge of water amounting to more than three separate drops.

A1 3.28**product type**

construction product with a set of representative performance levels or classes in relation to its Essential Characteristics, produced using a given combination of raw materials or other elements in a specific production process **A1**

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4 Classification

Flushing cisterns are classified as described below:

- **Class 1:** Flushing cisterns tested in accordance with the requirements of Clauses 5 and 8 using a nominal flush volume of either 4 l, 5 l, 6 l, 7 l or 9 l.
- **Class 2:** Flushing cisterns tested in accordance with the requirements of Clauses 6 and 8 using a maximum flushing volume of 6 l, or a dual-flush which combines a maximum flush of 6 l and a reduced flush no greater than two-thirds of the maximum flush.
- **Class 3:** Class 1 flushing cistern intended to be used in connection with urinals.

5 Requirements and test methods for class 1 products**5.1 Design****5.1.1 Flushing cistern equipment**

An equipped flushing cistern comprises:

- a shell, provided with a removable lid or an access flap allowing access to components;
- an inlet valve complying with EN 14124;
- a flushing device;
- an overflow device;
- an operating mechanism;

- a flush pipe, when the cistern is for use with an independent WC pan.

In special cases, a combined fitting providing the functions of filling, overflowing and evacuation is permissible. In this case, the fitting shall be designed to comply with the hygiene, physico-chemical, leaktightness, hydraulic, pressure resistance, acoustic and mechanical characteristics specified in EN 14124. The tests shall be performed on the flushing cistern as supplied.

5.1.2 Water supply connection

The inlet valve can be connected to the cistern through:

- the side;
- the back;
- the underside;
- the top.

5.1.3 Supply piping

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

5.1.4 Removable parts

It shall be possible to dismantle removable parts, without having to remove the flushing cistern.

5.1.5 Connecting dimensions

The connecting dimensions shall comply with Table 1.

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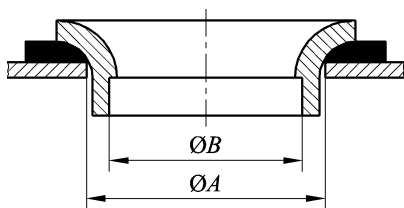
Table 1 — Connecting dimensions (Figures 1 and 2)

Designation	Symbol	Dimensions mm	Remarks
Hole for inlet valve	—	19 ± 2^c	For inlet valves size 3/8"
		23 ± 2^c	For inlet valves size 1/2"
Hole for outlet valve	A	$63^{+2}_{-3}^c$	For ceramic flushing cisterns
		$61^{+2}_0^c$	For thin-walled flushing cisterns (e.g. plastic)
		$45^{+2}_{-3}^c$	For high level flushing cisterns
Inside diameter of outlet connection	B	$32,5^{+1}_0^c$	For flush pipes of design A
		$51^{+0,5}_0^c$	For flush pipes of design B
Outside diameter of outlet connection	C a	$49,5^{+0,4}_0^b$	For flush pipes of design C
Hole in the cover for operating device	—	$40^{+2}_{-1}^c$	Recommended dimension

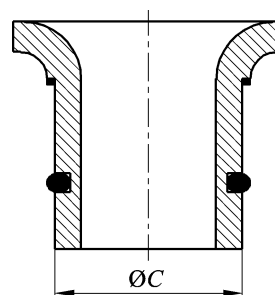
a Not applicable to flushing cisterns built into wall frames.

b Where the exterior diameter of the flush pipe is conical or has several stepped diameters, the maximum diameter is to be verified and recorded.

c Other dimensions are permissible if the performance of the cistern is assured.

**Key**

See Table 1.

Figure 1 — A_1 Outlet connection for flush pipes of design A, B1 and B2 A_1 A_1 NOTE Design B means design B1 and design B2. A_1 **Key**

See Table 1.

Figure 2 — Outlet connection for flush pipes of design C

5.1.6 Flush pipes

The dimensions of flush pipes designed to equip WC pans for independent supply shall comply with Table 2. The flush pipe shall be provided by the manufacturer of the flushing cistern.

Table 2 — Dimensions of flush pipes (Figures 3 to 6)

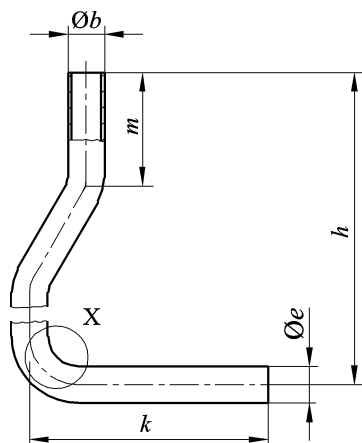
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Designation	Symbol	Dimension mm	Remarks
Outside diameter inlet	b	$32^{+0,5}_0$	For flush pipes of design A
		$50^{+0,5}_0$	For flush pipes of designs B1 and B2
Inside diameter	c	50^{+1}_0	For flush pipes of design C
Outside diameter at outlet WC	e	$32^{+0,5}_0$	For flush pipes of design A
		$44^{+0,5}_0$	For flush pipes of design B1
		$40^{+0,5}_0$	For flush pipes of design B2
		$45^{+0,5}_0$	For flush pipes of design C
Inside diameter at outlet WC	f	≥ 39	For flush pipes of designs B1, B2 and C
Height of flush pipe	h	$\geq 1\ 500$	For flush pipes of design A
		≥ 165	For flush pipes of designs B1 and B2
		≥ 600	
		≥ 165	For flush pipes of design C
Length	k	≥ 210	For flush pipes of designs A, B1 and B2
		≥ 180	For flush pipes of design C
Length of vertical inlet portion	m	≥ 100	For flush pipes of design A
Radius of bend	r	50 to 80	For flush pipes of design A
		≥ 15	For flush pipes of designs B1 and B2
		≥ 5	For flush pipes of design C

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Apart from dimension e other dimensions are permissible, provided the performance requirements in 5.2 are satisfied.

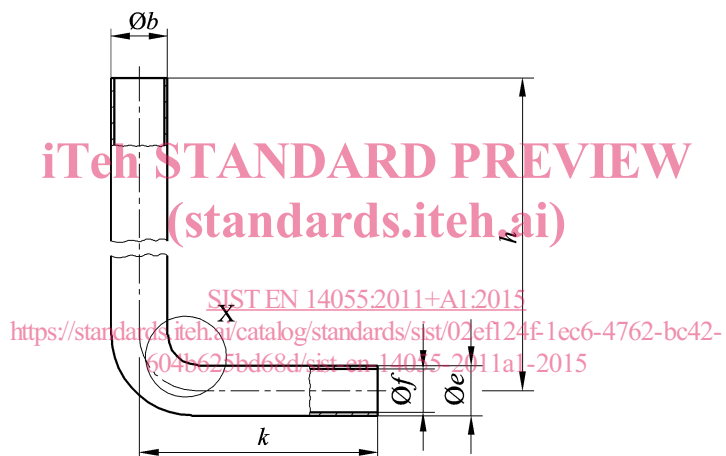
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Key

See Table 2.

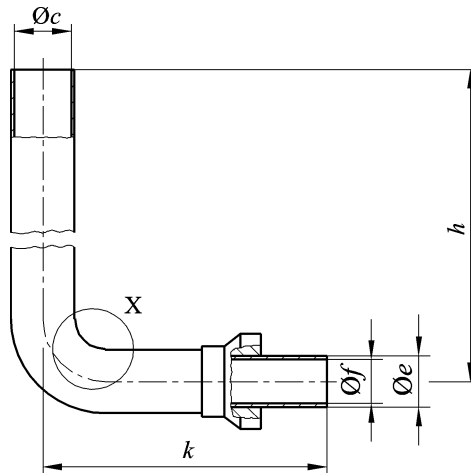
Figure 3 — Design A flush pipe for wall-hung high-level cisterns, fabricated in one or two parts



Key

See Table 2.

Figure 4 — A_1 Design B1 and B2 flush pipes for wall-hung low-level or mid-level cisterns A_1

**Key**

See Table 2.

Figure 5 — Design C flush pipe for built-in cisterns**Key** r Radius of bend**Figure 6 — Detail X****5.2 Hydraulic and mechanical characteristics****5.2.1 Flush volume**

Flush volume(s) shall correspond with those specified in Table 3, when measured as described in 5.3.2.