WC flushing cisterns

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Foreword

This European Standard (prEN 14055:2005) has been prepared by Technical Committee CEN/TC 163 “Sanitary appliances”, the secretariat of which is held by UNI.

This European Standard is currently submitted to the Unique Acceptance Procedure.

This European Standard has been prepared under a Mandate given to CEN by the European Commission and the European Free Trade Association, and supports the Essential Requirements of the Construction Products Directive (89/106/EEC).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this European Standard.

This European Standard is part of a series of standards for sanitary appliances. It is one of the standards pertaining to WCs with integral trap, as are those defining connecting dimensions for WC pans.
1 Scope

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

This European Standard covers only flushing cisterns designed to be connected to drinking water installations inside buildings.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 997, 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

prEN 13618, Water supply — Flexible hoses (elastomeric or plastic material hose with or without metallic or synthetic braiding) — Product standard

EN 14124, Inlet valves for flushing cisterns with internal overflow

BS 1212-1:1990, Float operated valves. Specification for piston type float operated valves (copper alloy body) (excluding floats)

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 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 European Standard, the following terms and definitions apply.

3.1 valve-type flushing cistern

cistern with integral valve actuated 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:
prEN 14055:2005 (E)

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 cistern
close-coupled cistern for use with different WC pans

3.4 independent cistern
cistern mounted separately from a WC pan

3.5 outlet valve
mechanism for opening and closing the outlet orifice of the cistern

3.6 outlet connection piece
component to facilitate connection between a cistern and a flush pipe

3.7 operating device
device to open, and if applicable, close the outlet valve
3.8 flush pipe
classifying pipe between a flushing cistern's outlet and a WC's inlet

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

3.10 inlet valve
flow control device, through which a flushing cistern is filled after flushing to a pre-set water level

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

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

3.13 critical water level
highest physical or piezometric water level in any part of the appliance, 2 s after the supply is cut-off

3.14 residual water level
water level (at the outlet valve seating), after a full flush is completed

3.15 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

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

3.17 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

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

3.19 flush volume
effective volume of water discharged during a flush cycle when the water level correspond to the nominal water level set by the manufacturer

3.20 safety margin – dimension c
distance between the nominal water level determined by the manufacturer, and the overflowing level

3.21 flush flow rate
volume of water flowing out of a flushing cistern as a function of time
3.22 flow stabiliser
device which is fitted to the horizontal part of the flush pipe and used to stabilise the flow

3.23 height for flush flow rate test
the distance between the seating of the flushing device and the horizontal axis of the flush pipe

4 Classification

Flushing cisterns are classified as described below:

— **Class 1:** Flushing cisterns tested in accordance with the requirements of Clauses 5 and 7 - 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 7 - 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.

5 Requirements and test methods for class 1 products

5.1 Design

5.1.1 General

For the purpose of protection of drinking water, the flushing cistern shall comply with EN 1717.

5.1.2 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 for use with flushing cisterns complying with EN 14124;

— a flushing mechanism;

— an overflow device;

— an operating device;

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

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 in the cistern as supplied.

5.1.3 Water supply connection

The inlet valve can be connected to the cistern through:
— the side;
— the back;
— the underside;
— the top.

5.1.4 Flexible hoses

The use of elastomeric flexible supply hoses complying with prEN 13618 is permissible.

5.1.5 Mechanical components

It shall be possible to dismantle mechanical components, without having to remove the cistern.

5.1.6 Connecting dimensions

The connecting dimensions shall comply with Table 1.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Symbol</th>
<th>Dimensions mm</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hole for inlet valve</td>
<td>—</td>
<td>19 ± 2 c</td>
<td>For inlet valves size 3/8&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 ± 2 c</td>
<td>For inlet valves size ½&quot;</td>
</tr>
<tr>
<td>Hole for outlet valve</td>
<td>A</td>
<td>63 ± 2 c</td>
<td>For ceramic cisterns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>61 ± 2 c</td>
<td>For thin-walled cisterns (e.g. plastic)</td>
</tr>
<tr>
<td>Inside diameter of outlet connection</td>
<td>B</td>
<td>32,5 ± 1 c</td>
<td>For flush pipes of design A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>51 ± 0,5 c</td>
<td>For flush pipes of design B</td>
</tr>
<tr>
<td>Outside diameter of outlet connection</td>
<td>C a</td>
<td>49,5 ± 0,4 b</td>
<td>For flush pipes of design C</td>
</tr>
<tr>
<td>Hole in the cover for operating device</td>
<td>—</td>
<td>40 ± 2 c</td>
<td>Recommended dimension</td>
</tr>
</tbody>
</table>

| a | Not applicable to 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. |
5.1.7 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)**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Symbol</th>
<th>Dimension mm</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside diameter at inlet</td>
<td>( b )</td>
<td>( \begin{align*} 32 &amp; +0.5 , 0 \ 50 &amp; +0.5 , 0 \end{align*} )</td>
<td>For flush pipes of design A/B</td>
</tr>
<tr>
<td>Inside diameter</td>
<td>( c )</td>
<td>( 50 &amp; +1 , 0 )</td>
<td>For flush pipes of design C</td>
</tr>
<tr>
<td>Outside diameter at outlet to WC</td>
<td>( e )</td>
<td>( \begin{align*} 32 &amp; +0.5 , 0 \ 44 &amp; +0.5 , 0 \ 45 &amp; +0.5 , 0 \end{align*} )</td>
<td>For flush pipes of design A/B/C</td>
</tr>
<tr>
<td>Inside diameter at outlet to WC</td>
<td>( f )</td>
<td>( \begin{align*} \geq 39 \end{align*} )</td>
<td>For flush pipes of designs B and C</td>
</tr>
<tr>
<td>Height of flush pipe</td>
<td>( h )</td>
<td>( \begin{align*} \geq 1 , 500 \ \geq 165 \ \geq 600 \end{align*} )</td>
<td>For flush pipes of design A/B/C</td>
</tr>
<tr>
<td>Length</td>
<td>( k )</td>
<td>( \begin{align*} \geq 210 \end{align*} )</td>
<td>For flush pipes of design A/B/C</td>
</tr>
<tr>
<td>Length of vertical inlet portion</td>
<td>( m )</td>
<td>( \geq 100 )</td>
<td>For flush pipes of design A</td>
</tr>
<tr>
<td>Radius of bend</td>
<td>( r )</td>
<td>( \begin{align*} 50 , \text{to} , 80 \ \geq 15 \ \geq 5 \end{align*} )</td>
<td>For flush pipes of design A/B/C</td>
</tr>
</tbody>
</table>
Apart from dimension e other dimensions are permissible, provided the performance requirements and clause 5.2 are satisfied.

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

Figure 4 — Design B flush pipe for wall-hung low-level or mid-level cisterns
5.2 Hydraulic and mechanical characteristics

5.2.1 Flush volume

Flush volume(s) shall correspond with those specified in EN 997 and/or with those specified in Table 3, when measured as described in 5.3.2.

Table 3 — Flush volumes

<table>
<thead>
<tr>
<th>Nominal flush volumes l</th>
<th>Flush volumes l</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For complete flushing</td>
<td>For water-saving (dual) flushing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>9,0</td>
<td>8,5</td>
<td>9,0</td>
<td>3,0</td>
</tr>
<tr>
<td>7,0</td>
<td>7,0</td>
<td>7,5</td>
<td>3,0</td>
</tr>
<tr>
<td>6,0</td>
<td>6,0</td>
<td>6,5</td>
<td>3,0</td>
</tr>
<tr>
<td>5,0</td>
<td>4,5</td>
<td>5,5</td>
<td>3,0</td>
</tr>
<tr>
<td>4,0</td>
<td>4,0</td>
<td>4,5</td>
<td>2,0</td>
</tr>
</tbody>
</table>

a Only for double-control water-saving (dual) flushing devices.
The nominal water level(s) shall be marked in multiple use cisterns.

Flushing cisterns with a nominal volume of 9 l, 7 l, 6 l or 5 l can be used to deliver the different volumes shown in Table 3. Adjustment can be effected at the inlet valve and/or the outlet mechanism. The manufacturer’s instructions shall describe the procedure and the consequences (e.g. increase in the residual water level or decrease in the filling level).

### 5.2.2 Water-saving devices

Water-saving mechanisms shall be designed so that when selected, only part of the total flush volume is delivered.

Water-saving mechanisms shall comply with the requirements specified below:

— Double-action mechanisms (interruptible):
  — one action initiates flushing and
  — a second action stops the flush.

Devices with immediate and automatic closing are not permitted.

— Double-control mechanisms (dual control):
  — one control releases the full flush volume and
  — another control releases a reduced flush volume.

Both devices shall deliver flush volumes in accordance with Tables 3 and 4.

### 5.2.3 Flush flow rate

When tested as described in 5.3.3, the flush flow rate shall comply with the values specified in Table 4.

### Table 4 — Flush flow rates

<table>
<thead>
<tr>
<th>Type of flushing cistern</th>
<th>Test height mm</th>
<th>Flush rate for complete flush l/s</th>
<th>Minimum flush rate for water-saving (dual) flush l/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent wall-hung low-level and built-in</td>
<td>200 ± 5</td>
<td>2,3 ± 0,3 b</td>
<td>2,0</td>
</tr>
<tr>
<td>Independent wall-hung mid-level</td>
<td>565 ± 5</td>
<td>1,8 ±0,4 b_0,1</td>
<td>1,6</td>
</tr>
<tr>
<td>Independent wall-hung high-level</td>
<td>1 365 ± 5</td>
<td>1,8 ±0,4 b_0,1</td>
<td>1,7</td>
</tr>
<tr>
<td>One-piece and close-coupled</td>
<td>—</td>
<td>not applicable c</td>
<td>not applicable c</td>
</tr>
<tr>
<td>Multiple use close-coupled</td>
<td>—</td>
<td>2,3 ± 0,3</td>
<td>2,0</td>
</tr>
</tbody>
</table>

a Cisterns with integral flush pipe and cisterns built into wall frames shall be tested as supplied by the manufacturer, regardless of the test height.

b Flush rate with flow stabiliser fitted (see Figure 9).

c One-piece and close-coupled type will be tested in accordance to EN 997.
5.2.4 Overflow

When tested as described in 5.3.4, the overflows shall be designed in accordance with the requirements specified below (see Figure 7):

a) the distance between the maximum water level and the level of overflow shall be $\leq 20$ mm;

b) the distance between the critical water level and the level of overflow shall be $\leq 10$ mm;

c) the distance between the meniscus level and the level of overflow shall be $\leq 5$ mm.
5.2.5 Inlet valve opening characteristics

When tested as described in 5.3.5, inlet valves used with flushing cisterns equipped with a water-saving device shall re-open during or after the short flush has been completed.

5.2.6 Safety margin – dimension $c$

When tested as described in 5.3.6, dimension $c$ (see Figure 8) corresponding to the distance between the overflowing level and the maximum nominal water level indicated by the manufacturer shall be at least 20 mm.
5.2.7 Backflow prevention

When tested as described in 5.3.7, the dimension \( a \) (see Figure 8) between the overflow level and the lowest point of the inlet valve or inlet orifice shall be 20 mm to prevent backflow.

In the case of adjustable overflow, the minimum adjustment shall provide a dimension \( a \) of 20 mm at least.

5.2.8 Leaktightness

When tested as described in 5.3.8, the leaktightness shall be ensured. A maximum of three drops does not constitute a failure.

5.2.9 Endurance

During endurance testing as described in 5.3.9, the outlet mechanism functions shall be ensured. The flushing device shall not undergo any failure or permanent distortion of any components including linkages that prevents normal operation of the mechanism.

5.2.10 Operating force

When tested as described in 5.3.10, it shall be possible for the outlet mechanism to be actuated with a maximum force of 25 N.

5.2.11 Durability

Class 1 products conforming with 5.2.1, 5.2.3 to 5.2.9 and Clause 7 are deemed to be durable.
5.3 Test methods

5.3.1 General

The tests described are type tests (laboratory tests) and not quality control tests carried out during manufacture.

5.3.2 Flush volume

5.3.2.1 General

The flush volume (s) shall be as specified in Table 3.

The flush volume (s) for one-piece and close-coupled cisterns supplied with a WC pan shall conform with the value(s) specified by the manufacturer.

5.3.2.2 Determination of the full flush volume

— Fill the flushing cistern via an inlet valve to the level indicated by the manufacturer.
— Shut-off the supply.
— Operate the flushing mechanism control and collect the water delivered.
— Measure the volume using a calibrated container.
— Perform the test three times.
— If there are differences in the volumes delivered, calculate the arithmetic mean for the three volumes.
— In the case of flushing cisterns that provide a choice of flush volumes, the test shall be repeated for each of these flush volumes.

5.3.2.3 Determination of the flush volume for water-saving devices

5.3.2.3.1 Double-action water-saving devices

— Fill the flushing cistern via an inlet valve to the level indicated by the manufacturer.
— Shut-off the supply.
— Operate the flushing mechanism control and stop the flush after 1,5 s whilst collecting the water delivered.
— Measure the volume using a calibrated container.
— Perform the test three times.
— If there are differences in the volumes delivered calculate the arithmetic mean for the three volumes.
— In the case of flushing cisterns that provide different flush volumes, the test shall be repeated for each of these volumes.

5.3.2.3.2 Double-control water-saving devices

— Fill the flushing cistern via an inlet valve to the level indicated by the manufacturer.
Shut-off the supply.

Operate the control for the reduced flush volume and collect the water delivered.

Measure the volume using a calibrated container.

Perform the test three times.

If there are differences in the volumes delivered, calculate the arithmetic mean for the three volumes.

In the case of flushing cisterns that provide different flush volumes, the test shall be repeated for each of these volumes.

5.3.3 Flush flow rate

5.3.3.1 Test apparatus

a) for flushing cisterns equipped with a flush pipe, the test shall be carried out with the flush pipe using the height specified in Table 4.

For low-level, mid-level or built-in flushing cisterns, a flow stabiliser as shown in Figure 9, detail X shall be fitted.

For multiple-use flushing cisterns, the test shall be carried out without a flush pipe.

b) a pressure sensor with the following characteristics shall be used:

- measuring range from 0 to 0,005 MPa (from 0 to 0,05 bar);
- accuracy > class 1;
- response time ≤ 10 ms;
- acquisition rate ≥ 40 acquisition.
Figure 9 — Test arrangement for testing low-level, mid-level and built-in flushing cisterns

5.3.3.2 Determination of the residual water level

— Fill the flushing cistern via an inlet valve to the water level indicated by the manufacturer.

— Shut-off the supply.

— Operate the flushing mechanism.

— Record the residual water level, when flushing is completed.

— Perform the test three times.

— If there are differences in the levels obtained, record the highest residual water level.

— In the case of flushing cisterns with alternative flush volumes indicated, the residual water level shall be established for each volume.

— In the case of flushing cisterns having an adjustment of flushing volumes via the outlet valve, the increased residual water level shall be established and marked for each of the adjustable flushing water volumes.

5.3.3.3 Establishing the measuring points to measure the flush rate

5.3.3.3.1 General

In order to measure the flush flow rate, it is necessary to establish the measuring points indicated in Figures 10, 11 and 12.
5.3.3.3.2 Flushing cisterns with an outlet valve adjustment for flushing volumes of 6 l, 7 l or 9 l respectively

The determination of the measuring points and the adjustment of the water level are illustrated in Figure 10.

The choice of measuring points is significant for measuring the flow rate.

![Figure 10 — Flushing cisterns with an outlet valve adjustment for flushing volumes of 6 l, 7 l or 9 l respectively](image)

Key
V1 Starting volume (full flush 1,0 l; reduced flush 1,0 l)
V2 Measuring volume (full flush 3,0 l; reduced flush 1,5 l)
V3 Finishing volume (full flush 2,0 l, 3,0 l, 5,0 l; reduced flush 3,5 l, 4,5 l, 6,5 l)

5.3.3.3 Flushing cisterns with an inlet valve adjustment for flushing volumes of 6 l, 7 l or 9 l respectively

The determination of the measuring points and the adjustment of the water level are illustrated in Figure 11.

The choice of measuring points is significant for measuring the flow rate.
Key  
V1 Starting volume (full flush \( \geq 1,0 \) l; reduced flush \( \geq 1,0 \) l)  
V2 Measuring volume (full flush \( \geq 2,0 \) l; reduced flush \( \geq 1,5 \) l)  
V3 Finishing volume (full flush \( \geq 1,0 \) l; reduced flush \( \geq 0,5 \) l)  
V4 Finishing volume (full flush individual; reduced flush individual)

Figure 11 — Flushing cisterns with an inlet valve adjustment for flushing volumes of 6 l, 7 l or 9 l respectively

5.3.3.3.4 Flushing cisterns with a combined outlet/inlet valve adjustment flushing volume of 4,0 l or 4,5 l respectively

The determination of the measuring points and the adjustment of the water level are illustrated in Figure 12.

The choice of measuring points is significant for measuring the flow rate.

Key  
V1 Starting volume (full flush \( \geq 1,0 \) l; reduced flush \( \geq 1,0 \) l)  
V2 Measuring volume (full flush \( \geq 2,0 \) l; reduced flush \( \geq 1,5 \) l)  
V3 Finishing volume (full flush \( \geq 1,0 \) l; reduced flush \( \geq 0,5 \) l)  
V4 Finishing volume (full flush individual; reduced flush individual)

Figure 12 — Flushing cisterns with a combined outlet/inlet valve adjustment flushing volume of 4,0 l or 4,5 l respectively
EXAMPLE

Maximum adjustable flushing volume 7,0 l
Adjustment via the filling valve to 5,5 l
Giving for

<table>
<thead>
<tr>
<th>Giving for</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>full flush</td>
<td>V1 = 1,0 l</td>
<td>V1 = 1,0 l</td>
</tr>
<tr>
<td></td>
<td>V2 = 2,0 l</td>
<td>V2 = 1,5 l</td>
</tr>
<tr>
<td></td>
<td>V3 = 1,0 l</td>
<td>V3 = 0,5 l</td>
</tr>
<tr>
<td></td>
<td>V4 = 1,5 l</td>
<td>V4 = 2,5 l</td>
</tr>
</tbody>
</table>

V4 being the volume remaining in the cistern, controlled by the outlet valve.

5.3.3.3.5 Flushing cistern having no flushing volume adjustment

For cistern having no flushing volume adjustment, i.e. where the volume is permanently set to 4 l, 4,5 l, 6 l, 7 l or 9 l, the measuring points and the setting of the water level shall be established or obtained by analogy with the description in 5.3.3.3.2 to 5.3.3.3.4.

5.3.3.4 Determination of flush flow rate

5.3.3.4.1 General

For flushing cistern providing the possibility of adjustment to different flushing volumes, the flush flow rate is to be measured at the adjustment corresponding to the lowest measuring points as 5.3.3.3.2 to 5.3.3.3.4.

5.3.3.4.2 Flush flow rate for complete flushing

— Fill the flushing cistern via an inlet valve to the datum level determined as described in 5.3.3.3.
— Shut-off the water supply.
— Operate the flushing mechanism.
— Using the sensors established in the cistern as described in 5.3.3.1, record the pressure/time curve.
— Extrapolate from the recording the nominal flush rate between the measuring points established as described in 5.3.3.3.
— The test shall be performed three times.
— The arithmetic mean of the three separate operations shall be taken as the flush flow rate.

5.3.3.4.3 Flush flow rate for water-saving (dual) flushing

— Fill the flushing cistern via an inlet valve to the datum level determined according to 5.3.3.3.
— Shut-off the supply.
— Operate the flushing control and stop the flush after \((1.5 \pm 0.2)\) s, if a double-action water-saving device is used, or operate the reduced flushing control, if a double-control water-saving device is used.

— Using the sensor fitted to the cistern as described in 5.3.3.1, record the pressure/time curve.

— Extrapolate from the recording the nominal flush flow rate between the measuring points established as described in 5.3.3.3.

— Perform the test three times.

— The arithmetic mean of three separate operations shall be recorded as the flush flow rate.

5.3.4 Overflow

— Record the reference level of the overflow.

— Supply the flushing cistern with a flow rate of 0.28 l/s for 60 s. In the case of a combined mechanism (filling valve + flushing mechanism), supply the mechanism at a pressure of 0.6 MPa (6 bar).

— Record the steady-state level (stabilised level).

— Shut-off the water supply.

— Determine the water level 2 s after the water supply is shut-off (critical water level).

— Record the level after stabilisation (overflow level).

5.3.5 Inlet valve opening characteristics

— Fill the flushing cistern using an inlet valve at a supply pressure of 0.3 MPa (3 bar) to the level(s) indicated by the manufacturer.

— In the case of a double-action cistern, stop the flush after \((1.5 \pm 0.2)\) s or in the case of a double-control cistern, operate the reduced flush control.

— Verify opening of the inlet valve and re-filling of the cistern to the level(s) indicated by the manufacturer.

5.3.6 Safety margin – dimension \(c\)

Fill the flushing cistern using an inlet valve to the highest water level indicated by the manufacturer.

Measure dimension \(c\) representing the safety margin (see Figure 8) between the existing water level and the overflow level.

5.3.7 Backflow prevention

Determine dimension \(a\) (see Figure 8) representing the distance between the lowest point of the inlet valve's air inlet orifice and the overflow level using the filling valve manufacturer's marking as specified in EN 14124.

5.3.8 Leaktightness

— Fill the flushing cistern to the nominal water level indicated by the manufacturer. In the case of flushing cisterns with adjustable levels, the minimum level shall be used.

— Actuate the flushing mechanism and allow the flushing cistern to fill again.
— Leave the flushing cistern for a period of 2 h.
— Wipe the outlet orifice dry.
— Place a piece of paper under the flushing cistern.
— Leave for 15 min. Observe and record any watermarks on the paper. No more than three drops are permitted.

In the case of double-control mechanisms, the test is to be repeated using the reduced flush volume.

5.3.9 Endurance

5.3.9.1 Test apparatus

The test apparatus comprises:
— a flushing cistern to be tested, supplied via an inlet valve;
— when operation is by mechanical means, an automatic system allowing the flushing mechanism to be actuated with a control force in the range of 25 N to 30 N and with a velocity of 5 cm/s in a time period of 0.5 s to 1 s;
— a system to ensure closing of the outlet valve, as the flushing cistern is being filled.

5.3.9.2 Test procedure

The test is carried out using the highest water level in flushing cisterns when alternative levels are indicated.

The water supply temperature shall be in the range of 7 °C to 25 °C.
— Fill the flushing cistern to the nominal water level indicated by the manufacturer.
— Actuate the flush operating control by means of the automatic system.
— Allow the mechanism to close again.
— Allow the flushing cistern to re-fill.
— Submit the cistern to 50 000 cycles.
— In the case of double-control mechanisms, each control shall be subjected to 25 000 cycles.
— At the end of the test, verify leaktightness as described in 5.3.8.

5.3.10 Operating force

5.3.10.1 Test apparatus

Examples of typical test arrangements are shown in Figures 13 and 14.
5.3.10.2 Procedure

— Fill the flushing cistern to the highest flushing level indicated by the manufacturer.

— Place the testing device 2 mm from the operating key.

— Release the system to apply a maximum force of 25 N to the operating key.

— Verify that the operating key mechanism is activated within 0,5 s to 1 s.

6 Functional requirements and test methods for class 2 products

6.1 Inlet valve

Either the first inlet valve or, in the event of this failing, all four of the remaining inlet valves shall comply with BS 1212, Parts 2, 3, or 4 subject to the amendments listed below:

— The water hardness during tests shall not exceed the range of \((230 \pm 20)\) ppm of calcium carbonate \((\text{CaCO}_3)\) during the course of the test.

— The supply pressure for the endurance test described in Parts 3 and 4 shall be \((0,15 \pm 0,01)\) MPa \((1,5 \pm 0,1)\) bar).

— Part 2 valves shall be subject to an endurance test as described in Parts 3 and 4 using a supply pressure of \((0,15 \pm 0,01)\) MPa \((1,5 \pm 0,1)\) bar).

— The endurance test shall be undertaken for 200 000 cycles and if the first inlet valve fails the test, the four valves subsequently tested shall all satisfy the requirements.

6.2 Backflow prevention

When tested in accordance with the backflow prevention requirements of Clauses 15 or 17 of BS 1212-3:1990 or BS 1212-4:1991 respectively there shall be no evidence of backflow.
6.3 Marking of flushing cistern

Every flushing cistern, other than a pressure flushing cistern, shall be clearly marked internally with an indelible line to show the intended volume of flush, together with an indication of that volume. Discharge volume(s) shall be based on measurement from the water level in the cistern using the manufacturer's original equipment to the residual water level in the cistern on completion of a flush.

6.4 Warning pipe and overflow provision

When tested as described in 6.10.2, every flushing cistern, not being a pressure flushing cistern, shall be fitted with a warning pipe connection arranged with the discharge level between 25 mm to 32 mm above the marked water level, or a no less effective device shall be provided. The top edge of any internal overflow shall be not less than 10 mm above the warning level.

6.5 Flush volume

6.5.1 Full flush

When tested as described in 6.10.3 with any adjustable flushing device set to deliver the maximum flush volume, the measured discharge shall on no occasion exceed 6 l.

6.5.2 Reduced flush

When tested as described in 6.10.3 with any adjustable flushing device set to deliver a reduced flush volume, the measured discharge shall on no occasion exceed two-thirds of the full flush volume.

6.6 Flush rate

When tested as described in 6.10.4, the mean flush rate of discharge per flush shall be \( \geq 1.85 \text{ l/s} \) for the full flush and \( \geq 1.6 \text{ l/s} \) for the reduced flush, if provided.

6.7 Physical endurance and leakage of flushing device

When tested as described in 6.10.5, the flushing device shall not undergo any failure or permanent distortion of any components including linkages that prevents normal operation of the mechanism.

No more than two instances of leakage are permitted. A leak is defined as being visible discharge of water amounting to more than three separate drops. If the first flushing device fails the test, the four devices subsequently tested shall all satisfy the requirements.

6.8 Chemical endurance of flushing device

When tested as described in 6.10.6, there shall be:

- no dimensional alteration of any component greater than 1 mm or 5 % whichever is the lesser;
- no weight loss of any component greater than 1 g or 5 % whichever is the lesser;
- no visible sign of physical change such that performance is impaired;
- no deterioration in performance.

The flushing device shall not leak after undergoing a 3 000 cycle physical endurance test and the long-term leakage test.
6.9 Durability

Class 2 products conforming with 6.1, 6.5, 6.6, 6.7, 6.8 and Clause 7 are deemed to be durable.

6.10 Test methods

6.10.1 Inlet valve tests

6.10.1.1 Test apparatus

Apparatus as specified in BS 1212 subject to the additional requirements specified in 6.1. Supply pressure requirements for pressurised cisterns shall conform with the manufacturer's recommendations.

6.10.1.2 Procedure

Subject the inlet valve to the tests as specified in BS 1212 Parts 2, 3, or 4 as appropriate. In testing against Clause 17 of BS 1212 (modified in 6.1) if the first inlet valve fails, four further valves shall be tested.

6.10.1.3 Expression of results

Record whether the inlet valve complied with the requirements of BS 1212 as modified by 6.1. For the test under Clause 17 of BS 1212 (as modified in 6.1), record whether the first inlet valves, or all four of the subsequent inlet valves, met the requirements.

6.10.2 Warning pipe and overflow provisions

6.10.2.1 Test apparatus

a) Flushing cistern with warning pipe connection or a device deemed to be no less effective and internal overflow, if provided, installed in accordance with the manufacturer's instructions;

b) measuring device with an accuracy of ± 0,1 mm;

c) water supply controlled by a stop valve.

6.10.2.2 Procedure

Set the flushing cistern level. Fill with water to the nominal static water level marked by the manufacturer. Measure the distance from the water level to the warning level, i.e. the invert of a side connection warning pipe connection or the top of a bottom connection warning pipe connection. If appropriate, measure the distance from the warning level to the top of any internal overflow.

6.10.2.3 Expression of results

Record compliance or any failure to comply with the requirements of 6.4.

6.10.3 Flush volume test

6.10.3.1 Apparatus

a) Flushing cistern, complete with fitments including flush pipe and cover, installed in accordance with the manufacturer's instructions, on a firm, flat, vertical surface;

b) measuring vessel capable of collecting the flush volume;
c) water supply controlled by a stop valve.

6.10.3.2 Procedure

Set the dual-flush control or setting if provided, to the full-flush volume in accordance with the manufacturer’s instructions. Connect the water supply to the flushing cistern and fill to the marked water line. Operate the flushing mechanism three times, completing three flushing cycles. Fill the flushing cistern to the water line. Shut-off the water supply, unless essential for the normal operation of the flushing device.

NOTE Where a water supply is essential for the normal operation of the device, maintain the supply at a hydraulic pressure of \((0,15 \pm 0,01)\) MPa \((1,5 \pm 0,1)\) bar or the minimum required to operate the device, whichever is the greater.

Operate the flushing device and collect the water in the measuring vessel. Record the volume of water collected. Repeat the procedure a further four times.

Reset the dual-flush control or setting, if provided, to the reduced-flush volume and repeat the procedure five times.

6.10.3.3 Expression of results

Measure the volume of water collected in the measuring vessel after each flush cycle. And record compliance or any failure to comply with the requirements of 6.5.

6.10.4 Flush rate test

6.10.4.1 Apparatus

a) Flushing cistern, complete with fitments including flush pipe and cover, installed in accordance with the manufacturer’s instructions on a firm, flat, vertical surface;
b) calibrated measuring container;
c) fluid level sensing devices;
d) electronic timer;
e) water supply controlled by a stop valve;
f) power supply.

6.10.4.2 Procedure

Set the dual-flush controller or setting, if provided, to the full-flush volume in accordance with the manufacturer’s instructions. Connect the water supply to the flushing cistern and fill to the marked water line. Shut off the water supply, unless essential for the normal operation of the flushing device.

NOTE Where a water supply is essential for the normal operation of the device, maintain the supply at a hydraulic pressure of \((0,15 \pm 0,01)\) MPa \((1,5 \pm 0,1)\) bar or the minimum required to operate the device, whichever is the greater.

Operate the flushing device completing one flushing cycle. On completion of the flush, using the calibrated measuring container, add 0.5 l of water to the flushing cistern. Locate and position a fluid sensing device at the water level in the flushing cistern. Using the calibrated measuring container add further water to the flushing cistern equivalent to the volume of full-flush recorded in 6.10.3.3 less 1,0 l. Locate and position a second fluid sensing device at the water level in the flushing cistern. Add further water to the cistern up to the marked water level for the full-flush volume. Connect the two fluid level sensing devices at the electronic timer and connect to the power supply. Operate the flushing device and on completion of the flush record the time taken to discharge the volume of water between the fluid level sensing devices as displayed on the timer. Repeat the procedure a further four times.
If the flushing device is provided with a reduced flush facility, shut-off the water and power supplies, and
operate the flushing mechanism. Using the calibrated container, add to the flushing cistern a volume of water
equivalent to the difference between the full-flush volume and reducedflush volume as recorded in 6.10.3.3. Add
a further 0.5 l. Locate and position a fluid level sensing device at the water level in the flushing cistern.
Using the calibrated measuring container add further water to the flushing cistern until it is filled to a volume
equivalent to the volume of full flush recorded in 6.10.3.3 less 1.0 l. Locate and position a second fluid sensing
device at this water level in the flushing cistern. Add further water to the flushing cistern, up to the marked
water level for the full-flush volume recorded in 6.10.3.3. Turn on the power and water supplies. Set the
dual-flush controller or setting to the reduced-flush volume in accordance with the manufacturer’s instructions.
Operate the flushing device and on completion of the flush record the time taken to discharge the volume of
water between the fluid level sensing devices as displayed on the timer. Repeat the procedure a further four
times.

6.10.4.3 Expression of results

From the five recorded times, at each flush volume, determine the average time and, using the following
formula, calculate the mean rate of discharge using the following methods.

For the full-flush

\[
\text{Volume of discharge per full flush in litres (recorded in 6.10.3.3) – 1.5 l}
\]
\[
\text{Average time in seconds (recorded in 6.10.4.3)}
\]

For the reduced-flush

\[
\text{Volume of discharge per reduced flush in litres (recorded in 6.10.3.3) – 1.5 l}
\]
\[
\text{Average time in seconds (recorded in 6.10.4.3)}
\]

6.10.5 Physical endurance and leakage test of flushing device

6.10.5.1 Test apparatus

a) Flushing cistern, complete with fitments including flushing device, flush pipe and cover, installed in
accordance with the manufacturer's instructions;

b) means of operating the flushing limiter activator automatically in accordance with the manufacturer's
instructions;

c) a water supply maintained at a hydraulic pressure of \((0.15 ± 0.01)\) MPa \((1.5 ± 0.1)\) bar, or the minimum
pressure required to operate the flushing device whichever is the greater; having maintained water
hardness not greater than the range \((230 ± 20)\) ppm as calcium carbonate \((\text{CaCO}_3)\) during the course of
the test;

d) paper of a type which changes colour when wet.

6.10.5.2 Procedure

Connect the water supply. For a single flush flushing device operate the flushing device and, if appropriate,
allow the flushing cistern to re-fill. Carry out the long-term leak test. Three drops or more observed on the
paper shall be considered a leak. Initiate automatic operation of the flushing device. Carry out the short-term
leakage test and inspect the flushing device after a further 2, 5, 10, 50, 100, 500, 1 000, 10 000 and every
subsequent 10 000 cycles. If a leak is detected, the leak test interval, but not the test itself, shall re-start (e.g.,
the short-term leak test shall be undertaken after a further 1, 2, 5, 10…cycles). Continue until 200 000 test
cycles have been completed, and then subject the flushing device to the long-term leak test. If, at any point
during the test, three leaks have been detected, the test terminates and four further flushing devices shall be
subjected to the same test, which again terminates if three leaks have been detected for any one of the flushing devices.

For flushing devices with reduced flush option operate the flushing device for a full flush and, if appropriate, allow the cistern to re-fill. Carry out the long-term leak test. Three drops or more observed on the paper shall be considered a leak. The test then continues with the sequence three reduced flushes activated followed by a maximum flush. The flushing device shall be subject to the short-term leak test after 2, 5, 10, 50, 100, 500, 1 000, 10 000 and every subsequent 10 000 flushes (maximum and reduced flushes each counting as one flush). If a leak is detected, the leak test interval, but not the test itself, shall re-start (e.g. the short-term leak test shall be undertaken after a further 1, 2, 5, 10...cycles). Continue until 200 000 test cycles have been completed, and then subject the flushing device to the long-term leak test. If at any point during the test, three leaks have been detected, the test terminates and four further flushing devices shall be subjected to the same test, which again terminates if three leaks have been detected for any one of the flushing devices.

The flushing device shall be inspected for wear at the same frequency as the short-term leak test. If the flushing device or any of its operating linkages suffers structural failure that affects operation, the test terminates.

6.10.5.3 Expression of results

Record compliance, or any failure to comply, with the requirements of 6.7.

6.10.6 Chemical endurance test of flushing device

6.10.6.1 Test apparatus

a) Weighing scales having a resolution of 0,1 g and an accuracy of ± 0,05 g;

b) micrometer having a resolution of 0,1mm and an accuracy of ± 0,05 mm;

c) test solution (100 ml of domestic chlorine-based bleaching agent, consisting of up to 5 % sodium hypochlorite (NaClO) and anionic surfactants to every 900 ml of water);

d) container.

6.10.6.2 Procedure

Dismantle the flushing device and weigh all seals, plungers, pistons or other components that initiate and stop water discharge and measure and record the principle dimensions, e.g. external diameter and thickness. Re-assemble the components and place the complete assembly in the container filled with test solution. Ensure that the assembly is covered by at least 100 mm depth of test solution. Leave for a period of (90 ± 2) d. Remove from the test solution and rinse under clean water.

**WARNING** — Appropriate precautions should be taken when using chlorine based agents. Do not touch raw crystals or the stock solution, or allow these to come into contact with clothing or easily combustible materials.

Subject the flushing limiter to a 3 000 cycle endurance test using the long-term leak test after the first and last cycles, and check for leaks.

6.10.6.3 Expression of results

Record compliance, or any failure to comply with the requirements of 6.8.
6.10.7 Requirements for compatibility testing of class 2 products

This subclause provides background notes on the testing and compatibility of elements of WC suites. Class 2 flushing cisterns are intended for use in class 2 WC suites as specified in EN 997. Reference should be made to EN 997, 6.17.11, extracts from which are reproduced below.

Inlet valves shall satisfy BS 1212 as modified in 6.1.

Flushing devices shall satisfy the requirements with regard to physical and chemical endurance. They shall also be capable of satisfying the flush volume test at full and, if appropriate, reduced flush volumes. They should also be capable of contributing towards the other requirements when tested in combination.

Flushing cisterns shall consist of compliant components and so satisfy warning pipe and overflow provisions and the flush volume test. They should also be capable of contributing towards the other requirements when tested in combination.

It should be noted that when undertaking tests involving more than one component of a WC suite, components which could adversely affect the results of the whole test should not be changed without re-starting that test.

7 Acoustic characteristics

The acoustic class corresponds to that applicable to the inlet valve.

The values declared for the cistern shall comply with the requirements for groups I, II or unclassified as specified in EN 14124.

8 Dangerous substances

NOTE See Annex ZA, ZA.1 and ZA.3.
9 Marking and product designation

All WC flushing cisterns shall be designated in accordance with the following system:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flushing volume</td>
<td></td>
</tr>
<tr>
<td>Class</td>
<td></td>
</tr>
<tr>
<td>Number of standard</td>
<td>EN 14055 — 1 — 6</td>
</tr>
<tr>
<td>Watertightness/leaktightness</td>
<td>W — VR — NL — DA</td>
</tr>
<tr>
<td>Outlet valve reliability</td>
<td></td>
</tr>
<tr>
<td>Noise level</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td></td>
</tr>
</tbody>
</table>

NOTE For CE marking, see Annex ZA.

10 Evaluation of conformity

10.1 General

The compliance of a WC flushing cistern with this European Standard shall be demonstrated by:

— initial type testing (see 10.2);

— factory production control by the manufacturer (FPC), including product assessment (see 10.3).

10.2 Type testing

10.2.1 Initial type testing

Initial type testing shall be performed before the product is put on the market for the first time and each time when its characteristics are changed.

Where characteristics are determined on the basis of conformity with other product standards, the manufacturer shall ensure that the products themselves have undergone appropriate initial and when necessary routine type testing to ensure the adequacy of the stated performance. Products CE marked in accordance with appropriate harmonised European Specifications may be presumed to have the performances stated of them, although this does not replace the responsibility of the flushing cistern manufacturer to ensure that the flushing cistern as a whole is correctly manufactured and its component products have the necessary performance values.

— All characteristics given in Tables 5 or 6 shall be subject to initial type testing.
10.2.2 Further type testing

WC flushing cisterns are considered to be of the same type, when they have the same design, construction and performance characteristics and when they are of the same material, however they may have different features.

Whenever a change occurs in the flushing cistern, the raw material or supplier of the components, or the production process would change significantly one or more of the stated characteristics, the type tests shall be repeated for the appropriate characteristics.

10.2.3 Sample, testing and compliance criteria

The WC flushing cistern shall be subjected to and pass the relevant tests in Tables 5 or 6.

<table>
<thead>
<tr>
<th>Characteristic to be tested</th>
<th>Assessment method according to clauses of this European Standard</th>
<th>Number of samples</th>
<th>Compliance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flushing cistern equipment</td>
<td>5.1.2</td>
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</tr>
<tr>
<td>Flush flow rate</td>
<td>5.3.3</td>
<td>1</td>
<td>5.2.3</td>
</tr>
<tr>
<td>Overflow</td>
<td>5.3.4</td>
<td>1</td>
<td>5.2.4</td>
</tr>
<tr>
<td>Inlet valve opening</td>
<td>5.3.5</td>
<td>1</td>
<td>5.2.5</td>
</tr>
<tr>
<td>Safety margin-dimensions c</td>
<td>5.3.6</td>
<td>1</td>
<td>5.2.6</td>
</tr>
<tr>
<td>Backflow prevention</td>
<td>5.3.7</td>
<td>1</td>
<td>5.2.7</td>
</tr>
<tr>
<td>Leaktightness</td>
<td>5.3.8</td>
<td>1</td>
<td>5.2.8</td>
</tr>
<tr>
<td>Endurance</td>
<td>5.3.9</td>
<td>1</td>
<td>5.2.9</td>
</tr>
<tr>
<td>Operating force</td>
<td>5.3.10</td>
<td>1</td>
<td>5.2.10</td>
</tr>
</tbody>
</table>
Table 6 — Type testing for class 2 products

<table>
<thead>
<tr>
<th>Characteristic to be tested</th>
<th>Assessment method according to clauses of this European Standard</th>
<th>Number of samples</th>
<th>Compliance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet valve</td>
<td>6.1, 6.10.1</td>
<td>1</td>
<td>6.1</td>
</tr>
<tr>
<td>Backflow prevention</td>
<td>6.2</td>
<td>1</td>
<td>6.2</td>
</tr>
<tr>
<td>Marking</td>
<td>6.3</td>
<td>1</td>
<td>6.3</td>
</tr>
<tr>
<td>Warning pipe and overflow provision</td>
<td>6.10.2</td>
<td>1</td>
<td>6.4</td>
</tr>
<tr>
<td>Flush volume(s)</td>
<td>6.10.3</td>
<td>1</td>
<td>6.5</td>
</tr>
<tr>
<td>Flush rate</td>
<td>6.10.4</td>
<td>1</td>
<td>6.6</td>
</tr>
<tr>
<td>Flushing device: physical endurance and leakage</td>
<td>6.10.5</td>
<td>1</td>
<td>6.7</td>
</tr>
<tr>
<td>Flushing device: chemical endurance</td>
<td>6.10.6</td>
<td>1</td>
<td>6.8</td>
</tr>
</tbody>
</table>

10.3 Factory production control

10.3.1 General

The manufacturer shall establish, document and maintain a FPC system to ensure that products placed on the market conform with the stated performance characteristics. The FPC system shall consist of documented procedures, regular inspections and tests and/or assessments and the use of the results obtained to control raw and other incoming materials or components, equipment, the production process and the product.

NOTE A FPC system conforming with the requirements of the relevant part(s) of EN ISO 9001 or equivalent, and made specific to the requirements of this European Standard, can/may be considered to satisfy the above requirements.

The results of inspections, tests or assessments requiring action shall be documented. The action to be taken when control values or criteria are not met shall be recorded.

10.3.2 Testing equipment

All weighing, measuring and testing equipment shall be calibrated and regularly inspected in accordance with documented procedures and frequencies of checks.

10.3.3 Raw materials and components

The specification of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity.

10.3.4 Product testing and assessment

The manufacturer shall establish and document procedures to ensure that the stated values of all of the characteristics are maintained.

10.3.5 Non-conforming products

If during the factory production control non-conforming products are detected, there shall be immediately implemented suitable measures for correction of failure(s) and handling defective products.
Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristic

This European Standard has been prepared under Mandate M/110 \(^1\) given to CEN by the European Commission [and the European Free Trade Association].

The clauses of this European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the WC flushing cisterns covered by this annex for their intended use; reference shall be made to the information accompanying the CE marking.

**WARNING** — Other requirements and other EU Directives, not affecting the fitness for intended use, can be applicable to the product(s) falling within the scope of this European Standard.

**NOTE 1** In addition to any specific clauses relating to dangerous substances contained in this Standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

**NOTE 2** An informative database of European and national provisions on dangerous substances is available at the Construction website on EUROPA (accessed through http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm).

This annex establishes the condition for the CE marking of the WC flushing cisterns intended for use indicated in Tables ZA.1.1 and ZA.1.2 and shows the relevant clauses applicable. This annex has the same scope as Clause 1 of this standard and is defined by Tables ZA.1.1 and ZA.1.2.

| Table ZA.1.1 — Scope and relevant clauses for class 1 WC flushing cisterns |
|-------------------------------------------------|------------------|-----------------|-----------------|
| Product: WC flushing cistern of class 1          | Intended use: Personal hygiene |
| Essential Characteristics | Requirement clauses in this European Standard | Mandated levels and/or classes | Notes |
| Waters tightness/leak tightness | 5.2.8 | None | Pass/fail |
| Outlet valve reliability | 5.2.9 | None | Pass/fail |
| Noise level | 7 | None | Declared group |
| Flushing volume | 5.2.1 | None | Pass/fail |
| Durability | 5.2.11 | None | Pass/fail |

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\(^1\) Mandate M/110 "Sanitary Appliances" as amended by M/139.
Table ZA.1.2 — Scope and relevant clauses for class 2 WC flushing cisterns

<table>
<thead>
<tr>
<th>Essential Characteristics</th>
<th>Requirement clauses in this European Standard</th>
<th>Mandated levels and/or classes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watertightness/leaktightness</td>
<td>6.7</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Outlet valve reliability</td>
<td>6.7</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Noise level</td>
<td>7</td>
<td>None</td>
<td>Declared group</td>
</tr>
<tr>
<td>Flushing volume</td>
<td>6.5</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Durability</td>
<td>6.9</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
</tbody>
</table>

The requirement on a certain characteristic is not applicable in those Member States where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products in the market of these Member States are not obliged to determine nor declare the performance of their products with regard to this characteristic and the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not be used where the characteristic is subject to a threshold level.

**ZA.2 Procedure for attestation of conformity of WC flushing cisterns**

**ZA.2.1 System of attestation of conformity**

The system of attestation of conformity of the WC flushing cisterns indicated in Tables ZA.1.1 and ZA.1.2, in accordance with the Decision of the Commission 96/578/EC of 1996-06-24 as amended by the Commission Decision 01/596/EC of 2001-01-08 as given in Annex III of the Mandate for “Sanitary Appliances” is shown in Table ZA.2 for the indicated intended use and relevant level(s) or class(es):

Table ZA.2 — System of attestation of conformity

<table>
<thead>
<tr>
<th>Product</th>
<th>Intended use</th>
<th>Level(s) or class(es)</th>
<th>Attestation of conformity system</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC flushing cistern</td>
<td>Personal hygiene</td>
<td>—</td>
<td>4</td>
</tr>
</tbody>
</table>


The attestation of conformity of the WC flushing cisterns in Tables ZA.1.1 and ZA.1.2 shall be based on the evaluation of conformity procedures indicated in Table ZA.3 resulting from application of the clauses of this European Standard indicated therein.

Table ZA.3 — Assignation of evaluation of conformity tasks

<table>
<thead>
<tr>
<th>Tasks for the manufacturer</th>
<th>Content of the task</th>
<th>Evaluation of conformity clauses to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial type testing</td>
<td>All relevant characteristics of Tables ZA.1.1 and ZA.1.2</td>
<td>10.2</td>
</tr>
<tr>
<td>Factory production control</td>
<td>Parameters related to all relevant characteristics of Tables ZA.1.1 and ZA.1.2</td>
<td>10.3</td>
</tr>
</tbody>
</table>
ZA.2.2 Declaration of conformity

When compliance with this annex is achieved, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;
— description of the product (e.g. type, identification, use,...), and a copy of the information accompanying the CE marking;
— provisions to which the product conforms (e.g. Annex ZA of this European Standard);
— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);
— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or of his authorised representative.

The above mentioned declaration and certificate shall be presented in the official language or languages of the Member State in which the product is to be used.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol shall be in accordance with Directive 93/68/EC and shall be shown on the WC flushing cistern (or when not possible it may be on the accompanying label, the packaging or on the accompanying commercial documents, e.g. a delivery note). The following information shall accompany the CE marking symbol:

— name or identifying mark and registered address of the manufacturer;
— the last two digits of the year in which the CE marking is affixed;
— number of the EC Certificate on conformity or factory production control certificate (if relevant);
— reference to this European Standard;
— description of the product: generic name, material, dimensions, ... and intended use;
— information on those relevant essential characteristics listed in Tables ZA.1.1 or ZA 1.2 which are to be declared presented as:
  — declared values and, where relevant, level or class (including “pass” for pass/fail requirements, where necessary) to declare for each essential characteristic as indicated in "Notes" in Tables ZA.1.1 or ZA 1.2;
  — “No performance determined” for characteristics where this is relevant;
  — as an alternative, as standard designation (as defined in Clause 9 of this standard) which shows some or all of the relevant characteristics (where the designation covers only some characteristics, it will need to be supplemented with declared values for other characteristics as above).
The NPD option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

NOTE 1 When NPD option is used for a characteristic, the durability corresponding to this required characteristic is considered as NPD.

NOTE 2 When the designation code is used with a NPD option for a characteristic, the corresponding symbol should not be mentioned and "NPD" should be declared.

Figure ZA.1 gives an example of the information to be given on the product, label, packaging and/or commercial documents.

![CE conformity marking](image)

CE conformity marking, consisting of the "CE" symbol given in Directive 93/68/EEC

| AnyCo Ltd, PO Box 21, B-1050 07 | Name or identifying mark and registered address of the producer |
| EN 14055 — 1 — 6 | Last two digits of the year in which the marking was affixed |
| W — VR — NL — DA | Number of European Standard, class, flushing volume and information on regulated characteristics as per designation code |

Figure ZA.1 — CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.
Bibliography