WC pans and WC suites with integral trap
National foreword


The start and finish of text introduced or altered by amendment is indicated in the text by tags \[ \] . Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by \[ \).

The UK participation in its preparation was entrusted to Technical Committee B/503, Sanitary appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments issued since publication

<table>
<thead>
<tr>
<th>Amd. No.</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>14805</td>
<td>13 October 2003</td>
<td>Error in date on national foreword</td>
</tr>
<tr>
<td>16965</td>
<td>28 February 2007</td>
<td>See national foreword</td>
</tr>
</tbody>
</table>
WC pans and WC suites with integral trap

Cuvettes de WC et cuvettes à réservoir attenant à siphon intégré

WC-Becken und WC-Anlagen mit angeformtem Geruchverschluss

This European Standard was approved by CEN on 2 July 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Scope</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Normative references</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Terms and definitions</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Classification</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Functional requirements and test methods for class 1 products</td>
<td>8</td>
</tr>
<tr>
<td>5.1</td>
<td>Depth of water seal</td>
<td>8</td>
</tr>
<tr>
<td>5.2</td>
<td>Flushing requirements</td>
<td>8</td>
</tr>
<tr>
<td>5.2.1</td>
<td>General</td>
<td>8</td>
</tr>
<tr>
<td>5.2.2</td>
<td>Wash of bowl</td>
<td>9</td>
</tr>
<tr>
<td>5.2.3</td>
<td>Flushing of toilet paper</td>
<td>9</td>
</tr>
<tr>
<td>5.2.4</td>
<td>Flushing of fifty small plastic balls</td>
<td>9</td>
</tr>
<tr>
<td>5.2.5</td>
<td>Over-splashing</td>
<td>9</td>
</tr>
<tr>
<td>5.2.6</td>
<td>After-flush volume</td>
<td>9</td>
</tr>
<tr>
<td>5.3</td>
<td>Water absorption</td>
<td>9</td>
</tr>
<tr>
<td>5.4</td>
<td>Static load</td>
<td>9</td>
</tr>
<tr>
<td>5.5</td>
<td>Leak tightness</td>
<td>9</td>
</tr>
<tr>
<td>5.6</td>
<td>Valve reliability</td>
<td>10</td>
</tr>
<tr>
<td>5.7</td>
<td>Durability of class 1 products</td>
<td>10</td>
</tr>
<tr>
<td>5.8</td>
<td>Test methods</td>
<td>10</td>
</tr>
<tr>
<td>5.8.1</td>
<td>Depth of water seal</td>
<td>10</td>
</tr>
<tr>
<td>5.8.2</td>
<td>Flushing tests</td>
<td>10</td>
</tr>
<tr>
<td>5.8.3</td>
<td>Determination of water absorption</td>
<td>12</td>
</tr>
<tr>
<td>5.8.4</td>
<td>Load test</td>
<td>13</td>
</tr>
<tr>
<td>5.8.5</td>
<td>Leak tightness</td>
<td>13</td>
</tr>
<tr>
<td>5.8.6</td>
<td>Valve reliability</td>
<td>13</td>
</tr>
<tr>
<td>5.9</td>
<td>Types of WC pans</td>
<td>14</td>
</tr>
<tr>
<td>5.9.1</td>
<td>Nominal flush volume</td>
<td>14</td>
</tr>
<tr>
<td>5.9.2</td>
<td>Flushing devices</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>Functional requirements and test methods for class 2 products</td>
<td>15</td>
</tr>
<tr>
<td>6.1</td>
<td>Inlet valve</td>
<td>15</td>
</tr>
<tr>
<td>6.2</td>
<td>Backflow prevention</td>
<td>15</td>
</tr>
<tr>
<td>6.3</td>
<td>Marking of flushing cistern</td>
<td>15</td>
</tr>
<tr>
<td>6.4</td>
<td>Warning pipe and overflow provision</td>
<td>15</td>
</tr>
<tr>
<td>6.5</td>
<td>Flush Volume</td>
<td>15</td>
</tr>
<tr>
<td>6.5.1</td>
<td>Full flush</td>
<td>15</td>
</tr>
<tr>
<td>6.5.2</td>
<td>Reduced flush</td>
<td>15</td>
</tr>
<tr>
<td>6.6</td>
<td>Flush rate</td>
<td>16</td>
</tr>
<tr>
<td>6.7</td>
<td>Physical endurance and leakage of flushing device (valve reliability and water/leak tightness)</td>
<td>16</td>
</tr>
<tr>
<td>6.8</td>
<td>Chemical endurance of flushing device (water/leak tightness)</td>
<td>16</td>
</tr>
<tr>
<td>6.9</td>
<td>Solids discharge and after-flush volume for maximum flush</td>
<td>16</td>
</tr>
<tr>
<td>6.10</td>
<td>Paper discharge for reduced-flush volume</td>
<td>16</td>
</tr>
<tr>
<td>6.11</td>
<td>Liquid contaminant dye retention</td>
<td>16</td>
</tr>
<tr>
<td>6.12</td>
<td>Wash of bowl</td>
<td>16</td>
</tr>
<tr>
<td>6.13</td>
<td>Depth of water seal</td>
<td>16</td>
</tr>
<tr>
<td>6.14</td>
<td>Static load of class 2 products</td>
<td>16</td>
</tr>
<tr>
<td>6.15</td>
<td>Water absorption</td>
<td>17</td>
</tr>
<tr>
<td>6.16</td>
<td>Durability of class 2 products</td>
<td>17</td>
</tr>
<tr>
<td>6.17</td>
<td>Test methods</td>
<td>17</td>
</tr>
<tr>
<td>6.17.1</td>
<td>Inlet valve tests</td>
<td>17</td>
</tr>
<tr>
<td>6.17.2</td>
<td>Warning pipe and overflow provisions</td>
<td>17</td>
</tr>
</tbody>
</table>
6.17.3 Flush volume and water trap seal tests
6.17.4 Flush rate test
6.17.5 Physical endurance and leakage test of flushing device
6.17.6 Chemical endurance test of flushing device
6.17.7 Solids discharge and after-flush volume for maximum flush volume test
6.17.8 Paper discharge for reduced-flush volume test
6.17.9 Liquid contaminant dye retention test
6.17.10 Wash of bowl
6.17.11 Summary of requirements for compatibility testing of class 2 products

7 Dangerous substances

8 Marking

9 Evaluation of conformity

9.1 General

9.2 Type testing

9.2.1 Initial type testing

9.2.2 Further type testing

9.2.3 Sample, testing and compliance criteria

9.3 Factory Production Control (FPC)

9.3.1 General

9.3.2 Testing equipment

9.3.3 Raw materials and components

9.3.4 Product testing and assessment

9.3.5 Non-conforming products

Annex A (normative) Valve-type test flushing cistern

Annex B (normative) Test rig for pressure flush valve

Annex C (normative) Test rig for after-flush volume test

C.1 Test rig for after-flush volume test for independent WC pans (Figures C.1 and C.2)

C.2 Test rig for after-flush volume test for one-piece WC pans, close-coupled suites and WC suites (Figure C.3)

Annex D (normative) Basket method

Annex E (normative) Preparation of test specimens

Annex F (normative) Valveless-type test flushing cistern

Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant characteristics

ZA.2 Procedure for attestation of conformity of WC pans and WC suites

ZA.2.1 System of attestation of conformity

ZA.2.2 Declaration of conformity

ZA.3 CE marking and labelling

Bibliography
Foreword

This document (EN 997:2003) 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 March 2004, and conflicting national standards shall be withdrawn at the latest by June 2005.

This document supersedes EN 997:1999.

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 EU Directive(s).

For relationship with EU Directive(s), 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.

NOTE: Noise level has not been considered in the present amendment. Noise level will be considered as soon as a European test method is available. ¹

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Foreword to amendment A1

This document (EN 997:2003/A1:2006) has been prepared by Technical Committee CEN/TC 163 “Sanitary appliances”, the secretariat of which is held by UNI.

This Amendment to the European Standard EN 997:2003 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2007, and conflicting national standards shall be withdrawn at the latest by September 2008.

This document supports the unified approach for CE marking of sanitary appliances covered by harmonised European Standards elaborated by CEN/TC 163 under the Mandate M/110 "Sanitary appliances".

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

¹ Presently, a test method is under elaboration by CEN/TC 126 "Acoustic properties of building products and of buildings"
1 Scope

This standard specifies constructional and performance requirements together with test methods for close-coupled suites, one-piece and independent WC pans with integral trap used for personal hygiene manufactured from vitreous china or stainless steel.

This standard does not apply to squatting toilettes, WC pans without integral trap, flushing cisterns as separate appliances.

Flushing cisterns are covered by other standards and the reference to cisterns in this standard is related only to the definition and requirements of flushing volume.

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.

AS 1172-1:1993, Water closets of 6/3 L capacity - Pans

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 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)

NOTE These normative references refer to products of class 2 only.

3 Terms and definitions

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

3.1 pedestal WC pan

floor-mounted WC pan that has an integral base

3.2 wall-hung WC pan

WC pan cantilevered clear of the floor

3.3 wash-out WC pan

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

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

3.5 siphonic WC pan

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

3.6 close-coupled suite

combination of a WC pan and flushing cistern directly coupled into a functional unit

3.7 one-piece WC pan

WC pan manufactured with an integral flushing cistern

3.8 independent WC pan

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

3.9 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

3.10 pressure flush valve

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

3.11 valveless type flushing cistern

cistern with outlet actuated by siphonic action which delivers a defined volume of flushing water for removal of excrement from a WC pan

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 flush volume

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

3.14 after-flush volume

remaining flush water volume after the last of four test specimens have left the outlet of the bowl
3.15 water trap
water seal that prevents backflow of foul odour from a drain

3.16 fluid contaminant
liquid to be removed by flushing action

3.17 residual fluid contaminant
liquid waste left behind in the WC bowl after completion of a flush

3.18 solid test media
media used to represent faecal matter

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

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

NOTE A flushing device can be a siphon, drop valve, flap valve or pressurised cistern etc. For the purposes of this specification, the flushing device includes the activator (i.e. handle, button, linkages etc.) and all seals, pistons, or other integral components.

3.21 dual-flush
flushing cisterns with two modes of operation, one delivering a larger volume than the other, in which:
— the larger (full) flush option is not greater than 6 l; and
— the smaller (reduced) flush option is not greater than two-thirds the volume of the larger flush
3.22
warning level

level of spillover 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.

3.23
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. A leak is defined as being visible discharge of water amounting to more than three separate drops.

3.24
long-term leak test

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

NOTE Drawings are diagrammatic only.

4 Classification

WC pans and suites are classified as described below:

Class 1: WC pans and suites designed for use with and tested using a nominal flush volume of either 4 l, 5 l, 6 l, 7 l or 9 l. The requirements of class 1 are given in Clause 5.

Class 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 no greater than two-thirds of the maximum flush volume. The requirements of class 2 are given in Clause 6.

5 Functional requirements and test methods for class 1 products

5.1 Depth of water seal

When tested in accordance with 5.8.1, the depth of the water seal shall be not less than 50 mm.

5.2 Flushing requirements

5.2.1 General

Table 1 correlates the flushing requirements to the WC pan type and flushing volume.
Table 1 — Flushing requirements

<table>
<thead>
<tr>
<th>Type of WC pan</th>
<th>Wash of bowl (5.2.2)</th>
<th>Flushing of toilet paper (5.2.3)</th>
<th>Flushing of 50 plastic balls (5.2.4)</th>
<th>Over-splashing (5.2.5)</th>
<th>After-flush volume (5.2.6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

The efficiency of flushing is simulated by the following requirements.

5.2.2 Wash of bowl

When tested in accordance with 5.8.2.3, 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 cm² after five flushing operations.

5.2.3 Flushing of toilet paper

When tested in accordance with 5.8.2.4, 12 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 5.8.2.5, 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 Over-splashing

When tested in accordance with 5.8.2.6, 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 5.8.2.7, 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 5.8.3, 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 5.8.4, wall-hung and non-ceramic WC pans and 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 suites comply with this requirement.

5.5 Leak tightness

When close-coupled suites comprising a flushing cistern and a WC pan supplied together by the manufacturer as a unit are tested in accordance with 5.8.5, there shall be no leakage between the WC pan and the flushing cistern.
5.6 Valve reliability

When tested in accordance with 5.8.6, the flush of the outlet shall not show leakage greater than three drops within 15 min.

5.7 Durability of class 1 products

Class 1 products conforming with the requirements of 5.2 to 5.6 are deemed to be durable.

5.8 Test methods

5.8.1 Depth of water seal

Install the WC pan in accordance with 5.8.2.2. Flush the WC pan and measure the height from the invert of the trappage back plate to the surface of the water.

5.8.2 Flushing tests

5.8.2.1 Apparatus

Independent WC pans are to be tested with one or both of the following separate flushing devices with test flushing volumes in accordance with Table 2 and annex C as indicated by the manufacturer:

<table>
<thead>
<tr>
<th>Valve-type flushing cistern</th>
<th>Type A (see annex A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure flush valve</td>
<td>Type C (see annex B)</td>
</tr>
</tbody>
</table>

For close-coupled suites and one-piece WC pans see Table 3 and annex C.

5.8.2.2 Preparation to test

Independent WC pans

Install the pedestal or wall-hung WC pan to be tested on a firm flat horizontal or vertical surface as appropriate. Connect a flushing device in accordance with annex A or B.

Close-coupled suites and one-piece WC pans

Install the suite or the one-piece WC pan on a firm flat horizontal or vertical surface as appropriate using the flushing device provided and specified by the manufacturer. The flushing volume shall be verified for the type of the WC pan (see Table 4).

5.8.2.3 Sawdust test

5.8.2.3.1 Test material

20 g of fine dry wooden sawdust.

5.8.2.3.2 Test method

Moisten the complete inner surface of the WC pan below the flushing rim and above the surface of the water in the trap. Immediately afterwards, sprinkle that sawdust as completely and evenly as possible over the moistened surface. Flush the WC pan and measure any unwashed area. Repeat this procedure 5 times.
5.8.2.4 Toilet paper test

5.8.2.4.1 Test material

Toilet paper with a saturation time of (15 ± 10) s verified by the basket method (see annex D). Individual sheets shall have a size approximately 140 mm x 100 mm. The mass per unit surface of the toilet paper shall be (30 ± 10) g/m².

5.8.2.4.2 Test method

Individually loosely crumple 12 sheets of toilet paper and drop them separately one after the other into the WC pan within a time of 14 s to 18 s. Operate the flushing mechanism within 2 s of the last sheet being dropped into the WC pan. Check for and remove any paper not flushed out of the bowl and the trap. Repeat this test 5 times.

5.8.2.5 Fifty plastic balls test

5.8.2.5.1 Test material

50 balls of non-absorbent material, each having a mass of (3.7 ± 0.1) g and a diameter of (20 ± 0.1) mm².

5.8.2.5.2 Test method

For each flushing operation place the 50 balls into the WC pan and flush the WC pan. Check for and remove any balls left in the WC pan. Repeat this test 5 times.

5.8.2.6 Over-splashing test

5.8.2.6.1 Test material

Paper of a type which shows surface change when wet.

5.8.2.6.2 Test method

Lay the paper around the WC pan to be tested projecting 200 mm beyond the plan of the bowl projected onto the floor. Flush the WC pan and record evidence of water on the paper. The test shall be made with the flushing volume which the WC pan will be approved for.

5.8.2.7 After-flush volume test

5.8.2.7.1 Test rig

A test rig in accordance with annex C.

NOTE Other test rigs can be used if the deviation of the after-flush volume related to 6 l is not more than ± 0.1 l using a reference WC pan.

5.8.2.7.2 Test material

Four test specimens prepared in accordance with annex E.

---

2) Suitable balls are available from Fa. Gebauer GmbH, Kugelfabrik, P.O. Box 425, 36004 Fulda, Germany or CIMAP, Avenue Paul Adam 21 – 25 75017 Paris, France. This information is given for the convenience of users of this standard and does not constitute an endorsement by CEN of these products.
5.8.2.7.3 Test material

Place the four test specimens one after the other into the WC pan and flush the WC pan. Repeat this test 10 times.

The test is positive, if:

a) in 8 out of 10 flushes all 4 test specimens are evacuated and the after-flush volume is on each occasion \( \geq 2,5 \text{ l} \) or

b) the arithmetical average of after-flush volume of the 10 flushing operations is \( \geq 2,8 \text{ l} \).

The result of flushing operations without four test specimens being evacuated shall count as 0 l.

If the WC pan does not provide results according to a) or b) repeat the procedure again for a further 20 flushing operations.

The test then is positive, if:

c) in 16 out of 20 flushes all four test specimens are evacuated and the after-flush volume is on each occasion \( \geq 2,5 \text{ l} \) or

d) the arithmetical average of after-flush volume of the 20 flushing operations is \( \geq 2,8 \text{ l} \).

5.8.3 Determination of water absorption

5.8.3.1 Test material and apparatus

— a balance accurate to 0,05 g;
— an oven controlled at a test temperature of \((105 \pm 2) \, ^\circ\text{C}\);
— a desiccator with fresh prepared silica gel;
— a chamois leather;
— a heated bath with controller;
— demineralized water;
— a pair of fine tweezers.

5.8.3.2 Test method

— Break three samples glazed on one face from a WC pan. The unglazed surface area of the samples shall be approximately 30 cm\(^2\) and the maximum thickness including the glaze shall be approximately 12 mm.

— Dry the samples at a temperature of 105 \(^\circ\text{C}\) for \((180 \pm 5)\) min.

— Allow the samples to cool in a desiccator.

— Weigh each sample to an accuracy of 0,05 g; the mass is \(m_0\)

— Using the fine tweezers place the samples in the bath and fill with demineralized water. Ensure they do not touch the sides or the bottom of the bath.

— Heat the water to boiling point for \((120 \pm 5)\) min. Afterwards stop the heating process and leave the samples immersed for a further \((20 \pm 1)\) h.

— Using the fine tweezers take the samples immediately from the water and dry them with a slightly damp chamois leather.
— Any cavities or holes shall be dried using a fine brush.
— Weigh each sample immediately; this mass is \( m_1 \).
— The coefficient of water absorption in percentage shall be calculated for each sample using equation (2).

\[
WA = \frac{m_1 - m_0}{m_0} \cdot 100
\]  

(2)

where

\( WA \) is the coefficient of water absorption, in %;
\( m_0 \) is the mass of dry sample, in g;
\( m_1 \) is the mass of sample after immersion in water, in g.

— Calculate the arithmetical average of the water absorption coefficient for the three samples. Report each individual value and the calculated arithmetical average.

5.8.4 Load test

Wall-hung WC pans shall be fixed in accordance with the manufacturer's instructions onto a smooth surface with a layer of mortar or other facing material used for pointing between the back of the WC pan and the smooth surface.

Pedestal WC pans of non-ceramic materials shall be fixed onto a solid smooth horizontal surface in accordance with the manufacturer’s instructions.

A force of \((4,00 \pm 0,05)\) kN shall be applied for a period of 1 h by means of a beam with a cross section of 100 mm \( \times \) 100 mm positioned across the centre of aperture of the bowl (see Figure 1).

5.8.5 Leak tightness

Flush the close-coupled suite and observe the connection between the WC pan and the flushing cistern for any leakage during complete flush.

5.8.6 Valve reliability

5.8.6.1 Test apparatus

The test apparatus comprises:

— the flushing cistern to be tested as component of close-coupled suite or one-piece WC pan filled through an inlet valve;

— an automatic system allowing the flushing mechanism to be activated with a controlled force in the range of 25 N to 30 N and with a velocity of 5 cm/s in a period of 0.5 s to 1 s;

— a water supply with a temperature of 15 °C to 25 °C
5.8.6.2 Test procedure

The test shall be performed using the highest level in the flushing cistern when several alternative water levels are indicated.

- Fill the flushing cistern to the nominal water level indicated by the manufacturer.
- Activate the flush by means of the automatic system.
- After the automatic closing of the outlet valve refill the flushing cistern.
- In case of single-flush mechanism, subject the mechanism to 50 000 cycles (category I) or 200 000 cycles (category II).
- In case of double-flush mechanisms, subject each mechanism to 25 000 cycles (category I) or 100 000 cycles (category II).
- 2 h after finishing of the cycles, verify the leak tightness, specified in 5.6.

5.9 Types of WC pans

5.9.1 Nominal flush volume

The nominal flush volume of independent WC pans shall correspond to one of the types given in Table 2.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal flush volume l</th>
<th>Test flush volume l</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>9</td>
<td>9 ± 0.1</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>7 ± 0.1</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>6 ± 0.1</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5 ± 0.5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4 ± 0.1</td>
</tr>
</tbody>
</table>

The close-coupled suites and one-piece WC pans shall correspond to one of the types given in Table 3.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal flush volume l</th>
<th>Test flush volume a l</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>9</td>
<td>9 ± 1.4</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>7 ± 0.5</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>6 ± 0.5</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5 ± 0.4 - 0.5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>4 ± 1.0 - 0.5</td>
</tr>
</tbody>
</table>

a Test flush volume and type shall be defined by the manufacturer.
5.9.2 Flushing devices

Independent WC pans shall be designed to be flushed by any one or both of the following separate flushing devices:

- Valve-type cistern Type A (see annex A)
- Pressure flush valve Type C (see annex B)

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.
- 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.
- The endurance test shall be undertaken for 200 000 cycles and if the first inlet valve fails the test, the four valves subsequently tested must 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 Parts 3 or 4 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 6.17, 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 6.17.3 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 6.17.3 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 6.17.4, 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 (valve reliability and water/leak tightness)

When tested as described in 6.17.5, 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 (water/leak tightness)

When tested as described in 6.17.6, 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 3000 cycle physical endurance test and the long term leakage test.

6.9 Solids discharge and after-flush volume for maximum flush

When tested as described in 6.17.7, for the first six flush cycles, or for a minimum of eight out of ten flush cycles, each of the four test specimens shall be completely evacuated from the WC bowl and pan's outlet. The recorded after-flush volume in each flush cycle shall be no less than 40 % of the full-flush volume.

6.10 Paper discharge for reduced-flush volume

When tested as described in 6.17.8, for the first six flush cycles, or for a minimum of eight out of ten flush cycles, all six sheets of toilet paper shall be flushed out of the WC pan and outlet.

6.11 Liquid contaminant dye retention

When tested as described in 6.17.9, for the first five flush cycles, or for a minimum of nine out of ten flush cycles at full-flush volume, the contaminate level shall be \( \leq 1 \% \). For the first five flush cycles, or for a minimum of nine out of ten flush cycles at reduced-flush volume, when provided, the contaminate level shall be \( \leq 6 \% \).

6.12 Wash of bowl

When tested as described in 6.17.10, the arithmetic average of any unflushed area below the rim and above the surface of the trap shall be no greater than 50 cm\(^2\) after five flushing operations.

6.13 Depth of water seal

When tested twice at random as described in 6.17.3, the depth of water seal shall be no less than 50 mm on either occasion. If any alternative trap seal device is utilised, a no less effective comparable seal shall be in operation.

6.14 Static load of class 2 products

When tested in accordance with 5.8.4, class 2 products shall meet the requirements of 5.4.
6.15 Water absorption

When tested in accordance with 5.8.3 class 2 products shall meet the requirements of 5.3.

6.16 Durability of class 2 products

Class 2 products conforming with 6.1 to 6.15 are deemed to be durable.

6.17 Test methods

6.17.1 Inlet valve tests

6.17.1.1 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.

6.17.1.2 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.

6.17.1.3 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.

6.17.2 Warning pipe and overflow provisions

6.17.2.1 Apparatus

a) 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.

6.17.2.2 Procedure

Set the 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.

6.17.2.3 Expression of results

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

6.17.3 Flush volume and water trap seal tests

6.17.3.1 Apparatus

a) cistern, complete with fitments including flushpipe 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;
d) water seal depth measuring device.

6.17.3.2 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 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, the supply should be maintained at a hydraulic pressure of (0,15 ± 0,01) MPa 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.

Record the water trap seal depth on two occasions at random by measuring the height from the invert of the trappage back plate to the surface of the water.

Reset the dual-flush control or setting, if provided, to the reduced-flush volume and repeat the procedure 5 times.

6.17.3.3 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. Record also any failure of the trap seal depth to conform with the requirements of 6.13.

6.17.4 Flush rate test

6.17.4.1 Apparatus

a) cistern, complete with fitments including flushpipe 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

6.17.4.2 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, the supply should be maintained at a hydraulic pressure of (0,15 ± 0,01) MPa 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 cistern. Locate and position a fluid sensing device at the water level in the cistern. Using the calibrated measuring container add further water to the cistern equivalent to the volume of full-flush recorded in 6.17.3 less 1,0 l. Locate and position a second fluid sensing device at the water level in the 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 to 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 cistern a volume of water equivalent to the difference between the full-flush volume and reduced-flush volume as recorded in 6.17.3. Add a further 0,5 l. Locate and position a fluid level sensing device at the water level in the cistern. Using the calibrated measuring container add further water to the cistern until it is filled to a volume equivalent to the volume of full-flush recorded in 6.17.3 less 1,0 l. Locate and position a second fluid sensing device at this water level in the cistern. Add further water to the cistern, up to the marked water level for the full flush volume recorded in 6.17.3. 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.

6.17.4.3 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

\[ \frac{Volume\ of\ discharge\ per\ full\ flush\ in\ litres\ (recorded\ in\ 6.17.3) - 1.5}{Average\ time\ in\ seconds\ (recorded\ in\ 6.17.4)} \]

For the reduced-flush

\[ \frac{Volume\ of\ discharge\ per\ reduced\ flush\ in\ litres\ (recorded\ in\ 6.17.3) - 1.5}{Average\ time\ in\ seconds\ (recorded\ in\ 6.17.4)} \]

6.17.5 Physical endurance and leakage test of flushing device

6.17.5.1 Apparatus

a) cistern, complete with fitments including flushing device, flushpipe 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 \((0.15 \pm 0.01)\) MPa, or the minimum pressure required to operate the flushing device whichever is the greater; having maintained water hardness not greater than the range \((230 \pm 20)\) ppm as calcium carbonate during the course of the test;
d) paper of a type which changes colour when wet.
6.17.5.2 Procedure

Connect the water supply. For a single flush flushing device operate the flushing device and, if appropriate, allow the cistern to refill. 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 leak 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 test interval, but not the test itself, shall restart (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 three 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 refill. 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 restart (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 three 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.

6.17.5.3 Expression of results

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

(NOTE 200 000 cycles = category II flush limiter)

6.17.6 Chemical endurance test of flushing device

6.17.6.1 Apparatus

a) weighing scales having a resolution of 0.1 g and an accuracy of ± 0.05 g;
b) micrometer having a resolution of 0.1 mm 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.

6.17.6.2 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. Reassemble 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.
6.17.6.3 Expression of results

Record compliance, or any failure to comply with the requirements of 6.8.

6.17.7 Solids discharge and after-flush volume for maximum flush volume test

6.17.7.1 Apparatus

a) WC pan with associated flushing cistern and/or flushing device, or a close-coupled/one-piece suite, installed in accordance with the manufacturer’s instructions on a firm, flat horizontal/vertical surface, as appropriate. The flushing device shall satisfy the requirements of this specification.

b) four test specimens prepared in accordance with annex E;

c) measuring vessel;

d) electronic test rig with sensor for measuring the volume of water discharged after the last test specimen (b) has been discharged from the WC (a suitable test rig is described in AS 1172.1-1993);

e) container capable of collecting test specimens and discharge volume;

f) timing device having an accuracy of ± 0.05 s;

g) directing device (see Figure 2);

h) water supply.

Dimensions in millimetres

Key
1 Position directional device over normal outlet bore of water seal
2 Surface of water seal

Figure 2 — Directing device
6.17.7.2 Procedure

Set the dual-flush controller or setting if provided to the full-flush volume in accordance with the manufacturer's instructions. Fill any flushing cistern to the marked water level. Shut off the water supply, unless essential for the normal operation of the flushing device.

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 or the minimum required to operate the device, whichever is the greater.

Operate the flushing device and measure the total flush volume. Using the direction device in Figure 2, drop the four test specimens into the WC pan. Operate the flushing device to evacuate the test specimens and record the trailing volume. Repeat the procedure a further 5 or 9 times as appropriate (see 6.9).

6.17.7.3 Expression of results

Record compliance, or any failure to comply with the requirements of 6.9.

6.17.8 Paper discharge for reduced-flush volume test

6.17.8.1 Apparatus

a) WC pan with associated flushing cistern or flush valve, or a close-coupled/one-piece suite, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate. The flushing device and cistern shall satisfy the requirements of this specification.

b) sheets of toilet tissue with a saturation time of \((15 \pm 10)\) s as verified by annex D, having an approximate size of 140 mm x 100 mm, and a mass per unit surface of \((30 \pm 10)\) g/m²;

c) water supply maintained at a hydraulic pressure of \((0.15 \pm 0.01)\) MPa or the minimum required to operate the flushing device, whichever is the greater.

6.17.8.2 Procedure

Fill any flushing cistern in accordance with the manufacturer's instructions. Operate the flushing mechanism twice, completing two flush cycles. Set the dual-flush control or setting to the reduced-flush volume in accordance with the manufacturer's instruction. Loosely crumple six individual sheets of toilet tissue and drop them separately into the WC pan within a period of 14 s to 18 s. Operate the flushing mechanism within 2 s of the last sheet being dropped into the WC pan. Check for any paper not flushed out of the bowl and the trap, and remove, if necessary. Repeat the procedure a further 5 (9) times as appropriate (see 6.10).

6.17.8.3 Expression of results

Record compliance or failure to comply with the requirements of 6.10.

6.17.9 Liquid contaminant dye retention test

6.17.9.1 Apparatus

a) WC pan with associated flushing cistern and/or flushing device, or a close-coupled/one-piece suite, all meeting the appropriate requirements of this standard, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate. The flushing device and cistern shall satisfy the requirements of this specification;

b) liquid contaminant dye \((5\) g/l potassium permanganate \((\text{KMnO}_4)\));

WARNING — Potassium permanganate is an oxidant and appropriate precautions should be taken when preparing the solution.

c) calibrated spectrophotometer with prepared glass cuvettes;
d) fluid suction device;
e) water supply.

6.17.9.2 Procedure

Set the dual-flush control or setting, if provided, to the full-flush volume in accordance with the manufacturer’s instruction. Fill any cistern to the marked water level suitable for the WC pan. 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 flushing device, maintain the supply at a hydraulic pressure of (0,15 ± 0,01) MPa or the minimum required to operate the device, whichever is the greater.

Using the fluid suction device, remove any water from the WC’s trap. Fill the WC’s trap with liquid contaminant dye to the trap seal depth. Operate the flushing device. On completion of the flush, place a sample of the liquid remaining in the trap in the spectrophotometer cuvette. Measure and record the concentration of potassium permanganate in the sample. Repeat the procedure a further 4 (9) times as appropriate (see 6.11).

Reset the dual-flush control or setting, if provided, to reduced-flush volume and repeat the procedure 5 (10) times as appropriate (6.11).

6.17.9.3 Expression of results

Record compliance or failure to comply with the requirements of 6.11.

6.17.10 Wash of bowl

6.17.10.1 Apparatus

a) WC pan with associated flushing cistern and/or flushing device, or a close-coupled/one-piece suite, all meeting the appropriate requirements of this standard, installed in accordance with the manufacturer’s instructions on a firm, flat horizontal/vertical surface as appropriate. The flushing device shall satisfy the requirements of this specification;
b) supply of fine dry wooden sawdust;
c) 2 mm sieve;
d) water supply.

6.17.10.2 Procedure

Set the dual-flush control or setting, if provided, to full-flush volume in accordance with the manufacturer’s instruction. Fill any cistern to the marked water level. 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 flushing device, the supply should be maintained at a hydraulic pressure of (0,15 ± 0,01) MPa or the minimum required to operate the device, whichever is the greater.

Moisten the complete inner surface of the WC pan below the flushing rim and above the water in the trap. Immediately afterwards, sprinkle 20 g of sieved sawdust as completely and evenly as possible over the moistened surface. Operate the flushing device and record any area of unflushed surface.

Repeat the procedure a further four times.

6.17.10.3 Expression of results

On completion of the five test procedures calculate the arithmetic average of the unflushed area between the water level in the trap and the underside of the rim. Record compliance or any failure to comply with the requirements of 6.12.
6.17.11 Summary of requirements for compatibility testing of class 2 products

This clause provides further background notes on the testing and compatibility of elements of the WC suite for the purposes of this specification.

The expectation of clauses 6.1 to 6.17 is that any element of a WC suite offered for sale independently should enable other associated elements to meet the performance characteristics of class 2 of this specification when combined to form a WC suite. Nonetheless, it is clearly unreasonable for the manufacturer of an independent component of a suite to ensure that the product would satisfy the requirements, if installed with every other available other part that could make up a WC suite. Therefore, manufacturers need to complete those tests relevant to their product and ensure that when installed as part of a whole WC suite their product would be capable of fulfilling the complete set of tests. The whosoever selects the components to form a WC suite should ensure that they form a compliant suite which satisfies the all the tests in this specification.

Inlet valves shall satisfy BS 1212 as modified in 6.1.

Flush 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.

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.

WC pans shall, for their intended flush volume, satisfy the requirements regarding solid and paper discharge, after-flush volume, liquid dye contaminant retention, wash of bowl and trap seal depth.

The whole WC suite shall comprise of fully compliant components which, when installed together, satisfy all the tests. This shall include a cistern suitably marked for the intended full and, if appropriate, reduced flush volume of the WC pan.

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 Dangerous substances

See annex ZA, ZA.1 and ZA.3.
8 Marking and product designation

The relevant product characteristics and the essential characteristics for independent WC pans, WC suites and one-piece WC pans including their abbreviations are given in Table 4.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 997</td>
<td>European Standard for WCs and WC suites for product description</td>
</tr>
<tr>
<td>CL 1</td>
<td>Class 1 product: fixed flush volumes (9 l, 7 l, 6 l, 5 l or 4 l)</td>
</tr>
<tr>
<td>CL 2</td>
<td>Class 2 product: flush volume ≤ 6 l</td>
</tr>
<tr>
<td>9</td>
<td>Flush volume 9 l</td>
</tr>
<tr>
<td>7</td>
<td>Flush volume 7 l</td>
</tr>
<tr>
<td>6</td>
<td>Flush volume 6 l</td>
</tr>
<tr>
<td>5</td>
<td>Flush volume 5 l</td>
</tr>
<tr>
<td>4</td>
<td>Flush volume 4 l</td>
</tr>
<tr>
<td>A</td>
<td>Flushing cisterns with fixed flush volume</td>
</tr>
<tr>
<td>C</td>
<td>Pressure flush valve</td>
</tr>
<tr>
<td>WL</td>
<td>Watertightness / leaktightness</td>
</tr>
<tr>
<td>CF</td>
<td>Capacity of flush</td>
</tr>
<tr>
<td>BP</td>
<td>Backflow prevention (foul air)</td>
</tr>
<tr>
<td>CA</td>
<td>Cleanability</td>
</tr>
<tr>
<td>VR(x)</td>
<td>Valve Reliability (Class 1 close-coupled suites and one-piece WC pans only – category I or II)</td>
</tr>
<tr>
<td>LR</td>
<td>Load resistance (wall-hung appliances only)</td>
</tr>
<tr>
<td>DA</td>
<td>Durability</td>
</tr>
</tbody>
</table>

All independent WC pans, WC suites and one-piece WC pans shall be designated in accordance with the following system: EN 997: 2003 (E)
Valve reliability (category I or II)

Flushing device
Flush volume
Class of product
Number of standard

EN 997 — CL1 (or 2) — (x) — A (or C) — VR I (or II)
WL — CF — BP — CA — VR — LR — DA

Watertightness / leaktightness
Capacity of flush
Backflow prevention (of foul air)
Cleanability
Valve reliability
Load resistance
Durability

The second line of the designation code can be omitted when those characteristics are fulfilled.

EXAMPLE 1 Class 1 independent WC pan for a flush volume of 5 l and 4 l when flushed by a flushing cistern, and for a flush volume of 6 l when flushed with a pressure flush valve. All essential characteristics specified for class 1 products in accordance with Annex ZA are satisfied:

EN 997 — CL 1 — 5/4 A — 6 C

EXAMPLE 2 Class 1 WC suite or one-piece WC pan with a flush volume of 6 l when flushed with a flushing cistern equipped with a valve of reliability category II. The requirements for class 2 products are also satisfied:

EN 997 — CL 1 — 6 — VR II + CL 2

NOTE 1 If class 1 close-coupled suites components (WC pan and flushing cistern) are delivered separately, both components should be CE marked.

EXAMPLE 3 Class 2 WC suite for use with (a) designated flushing cistern(s). All essential characteristics specified for class 2 products in accordance with Annex ZA are satisfied:

EN 997 — CL 2

NOTE 2 For CE marking, see Annex ZA

9 Evaluation of conformity

9.1 General

The compliance of an independent WC pan, a one piece WC pan, a close-coupled suite or a WC suite with this standard shall be demonstrated by:

— type testing (see 9.2)
— factory production control by the manufacturer (FPC), including product assessment (see 9.3)
9.2 Type testing

9.2.1 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 harmonized European Specifications may be presumed to have the performances stated of them, although this does not replace the responsibility of the WC pan manufacturer to ensure that the WC pan with integral trap as a whole is correctly manufactured and its component products have the necessary performance values.

The following characteristics will be assessed respectively in the following conditions:
- release of dangerous substances, which may be assessed indirectly by controlling the content of the substance concerned;
- durability, which is ensured by correct design and by a prescriptive requirement on corrosion protection of metallic members.

9.2.2 Further type testing

WC pans with integral trap 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 WC pan, 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.

9.2.3 Sample, testing and compliance criteria

The WC pan with integral trap shall be subjected to and pass the relevant tests in Tables 4 and 5 respectively before delivery commences.

Table 5 — Type testing for class 1 products

<table>
<thead>
<tr>
<th>Characteristic to be tested</th>
<th>Assessment method according to clauses of this standard</th>
<th>Number of samples</th>
<th>Compliance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of water seal</td>
<td>5.8.1</td>
<td>1</td>
<td>5.1</td>
</tr>
<tr>
<td>Wash of bowl</td>
<td>5.8.2.3</td>
<td>1</td>
<td>5.2.2</td>
</tr>
<tr>
<td>Flushing toilet paper</td>
<td>5.8.2.4</td>
<td>1</td>
<td>5.2.3</td>
</tr>
<tr>
<td>Flushing of 50 plastic balls</td>
<td>5.8.2.5</td>
<td>1</td>
<td>5.2.4</td>
</tr>
<tr>
<td>Over-splashing</td>
<td>5.8.2.6</td>
<td>1</td>
<td>5.2.5</td>
</tr>
<tr>
<td>After-flush volume</td>
<td>5.8.2.7</td>
<td>1</td>
<td>5.2.6</td>
</tr>
<tr>
<td>Water absorption</td>
<td>5.8.3</td>
<td>1</td>
<td>5.3</td>
</tr>
<tr>
<td>Static load</td>
<td>5.8.4</td>
<td>1</td>
<td>5.4</td>
</tr>
<tr>
<td>Leak tightness</td>
<td>5.8.5</td>
<td>1</td>
<td>5.5</td>
</tr>
<tr>
<td>Valve reliability</td>
<td>5.8.6</td>
<td>1</td>
<td>5.6</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 Standard</th>
<th>Number of samples</th>
<th>Compliance criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inlet valve</td>
<td>6.17.1</td>
<td>1</td>
<td>6.1</td>
</tr>
</tbody>
</table>
| Backflow prevention                             | 6.2a  
6.17.3                                                | 1                 | 6.2  
6.13                          |
| Flushing cistern marking                        | 6.3                                                    | 1                 | 6.3                |
| Warning pipe and overflow provision             | 6.17.2                                                 | 1                 | 6.4                |
| Flush volume                                    | 6.17.3                                                 | 1                 | 6.5                |
| Flush rate                                      | 6.17.4                                                 | 1                 | 6.6                |
| Flushing device: Physical endurance and leakage | 6.17.5                                                 | 1                 | 6.7                |
| Flushing device: Chemical endurance             | 6.17.6                                                 | 1                 | 6.8                |
| Solids discharge and after flush volume for maximum flush | 6.17.7                                                 | 1                 | 6.9                |
| Paper discharge for reduced flush volume        | 6.17.8                                                 | 1                 | 6.10               |
| Liquid contaminant dye retention                | 6.17.9                                                 | 1                 | 6.11               |
| Wash of bowl                                    | 6.17.10                                                | 1                 | 6.12               |
| Water seal depth                                | 6.17.3                                                 | 1                 | 6.13               |
| Static load                                     | 5.8.4                                                  | 1                 | 6.14               |
| Water absorption                                | 5.8.3                                                  | 1                 | 6.15               |
| **a** Foul air and water                        |                                                        |                   |                    |

### 9.3 Factory Production Control (FPC)

#### 9.3.1 General

The manufacturer shall establish, document and maintain a FPC system to ensure that the products placed on the market conform with the stated performance characteristics. The FPC system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results 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 9000 series or equivalent, and made specific to the requirements of this standard, can/may be considered to satisfy the above requirements.

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

#### 9.3.2 Testing equipment

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

#### 9.3.3 Raw materials and components

The specifications of all incoming raw materials and components shall be documented, as shall the inspection scheme for ensuring their conformity.
9.3.4 Product testing and assessment

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

9.3.5 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 A
(normative)

Valve-type test flushing cistern

Dimensions in millimetres

Key
1 Water level for the total test volume
2 Upper and lower water level sensors connected to a level control unit and an electronic timer
3 Water level for the total test volume
4 Residual water
5 Flow rate (2.3 ± 0.1) l/s, related to the nominal flushing volume 6 l
6 Test height: 200 mm

Starting volume V1 (see Table A.1)
Measuring volume V2 (see Table A.1)
Finishing volume V3 (see Table A.1)
Residual volume V4 (see Table A.1)
Total flushing volume V1 + V2 + V3
Total test volume V1 + V2 + V3 + V4

Figure A.1 — Valve-type test flushing cistern
Table A.1 — Test volumes

<table>
<thead>
<tr>
<th>Nominal flush volume</th>
<th>Total test volume</th>
<th>Starting volume V1</th>
<th>Measuring volume V2</th>
<th>Finishing volume V3</th>
<th>Residual volume V4</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

<sup>a</sup> For the nominal flushing volumes 5l and 4l, the test flushing cistern has to be equipped with a closing unit at the outlet valve.

Procedure to test the flush rate

All water to be added using a calibrated container.

1) Insert the restrictor into the flush pipe in accordance with Figure A.1.
2) Fill the flushing cistern to the total test volume in accordance with Table A.1 and mark this.
3) Flush the flushing cistern.
4) Add V3 l water to the residual water and set the lower level sensor just contacting the water.
5) Add V2 l water and set the upper level sensor just contacting the water.
6) Add V1 l water to reach the total test volume.
7) Flush the flushing cistern and measure the flush rate during delivery of the V2 l flushed between the upper and lower level sensors. The required flush rate (2.3 ± 0.1) l/s is verified by the arithmetical average of five flushing operations using water at a temperature of between 7 °C and 20 °C.
8) The outlet valve has to be closed in such a way, that the relevant nominal flushing volume is submitted.
Annex B
(normative)

Test rig for pressure flush valve

Dimensions in millimetres

Key
1 Main water supply
2 Pressure regulator
3 Centrifugal-pump with frequency meter
4 Flow meter
5 Amplifier
6 Integrating/differentiating instrument
7 Control valve
8 Pressure gauge
9 Test pressure flushing valve
10 Flush pipe

Main supply (1) or tank with pump (3) are alternatives.

Figure B.1 — Test rig

The test pressure flush valve shall deliver the hydraulic values specified in Table B.1

Table B.1 — Test pressure flush valve

<table>
<thead>
<tr>
<th>Flush volume l</th>
<th>Flush rate l/s</th>
<th>Impact force measured at the end of the flush pipe N</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 -0.1</td>
<td>1 +0.05 -0.05</td>
<td>5.0 ± 0.2</td>
</tr>
<tr>
<td>7 -0.1</td>
<td>1,15 +0.05 -0.05</td>
<td>6.5 ± 0.2</td>
</tr>
<tr>
<td>9 -0.1</td>
<td>1,15 +0.05 -0.05</td>
<td>6.5 ± 0.2</td>
</tr>
</tbody>
</table>
Procedure to measure the impact force

The impact force in Newton of a pressure flush valve complete with the flush pipe shall be measured with the test device shown in Figure B.3. The flushing water from the flush pipe shall be directed against the disc (50 mm diameter) to create an impact force. This impact force shall be measured with a load cell and expressed in Newton.
Figure B.3 — Test device to measure the impact force

Key
1 Load cell
2 Measuring box
3 Flush pipe

Dimensions in millimetres
Annex C
(normative)

Test rig for after-flush volume test

C.1 Test rig for after-flush volume test for independent WC pans (Figures C.1 and C.2)

Key
A Test flushing cistern in accordance with Annex A
B Outlet device of test flushing cistern
C WC pan to be tested
D Discharge bend (if needed)
E Sensor
F Measuring vessel
G Test pressure flush valve in accordance with annex B

Figure C.1 — Test rig for independent WC pan and flushing cistern
Figure C.2 — Test rig for independent WC pan and pressure flush valve
C.2 Test rig for after-flush volume test for one-piece WC pans, close-coupled suites and WC suites (Figure C.3)

Key
H One-piece WC pan, close-coupled suite or WC suite

![Figure C.3](image)

Figure C.3 — Test rig for one-piece WC pans, close-coupled suites and WC suites

Procedure to classify the WC pan

1) Connect the flushing cistern to a water supply of \((0,2 \pm 0.01)\) MPa and adjust the flushing volume in accordance with the manufacturer's instructions.

2) Flush the flushing cistern 3 times and measure the flushing volume with tolerances \(\pm 0.1\) l. The water supply shall be closed during the flushing operation.

3) The WC pan shall be classified on the arithmetical average resulting from three flushing operations referring to Table 3 or Table 4.

4) The flushing tests in accordance with this standard shall be carried out on the basis of the WC pan class (see Table 2).
Annex D
(normative)

Basket method

The saturation time of the paper is measured using the basket method and it shall fall within the range of
$(15 \pm 10)$ s.

A sufficient number of sheets of paper are stacked and cut to a size of $75 \text{ mm} \times 250 \text{ mm}$. Approximately $5 \text{ g}$ are weighed out, rolled up (in the transverse direction) and put into the basket in accordance with Figure D.1.

Place the inverted basket containing the paper into a cylindrical glass vessel in accordance with Figure D.2, containing water that does not deviate more than $\pm 3 ^\circ \text{C}$ of the temperature of the water used for flushing. Measure the time in seconds from placing the basket into the water until it is completely immersed. Repeat the test 3 times and record the arithmetical average time taken.

The test shall be carried out under the same conditions of relative humidity and temperature of air as for the flushing test.

Dimensions in millimetres

Diameter of wire 0.75 mm
Mass 3 g

Figure D.1 — Basket
Figure D.2 — Placing the basket
Annex E
(normative)

Preparation of test specimens

1) Moisten the artificial sausage skin and cut it to length in accordance with Figure E.1. Tie the bottom end with string of 1 mm diameter in accordance with Figure E.2.

2) Insert the metal detector ring with a 10 mm internal diameter, fill in 37 ml of water and tie the upper end with string. Position the O-rings diameter 10/14 in accordance with Figure E.2.

3) Verify whether the specimen is completely filled with water in accordance with Figure E.3.

4) For protection the test specimen shall be covered with a tubular bandage and tied with strings in accordance with Figures E.4 and E.5.

5) Check finally the test specimens with a template in accordance with Figure E.6.

Dimensions in millimetres

Figure E.1 — Measuring template
Figure E.2 — Tie position of test specimen
Figure E.3 — Verifying position of test specimen

Figure E.4 — How to roll the tubular bandage over the test specimen

Dimensions in millimetres

Figure E.5 — Protected test specimen with tubular bandage

Figure E.6 — Template to check the final configuration of the test specimen

Key

1. Position of test specimen in the gauge without any tension
Annex F
(normative)

Valveless-type test flushing cistern

Invert of siphon to be ≥ 60 mm above the nominal flushing volume water level

Key
1  Test height (250 ± 10) mm
2  Water level
3  Upper and lower level sensors connected to a level control unit and an electronic timer
4  Nominal flushing volume ≥ 6 l
5  Residual water
6  Flow rate (2 ± 0.15) l/s
7  Engagement of flush pipe into siphon to be between 25 mm minimum and 50 mm maximum
8  Starting force: 40 N

Starting volume \( V_1 = 0.5 \) l or 1.5 l
Measuring volume \( V_2 = 3.0 \) l
Finishing volume \( V_3 = 2.5 \) l
Total flushing volume \( V_1 + V_2 + V_3 \)

Figure F.1 — Valveless-type test flushing cistern
Procedure to test the flow rate

All water to be added using a calibrated container.

1) Fill the flushing cistern to the nominal water level 6 l or 7 l and mark it.

2) Flush the flushing cistern.

3) Add 2,5 l of water to the residual water and set the lower level sensor just contacting the water.

4) Add 3 l of water (volume for testing flow rate) and set the upper level sensor just contacting the water.

5) Add further water to reach the nominal water level for 6 l and 7 l.

6) Flush the flushing cistern and measure the flush rate during delivery of the 3 l flushed between the upper and lower level sensors.

7) Valveless outlet device to be selected or calibrated by restriction, if necessary, to deliver an average flush rate of (2,00 ± 0,15) l/s measured during delivery of the 3 l flushed between the upper and lower level sensors. The flush rate is verified by the arithmetical average of 5 flushing operations using water at a temperature between 7 °C and 20 °C.
Annex ZA
(informative)

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

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under Mandate M/110\(^3\) given to CEN by the European Commission and the European Free Trade Association.

The clauses of the 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 independent WC pans, WC suites and one-piece WC pans 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 construction 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 web site on EUROPA (accessed through http://europa.eu.int/comm/enterprise/construction/internal/dangsub/dangmain.htm).

This annex establishes the conditions for the CE marking of the independent WC pans and WC suites 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 the Tables ZA.1 and ZA 1.2.

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.

\(^3\) M/110 "Sanitary Appliances" as amended by M/139.
Table ZA.1.1 — Scope and relevant clauses for class 1 products

<table>
<thead>
<tr>
<th>Construction Product:</th>
<th>Close-coupled suite, one-piece and independent WC pan with integral trap of class 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended use:</td>
<td>Personal hygiene</td>
</tr>
</tbody>
</table>

<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>Capacity of flushing water</td>
<td>5.2.1</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td></td>
<td>5.2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backflow prevention</td>
<td>5.1</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Cleanability</td>
<td>5.2.2</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td></td>
<td>5.2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.2.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load resistance</td>
<td>5.4</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Valve reliability</td>
<td>5.6</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Water/leak tightness</td>
<td>5.5</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Durability</td>
<td>5.7</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
</tbody>
</table>

Table ZA.1.2 — Scope and relevant clauses for class 2 products

<table>
<thead>
<tr>
<th>Construction Product:</th>
<th>WC suite of class 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended use:</td>
<td>Personal hygiene</td>
</tr>
</tbody>
</table>

<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>Capacity of flushing water</td>
<td>6.3</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td></td>
<td>6.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backflow prevention  a</td>
<td>6.2</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td></td>
<td>6.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleanability</td>
<td>6.9</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td></td>
<td>6.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load resistance</td>
<td>6.14</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Water/leak tightness</td>
<td>6.7 and 6.8</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Valve reliability</td>
<td>6.7</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
<tr>
<td>Durability</td>
<td>6.16</td>
<td>None</td>
<td>Pass/fail</td>
</tr>
</tbody>
</table>

a Foul air and water.
ZA.2 Procedure for attestation of conformity of independent WC pans, WC suites and one-piece WC pans

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of the independent WC pans, WC suites and one-piece WC pans indicated in Tables ZA.1.1 and ZA.1.2, in accordance with the Decision of the Commission 96/578/EEC of 1996/06/24 as amended by the Commission Decision 01/596/EC and given in Annex III of the mandate for "Sanitary Appliances" is shown in Table ZA.2 for the intended use and relevant level(s) and 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 pan and WC suite</td>
<td>Personal hygiene</td>
<td>—</td>
<td>4</td>
</tr>
</tbody>
</table>

The attestation of conformity of the independent WC pans, WC suites and one-piece WC pans with integral trap in Tables ZA.1.1 and ZA.1.2 shall be according to the evaluation of conformity procedure indicated in Table ZA.3 resulting from the application of the clauses of this European Standard indicated therein.

Table ZA.3 — Assignment of evaluation of conformity tasks

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Content of task</th>
<th>Evaluation of conformity clauses to apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task for the manufacturer</td>
<td>Initial type testing</td>
<td>9.2</td>
</tr>
<tr>
<td></td>
<td>All relevant characteristics of Tables ZA.1.1 and ZA.1.2 respectively</td>
<td></td>
</tr>
<tr>
<td>Factory production control</td>
<td>Parameters related to all relevant characteristics of Tables ZA.1.1 and ZA.1.2 respectively</td>
<td>9.3</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 (type, identification, use, ...) and a copy of the information accompanying the CE marking;

— provisions to which the product conforms (i.e. Annex ZA of this European Standard);

— particular conditions applicable to the use of the product (e.g. provisions for the use under certain conditions etc.);

— name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

The above mentioned declaration shall be presented in the official language or languages of the Member State in which to product is to be used.
ZA.3 CE marking

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/EEC and shall be shown on the independent WC pan or WC suite (or when not possible it may be on the accompanying label, the packaging or on the accompanying commercial documents, e.g. delivery note). The following information and characteristics shall accompany the CE marking symbol:

- name or identifying mark and registered address of the manufacturer;
- last two digits of the year in which the CE marking is affixed;
- reference to this European Standard, i.e. EN 997;
- information on those relevant Essential Characteristics listed in Tables ZA.1.1 and/or ZA.1.2 respectively which are to be presented in a form of standard designation as defined in Clause 8 of this standard.

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 characteristics is considered as NPD.

NOTE 2 When the designation code is used with a NPD option for a characteristic, it should be presented as, e.g. LR/NPD.

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

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

AnyCo Ltd, PO Box 21, B-1050

07

EN 997 — CL 1 — 6 A

Name or identifying mark and registered address of the manufacturer

Last two digits of the year in which the marking was affixed

Number of European Standard, product class, flush volume and flushing device

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 3 European legislation without national derogations need not be mentioned.

NOTE 4 Affixing the CE marking symbol means, if a product is subjected to more than one directive, that it complies with all applicable directives. ☑
Bibliography

EN ISO 9000, Quality management systems — Fundamentals and vocabulary (ISO 9000:2005)
BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover.

Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre.

Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration.

Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001.
Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

Copyright subsists in all BSI publications. BSI also holds the copyright, in the UK, of the publications of the international standardization bodies. Except as permitted under the Copyright, Designs and Patents Act 1988 no extract may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior written permission from BSI.

This does not preclude the free use, in the course of implementing the standard, of necessary details such as symbols, and size, type or grade designations. If these details are to be used for any other purpose than implementation then the prior written permission of BSI must be obtained.

Details and advice can be obtained from the Copyright & Licensing Manager.

Tel: +44 (0)20 8996 7070. Fax: +44 (0)20 8996 7553.
Email: copyright@bsi-global.com.