



Department
for Environment
Food & Rural Affairs



Llywodraeth Cymru
Welsh Government

WC Suite Performance Specifications

Specification for WC Suites delivering a single flush of 6 litres maximum or a dual-flush of 6 litres maximum and reduced flush of no greater than $\frac{2}{3}$ of the maximum flush

Date: 6 May 2026

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Any enquiries regarding this publication should be sent to us at

Department for Environment, Food and Rural Affairs,
Water Sector Delivery,
Ground Floor,
Seacole Building,
2 Marsham Street,
London,
SW1P 4DF

Or email at: drinkingwaterquality@defra.gov.uk

www.gov.uk/defra

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Introduction

The [Water Supply \(Water Fittings\) Regulations 1999](#) (the 'Regulations'), have the specific purpose to prevent the waste, misuse, undue consumption, contamination or erroneous measurement of public water supplies, meaning those supplied by a water undertaker (an appointed water company) or a water supply licensee.

The Regulations apply to any water fitting installed or used, or to be installed or used, in premises to which water is or is to be supplied by a water undertaker or water supply licensee.

The Regulations set out the legal requirements for plumbing systems and play an important role in protecting public health, safeguarding public water supplies and promoting the efficient use of water within premises. The Regulator, which is the Secretary of State or Welsh Ministers, can approve specifications to ensure fittings are of an appropriate quality and standard and suitable for the circumstances in which they are used. They can also approve specifications to ensure fittings are installed, connected, altered, repaired or disconnected in a workmanlike manner.

This specification sets out the performance and where necessary dimensional requirements expected from Water Closet (WC) suites and key components within them. These include inlet valves, flushing devices and flushing cisterns. This specification is accompanied by a series of other specifications known as Test Code Sheets.

Conformity testing

To demonstrate conformity with Regulation 4(1)(a), manufacturers should, as good practice, have in place a documented system of assessment of the performance of the product. They should also have factory production controls to ensure consistency of manufacturing and product performance as described in the Construction Products Regulations 2011 as amended.

The expectation of this specification is that any element of a WC Suite offered for sale independently should enable other associated elements to meet the essential performance characteristics (parts 1 to 4) of this specification when combined to form a WC Suite.

Nonetheless, it is clearly unreasonable for the manufacturer of an independent component that may be used in 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, component 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. Whosoever selects the components to form a WC suite should ensure that they form a compliant suite which satisfies all the tests in this specification (see Informative Annex).

Scope

This specification sets performance requirements and methods of test for WC suites designed to operate with either a pressure flushing valve or a flushing cistern incorporating some other flushing device. The WC Suite shall be capable of delivering a maximum flush volume of 6 litres or a dual-flush combining a maximum flush volume of 6 litres and a reduced flush volume no greater than two thirds of the maximum flush volume.

NOTE: This specification does not cover backflow prevention requirements (see Informative Annex), which need to be considered separately.

Normative references

This specification incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these standards apply to this specification only when incorporated in it by amendment or revision. For undated references the latest edition of the standard referred to applies.

- BS 1212-2 Float operated valves - Specification for diaphragm type float operated valves (copper alloy body) (excluding floats)
- BS 1212-3 Float operated valves - Specification for diaphragm type float operated valves (plastics bodied) for cold water
- BS 1212-4 Float operated valves - Specification for compact type float operated valves for WC flushing systems (including floats)
- TCS 1211.15 Flushing device physical endurance and leakage
- TCS 1411.3 Flushing device chemical endurance
- TCS 1511.2 Flush rate
- TCS 1512.10 Paper discharge for reduced flush volume
- TCS 1512.11 Solids discharge and after flush volume for maximum flush
- TCS 1512.12 Wash of Bowl
- TCS 1611.16 Liquid contaminant dye retention
- TCS 2212.20 Backflow prevention Regulator's specification for WC suites (anti-siphonage capability)

- TCS 2213.21 Joints below critical water level
- TCS 3212.1 WC flush volume and water seal depth
- TCS 5011.6 Water seal depth
- TCS 5011.7 Warning pipe and overflow provision
- TCS 6001.1 Marking for identification

Definitions

For the purposes of this specification the following definitions apply:

After-flush volume

Remaining flush water volume after the last of four specimens have left the outlet of the bowl.

Critical level

The physical or piezometric level of the fluid in any part of the receptacle two seconds after closing the water inlet, starting from maximum water level.

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 litres; and
- the reduced smaller flush option is not greater than two-thirds the volume of the larger flush.

Fluid contaminant

Liquid to be removed from WC pan by flushing action.

Flush volume

Volume of water discharged from the flushing device during a flush cycle.

NOTE: In the case of devices that require a continuous water supply during flushing (e.g. for outlet seal and/or trap refill) the inflow during flushing forms part of the flush volume.

Flushing Device

Device fitted to a flushing cistern to provide controlled measured volume(s) of water to a WC 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.

Inlet valve

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

Residual fluid contaminant

Liquid waste left behind in the WC bowl after completion of the flush.

Regulations

In this specification means the Water Supply (Water Fittings) Regulations 1999.

Regulator's Specification Test Code Sheet (TCS)

A technical specification which detail specific testing procedures which, either on their own or in combination with other TCSs, verify a water fitting(s) is of a suitable quality and standard and or in compliance with the requirements of the Regulations or accompanying Regulator's Specifications.

Solid test media

Media used to represent faecal matter.

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.

Warning pipe

Means an overflow pipe whose outlet is located in a position where the discharge of water can be readily seen.

Water trap

Water seal that prevents backflow of odour from a drain.

WC suite

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

Performance Requirements

General tolerances and measurements

In the absence of specific tolerances or accuracies for measuring instruments the following shall apply.

Tolerances and measurements

1. Dimension: up to and including 75 mm $\pm 5\%$; over 75 mm $\pm 2\%$.
2. Flow rate and pressure: $\pm 5\%$ of the value specified.
3. Temperature: cold water $\pm 10\text{ }^\circ\text{C}$ of the value specified.

Accuracy of measuring instruments

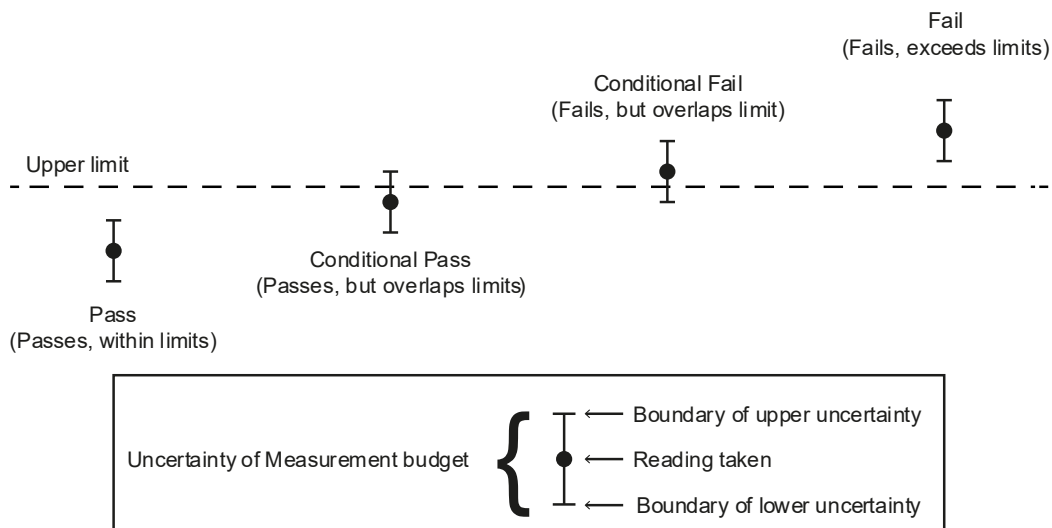
All the measuring instruments shall have an error limit of $\pm 2\%$ of the measured value.

Linear measuring instruments shall have a minimum resolution of 0.5 mm.

Timing instruments shall have a minimum resolution of 0.1 seconds.

Uncertainty of Measurement. When testing there should be in place a scheme of Uncertainty of Measurement to determine the budget range. The budget (See Figure 1) should account for the variations (instrumentation, equipment etc.) that might occur throughout all stages of the testing process. Where Uncertainty of Measurement budget is likely to cross over the acceptance limit given by the requirement, it should be reported with the test result.

Figure 1: Reporting uncertainty of measurement budgets



1 Inlet valve

An inlet valve for use within a WC suite, and satisfy this Specification, shall be of an appropriate quality and standard (see Regulation 4) complying with BS 1212 Parts 2, 3, or 4, subject to the following essential characteristics of: performance (1.1), anti-siphonage capability (1.2) and have no joints below the critical water level (1.3).

1.1 Performance

1.1.1 Requirement

Inlet valves shall comply with BS 1212 Parts 2, 3, or 4, subject to the amendments specified below:

Water quality

- The water hardness during tests shall not exceed the range of 230 ± 20 ppm of calcium carbonate during the course of the test.

Endurance

- 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.
- The supply pressure for the endurance test shall be 1.5 ± 0.1 bar.
- Inlet valves to BS 1212-2:1990 shall be subject to an endurance test as described in BS 1212-3:1991 using a supply pressure of 1.5 ± 0.1 bar.

1.1.2 Test method

i Apparatus

Apparatus as specified in BS 1212 subject to the additional requirements specified in Clause 1.1.1. Supply pressure requirements for pressurised cisterns shall conform with the manufacturer's recommendations.

ii Procedure

Subject the inlet valve to the tests as specified in BS 1212 Parts 2, 3, or 4 as appropriate. In testing against the endurance clause of BS 1212 (modified in Clause 1.1.1) if the first inlet valve fails, four further valves shall be tested.

iii Expression of results

Record compliance, or failure to comply with the requirements of the appropriate part of BS 1212 and Clause 1.1.1.

1.2 Anti-siphonage capability

1.2.1 Requirement

When tested in accordance with the requirements of Clause 1.2.2 there shall be no evidence of back-siphonage.

1.2.2 Test method

i. Apparatus and procedure

Inlet valves to BS 1212 part 2 or 3 shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 2212.20.

Inlet valves to BS 1212 part 4 shall be tested in accordance with Test Procedure 4 (B) of the Regulator's Specification Test Code Sheet 2212.20.

ii Expression of results

Record compliance, or failure to comply with the requirements of Clause 1.2.1.

1.3 Joints below the water line

1.3.1 Requirement

When tested as described in Clause 1.3.2 no ***mechanical joint*** within a flushing cistern on submerged supply pipes or inlet devices shall be at or below the critical water level.

Mechanical joints are joints which when undone open a direct pathway between the wholesome water (incoming supply) and the fluids stored within the flushing cistern. These include joints that:

- a. are 'adjustable' or can be 'dismantled'; or
- b. rely on elastomeric, or other material, to provide a water-tight seal; or
- c. where the coupling of two components being dependent upon mechanically applied forces, with or without the use of secondary seal.

Joints not considered *mechanical joints* include:

- a. Nuts or jointing mechanism on the diaphragm housing assembly.
- b. Joints where the joining surface are permanently fused together, for example by a chemical process or the application of heat.

1.3.2 Test method

i. Apparatus and procedure

The flushing cistern, complete with all fitments (e.g. inlet valve, flushing device, overflow etc.) installed in accordance with the manufacturer's instructions, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 2213.21.

ii. Expression of results

Record compliance, or failure to comply with the requirements of 1.3.1.

2 Flushing devices

2.1 Physical endurance and leakage

2.1.1 Requirement

When tested as described in Clause 2.2.1, 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 2 instances of leakage are permitted. A leak is defined as being visible discharge of water amounting to more than 3 separate drops. If the first flushing device fails the test, the four devices subsequently tested must all satisfy the requirements.

2.1.2 Test method

i Apparatus and procedure

The flushing cistern, complete with fitments including flushing device, flushpipe (where appropriate) and cover, installed in accordance with the manufacturer's instructions shall be tested in accordance with Test Procedure 4.1 of the Regulator's Specification Test Code Sheet 1211.15.

In Test Code Sheet 1211.15 the following definitions shall apply:

Short term leak test means a leak test consisting of a 15 minute wait after flushing then positioning paper designed to change colour when wet, under the flushing device for 10 minutes. A leak is defined as being visible discharge of water amounting to more than 3 separate drops.

Long term leak test means a leak test consisting of a 2 hour wait after flushing then position paper, designed to change colour when wet, under the outlet for 15 minutes. A

leak is defined as being visible discharge of water amounting to more than 3 separate drops.

ii Expression of results

Record compliance, or any failure to comply, with the requirements of Clause 2.1.1.

2.2 Chemical endurance

2.2.1 Requirement

When tested as described in Clause 2.2.2, 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 (see 2.1.2 i).

2.2.2 Test method

i Apparatus and procedure

The flushing device shall be tested in accordance with Test Procedure 4 of the Regulator's Specification Test Code Sheet 1411.3.

In TCS 1411.3 the definition of *long term leak test* shall be taken as that given in 2.1.2 i above.

ii Expression of results

Record compliance, or any failure to comply with the requirements of Clause 2.2.1.

3 Flushing cisterns

3.1 Marking

3.1.1 Requirement

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.

3.1.2 Test method

i Apparatus and procedure

The flushing cistern shall be tested in accordance with the appropriate Test Procedure 4.1 (C) of the Regulator's Specification Test Code Sheet 6001.1.

ii Expression of results

Record compliance, or any failure to comply with the requirements of Clause 3.1.1.

3.2 Warning and Overflow Pipe Provision

3.2.1 Requirement

i Point of discharge

When tested as described in Clause 3.2.2, every flushing cistern, not being a pressure flushing cistern, shall be arranged:

a) in the case of a combined warning and overflow pipe

- i. with the discharge level between 20 mm and 51 mm inclusive, above the marked water level.

or

b) in the case of separate warning and overflow pipes

- i. fitted with a warning pipe connection arranged with the discharge level between 20 mm and 41 mm inclusive, above the marked water level; and
- ii. the top edge of any internal overflow between 30 mm and 51 mm inclusive and not less than 10 mm above the warning level.

An alternative, no less effective device, may be used in place of a warning pipe.

ii Size of overflow and air gap to drain

In the case of an internal overflow within a WC suite, i.e. one that discharges into the flush pipe or bowl, requirements relating to the overflow size and the provision of air gaps to drain, need not apply provided:

- a) the overflow is not less than 19 mm internal diameter at the point water enters the overflow to be discharged; and

b) the critical water level (h) has been verified by test.

3.2.2 Test method

i Apparatus and procedure

The 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, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 5011.7.

ii Expression of results

Record compliance or any failure to comply with the requirements of Clause 3.2.1.

3.3 Flush Volume

3.3.1 Requirement

i Full Flush

When tested as described in Clause 3.3.2 with any adjustable flushing device set to deliver the maximum flush volume, the measured discharge shall on no occasion exceed 6 litres.

ii Reduced flush

When tested as described in Clause 3.3.2 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.

3.3.2 Test method

i Apparatus and procedure

The flushing cistern, complete with fitments including flushpipe and cover, installed in accordance with the manufacturer's instructions, on a firm, flat, vertical surface shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 3212.1.

ii Expression of results

Record compliance or any failure to comply with the requirements of Clause 3.3.1.

Note it is also possible to record any failure of the trap seal depth to conform with the requirements of Clause 4.5.1 4.13.

3.4 Flush rate

3.4.1 Requirement

When tested as described in Clause 3.4.2, the mean flush rate of discharge per flush shall be ≥ 1.85 L/s for the full-flush and ≥ 1.6 L/s for the reduced-flush - if provided.

3.4.2 Test method

i Apparatus and procedure

A flushing cistern, complete with fitments including flushpipe (where appropriate) and cover, installed in accordance with the manufacturer's instructions on a firm, flat, vertical surface, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 1511.2.

ii Expression of results

Record compliance or any failure to comply with the requirements of Clause 3.4.1.

4 Water Closet Suite

4.1 Solids discharge and after-flush volume for maximum flush

4.1.1 Requirement

When tested as described in Clause 4.1.2, 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.

4.1.2 Test method

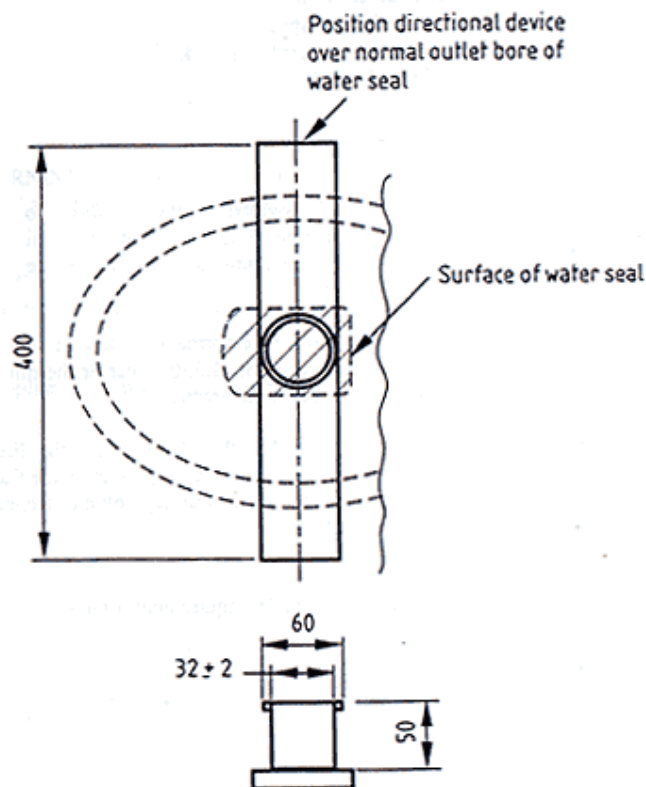
i Apparatus and procedure

The WC pan with associated flushing cistern and/or flushing device, or a close-coupled/one-piece suite, satisfying the requirements of this specification, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 1512.11.

In Test Code Sheet 1512.11 the following shall apply:

- (a) in 4.2 b) the undated reference to “Annex F of BS EN 997” shall be taken as the “Preparation of test specimens’ of BS EN 997 WC pans and WC suites with integral trap”; and
- (b) in 4.2 f) the timing device is to have an accuracy of 0.05 seconds; and
- (c) in 4.2 g) reference to “Figure 1”, and in 4.3 reference “Figure 1 of AS 1172.1:1993” can be taken as the directing device in Figure 2 below, with all dimensions given in millimetres.

Figure 2: Directing device



ii Expression of results

Record compliance, or any failure to comply with the requirements of Clause 4.1.1.

4.2 Paper discharge for reduced flush volume

4.2.1 Requirement

When tested as described in Clause 4.2.2, 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.

4.2.2 Test method

i Apparatus and procedure

The WC pan with associated flushing cistern and/or flushing device (satisfying the requirements of this specification), or a close-coupled/one-piece suite, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 1512.10.

In Test Code Sheet 1512.10 clause 4.2 b) the undated reference to "*Annex E of BS EN 997*" shall be taken as the "*Basket method of BS EN 997 WC pans and WC suites with integral trap*".

ii Expression of results

Record compliance or failure to comply with the requirements of Clause 4.2.1.

4.3 Liquid contaminant dye retention

4.3.1 Requirement

When tested as described in Clause 4.3.2, 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 $\leq 6\%$.

4.3.2 Test method

i Apparatus and procedure

The WC pan with associated flushing cistern and/or flushing device (satisfying the requirements of this specification), or a close-coupled/one-piece suite, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 1611.16.

ii Expression of results

Record compliance, or failure to comply with the requirements of Clause 4.3.1.

4.4 Wash of Bowl

4.4.1 Requirement

When tested as described in Clause 4.4.2 the arithmetic average of any unflushed area below the rim and above the water surface of the trap shall be no greater than 50 cm² after 5 flushing operations. For rimless WC pans the surface to be tested is the area between the water surface of the trap and a horizontal line 85 mm below the top edge of the bowl.

4.4.2 Test method

i Apparatus and procedure

The WC pan with associated flushing cistern and/or flushing device (satisfying the requirements of this specification), or a close-coupled/one-piece suite, installed in accordance with the manufacturer's instructions on a firm, flat horizontal/vertical surface as appropriate, shall be tested in accordance with Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 1512.12.

ii Expression of results

Record compliance, or any failure to comply with the requirements of Clause 4.4.1.

4.5 Water seal depth

4.5.1 Requirement

When tested twice as described in Clause 4.5.2, the water seal depth 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.

4.5.2 Test method

i Apparatus and procedure

The 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 shall be tested in accordance with either:

- (a) Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 3212.1, if combined with the flush volume test (see 3.3.2); or
- (b) Test Procedure 4 (A) of the Regulator's Specification Test Code Sheet 5011.6.

ii Expression of results

Record compliance, or failure to comply with the requirements of Clause 4.5.1.

5 Coming into effect

This specification on WC Suite Performance will come into effect on 6 May 2027, being one year after its publication on gov.uk.

Informative Annex - Summary Requirements for Compatibility Testing

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

Users should note WC suites will require appropriate backflow protection in addition to conformance with this specification. This can be incorporated within the design of the WC suite. Backflow prevention requirements are set out in paragraph 15 of Schedule 2 of the Regulations. The Specification on the Prevention of Backflow details appropriate arrangements within Table 1 which includes Type AUK4 arrangements specifically for use with flushing cisterns and subject to certain characteristics compatibility testing. Where backflow prevention is not incorporated within the design, separate backflow prevention arrangement will be required on the upstream supply.

Inlet valves must satisfy BS 1212 as modified in section 1 and have no joints below the critical water level.

Flushing devices must satisfy the requirements with regard to physical and chemical endurance. They must 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 must consist of compliant components and so satisfy warning pipe and overflow provisions and the flush volume test. They should be suitably marked for the intended full-flush volume of the WC pan. They should also be capable of contributing towards the other requirements when tested in combination.

WC pans must, 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 must comprise of fully compliant components which, when installed together, satisfy all the tests.

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.