

Table ZA.1.1- Scope and relevant clauses for class 1 product

- Construction Product: Close-coupled suite, one-piece and independent WC integral trap of class 1
- Intended use: personal hygiene

Essential Characteristics	Requirements clauses in this European Standard	Mandated levels and/or classes	Notes
Capacity of flushing water	5.2.1 5.5.4	None	Pass/ Fail
Backflow prevention (of foul air)	5.1	None	Pass/ Fail
Cleanability	5.2.2 5.2.3 5.2.4 5.2.5 5.2.6 5.3 N/A	None N/A	Pass/ Fail N/A
Load resistance	5.4	None	Pass/ Fail
water/ leak tightness	5.5.5	None	Pass/ Fail
valve reliability	5.5.6 5.5.7	None	Pass/ Fail
Durability	5.6	None	Pass/ Fail

5.2.1 General PASSED

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

R&D **Unit flushes with 6.00 Liters**

Table 1 — Flushing requirements

Type of WC pan	Wash of bowl (5.2.2)	Flushing of toilet paper (5.2.3)	Flushing of 50 plastic balls (5.2.4)	Over-splashing (5.2.5)	After-flush volume (5.2.6)
9	X	X	X	X	
7	X	X	X	X	
6	X	X	X	X	X
5	X	X		X	X
4	X	X	X	X	

Table 2 — Types of independent WC pans

Type	Nominal flush volume l	Test flush volume l
9	9	9 ⁰ _{0,1}
7	7	7 ⁰ _{0,1}
6	6	6 ⁰ _{0,1}
5	5	5 ⁰ _{0,5}
4	4	4 ⁰ _{0,1}

5.5.4 Flush Volume of the flushing cistern PASSED

The flushing volume shall conform to the value specified by the manufacture according to table 3.

R&D **unit was flushed, and a volume of water was measured and recorded (6.00 liters)**

5.1 Depth of water seal PASSED

When tested the water seal shall be no less than 50 mm (1.96 in)

R&D **Water seal was measured and recorded 63.5mm (2.5 in)

5.2.2 Wash of bowl PASSED

When tested 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 50cm squared (2.64 in)

- Sawdust test (20g of fine wood sawdust)
- **Procedure:** 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 the sawdust as evenly as possible over the moistened surface. Flush the WC pan and measure any unwashed area repeat 5 times

Sawdust Test Number	Grams of Fine Sawdust	Unwashed Surface Area (Millimeters/Inches)
1	20g	38.1mm (1.5in)
2	20g	31.75mm (1.25in)
3	20g	Less than 12.7mm (0.5in)
4	20g	38.1mm (1.5in)
5	20g	Less than 12.7mm (0.5in)

R&D **20g of sawdust was applied to the WC surface 5 times and flushed. The average was 25.4mm Squared (1in)

5.2.3 Flushing of toilet paper PASSED

When tested 12 sheets of toilet paper shall be flushed out of the WC pan

- Single layer toilet paper 140mm X 100mm (5.5in X 4in)
- **Procedure:** 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 to 18 seconds. Activate the full flush within 2 seconds of last sheet. All paper needs to pass through 4 out of 5 times

Toilet Paper Test Number	Sheets of Paper	Number of Sheet Expelled from Waste
1	12	12 sheets
2	12	12 sheets
3	12	11 sheets
4	12	12 sheets
5	12	12 sheets

R&D

****The toilet paper test was successful. 4 out 5 test expelled all 12 sheets of required toilet paper****

5.2.4 Flushing of fifty small plastic balls PASSED

When tested, after five test, each with 50 balls, a minimum of 85% (42balls) shall be flushed out of the WC pan.

- Ball outside diameter 20mm (0.8in)
- Ball Weight 3.7g
- **Procedure:** For each flushing operation place 50 balls into the WC pan and flush the WC pan with a full flush. Record and remove any balls left in the WC pan. Repeat this test 5 times.

Small Plastic Ball Test #	Amount of Balls	Number of Balls Expelled from Waste 85% (42 balls +) Pass
1	50	45 balls expelled
2	50	49 balls expelled
3	50	45 balls expelled
4	50	50 balls expelled
5	50	48 balls expelled

R&D ** all five test expelled the required balls successfully**

5.2.5 Over splashing PASSED

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

- Use paper of a type which shows surface change when wet
- **Procedure:** Lay the paper around the WC pan to be tested projecting 200mm (7.87in) beyond the plan of the bowl projected onto the floor. Flush the WC pan and record evidence of water on the paper.

R&D ** The Over splashing test was successful, there were only two small drops found on the surrounding paper**

5.2.6 After-flush volume

When tested an after-flush volume of 2.05 or 2.08 liters, as appropriate is required

R&D ** After flushing the water volume inside the bowl was 1.5 liters**

5.5.5 Leak tightness flushing cistern and bowl PASSED

When tested there shall be no leakage between the WC pan and the flushing cistern.

R&D ** After flushing there were no leaks detected at the cistern, the connection of the cistern to the WC, or the WC itself NOTE—Proper installation will avoid leaks**

5.5.6 Outlet valve reliability PASSED

When tested the outlet shall not show any leakage greater than three drops within a 15min period.

Procedure

- Fill the flushing cistern to the water level corresponding to the normal flush volume indicated by the manufacture.
- Actuate the flushing mechanism and allow the flushing cistern to fill again
- Leave the flushing cistern for a period of 2 hours
- Wipe the outlet orifice dry
- Place a piece of paper under the flushing cistern
- Leave for 15 minutes and observe and record any water marks on the paper. No more than three drops are permitted.

R&D **following the above procedure, the cistern only dripped once during the 15 minute observation period**

5.5.7 Outlet valve reliability PASSED

When tested the outlet mechanism functions shall be ensured. The flushing device shall not show any failure or permanent distortion of any component, including leakages that prevent normal operation of the mechanism.

R&D **the cistern flushed and performed to normal operating standards without failure**

5.6 Durability

Class 1 products conforming to the requirements of 5.2 to 5.4 and 5.5.5 to 5.5.10 are deemed durable

- 5.2 to 5.4 passed all flushing requirements
- 5.5.5 to 5.5.10 passed all requirements

5.4 Static load PASSED

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 (899 LBS) without showing any evidence of cracking or permanent deformation.

5.8.4 Load test PASSED

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 ± 0.05) kN (899 LBS) shall be applied for a period of 1 hour by means of a beam with a cross section of 100 mm x 100 mm positioned across the center of the top surface of the WC pan (see Figure 1).

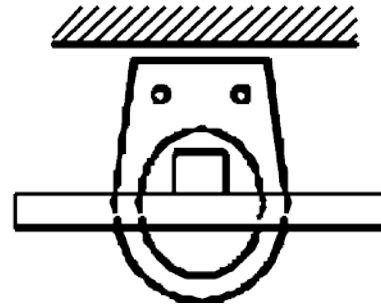


Figure 1 — Load test

R&D: The unit was secured to a fixture and a load of 900LBS was applied. Measurements were taken prior to the load being applied. After 1 hour the load was removed and the measurements were then compared. Following the requirements set place by 5.8.4, there was no permanent deflection once the load was removed. An addition inspection took place looking for cracks, broken welds, and distortion, none were found.

Photos before load was applied**Load Applied****Photos after load was removed**