

# DIN EN 997:2018-12 (E)

## WC pans and WC suites with integral trap

---

<b>Contents</b>		<b>Page</b>
European foreword .....		5
<b>1</b>	<b>Scope .....</b>	<b>6</b>
<b>2</b>	<b>Normative references .....</b>	<b>6</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>6</b>
<b>4</b>	<b>Classification .....</b>	<b>11</b>
<b>5</b>	<b>Functional characteristics and test methods for type 1 products .....</b>	<b>11</b>
5.1	Depth of water seal .....	11
5.2	Flushing characteristics .....	11
5.2.1	General .....	11
5.2.2	Wash of bowl .....	11
5.2.3	Flushing of toilet paper .....	12
5.2.4	Flushing of fifty small plastic balls .....	12
5.2.5	Oversplashing .....	12
5.2.6	After-flush volume .....	12
5.3	Water absorption .....	12
5.4	Static load .....	12
5.5	Additional characteristics of flushing cisterns for close-coupled suites and one-piece WCs .....	12
5.5.1	General .....	12
5.5.2	Inlet valve of the flushing cistern .....	12
5.5.3	Supply piping .....	12
5.5.4	Flush volume(s) of the flushing cistern .....	13
5.5.5	Leak-tightness between flushing cistern and bowl .....	13
5.5.6	Outlet valve leak-tightness .....	13
5.5.7	Outlet valve reliability .....	13
5.5.8	Overflow .....	13
5.5.9	Safety margin - dimension "c" .....	14
5.5.10	Safety margin - dimension "a" .....	15
5.6	Durability .....	15
5.7	Test methods .....	15
5.7.1	Depth of water seal .....	15
5.7.2	Flushing tests .....	15
5.7.3	Determination of water absorption .....	18
5.7.4	Load test .....	19
5.7.5	Tests for flushing cisterns of close-coupled suites and one-piece WCs .....	20
5.8	Sub-types of independent WC pans, close-coupled suites and one-piece WCs .....	23
5.8.1	Nominal flush volume .....	23
5.8.2	Flushing devices .....	23
5.8.3	Verification of sub-types .....	24
<b>6</b>	<b>Functional characteristics and test methods for type 2 products .....</b>	<b>24</b>
6.1	Inlet valve .....	24
6.2	Backflow prevention .....	24
6.3	Marking of flushing cistern .....	24
6.4	Warning pipe and overflow provision .....	24
6.5	Flush volume .....	25
6.5.1	Full flush .....	25

6.5.2	Reduced flush .....	25
6.6	Flush rate .....	25
6.7	Physical endurance and leakage of flushing device .....	25
6.8	Chemical endurance of flushing device .....	25
6.9	Solids discharge and after-flush volume for maximum flush .....	25
6.10	Paper discharge for reduced-flush volume .....	25
6.11	Liquid contaminant dye retention .....	25
6.12	Wash of bowl .....	26
6.13	Depth of water seal .....	26
6.14	Static load of type 2 products .....	26
6.15	Water absorption .....	26
6.16	Durability of type 2 products .....	26
6.17	Test methods .....	26
6.17.1	Inlet valve tests .....	26
6.17.2	Warning pipe and overflow provisions .....	26
6.17.3	Flush volume and water trap seal tests .....	27
6.17.4	Flush rate test .....	27
6.17.5	Physical endurance and leakage test of flushing device .....	29
6.17.6	Chemical endurance test of flushing device .....	30
6.17.7	Solids discharge and after-flush volume for maximum flush volume test .....	30
6.17.8	Paper discharge for reduced-flush volume test .....	31
6.17.9	Liquid contaminant dye retention test .....	32
6.17.10	Wash of bowl .....	33
6.17.11	Summary of requirements for compatibility testing of type 2 products .....	33
7	Dangerous substances .....	34
8	Marking .....	34
9	Assessment and verification of constancy of performance - AVCP .....	37
9.1	General .....	37
9.2	Type testing .....	37
9.2.1	General .....	37
9.2.2	Test samples, testing and compliance criteria .....	38
9.3	Factory production control (FPC) .....	39
9.3.1	General .....	39
9.3.2	Equipment .....	40
9.3.3	Raw materials and components .....	40
9.3.4	Product testing and assessment .....	40
9.3.5	Non-complying products .....	40
9.3.6	Corrective action .....	40
Annex A (normative) Valve-type test flushing cistern .....		41
A.1	Valve-type test flushing cistern (Figures A.1 to A.3) .....	41
A.2	Calibration of the valve-type test flushing cistern .....	43
A.3	Procedure to test the flush rate of the test flushing cistern .....	43
A.4	Procedure to test the flushing requirements of the WC .....	44
A.5	Procedure to measure the impact force of the test flushing cistern .....	44
A.5.1	General .....	44
A.5.2	Test device .....	44
A.5.3	Procedure for calibrating the load cell unit and the measurement amplifier .....	46
A.5.4	Measurement procedure .....	46
A.5.5	Calculation procedure for fixed time frame 0,35 s to 0,5 s .....	47
A.5.6	Calculation procedure for maximum impact force .....	47
Annex B (normative) Test rig for test pressure flush valve .....		48
B.1	Test rig (Figure B.1) .....	48
B.2	Procedure to measure the impact force .....	49
Annex C (normative) Test rig for after-flush volume test .....		51

<b>C.1</b>	<b>Test rig for after-flush volume test for independent WC pans (Figures C.1 and C.2)</b> .....	<b>51</b>
<b>C.2</b>	<b>Test rig for after-flush volume test for one-piece WC pans, close-coupled suites and WC suites (Figure C.3)</b> .....	<b>52</b>
<b>Annex D (normative)</b>	<b>Basket method</b> .....	<b>53</b>
<b>Annex E (normative)</b>	<b>Preparation of test specimens</b> .....	<b>54</b>
<b>Annex F (normative)</b>	<b>Examples of flush pipes and outlet valves for test flushing cisterns</b> .....	<b>57</b>
<b>Annex ZA (informative)</b>	<b>Relationship of this European Standard with Regulation (EU) No.305/2011</b> ..	<b>61</b>
<b>Bibliography</b>	.....	<b>64</b>