

Sanitary Components

Technical document 076-06

Connection elements for toilets,
urinals and squat toilets

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Modification history

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1 Scope

This document specifies the requirements pertaining to the design and performance, as well as the test methods applicable to the connection elements used for toilets, urinals and squat toilets.

This document does not cover the following: extensible discharge pipes, discharge pipes with tapping or pipes with a trap.

2 Definitions

Discharge pipe:

Multi-material connection element(s) designed to connect toilets, urinals, bedpan closets and squat toilets (wall-hung or pedestal) to the drainage system.

Flush pipe:

Connecting tube between the flushing cistern and the WC pan water supply system, the urinal, the bedpan toilet and the squat toilet.

3 Materials/Design/Manufacture

All the materials used shall be compatible in terms of use. No material may be excluded from the above-mentioned scope provided that the connection elements comply with the technical requirements in § 4.

Manufacturers shall declare the hardness classification applicable to the joint seals used in accordance with Standard NF EN 681-1 § 3.

The elastomers and silicones used for the joint seals shall have a sufficient life span that is compatible with their intended use, and low moisture content regain. In addition, their resistance to disinfecting products shall be satisfactory.

Elastomers shall comply with the following:

- specifications 4.2.3, 4.2.4, 4.2.5, 4.2.8, 4.2.9 for the corresponding classes in Table 2 of Standard NF EN 681-1
or
- specifications 5.3, 5.4, 5.5, 5.8, 5.9 for the corresponding classes in Table 2 of Standard NF EN 681-2.

4 Technical Requirements

4.1 Dimensions

The flush pipe shall comply with Standard NF EN 14055.

The discharge pipe shall conform to devices that comply with Standards NF EN 33, NF EN 80 or NF D 11-130. In addition, its diameter shall comply with the following standards pertaining to piping systems for wastewater discharge:

- NF EN 1329-1 for PVC-U piping
- NF EN 1451-1 for PP piping
- NF EN 1519-1 for PE piping
- NF EN 877/A1 for cast iron piping

If the discharge pipe can be cut again, the diameter shall be measured over the whole cutting range declared by the manufacturer.

4.2 Impact resistance of the connection elements

The test is performed on unassembled discharge pipes and flush pipes.

It shall be conducted at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and consists in dropping each connection element as delivered three times in a row, from a table from a height of 800 mm, + 50 mm, - 50 mm onto a concrete surface, by positioning the samples differently before the next drop.

At the end of the three drops, the tested sample shall not show any sign of deformation visible to the naked eye, or any crack likely to impair its proper functioning.

4.3 Tightness

4.3.1 Water tightness of the discharge pipe

The test shall be carried out after the impact resistance test specified in § 4.2, using the test bench described in Figure 1.

The discharge pipe (oriented upwards) shall be connected to the metal template described in Figure 2 in accordance with the manufacturer's installation instructions (lubrication of the joint seal). The pipe to be tested shall be held vertically throughout the duration of the test. The tightness test shall be undertaken by filling up the pipe completely with water.

Specification: no leakage for at least 15 min.

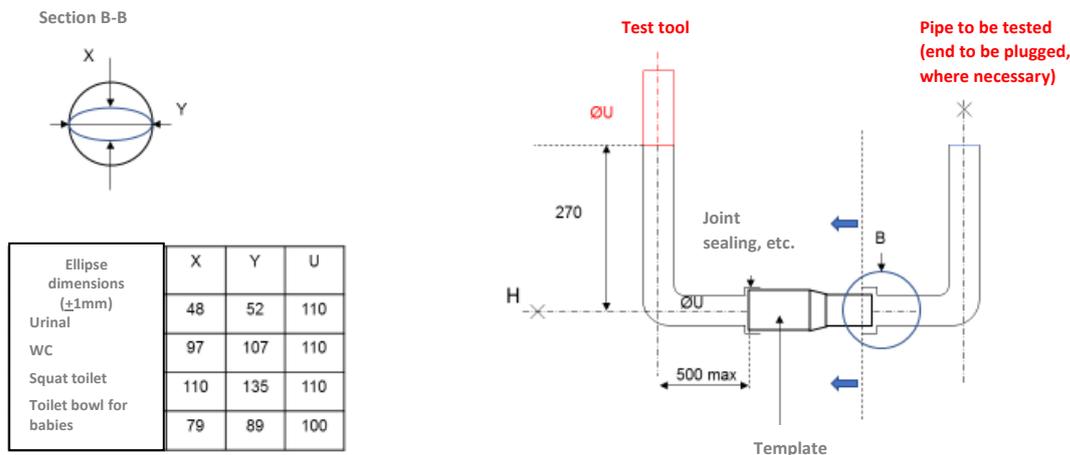


Figure 1: Test arrangement for water tightness (dimensions in mm)

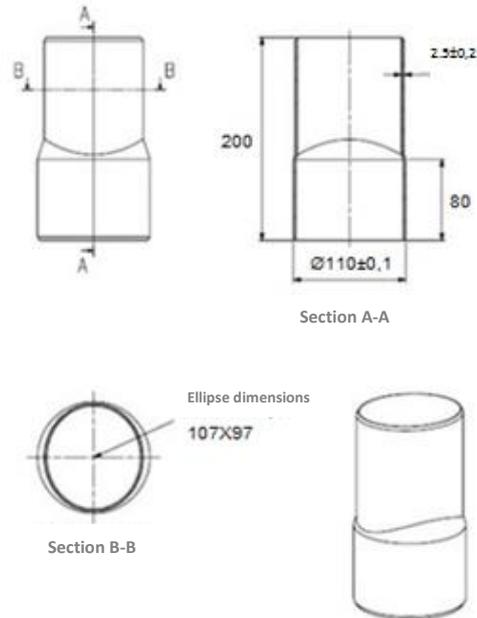


Figure 2: Template for water tightness test to simulate the sanitary appliances' outlet (dimensions in mm)

4.3.2 Air tightness of the discharge pipe

The test shall be carried out on all the elements that make up the discharge pipe using the test arrangement described in Figure 3, making sure that the water temperature does not vary by more than $\pm 2^\circ\text{C}$ during the test. The discharge pipe shall be installed on the test bench according to the manufacturer's installation instructions (lubrication of the joint seal).

It shall be connected to an air tight pipe, $2.0\text{l} \pm 0.2\text{l}$ in volume, which shall be as short as possible.

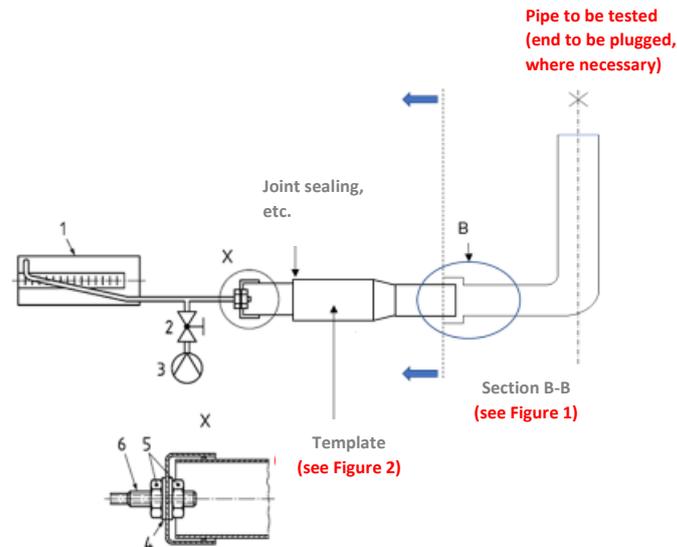
A positive pressure of 200^{+50}_0 Pa shall be applied by means of a hand-operated pump (or equivalent).

The pressure measurements shall be carried out using an incline tube manometer, a U-tube manometer or similar.

Once the pressure is stable, valve 2 (see Figure 3) is to be closed.

If the pressure has not stabilized within 2 min, the test shall be interrupted (test failed).

After 15 min, make sure that the pressure has not dropped by $\geq 10\%$ of the stabilized value.



Caption

- 1 incline tube manometer or U-tube manometer or similar
- 2 valve
- 3 pump
- 4 seal and washers
- 5 nuts
- 6 threaded end of tube

Figure 3: Test arrangement for air tightness

4.4 Fixing the flush pipe and discharge pipe firmly onto the built-in frame

In order to check that the connection elements are properly fixed onto the built-in frame, a WC pan is to be installed on the frame according to the manufacturer's instructions.

The flush pipe and the discharge pipe shall remain integral with the built-in frame.

4.5 Compatibility of the connection elements with the products used for disinfection of water distribution networks

All the materials used for flush pipes and discharge pipes shall be compatible with the products used for the disinfection of networks. All the constituent parts, and in particular those made of elastomer, shall be compatible with water treated with potassium permanganate or sodium hypochlorite when disinfecting the networks.

This compatibility shall be verified by placing the inner parts of the flush pipe and discharge pipe into contact with the following products:

- for 96h, with a solution containing 0.30 g potassium permanganate per litre of demineralized water,
- for 24h, with a solution containing 0.10 g sodium hypochlorite per litre of demineralized water.

The test shall be conducted at ambient temperature.

At the end of the test, a visual examination of the connection elements shall be made and shall not reveal any change in appearance, or any deformation.

4.6 Marking

The connection elements shall be marked clearly and durably and specify the following: casting, engraving, painting, punching, labelling, etc.:

- Manufacturer's name and/or trademark and/or code
- Identification of the diameter (DE)

In addition, manufacturers shall implement a quality system to ensure traceability of the products.

5 Quality requirements of the manufacturer's production

5.1 Nature and frequency of the inspection operations

5.1.1 Inspection during production

The manufacturer shall make sure that the characteristics described in paragraphs 3 and 4 of this document are complied with. However, procedures and equipment different from those described in the standards may be used.

During manufacture, the functions to be checked as well as their frequency are specified below.

Table 1: Inspection during manufacture

Controlled function	Inspection frequency
Supply of materials and components	Identification of the material for each batch, at each delivery or supplier's certificate of conformity and/or inspection
Standardised dimensions	Quality documentation
Impact resistance	Quality documentation
Anchoring	Quality documentation
Marking	Quality documentation

5.1.2 Inspection of finished products

The procedures for the inspections carried out on finished products in the plant laboratory or in an outside laboratory and the test rigs used shall conform to the specifications defined in paragraphs 3 and 4 of this document. However, different procedures and test rigs may be used provided that the results obtained are identical and subject to CSTB's agreement.

The products to be controlled are sampled at the end of the assembly lines (after packaging) or on entry into the warehouse.

The types of inspections on finished products and their sampling are given in the table below.

Table 2: Inspection of finished products

Tests (§ in Technical Document 076-06)	Sampling: Requirements or sampling plans approved by CSTB
Dimensional characteristics (§4.1)	Yes
Impact resistance (§4.2)	Yes
Water tightness (§4.3.1)	Twice a year per discharge pipe model
Air tightness (§4.3.2)	Yes
Anchoring (§1.14)	Yes
Compatibility with the products used for disinfection of water distribution networks (§4.5)	Yes

6 Procedures of inspections carried out by CSTB

6.1 Types of products

The different types of products controlled by the inspection body or bodies and tested by the laboratory or laboratories of the NF mark are connection elements used for toilets, urinals and squat toilets (flush pipes and discharge pipes).

6.2 Nature of inspections

The inspections and tests are carried out in conformity with paragraphs 3 and 4 of this document.

Test no.	Type of test
1	Verification of dimensional characteristics
2	Impact resistance
3	Water tightness
4	Air tightness
5	Anchoring
6	Compatibility with the products used for disinfection of water distribution networks
7	Marking

6.3 Sampling

6.3.1 Admission case

The tests are performed on the samples taken during the admission audit, according to the conditions described below.

Tests 1 to 6 are carried out on all the models and, in the event of a range of products, on 1 representative product.

As regards marking (item 7), the manufacturer shall submit an implementation project.

6.3.2 Follow-up case

The tests are performed on the samples taken during the follow-up audit, according to the conditions described below.

Test no.	Type of inspections of products and sampling
1 to 6	1 flush pipe model and 1 discharge pipe model

6.3.3 Case of complementary admission (new products) or extension (modified products)

Following CSTB's agreement and depending on the modifications, the manufacturer shall send the samples necessary for the tests for the tests to be performed.