

Translation from Finnish

Legally binding only in Finnish and Swedish

3/19

Decree of the Ministry of the Environment

on the Type Approval of Brass and Copper Pipe Fittings Intended for Water Supply Systems of Buildings

By decision of the Ministry of the Environment, the following is enacted pursuant to section 6, subsection 3; section 9, subsection 2; and section 10, subsection 3 of the Act on the Type Approval of Certain Construction Products (954/2012):

Section 1

Scope of application

This Decree applies to the requirements of type approval of brass and copper pipe fittings of water supply systems intended for conducting household water and domestic hot water in a building and on property. This Decree shall also be applicable to pipe fittings manufactured of other copper alloys.

This Decree covers pipe fittings and manifolds whose threaded reducer size ranges from 1/4 inch to 4 inches (nominal size DN 8 - DN 100). This Decree also applies to pipe fittings with capillary reducers for copper pipes with a nominal outside diameter of 10-108 millimetres.

Section 2

Definitions

In this Decree:

- 1) *The nominal size of pipe fittings* means the dimensionless integer relating to the thread size of threaded pipe fittings.
- 2) *The nominal diameter of pipe fittings* means the nominal outside diameter of the copper pipe intended to be connected to the socket-type reducer of the capillary parts.

Section 3

Establishment of conformity

Type approval can be used to demonstrate that the pipe fittings comply with the essential technical requirements laid down in section 117 c of the Land Use and Building Act (132/1999), as amended by Act (958/2012), and thereunder.

Section 4

Suitability for conducting household water

An accredited testing laboratory shall inspect the information on the material of the pipe fittings.

An accredited testing laboratory shall test the concentration of lead dissolved into test water from the manufacturing material of the pipe fitting with a 26-week long dissolution test, or the dissolution of lead and cadmium from the pipe fitting with a 10-day test in accordance with Appendix 1.

Section 5

Composition and materials

An accredited testing laboratory shall analyse the chemical composition of the metal parts of the pipe fittings that come into contact with water. The composition shall conform to the composition stated by the manufacturer.

Section 6

Corrosion resistance

An accredited testing laboratory shall measure the dezincification resistance of the pipe fitting for a copper pipe if the zinc content of the composition of the pipe fitting exceeds 15 per cent.

An accredited testing laboratory shall test the stress corrosion resistance of brass pipe fittings if the structure is found susceptible to stress corrosion in the visual inspection of the pipe fitting without magnification. In the test, no cracks that are visible with a ten-fold magnification may appear in the parts.

Section 7

Surface properties

An accredited testing laboratory shall examine the outer appearance of the pipe fittings visually without magnification.

Section 8

Structure and dimensions

An accredited testing laboratory shall examine the structure and dimensions of the pipe fittings.

Section 9

Tightness

An accredited testing laboratory shall test the tightness of the pipe fitting with a test pressure of 2.5 ± 0.1 Mpa. In the test, the water temperature shall be 5–25 degrees Celsius. The test period is 15 minutes. In the test, the pipe fitting shall be tight.

Section 10

Marking

An accredited testing laboratory shall inspect the markings of the pipe fittings.

Section 11

Type testing

For type approval, an accredited testing laboratory shall type test the pipe fittings in accordance with the extent of testing presented in Table 2.1 of Appendix 2. For type testing, the manufacturer shall, in addition to the samples, submit product designs and raw-material information.

Section 12

Quality control relating to type approval

The certifying body for quality control shall verify that the pipe fittings comply with the requirements of type approval and also meet the conditions set in the decision on type approval.

The certifying body for quality control shall carry out an initial inspection of the production, an on-going control of the internal production quality control as well as the selection of random samples of products and their testing once annually or more frequently if the products do not meet the type-approval requirements. The extent of testing of random samples is presented in Table 2.2 of Appendix 2.

The manufacturer's internal production quality control shall cover at least the inspections and tests presented in Table 3.1 of Appendix 3.

Section 13

Entry into force

This Decree enters into force on 1 January 2020.

Helsinki, 9 April 2019

Minister of the Environment, Energy and Housing Kimmo Tiilikainen

Senior Specialist Tomi Marjamäki

Dissolution of heavy metals - test method

Dissolution of heavy metals (lead and cadmium) shall be tested on an unused pipe fitting with a ten-day test.

Test solution

The test solution (synthetic potable household water) shall be prepared by weighing 50 milligrams of NaCl, 50 milligrams of Na₂SO₄ and 50 milligrams of CaCO₃ (all p.a. quality) per litre of distilled and /or deionized water. The solution shall be stirred and CO₂ shall be bubbled therein until all CaCO₃ has dissolved. After that air shall be bubbled into the solution while stirring it until the pH value has reached 7.0± 0.1. Since CaCO₃ dissolves very slowly, it must be ensured that all CaCO₃ has dissolved before air is bubbled; if not, the solution will not stabilize.

The test solution may also be prepared by weighing 50 milligrams of NaCl, 50 milligrams of Na₂SO₄ and 37 milligrams of Ca(OH)₂ (all p.a. quality) per litre of distilled and /or deionized water. The solution shall be stirred until Ca(OH)₂ is almost dissolved and CO₂ shall be bubbled therein until the pH value is below five. After that air shall be bubbled into the solution while stirring it until the pH value has reached 7.0± 0.1. This preparation method will make the dissolution of the salts easier.

The synthetic potable household water shall be prepared either immediately before each water replacement or it shall be ensured that the solution is clear and that its pH value is 7.0 ± 0.1 at least in connection with the water replacements on days four, eight and nine. A blank sample shall be taken in connection with the water replacements on days 8 and 9.

Analysis apparatus

An atomic absorption spectrometer equipped with a graphite furnace or another sufficiently sensitive measuring instrument. The limit of determination shall be at least 0.1 micrograms per litre for lead (Pb) and 0.02 micrograms per litre for cadmium (Cd).

Test method

The sample shall be degreased with pure ethanol for those parts that come into contact with potable household water. After that, tap water shall be run through the sample for one hour at the flow rate corresponding to the flow rate of 1-2 meters per second in the pipe fitting. Stoppers made of colourless polyethylene or covered with a polyethylene coating shall be used in the flow orifices of the sample. The stoppers may also be made of other material as long as no cadmium or lead is dissolved therefrom. The sample shall be immediately rinsed with synthetic potable household water by filling it halfway and shaking it for approximately 30 seconds, after which the water is poured off. Immediately after that the sample shall be filled with synthetic potable household water so that no air remains inside it and its flow orifices are equipped with stoppers.

The synthetic potable household water shall be let stand in the sample for 24 hours, after which it is emptied, the amount of water is measured and the sample is refilled. The synthetic potable household water in the sample shall be replaced after days 1, 2, 3, 4, 7, 8 and 9. It shall be checked that the amount of water emptied from the sample remains constant (± 10 per cent).

The water samples replaced after days 8 and 9 (test period of 9 and 10 days) shall be analysed for cadmium and lead. The measured concentrations deducted with the equivalent concentrations in the blank samples shall be indicated in the results (micrograms per litre). In addition,

the total amounts of cadmium and lead (in micrograms) derived from the concentrations and the water volume of the sample as well as the water volume of the sample in litres shall be indicated.

Type testing of brass and copper pipe fittings and the tests used in the verification of quality control

Table 2.1. The properties to be tested in the type testing of pipe fittings and the samples to be tested.

Property	Samples to be tested
Outer appearance, structure and dimensions	1 pc/size, all sizes
<u>Brass pipe fittings</u>	
Dissolution of heavy metals	1–2 pcs, DN 25–DN 80
Composition of material	1 pcs/size, 3 fittings of different types
Dezincification resistance	1 pcs/size, 2 fittings of different types
Stress corrosion	On the basis of visual inspection
Tightness	On the basis of visual inspection
<u>Copper capillary parts</u>	
Composition of material	1 pcs/size, 3 sizes

Table 2.2. Properties to be tested in the verification of quality control of the manufacture of pipe fittings and their testing frequency.

Property	Testing frequency
Outer appearance, structure and dimensions	3 pcs/size, 3 sizes/year. Sizes to be tested shall be alternated annually
<u>Brass pipe fittings</u>	
Composition of material	1 pc/size, 3 sizes/year
Dezincification resistance	Need for testing shall be assessed on the basis of a chemical analysis
<u>Copper capillary parts</u>	
Composition of material	1 pc/size, 3 sizes/year
Markings	All samples to be tested

Testing by the manufacturer's internal quality control

Table 3.1. Testing by the internal quality control of the manufacture of pipe fittings and its minimum frequency.

Inspection ¹⁾	Frequency ¹⁾
Material acceptance inspection	Each accepted batch, material certificates, inspections and any non-conformities observed shall be recorded
Outer appearance Dimensions	At the beginning and end of the manufacture of a production batch as well as at least once every eight hours
Tightness of cast parts	All parts subject to water pressure
Markings	At the beginning and end of the manufacture of a production batch as well as at least once every eight hours.
¹⁾ The manufacturer shall have a documented procedure for the performance of internal quality control and the handling of non-conformities. With regard to personnel, production equipment as well as measuring and testing instruments, the manufacturer shall have adequate preconditions for manufacturing uniform products.	