

**Translation from Finnish**

**Legally binding only in Finnish and Swedish**

**2/19**

## **Decree of the Ministry of the Environment**

### **on the Type Approval of Copper Pipes 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 copper pipes of water supply systems intended for conducting household water and domestic hot water in a building and on property.

This Decree covers copper pipes with a nominal outside diameter of 10-108 millimetres.

#### Section 2

##### *Establishment of conformity*

Type approval can be used to demonstrate that the copper pipes 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 3

##### *Chemical composition*

An accredited testing laboratory shall analyse the chemical composition of the copper pipe. The chemical composition of a copper pipe shall be analysed using a European or an international method of analysis.

#### Section 4

##### *Measuring of tensile strength and elongation*

An accredited testing laboratory shall measure the tensile strength and elongation of a copper pipe. The tensile strength and elongation shall be measured with a tensile test in accordance with a European or an international test method.

#### Section 5

##### *Dimensions and tolerances*

An accredited testing laboratory shall examine the dimensions and tolerances of the copper pipes.

#### Section 6

##### *Freedom from defects*

An accredited testing laboratory shall test the freedom from defects of a copper pipe with an eddy current inspection.

#### Section 7

##### *Surface properties*

An accredited testing laboratory shall examine the inner and outer surfaces of a copper pipe visually without magnification.

An accredited testing laboratory shall determine the carbon content of the inner surface using quantitative combustion analysis.

An accredited testing laboratory shall examine the occurrence of carbon film on the inner surface using qualitative carbon film analysis.

#### Section 8

##### *Bending test*

An accredited testing laboratory shall use the bending test to test copper pipes with a nominal outside diameter of 10-18 millimetres in R290 (hard) material condition. The test shall be carried out in room temperature without internal mandrel. The test piece shall be bent to an angle of 90 degrees with the minimum radius of curvature given in Table 1. In the test, the pipe may not exhibit visible contraction marks. The presence of stretcher strain marks is accepted.

Table 1. Minimum radius of curvature.

Nominal outside diameter $d_n$	Minimum radius of curvature	
	Internal radius of curvature	Neutral axis radius
10	35	40
12	39	45
15	48	55
18	61	70

### Section 9

#### *Drift expanding test*

An accredited testing laboratory shall perform a drift expanding test on copper pipes with a nominal outside diameter of 10-18 millimetres in material conditions R220 (annealed) and R250 (half hard). In the drift expanding test, the outside diameter of the pipe end shall be expanded by 30 per cent using a conical mandrel with an angle of 45 degrees. The drift expanding test may not cause visible cracks, breaks or necking in the pipe.

### Section 10

#### *Marking*

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

### Section 11

#### *Type testing*

For type approval, an accredited testing laboratory shall type test the copper pipes in accordance with the extent of testing presented in Table 1.1 of Appendix 1. For type testing, the manufacturer shall, in addition to samples, submit information on the chemical composition of the raw material, pipe sizes and material conditions.

### Section 12

#### *Quality control relating to type approval*

The verification of quality control of copper pipes shall ensure that the copper pipes 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 1.2 of Appendix 1.

The manufacturer's internal production quality control shall cover at least the inspections and tests presented in Table 2.1 of Appendix 2.

### 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

**Type testing and external quality control of copper pipes**

Table 1.1. The properties to be tested in the type tests of copper pipes and the number of samples.

<b>Property to be tested</b>	<b>Test method</b>	<b>Samples to be tested <sup>1)</sup></b>
Chemical composition	Analysis	All samples
Mechanical properties	Tensile test	All samples
Dimensions and tolerances	Determination of the cross-sectional dimensions of a pipe	All samples
Freedom from defects	Eddy current inspection	At least two pipe sizes
Surface quality	Visual surface quality inspection, carbon content determination and carbon film test	All samples
Bending	Bending test	1 sample/pipe size, limitation in section 8
Drift expanding	Drift expanding test	1 sample/pipe size, limitation in section 9
Marking	Inspection of pipe markings	All samples

<sup>1)</sup> At least 10 copper pipes including different pipe sizes and material conditions.

Table 1.2. Tests belonging to the external quality control of copper pipes and the number of samples.

<b>Property to be tested</b>	<b>Test method</b>	<b>Samples to be tested <sup>1)</sup></b>
Chemical composition	Analysis	All samples
Mechanical properties	Tensile test	All samples
Dimensions and tolerances	Determination of the cross-sectional dimensions of a pipe	All samples
Surface quality	Visual surface quality inspection, carbon content determination and carbon film test	All samples
Bending	Bending test	1 sample/pipe size, limitation in section 8
Drift expanding	Drift expanding test	1 sample/pipe size, limitation in section 9
Marking	Inspection of pipe markings	All samples

<sup>1)</sup> At least 3 copper pipes annually, including different pipe sizes and material conditions.

**Testing by the manufacturer's internal quality control**

Table 2.1. Internal quality control tests of the manufacture of copper pipes.

<b>Procedure</b>	<b>Measures</b>
Methods	Production methods shall be recorded.
Personnel	The liabilities, powers and relations of personnel shall be determined.
Regular inspections	Conformity of equipment shall be examined on a regular basis.
Tests/assessments	The manufacturer shall, on a regular basis, perform on the products tensile tests and determine tensile strength as well as elongation, examine dimensions and freedom from defects, determine carbon content, perform carbon film tests as well as bending tests.
Raw-material acceptance inspections	Raw-material specifications and all inspections shall be documented
Regular surveillance of equipment, processes and products	All equipment used in the establishment of conformity of products shall be calibrated or verified.
Non-conforming products	Written instructions for dealing with non-conforming products.