

**Unofficial translation.**

**Legally binding only in Finnish and Swedish**

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

### **on the Structures and Fire safety of Chimneys**

By decision of the Ministry of the Environment, the following is enacted pursuant to section 117 b, subsection 3 of the Land Use and Building Act (132/1999), as amended by Act 958/2012:

#### Section 1

##### *Scope of application*

This Decree shall apply to the design, construction and maintenance of chimneys the total thermal input to the fireplaces connected to which does not exceed 120 kW as well as to the design and construction of repair and alteration work on or affecting them.

The repair and alteration work shall include the retrofitting of a chimney, the repair or coating of a chimney or a smoke flue, the exchange or alteration of a fireplace as well as the installation of a new smoke flue to a chimney or to a building element in another use.

#### Section 2

##### *Definitions*

In this Decree:

1) *Class A1 products* mean building products, materials or components used for building which do not contribute to fire;

2) *acid dew point* means the temperature at which corrosive acid from combustion gas containing sulphuric compounds or sulphur chlorides begins to condense on the inner surface of the smoke flue;

3) *pointing* means the packing of mortar in a joint that was left incomplete in connection with the masonry;

4) *a system chimney* means a chimney specified in the harmonised product standard published in the Official Journal of the European Union;

5) *a gas fireplace* means a fireplace that uses natural gas or liquid petroleum gas or is equipped with a gas burner;

6) *mortar* means a mixture of binding agents, aggregate, water and air which may also contain additives, colouring agents and filling agents;

7) *a connecting flue pipe* means a separate channel belonging to a fireplace which connects the fireplace to the smoke flue through a connective flue or directly;

8) *a heating apparatus* means a device belonging to a building or located outside it where solid, liquid or gaseous substances are burnt and which is connected to the chimney of the building or to a separate chimney;

9) *temperature class (T-class)* means the class which indicates the product-specific highest allowed temperature of the combustion gases conducted to a chimney constructed of CE marked smoke flue products;

10) *a masonry fireplace* means a device built on site mainly of masonry components and mortar which uses solid fuel and which may also contain metallic or other fireproof parts or fireproof masonry components joined together in various ways;

11) *a masonry component* means a component of a specific shape intended to be used in a masonry structure;

12) *soot fire* means a situation where the ignition of soot collected in the smoke flue causes the flue to heat, which may damage the chimney;

13) *soot fire resistance class G* means the classification given to a smoke flue on the basis of a soot fire test relating to the CE marking (G = soot fire resistant) where the soot fire resistance is tested by conducting to the chimney gas of 1000 degrees centigrade in temperature for 30 minutes;

14) *a chimney laid on site* means a chimney laid on site mainly of bricks and mortar;

15) *a chimney built on site of metal* means a chimney built on site mainly of metal fittings and Class A1 heat insulation material;

16) *burnt brick* means a masonry component composed of clay or clayey materials, possibly also of sand, fuel or other additives and burned in a sufficiently high temperature in order to achieve a ceramic bond;

17) *clay mortar* means mortar containing mainly clay, water and sand but which may also contain additives;

18) *a smoke flue* means the channel and its walls used for extracting combustion gases produced in a fireplace along which the combustion products are conveyed to open air. A fireplace may be connected to a smoke flue with separate connective flues or connecting flue pipes;

19) *a chimney* means a usually vertical building element with one or several smoke flues where the thermal input to the fireplaces connected to it does not exceed 120 kW; a chimney may be prefabricated or a system chimney or laid on site or built on site of metal or an individual component (non-series produced) manufactured on site or elsewhere;

20) *a damper* means a device which can be used to close the flow of combustion gases and air formed by the smoke flue;

21) *a weather guard* means a structure on top of a chimney which protects the chimney from the effects of the weather;

22) *a prefabricated chimney* means a chimney defined in the harmonised product standard published in the Official Journal of the European Union;

23) *a fireplace* means a device in a building intended for the burning of solid, liquid or gaseous substances, the combustion gases from which are conducted through a chimney to open air. A heating apparatus in accordance with the definition of this Decree shall be a fireplace;

24) *thermal input to the fireplace* means the rate arrived at by multiplying the amount of fuel used by the fireplace within a given period of time, i.e., the mass flow rate (kg/s), with the lower, i.e., the net calorific value, of the fuel (kJ/kg) (in kW);

25) *a fire brick* means a ceramic masonry component capable of withstanding high temperatures and temperature changes and made by burning special clay and additives;

26) *draft* means the inherent ability of a chimney to conduct combustion gases to open air. The factors that affect the draft are the fireplace, the length and form as well as size of the connecting flue pipe, the height of the chimney, the airflow resistance of the smoke flue, the fluid mechanical properties of the top of the chimney and its placement as well as the prevailing temperature differences and the local airflow conditions caused by buildings and topography;

27) *water dew point* means the temperature at which the water vapour in the combustion gases starts to condense as water;

28) *a connective flue* means a separate part of a smoke flue between a fireplace and a chimney but not belonging to the chimney.

### Section 3

#### *Design of a chimney*

The principal designer, construction designer and specialist designer shall, in accordance with their respective duties, design the chimney with penetrations, its foundation or other substructure, brackets and vertical structure as well as chimney hatches and connective flues as well as connecting flue pipes and attachments so that the draft, structural durability, integrity and service life necessary for the operation of a fireplace connected to it are achieved. The chimney may not pose a risk of fire or explosion taking into account the fireplaces to be connected thereto and the fuels to be used in the fireplaces. The chimney shall sustain any loads directed thereat, weathering, deformations and stress resulting from freezing, thawing, temperature changes and compounds forming at the acid dew point.

The chimney and its surrounding premises shall be designed and constructed so that the chimney and its flues can be cleaned and its integrity and condition inspected. In designing a repair of a chimney, the condition of the chimney to be repaired as well as the products to be used in its construction and the properties of the combustion gases to be conducted thereto shall be taken into account.

The design shall present the products to be used in the construction, the installation instructions of the chimney and the fireplace to be connected thereto, the information needed in the instructions for use and maintenance as well as the interoperability with the temperature of the combustion gases to be conducted from the fireplace to the chimney, the principles for penetrations with information on the sealing of the joints as well as the safety distances and cleaning. The drainage of condensate condensing at the water dew point shall be presented in the design if condensation can occur.

### Section 4

#### *Chimney laid on site*

The minimum wall thickness of a chimney laid on site of bricks shall be 120 mm when the total thermal input to the fireplaces connected to one smoke flue does not exceed 60 kW, and a minimum of 230 mm when the thermal input to the fireplaces connected to one smoke flue does not exceed 60-120 kW. The parts of the external wall inside a building shall be coated with a Class A1 filler up to the level of the roofing. The parts of the chimney visible in room premises, which have been struck, may be left uncoated. When the total thermal input to the fireplaces connected to one smoke flue does not exceed 60 kW, pointing may be applied instead of striking.

The parts of the chimney where the temperature of the combustion gases may rise above 350 degrees Celsius shall be laid using flexible mortar which sustains the loads directed at the joint as well as the stress resulting from temperature changes. Weathering mortar shall be used in laying the external parts of the chimney.

The top of a masonry chimney shall be protected against the effects of weather. The weather guard shall be manufactured of Class A1 products.

### Section 5

#### *Chimney built on site of metal*

The material of the smoke flue of a chimney built on site of metal shall be made of steel or cast iron with a wall thickness of at least 4 mm and the material of the outer steel casing of the

heat insulation of the smoke flue shall be at least 0.5 mm thick if the suitability of other products for the intended purpose of use has not been indicated in the design.

The inner casing of the chimney shall be encased with continuous 100-mm thick Class A1 heat insulation in at least two overlapping layers, the highest usage temperature of which is at least 600 degrees centigrade and the thermal conductivity in the average temperature of 600 degrees centigrade does not exceed 0.19 Watts/meter \* Kelvin (W/(m \* K)).

## Section 6

### *Safety distances and penetrations of chimneys laid and built on site as well as of other non-series produced chimneys*

An expansion gap of at least 20 millimetres shall be left between a chimney laid or built on site or a non-series produced chimney manufactured elsewhere and a building element and it shall be filled with a Class A1 product suitable for the purpose. When determining the width of the expansion gap, the deformations according to the service state of the adjacent structures in relation to the chimney shall be taken into account in the structural design. A ventilation gap of at least 50 mm shall be left between the heat-insulated wall and the chimney even if the necessary safety distance or the expansion gap were smaller.

The building elements and products manufactured of other than Class A1 products shall be at a distance of at least 100 mm from the external wall of the chimney. The penetrations through intermediate or top floors or through a wall as well as a joint of a wall shall be mounted with an at least 100-mm thick heat-insulating layer of a suitable Class A1 product. If the thickness of the masonry wall of a chimney is at least 230 mm and the total thermal input to the fireplaces connected to one smoke flue does not exceed 60 kW, the 100-mm distance referred to above and the heat insulating layer made of a Class A1 product shall not be necessary.

The heat insulation around the penetration shall be of a Class A1 product and its thickness at most 200 mm at the width of 200 mm unless the suitability of another solution is indicated with test results or with a calculation method verified on the basis of tests. The width shall be measured from the external surface of the heat insulation in accordance with subsection 2. The area shall be protected of trash and other combustible loose material.

The design of a non-series produced metal chimney or a chimney built of Class A1 products suitable for the purpose of use shall be governed also by the provisions of sections 4 and 5.

## Section 7

### *Damper*

A chimney shall be equipped with a damper if the fireplace connected to it is not a gas fireplace or a fireplace with a continuous fuel feed. If the fireplace connected to the chimney or its connecting flue pipe or connective flue is equipped with a damper, the chimney need not be equipped with a damper.

The damper shall be replaceable or its service life shall be the same as that of the chimney. The carbon monoxide forming in the fireplace must have access to open air through the chimney also in a situation where the damper has been closed after the use of the fireplace.

The smoke flue may not act as the air supply route for indoor air.

## Section 8

### *Soot fire*

Smoke flues, the combustion gases conducted to which may cause soot or pitch deposits, shall tolerate cleaning to remove the deposits of soot and pitch. The chimney shall be soot-fire resistant.

The soot fire resistance of a chimney laid on site of burnt brick in accordance with this Decree or of a chimney built on site of metal in accordance with section 5 or of a non-series produced chimney manufactured elsewhere need not be separately indicated when the material used in the smoke flue of a metal chimney is cast iron or steel with a wall thickness of at least four millimetres. The soot fire resistance of CE marked chimneys and smoke flues shall be of classification G.

After a soot fire incident, the owner of the building shall ensure that the structure of the chimney and fireplace as well as the fire safety and security of persons are inspected and the necessary repair measures are carried out prior to continuing the use.

## Section 9

### *Interoperability of a fireplace and a chimney*

A chimney and the connecting flue pipes and connective flues with joints of the fireplace to be connected thereto shall form an entity that is fire safe and secure for persons as well as functional. The party engaging in a construction project shall ensure that the chimney is built and repaired according to the design.

In order to ensure the interoperability of a chimney and a fireplace, the design shall state the highest temperature of the combustion gases conducted from the fireplace to the chimney. The heat resistance to combustion gases of a fireplace using solid fuel as well as of the chimney of a sauna heater and of the connecting flue pipes and connective flues shall be at least in accordance with temperature class T600. The fireplace to be connected to the chimney may be prefabricated or laid or built on site.

The heat resistance in accordance with class T600 can be demonstrated by masonry the chimney in accordance with this Decree of burnt brick or by building a metal chimney in accordance with section 5 on site where the material of the smoke flue is cast iron or steel with a wall thickness of at least four millimetres.

## Section 10

### *Surface temperatures and placement*

The chimney and the connecting flue pipes and connective flues as well as the chimney hatches of the fireplace to be connected thereto shall be designed so that their surface temperatures do not cause danger to fire safety or the security of persons.

The safety distances of prefabricated chimneys and flue products shall be determined by testing or by a calculation method verified on the basis of tests. The non-overlapping joints between the chimney elements may not be placed inside the structures at the structure penetration points.

The placement or protection of a chimney shall be presented in the designs so that the placement of movables in its immediate proximity is not possible especially in a store room or closet. The height of the chimney measured from the roofing shall be at least 0.8 meters at the roof ridge. With regard to roofing not belonging to the Class B Roof (t2), the height shall be at

least 1.5 metres. The height of a chimney on a pane of roof shall be added with 0.1 meters for each meter of pane calculated from the ridge if the suitability of another solution is not indicated in the designs.

Other structures may not be supported against or attached to a chimney, and pipes, cables or other devices not belonging to the operation of the chimney may not be fitted thereto.

## Section 11

### *Commissioning as well as instructions for use and maintenance*

Prior to the commissioning of a chimney, the party engaging in the construction project shall ensure that the suitability and interoperability of the chimney and the fireplace as well as the compliance of the installations with the designs have been inspected. The person performing the inspection shall make an entry in the construction inspection document as well as its summary regarding the interoperability and compliance of the installations with the designs.

The principal designer shall ensure that information that is material with regard to the use and maintenance of the chimney and the fireplace to be connected thereto has been transferred to the instructions for the use and maintenance of the building.

## Section 12

### *Entry into force*

This Decree enters into force on 1 January 2018.

Upon the entry into force of this Decree, pending projects shall be subject to the rules valid at the time of entry into force of this Decree.

Helsinki, 10 December 2017

Kimmo Tiilikainen, Minister of the Environment, Energy and Housing

Jyrki Kauppinen, Senior Engineer