SAURESTA
Metal chimney systems

INSTRUCTION MANUAL
OF INSTALLATION, SELECTION AND OPERATION OF METAL CHIMNEYS AND THEIR SYSTEM ELEMENTS

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PREFACE

SAURESTA UAB is a specialised manufacturer of stainless steel chimneys. The company was founded in 2004. Most of its specialists are successfully engaged in the activities from 1999. The company's high operational standards and its commitment towards top performance secure the trust of customers and enable the successful growth of the company. Currently, the products from SAURESTA UAB are marketed in Lithuania, Latvia, Estonia, Finland, Sweden, Norway, Denmark, Germany and the Netherlands. The company also successfully expands its activities in other European countries.

This Instruction Manual defines the key performance criteria, which are applied to the chimneys, manufactured by SAURESTA UAB, including fl ue liners and connecting fl ue pipes, which are used to convey the products of combustion from heating appliances to the outside atmosphere. The manual also contains the requirements for installation, safe operation and maintenance of chimney systems.

The Instruction Manual specifi es the essential criteria and requirements, which are set on the basis of operational tests and calculations of chimney systems, performed in Denmark and Lithuania in 2013-2018.

The products of SAURESTA UAB are certifi ced according to the European harmonized standards (EN 1826 1:2009 and EN 1826-2:2009), complying with the highest quality requirements.

WARNING: Installation, operation and maintenance of the products, manufactured by SAURESTA UAB, shall be always in all cases performed in guidance and compliance with the relevant national and/or international laws and standards, which regulate the procedures of installation, operation and maintenance of the respective products, and fi re safety requirements.

If the relevant act of legislation sets other requirements than the requirement specifi ed in this manual, the compliance with more stringent requirements is obligatory in all cases.

METAL CHIMNEY SYSTEMS MANUFACTURED BY SAURESTA UAB:

- Double-wall chimneys
- Circular cross-section flue liners
- Oval cross-section flue liners
- Double-wall connecting flue pipes
- Single-wall connecting flue pipes

RELEVANT ACTS OF LEGISLATION

1. EN 1443:2003 Chimneys. General requirements.

2. EN 15287- 1 :2007+A1:2010/P:2014 Chimheys.Design, installation and commissioning of chimneys - Part 1. Chimneys for non-roomsealed heating appliances.

3. EN 1856-1:2009 Chimneys.-Part 1. Requirements for metal chymneys - Part 1. System chimney products.

4. EN 1856-2:2009 Chimneys - Part 2. Requirements for metal chymneys - Part 2. Connecting flue pipes.

WARRANTIES

SAURESTA UAB warrants that double-wall chimneys and flue liner system elements are made of high-quality materials, which meet the requirements of the harmonized standards of construction products.

All double-wall chimneys, which flue liners are manufactured of stainless, acid-resistant steel ofgrade 1,4404 and 1,4301, while the external pipes are made of stainless steel 1,4301 and 1,4509, with galvanized or non-galvanized pained tinplate, shall be given a 5-year warranty.

5-year warranty shall be applied to flue liners and connecting flue pipes made of stainless, acid-resistant steel of class 1,4404 and 1,4301.

Warranty shall not be applied to the products manufactured by SAURESTA UAB, where:

1. The requirements of installation, operation and/or maintenance of chimneys and flue liners defined in these instructions or relevant laws have not been complied with.

2. Chimney systems and flue liner system elements have been misused or used for an improper purpose.

3. The products have suffered damages unrelated to manufacture (mechanical damage, chemical agents).

4. The wrong fuel has been used and/or operational settings have been departed from.

5. Inappropriate tools, cleaning methods and other improper means or methods have been used for installation, operation and/or maintenance of chimneys and flue liners.

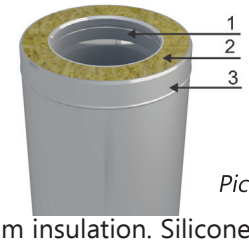
6. Chimney systems and flue liner systems have been improperly operated and maintained (e.g. chimney has been cleaned at a less periodicity than required).

7. Chimneys and flue liner system elements of other manufacturers have been installed in the chimney and flue liner systems.

1.1. DOUBLE-WALL CHIMNEY SYSTEMS

It is forbidden: to cut, disassemble the elements of circular cross-section double-wall chimney

The intended use of metal double-wall chimneys is to convey the products of combustion from appliances to the outside atmosphere. The place of installation and type of double-wall chimney shall be determined by the constructional and technical solutions, also by the price, design and other criteria. These double-wall chimney systems are intended to convey the products of combustion by a natural draught **(N1 40 Pa).** These appliances may use gaseous, liquid, granular and solid fuels. The chimney systems shall be mounted on the external and internal walls of the building and other bearing structures (metal or concrete).



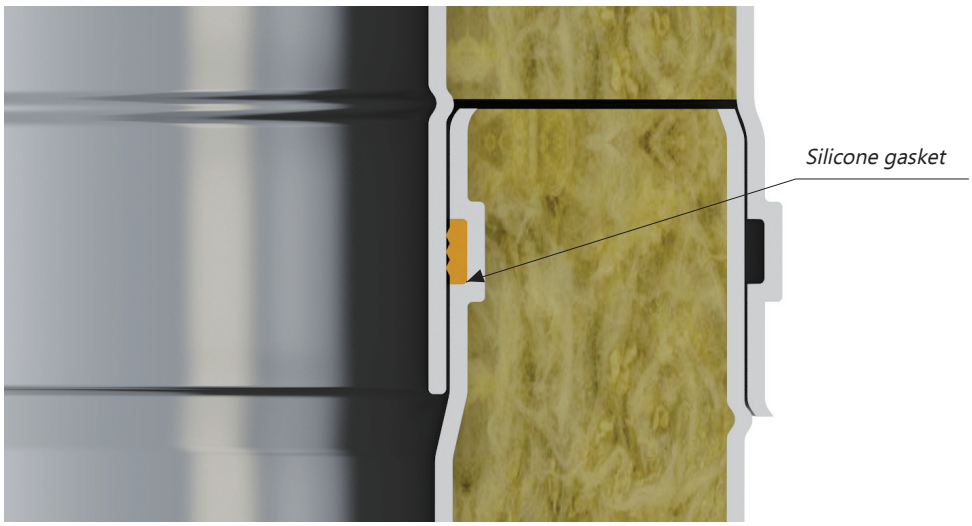
1) Flue liner
2) Insulation
3) External pipe (NP; RR; FP)

Picture 1.

Double-wall chimney consists of two pipes of circular cross-section and different diameters external and internal (flue liner). Between these pipes the thermal insulation layer 25 mm or 50 mm 180 kg/m3 density is placed (Picture 1). Double-wall chimney may be used as the connecting flue pipes to connect the heating appliances with chimney and flue liner systems.

Double-wall chimney systems **(P1 200 Pa)** are intended to convey the products of combustion by a forced draught. These appliances may use gaseous and liquid fuels, this system is manufactured with 25 mm insulation. Silicone gaskets are used to ensure the tightness of connections (Picture 1A). The system is non-resistant to soot ignition and the maximum safe operating temperature is 200°C. External pipe of double-wall chimney system is made of various types of steel: stainless steel 1,4301; stainless steel 1,4509; painted 1,4509. For double-wall chimneys, the manufacturer conducts thermal testing with chimney systems of 200 mm internal nominal diameter and declares the safe distance from chimney surface to combustible materials (in mm). **These systems were tested as installed in a room (the chimney is not covered with any additional enclosures), crossing insulated ceiling.** As for double-wall chimneys of larger dimensions, safe distances to combustible materials are calculated according to the standard EN 1856-1:2009 (Article 6.4) and applying the indexes, i.e.:

P1 systems T200 with 25 mm insulation	**N1 systems T450 with 25 mm insulation**	**N1 systems T450 with 50 mm insulation**	**N1 systems T600 with 50 mm insulation**
Ø 80 – 300 mm – 30 mm;	Ø 80 – 300 mm – 70 mm;	Ø 80 – 300 mm – 50 mm;	Ø 80 – 300 mm – 100 mm;
Ø 350 – 450 mm – 45 mm;	Ø 350 – 450 mm – 105 mm;	Ø 350 – 450 mm – 75 mm;	Ø 350 – 450 mm – 150 mm;
Ø 500 - 600 mm - 60 mm.	Ø 500 - 600 mm - 140 mm.	Ø 500 - 600 mm - 100 mm.	Ø 500 - 600 mm - 200 mm.



Picture 1A.

1.1.1 Circular cross-section double-wall chimney system SR-25

Ø 80-300 mm, T450-N1-W-Vm-L50(050-100) - G70
Ø 350-450 mm, T450-N1-W-Vm-L50(060-100) - G105
Ø 500-600 mm, T450-N1-W-Vm-L50(060-100) - G140

1.1.2 Circular cross-section double-wall chimney system SRD-25

Ø 80-300 mm, T450-N1-D-Vm-L20(050-100) - G70
Ø 350-450 mm, T450-N1-D-Vm-L20(060-100) - G105
Ø 500-600 mm, T450-N1-D-Vm-L20(060-100) - G140

1.1. DOUBLE-WALL CHIMNEY SYSTEMS

1.1.3 Circular cross-section double-wall chimney system SR-50

When T450:

Ø 80-300 mm, T450-N1-W-Vm-L50(050-100) - G50
Ø 350-450 mm, T450-N1-W-Vm-L50(060-100) - G75
Ø 500-600 mm, T450-N1-W-Vm-L50(060-100) - G100

When T600:

Ø 80-300 mm, T600-N1-W-Vm-L50(050-100) - G100
Ø 350-450 mm, T600-N1-W-Vm-L50(060-100) - G150
Ø 500-600 mm, T600-N1-W-Vm-L50(060-100) - G200

1.1.4 Circular cross-section double-wall chimney system SRD-50

When T450:

Ø 80-300 mm, T450-N1-D-Vm-L20(050-100) - G50
Ø 350-450 mm, T450-N1-D-Vm-L20(060-100) - G75
Ø 500-600 mm, T450-N1-D-Vm-L20(060-100) - G100

When T600:

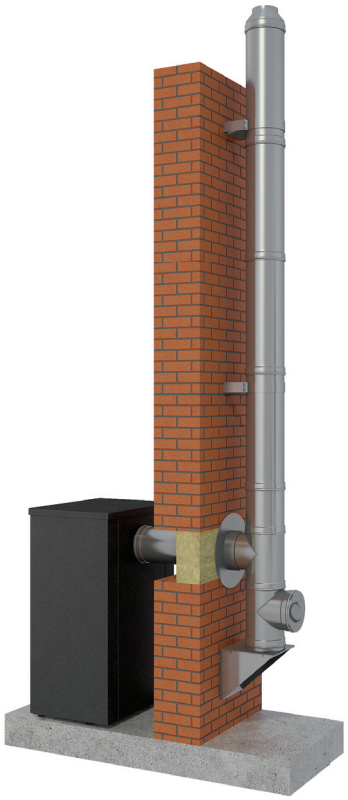
Ø 80-300 mm, T600-N1-D-Vm-L20(050-100) - G100
Ø 350-450 mm, T600-N1-D-Vm-L20(060-100) - G150
Ø 500-600 mm, T600-N1-D-Vm-L20(060-100) - G200

1.1.5 Circular cross-section double-wall chimney system with silicone gaskets SRG-25

Ø 80-300 mm, T200-P1-W-Vm-L50(050-100) - O30
Ø 350-450 mm, T200-P1-W-Vm-L50(060-100) - O45
Ø 500-600 mm, T200-P1-W-Vm-L50(060-100) - O60

1.1.6 Circular cross-section double-wall chimney system with silicone gaskets SRGD-25

Ø 80-300 mm, T200-P1-D-Vm-L20(050-100) - O30
Ø 350-450 mm, T200-P1-D-Vm-L20(060-100) - O45
Ø 500-600 mm, T200-P1-D-Vm-L20(060-100) - O60



Meaning of markings:

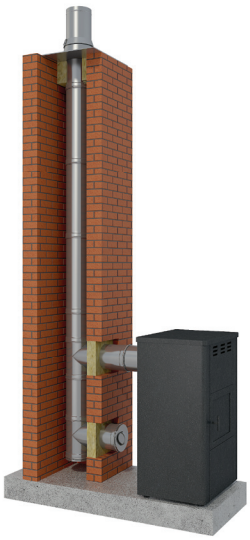
T600 - temperature class: maximum safe operating temperature is 600°C;
T450 - temperature class: maximum safe operating temperature is 450°C;
T200 - temperature class: maximum safe operating temperature is 200°C;
N1 - pressure class: N1- negative pressure in the chimney (natural draught);
P1 - pressure class: P1- positive pressure in the chimney (forced draught);
W - resistance to condensate: suitable for operation under humid conditions;
D - suitable for operation under dry conditions;
Vm - resistance of an element to corrosion (declared according to the type of material and wall thickness);
L50 - flue liner material: acid-resistant, stainless steel of grade 1.4404
L20 - flue liner material: acid-resistant, stainless steel of grade 1.4301
050-100 - flue liner steel thickness from 0.5 to 1.0 mm;
G(xxx) - flue liner, resistant to soot ignition - G;
O(xxx) - flue liner, non-resistant to soot ignition - O;
- xxx - permissible minimum distance from the outer surface of the chimney to combustible materials.

Note: *These marking meanings are also applied in the descriptions below of the listed systems.*

1.2. CIRCULAR CROSS-SECTION FLUE LINER SYSTEMS

Circular cross-section flue liners shall be installed in brick, concrete and metal channels.

In accordance with the standard EN 1856-2, the same element (according to the marking) may be used as a flue liner system element or as a connecting flue pipe system element, except the oval cross-section flue liners. In accordance with the requirements of the standard EN 1856-2:2009 (Article 7.2.1), the minimal distance from the flue liner surface to the combustible materials (except the connecting flue pipes) is not applied as the flue liners shall be installed only in concrete or brick channels.



1.2.1. Circular cross-section flue liner system SRI

Ø 80-600 mm, T600-N1-W-Vm-L50(050-100)-G

1.2.2. Circular cross-section flue liner system SRID

Ø 80-600 mm, T600-N1-D-Vm-L20(050-100)-G

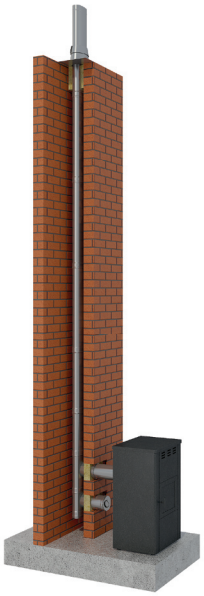
1.2.3. Circular cross-section flue liner system with silicone gaskets SRIG

Ø 80-600 mm, T200-P1-W-Vm-L50(050-100)-O

1.2.4. Circular cross-section flue liner system with silicone gaskets SRIGD

Ø 80-600 mm, T200-P1-D-Vm-L20(050-100)-O

1.3. OVAL CROSS-SECTION FLUE LINER SYSTEMS



Oval cross-section flue liners shall be installed in brick, concrete or metal channels.

Oval cross-section flue liner system elements may not be used as the connecting flue pipes, the minimal distance to combustible materials is not applied for these system elements. Oval cross-section system elements are manufactured only of 0,6 mm thickness acid-resistant stainless steel of grade 1.4404 or 1.4301.

1.3.1. Oval cross-section flue liner system SRO

(110 x 180, 110 x 220, 120 x 230, 120 x 240) mm

T600—N1—W—Vm—L50060—G

1.3.2. Oval cross-section flue liner system SROD

(110 x 180, 110 x 220, 120 x 230, 120 x 240) mm

T600—N1—D—Vm—L20060—G

1.4. DOUBLE-WALL CONNECTING FLUE PIPE SYSTEMS

These double-wall connecting flue pipe systems shall be used to connect the heating appliances with the chimney or flue liner. In accordance with the standard EN 1856-2, the same element (according to the marking) may be used as a chimney system element or as a connecting flue pipe system element.

1.4.1 Circular cross-section double-wall connecting flue pipe system SRC-25

Ø 80-300 mm, T450-N1-W-Vm- L50(050-100) – G70M;

Ø 350-450 mm, T450-N1-W-Vm-L50(060-100) – G105M;

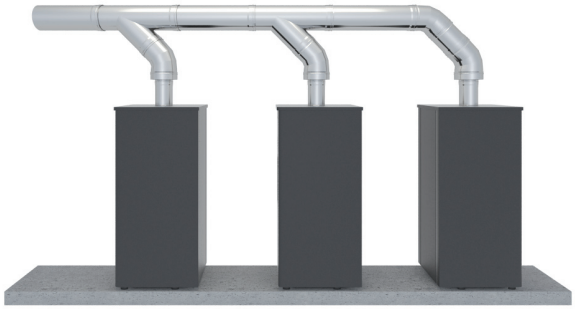
Ø 500-600 mm, T450-N1-W-Vm-L50(060-100) – G140M;

1.4.2. Circular cross-section double-wall connecting flue pipe system SRCD-25

Ø 80-300 mm, T450-N1-D-Vm-L20(050-100) – G70M

Ø 350-450 mm, T450-N1-D-Vm-L20(060-100) – G105M

Ø 500-600 mm, T450-N1-D-Vm-L20(060-100) – G140M



1.4.3 Circular cross-section double-wall connecting flue pipe system SRC-50

when T450:

Ø 80-300 mm, T450-N1-W-Vm-L50(050-100) – G50M;

Ø 350-450 mm, T450-N1-W-Vm-L50(060-100) – G75M;

Ø 500-600 mm, T450-N1-W-Vm-L50(060-100) – G100M.

when T600:

Ø 80-300 mm, T600-N1-W-Vm-L50(050-100) – G100M;

Ø 350-450 mm, T600-N1-W-Vm-L50(060-100) – G150M;

Ø 500-600 mm, T600-N1-W-Vm-L50(060-100) – G200M.

1.4.4 Circular cross-section double-wall connecting flue pipe system SRCD-50

when T450:

Ø 80-300 mm, T450-N1-D-Vm-L20(050-100) – G50M;

Ø 350-450 mm, T450-N1-D-Vm-L20(060-100) – G75M;

Ø 500-600 mm, T450-N1-D-Vm-L20(060-100) – G100M.

when T600:

Ø 80-300 mm, T600-N1-D-Vm-L20(050-100) – G100M;

Ø 350-450 mm, T600-N1-D-Vm-L20(060-100) – G150M;

Ø 500-600 mm, T600-N1-D-Vm-L20(060-100) – G200M.

G(xxx)M – minimum permissible distance (in mm) from the outer surface of connecting flue pipes to the combustible materials, where M is a value determined by testing. The distance from the pipe surface to combustible materials (in mm), which is declared by the manufacturer for doublewall connecting flue pipes, shall be determined by thermal testing of the connecting flue pipes of these systems of 200 mm of internal nominal diameter. Based on the test results, for installation of elements of the larger dimensions, the distances to combustible materials is calculated according to the standard EN 1856-1:2009, Article 6.4, applying the coefficients, i.e. when:

N1 systems T450 with 25 mm insulation	N1 systems T450 with 50 mm insulation	N1 systems T600 with 50 mm insulation
Ø 80 – 300 mm – 70 mm;	Ø 80 – 300 mm – 50 mm;	Ø 80 – 300 mm – 100 mm;
Ø 350 – 450 mm – 105 mm;	Ø 350 – 450 mm – 75 mm;	Ø 350 – 450 mm – 150 mm;
Ø 500 - 600 mm - 140 mm.	Ø 500 - 600 mm - 100 mm.	Ø 500 - 600 mm - 200 mm.

1.5. SINGLE-WALL CONNECTING FLUE PIPE SYSTEMS

These single-wall connecting flue pipe systems shall be used to connect the heating appliances with the chimney or flue liner. In accordance with the standard EN 1856-2, the same element (according to the marking) may be used as a chimney system element or as a connecting flue pipe system element.

1.5.1. Circular cross-section single-wall connecting flue pipe system SRC

Ø 80 – 600 mm, T600—N1—W—Vm—L50(050-100)—G500NM

1.5.2. Circular cross-section single-wall connecting flue pipe system SRCD

Ø 80 – 600 mm, T600—N1—D—Vm—L20(050-100)—G500NM

G (xxx)NM – minimum permissible distance (in mm) from the outer surface of connecting flue pipe to the combustible materials, where NM is a value determined by calculation (in accordance with the standard EN 15287-1:2007). Single-wall connecting flue pipe system under the standard EN 1856-2T600-N1-W-VmL50xxx-G(500NM) (in accordance with the results of calculation) shall be installed in a distance at least 500 mm from combustible materials, as declared by the manufacturer.

2. SPECIFICATION OF MATERIALS USED

Flue liners and their elements are manufactured of:

- Acid-resistant, stainless steel of grade 1,4404 (X2CrNiMo 17-12-2), which equivalent is 1.4571 (X6CrNiMoTi 17-12-2);
- Acid-resistant, stainless steel of grade 1,4301 (X5CrNi18-10).

Steel types meet the requirements of the standards EN 10088:1999+A22008 and EN 573-3:2014.

The thickness of steel sheet, used in manufacture, may be:

- 0,5; 0,6; 0,8; 1,0 mm when Ø 80-200 mm;
- 0,6; 0,8; 1,0 mm when Ø 230-550 mm;
- 0,8; 1,0 mm when Ø 600 mm.

Oval cross-section system elements are manufactured only of 0.6 mm thickness stainless steel of grades 1,4404 or 1,4301.

Double-wall chimney external pipes are manufactured only of:

- 0,5 mm thickness acid-resistant stainless of grade 1,4301 (NP);
- 0,5 mm thickness painted stainless of grade 1,4509 (RR);
- 0,5 mm thickness stanless of grade 1,4509 (FP).

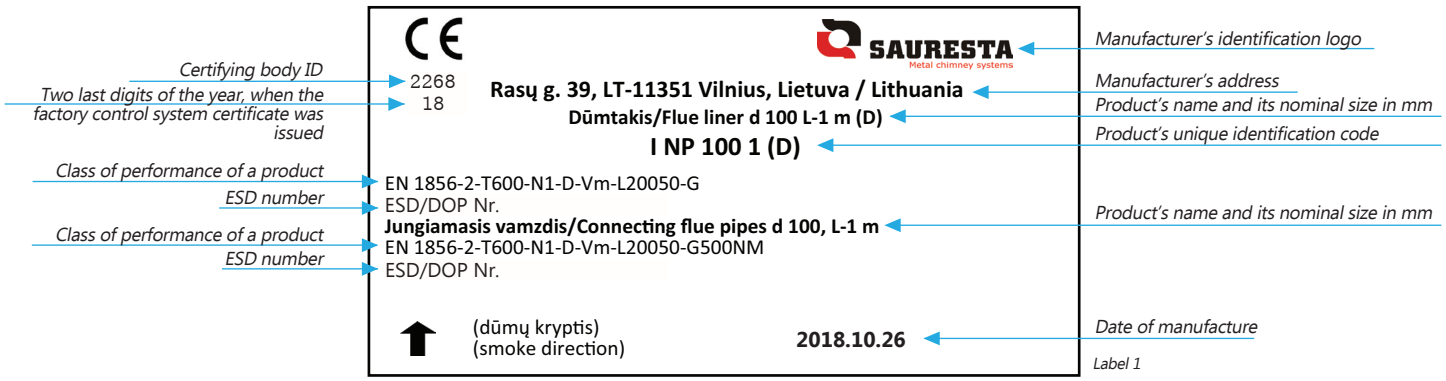
Steel types meet the requirements of the standard EN 10088:1999+A22008.

Thermal insulation – injected mineral wool 25 mm or 50 mm thickness, 180 kg / m3 density.

3. MARKING OF PRODUCTS ACCORDING TO THE REQUIREMENTS OF STANDARDS LST EN 1856-1:2009 AND LST EN 1856-2:2009

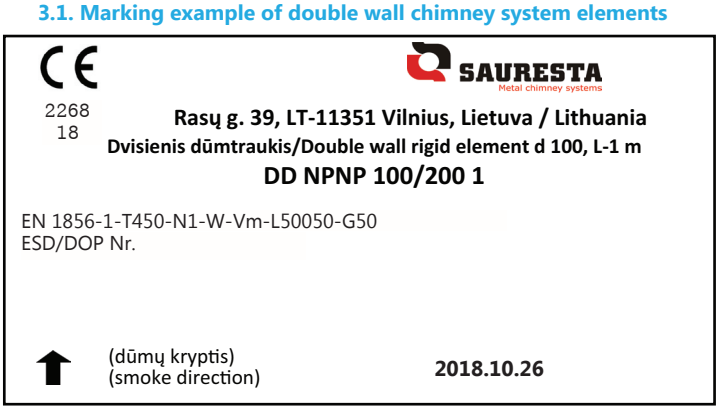
Every chimney system element, introduced to the market, which shall be applied the harmonized standard requirements, shall have the CE marking The element shall have an adhesive label with the indicated performance characteristics. Under the symbol CE, there shall be indicated two last digits of the year, when the production quality control certificate has been issued and the product (system) has been started to have CE marking, also there shall be indicated the name of the manufacturer, address of the manufacturer, identification logo of the manufacturer, unique identification code of the element, performance declaration number, class of operating characteristics declared for a product, references to the applied harmonized standards and the date of manufacture of a product. *Example of marking of the product with explanations is presented on a label 1 (Picture 3.1 and 3.2).*

3.2. Marking example of flue liner and connecting flue pipe systems



Label 1

3.1. Marking example of double wall chimney system elements



Label 2

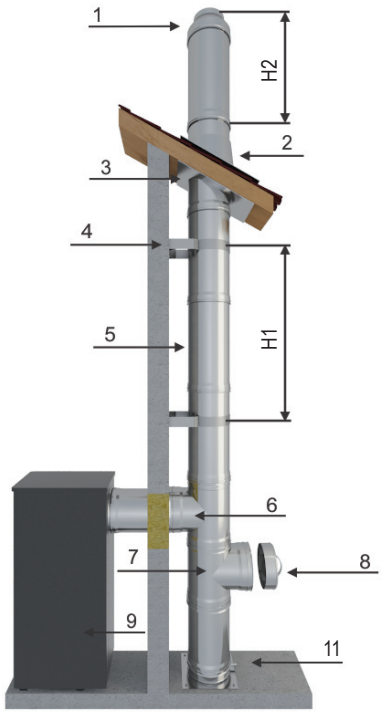
As shown on the label 1, the same product can be used as a fl ue liner system element, when the distance to combustible materials is not applied (EN 1856-2-T600-N1-D-Vm-L20050-G), or as a connecting fl ue pipe system element, when the distance to combustible materials must be indicated (EN 1856-2-T600-N1-D-Vm-L20050-G500 NM).

In the installation, operation and maintenance of the chimneys, flue liners or connecting flue pipes, the parameters, specifi ed by the manufacturer on a product label, must be strictly observed!

4. INSTALLATION SCHEMES

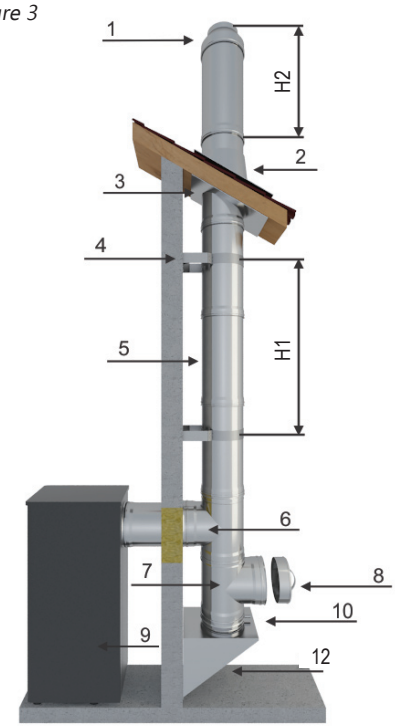
Typical schemes of double-wall chimneys, single wall flue liners (of circular and oval cross sections) and their system elements

Picture 2



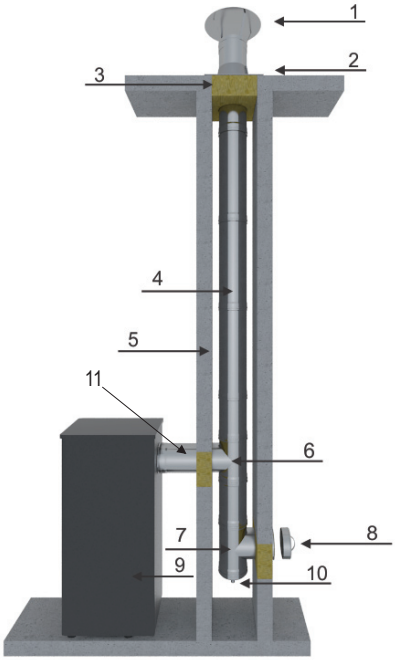
A

Picture 3



A

Picture 4



B

Double-wall chimney (A)

1. Upper cover
2. Roof fl ashing detail
3. Finishing detail
4. Fastening elements (brackets)
5. Double-wall chimney
6. Double-wall tee
7. Double-wall clean-out
8. Double-wall base plug
9. Heating appliance
10. Double-wall drain plug
11. Double-wall drain plug with base support
12. Support platform

Single-wall fl ue liner (of circular or oval cross-section) (B)

1. Terminal
2. Upper holder
3. Insulation layer
4. Flue liner
5. Brick, concrete chimney
6. Tee
7. Clean-out
8. Base plug
9. Heating appliance
10. Drain plug
11. Connecting fl ue pipe

H1 – distance between the bearing structures (brackets) ≤2.0 m (all diameters),
H2 – length of unfastened part of the chimney (hanger) ≤1.0 m (all diameters).

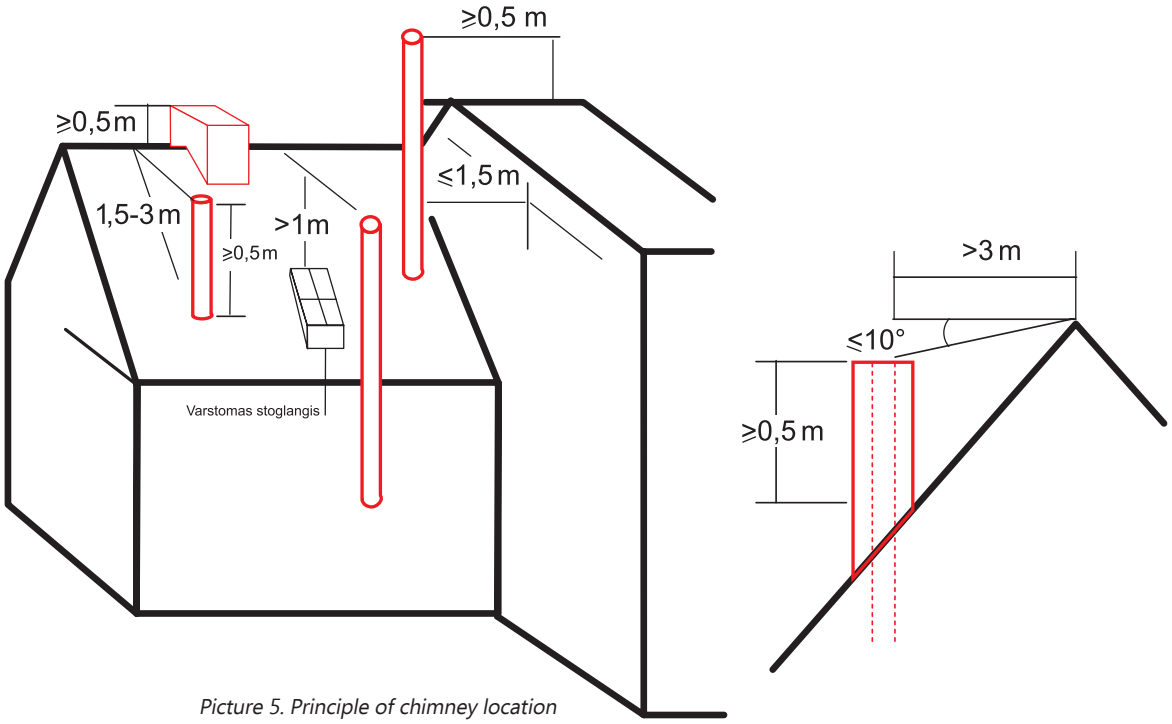
5. INSTALLATION OF SYSTEMS

5.1. General requirements

The top of the chimney, which is calculated according to the highest roof element or the roof of the same building or the attached building that is less than 3 m distant from the chimney, as shown in Picture 5, shall be:

- at least 1 m above the fl at roof;
- at least 0.5 m above the roof ridge or parapet, if the distance between the chimney and ridge or parapet is less than 1.5 m;
- not lower than roof ridge or parapet, if the distance between the chimney and roof ridge or parapet is from 1.5 to 3 m;
- not lower than the line, running from the horizontal axis at an angle of 10° downwards from the ridge, when the chimney is distant from the roof ridge more than 3 m;
- not lower than 1 m above the hinged window, if the distance in the horizontal projection is 3 m or less from the chimney to the window.

Installation instructions, given by the manufacturers of the heating appliances, and requirements of fi re safety regulations shall be followed during selection of chimney systems. The cross-section of connecting flue liner shall be not less than the cross-section of the opening of the heating appliance, which shall be connected to.



Picture 5. Principle of chimney location

The installed chimneys shall be mechanically stable and bear the horizontal and vertical loads. According to the results of the mechanical tests performed, it is allowed to install the following quantity of elements:

Double-wall chimneys:

when Ø 80-200 mm 20 m double-wall elements;
when Ø 250-500 mm 10 m double-wall elements;
when Ø 550 mm 10 m double-wall elements with strengthened tee;
when Ø 600 mm 10 m double-wall elements with strengthened tee.

Circular cross-section flue liners:

when Ø 80-200 mm – 20 m flue liner elements;
when Ø 230-550 mm – 15 m flue liner elements;
when Ø 600 mm – 15 m flue liner elements with strengthened tee.

Oval cross-section fl ue liners:

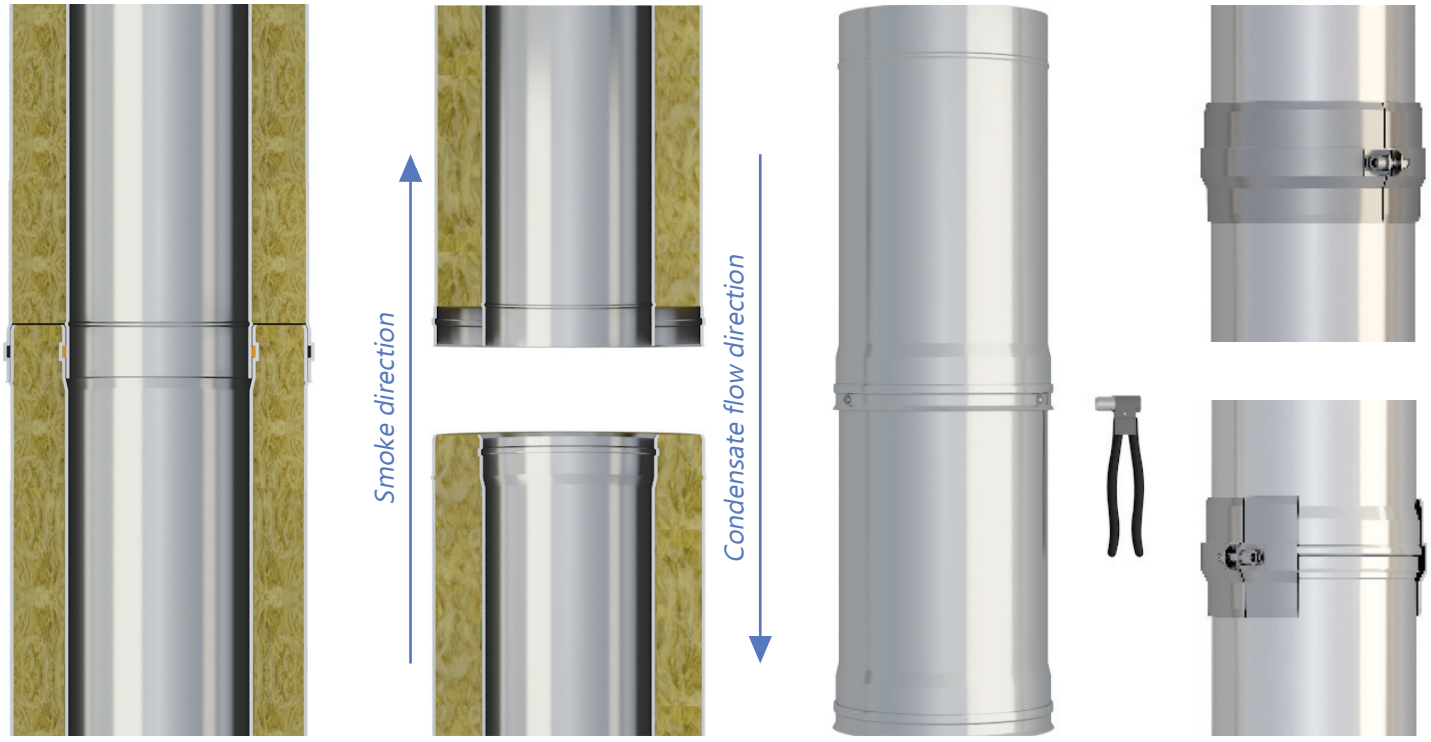
when (110x180; 110x220; 120x230; 120x240 mm) – 20 linear elements.

5.2. INSTALLATION OF DOUBLE-WALL CHIMNEYS

The connections of double-wall chimney system elements (all sizes from 80 mm to 600 mm) shall be riveted using the stainless steel rivets A2/A2 of at least 4 mm nominal diameter. Quantity of rivets required for this connection is specified in *Table 4*. Connection with clamping rings also might be used for double-wall chimney system elements (all sizes from 80 mm to 300 mm) *(Picture 6)*.

Double-wall chimneys of **(N1) system** shall be connected by fitting one element to another, using the increasers formed at the ends of the pipes. It is recommended to put some liquid soap on silicone gaskets as this would ensure simple and easy connection of double-wall chimneys of **(P1) system** *(Picture 6)*. All elements are connected using the stainless steel rivets A2/A2 or clamping rings. **Please pay attention to the direction and proper position of clamping ring. Bolt must be fully tightened to ensure proper connection.**

Labeling of each element indicates smoke direction (according to the requirements of the standard EN 1856-1 and 1856-2), indicating position of element installed in the chimney system *(Label 2)*.



A – Double-wall chimney with silicone gasket

B – Double-wall chimney

C – Riveted connection

D – Connection with clamping ring

Picture 6. Schemes of connecting the elements

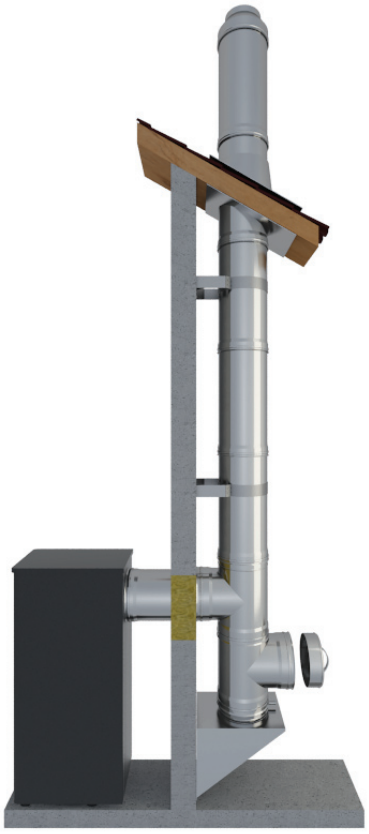
When installing double-wall chimney, an appropriately sized opening must be formed in a wall structure (keeping safe distances to combustible materials), through which the heating appliance is connected with the chimney stack using the connecting flue pipes. Under the tee, the clean-out is connected with a condensate plug and mounted on the support platform or table *(Picture 8)*, attached to the wall or placed on the ground or on the base plate *(Picture 9)*. Chimney cleaning door may be installed in the upper or another part of the chimney in order to ensure proper inspection and cleaning. Using brackets and bands, chimneys may be installed in a brick, concrete, metal or wooden walls, bearing constructions, flooring slabs. All connections of separate elements shall be riveted using stainless steel rivets A2/A2 of not less than 4 mm of nominal diameter (Standard (EN) ISO 15983). Elements also might be connected with clamping rings.

After the installation of the chimney, the cavity between the building's wall and chimney elements must be covered by a flameproof insulation material. In accordance with the client's demands, the finishing details of a right type may be installed. Inspection and soot removal shall be performed through the cleaning doors installed in the system *(Pictures 2, 3)*. The distances between the fastenings are provided *(Picture 2, 3)*.

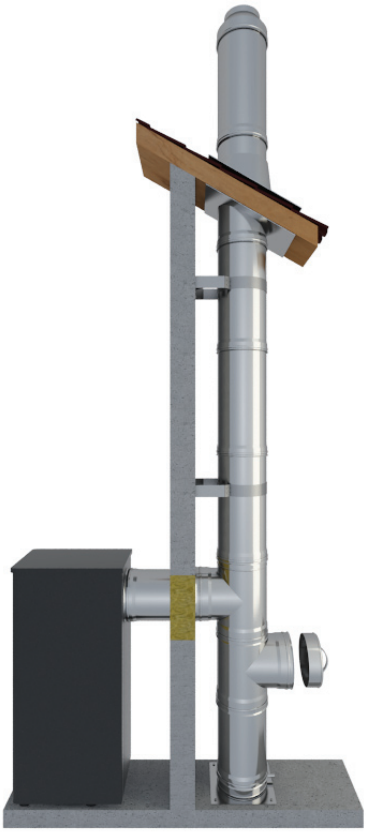
5.2. INSTALLATION OF DOUBLE-WALL CHIMNEYS

Picture 7. Typical drawing of a support platform (table)

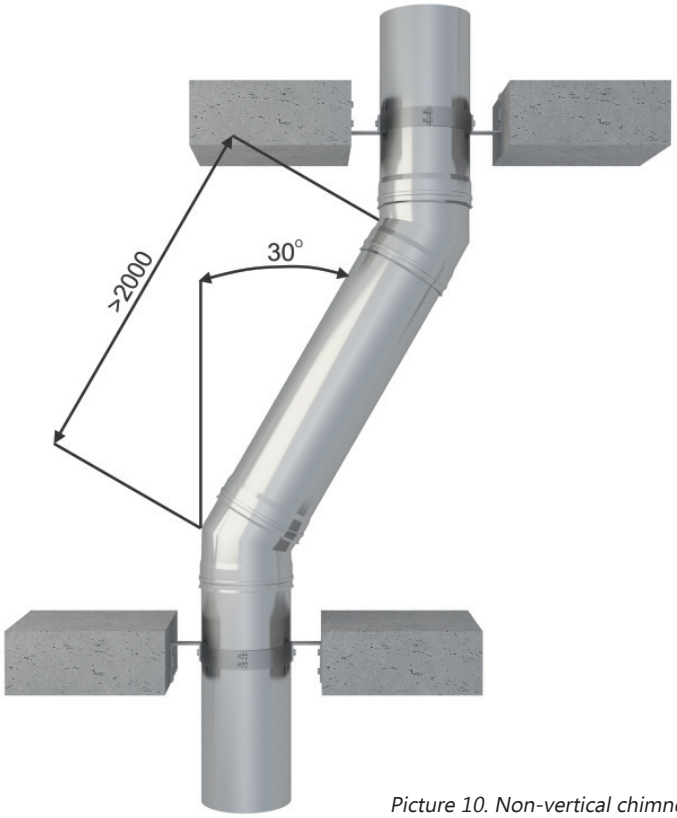
Picture 8. On the support platform



Picture 9. On the base platform



Circular cross-section double-wall and single-wall segments may be installed in a non-vertical position only if the length of these segments does not exceed 2 m. The angle of installation shall be less than 30° from the vertical axis (determined by testing) *(Picture 10).*



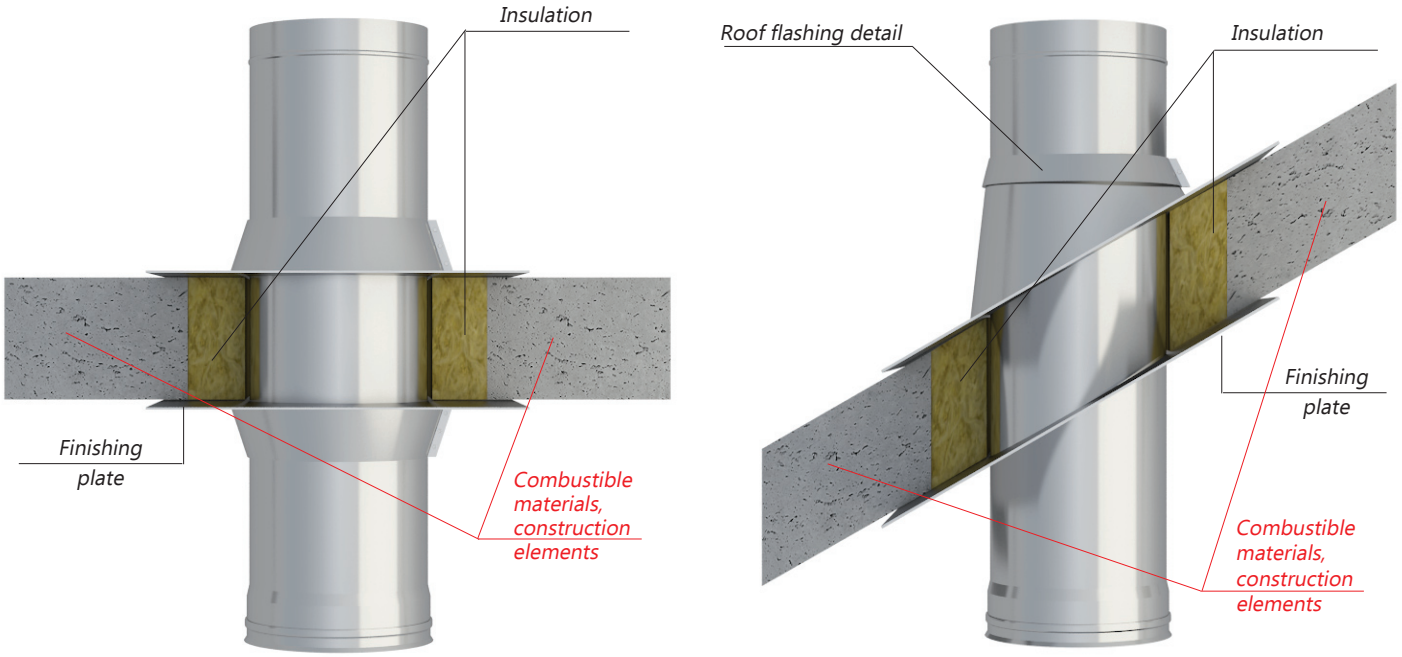
Picture 10. Non-vertical chimney installation scheme

5.3. INSTALLATION OF DOUBLE-WALL CHIMNEY SYSTEMS, INTERSECTING WITH BUILDING STRUCTURES

Installation works of chimneys inside the buildings must comply with the safety distances to combustible materials, which are specified in this instruction manual **(Chapter 1.1).** When the chimney stack intersects with a building's structural element (a flooring slab or a roof element), an appropriately sized opening shall be made in the structural element, maintaining the safe distance from the surface of the chimney to combustible materials.

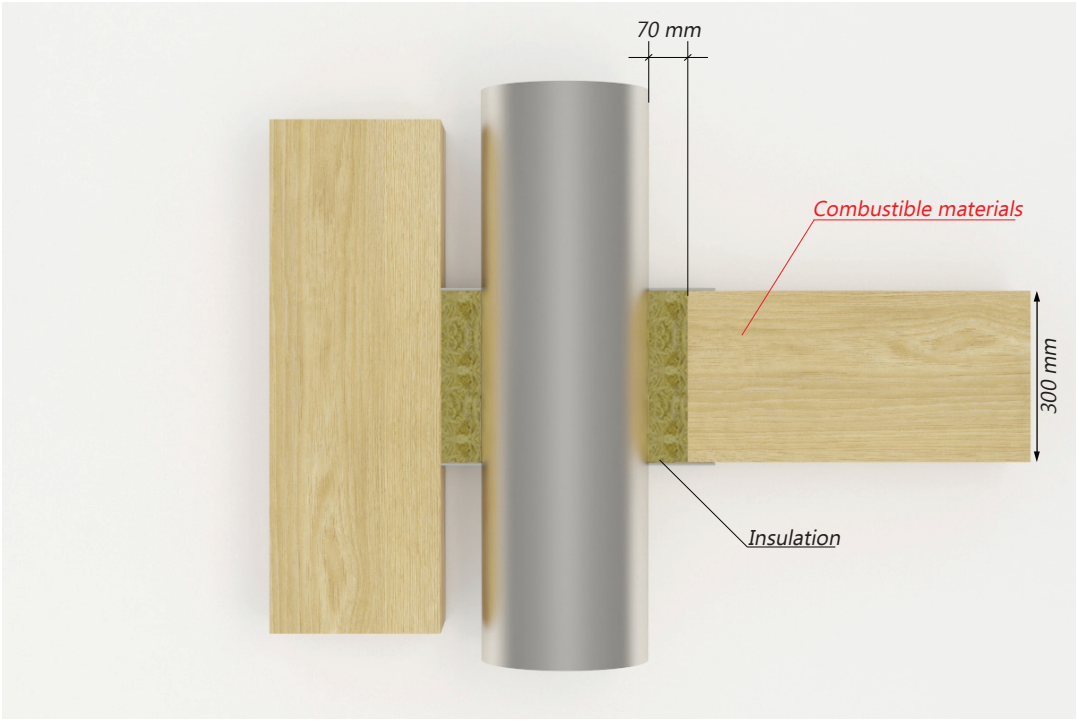
The engineering design of chimney systems must note that the connections between the chimney elements shall not be installed in the structures of the building's flooring slab!

Double-wall chimneys of **P1 system** can be installed in constructions exceeding 400 mm. Any cavities between constructions and chimney shall be filled with mineral wool Rockwool Firerock. If necessary, the filled cavity shall be covered from the outside by a finishing plate. In order to seal the roof structure, a roof flashing detail of the selected type and angle shall be used *(Picture 11).*



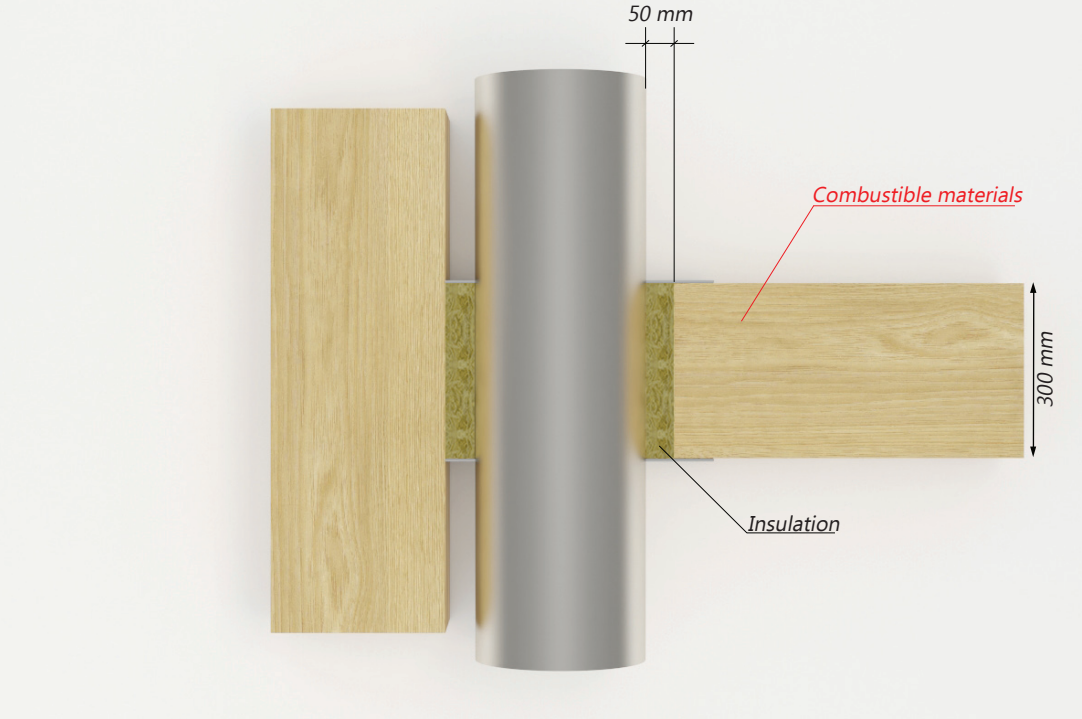
Picture 11. Installation of chimney systems, intersecting with building structures

When installing double-wall chimney systems with 25 mm insulation T 450, N1 presure classes, must not have a height / thickness of more than 300 mm when crossing penetration or roof structures, the distance to combustible materials must be at least 70 mm, the spaces between the flue and combustible materials fully filled with A1 flammability class mineral wool Rockwool Firerock (*Picture 12*).



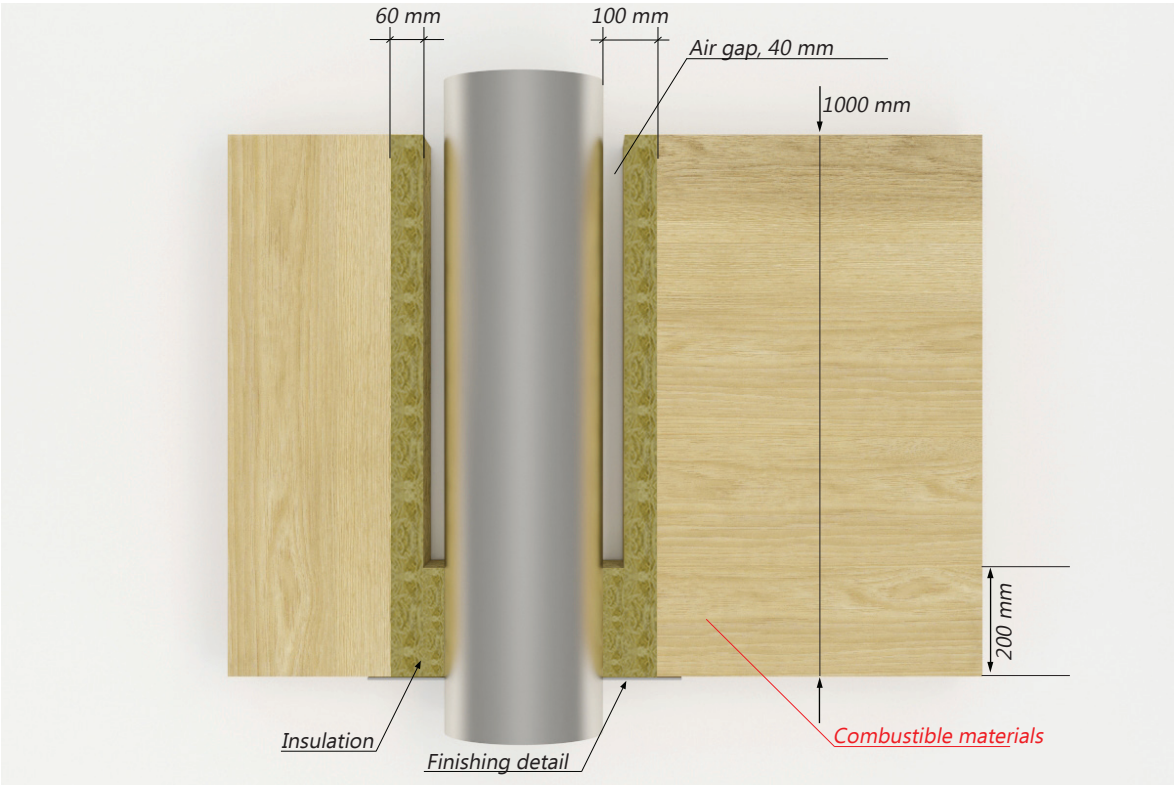
Picture 12. Double-wall chimney systems with 25 mm insulation T 450, N1

When installing double-wall chimney systems with 50 mm insulation T 450, N1 presure classes, must not have a height / thickness of more than 300 mm when crossing penetration or roof structures, the distance to combustible materials must be at least 50 mm, the spaces between the flue and combustible materials fully filled with A1 flammability class mineral wool Rockwool Firerock (*Picture 13*).



Picture 13. Double-wall chimney systems with 50 mm insulation T 450, N1

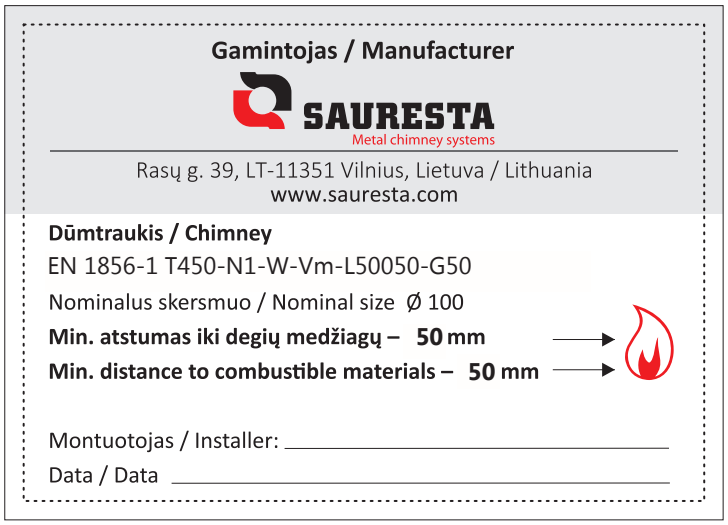
When installing double-wall chimney systems with 50 mm insulationT600, N1 presure classes, must not have a height / thickness of more than 1000 mm when crossing penetration or roof structures, the distance to combustible materials must be at least 100 mm, the spaces between the chimney and combustible materials must be 200 mm Highly filled with A1 flammability class mineral wool Rockwool Firerock, remaining 800 mm. The construction part of the 60mm beam is flooded with A1 flammable mineral wool Rockwool Firerock, leaving ventilation air gap of 40 mm around the chimney (*Picture 14).*



Picture 14. double-wall chimney systems with 50 mm insulationT600, N1

After the chimney has been installed, on its external side on a visible place the information table shall be fixed with the following information indicated:

- Name of the manufacturer;
- Nominal size of the chimney;
- Minimal distance to combustible materials;
- Name of the installer of the chimney (name of a person or a company;
- Date of installation.



5.4. INSTALLATION OF FLUE LINERS (CIRCULAR AND OVAL CROSS-SECTION)

The flue liners shall be fixed to the channels from above, every straight element shall be fitted together and riveted by stainless steel rivets (specific number of rivets required for connection is given in Table 4). Circular cross-section flue liners also can be connected with clamping rings *(Picture 15).*

It is recommended to put some liquid soap on silicone gaskets as this would ensure simple and easy connection of **(P1)** system flue liners.

Oval flue liner elements shall be riveted together by four rivets A2/A2 of at least 4 mm of nominal size (two rivets on each of the opposite sides of flue liner *(Picture 15).* Clamping rings are not used to connect oval cross-section flue liners.

Circular cross-section flue liner elements shall be riveted together by four rivets A2/A2 of at least 4 mm of nominal size (two rivets on each of the opposite sides of flue liner *(Picture 15).* Elements also might be connected with clamping rings (all sizes from 80 mm to 400 mm). Both fixing options clamping rings and riveting enable connecting the same number of elements *(Table 4A).* **Please pay attention to the direction and proper position of clamping ring. Bolt must be fully tightened to ensure proper connection.**

Circular cross-section flue liner systems may be installed also in a non-vertical position. Distance between the axes shall not exceed 2 m; and deflection from a vertical cannot not exceed 30°.

In order to install the tee and clean-out detail, the openings of an appropriate size shall be formed in the channel (maintaining the distances to combustible materials), and all the connecting elements shall be installed through the openings.

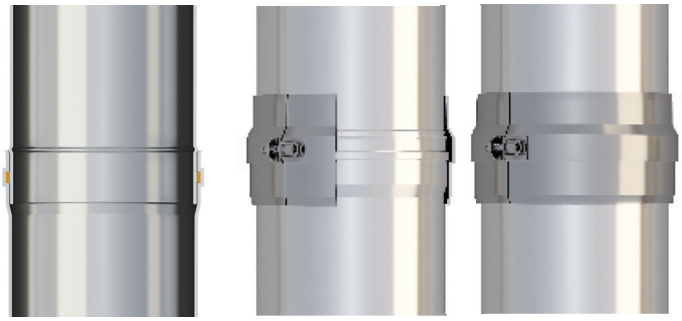
Clean-outs of flue liner may be installed in the upper part or another part of the flue liner in order to ensure proper inspection and cleaning. All the connections shall be fastened by rivets. After the installation works have been completed, these openings shall be sealed by a flameproof insulation material (rock wool). The finishing details may be installed according to the client needs.

Flue liner elements (both, circular or oval cross-section) shall be fitted together and connected in such direction that a condensate would flow from the top to a condensate plug, thus preventing it from soaking to the external surface and damaging chimney *(Picture 16).* Condensate may be collected into a collection tank or directed to the building's sewerage system.

The cavity between the flue liner and channel in the upper part of brick chimney (or any other type), shall be filled with a fireproof insulation material (rock wool). The upper cover of the flue liner shall be installed on the top, which shall be connected with flue liner using rivets. Height of flue liner shall not exceed 20-25 cm above the channel in order to avoid condensing. Inspection and soot removal shall be performed through the clean-outs installed in the systems *(Picture 4).*

Picture 15.

Oval cross-section | Circular cross-section



Circular cross-section with silicone gasket | Connection with clamping ring

Picture 16.

Oval cross-section | Circular cross-section

5.4. INSTALLATION OF FLUE LINERS (CIRCULAR AND OVAL CROSS-SECTION)

After the flue liner has been installed, on its external side on a visible place the information table shall be fixed with the following information indicated:

- Name of the manufacturer;
- Nominal size of the chimney;
- Name of the installer of the chimney (name of a person or a company);
- Date of installation.

Gamintojas / Manufacturer

SAURESTA
Metal chimney systems

Rasų g. 39, LT-11351 Vilnius, Lietuva / Lithuania
www.sauresta.com

Dūmtakis / Flue liners

EN 1856-2 T600-N1-D-Vm L20050-G

Nominalus skersmuo / Nominal size Ø 200

Montuotojas / Installer: _____

Data / Data _____

5.5. WEIGHTS OF SINGLE-WALL AND DOUBLE-WALL LINEAR ELEMENTS

Weights of single-wall circular cross-section flue liners of 1 m length (N1 T600 ir P1 T200 systems)

Table 1.

Wall thickness, mm	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,60**	**0,6**	**0,6**	**0,8**
d, mm	80	100	115	120	130	150	160	180	200	230	250	300	350	400	450	500	550	600
m, kg	1,0	1,25	1,4	1,50	1,60	1,85	2,02	2,25	2,50	3,45	3,75	4,5	5,3	6,0	6,8	7,5	8,3	12,0
Wall thickness, mm	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**									
d, mm	80	100	115	120	130	150	160	180	200	230	250	300	350	400	450	500	550	600
m, kg	1,21	1,45	1,7	1,75	1,9	2,25	2,3	2,65	2,9	-	-	-	-	-	-	-	-	-
Wall thickness, mm	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**
d (mm)	80	100	115	120	130	150	160	180	200	230	250	300	350	400	450	500	550	600
m (kg)	-	1,9	2,3	2,4	2,55	2,85	3,1	3,45	3,85	4,45	4,85	5,85	6,75	7,7	8,8	9,5	10,7	12,0
Wall thickness, mm	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**
d (mm)	80	100	115	120	130	150	160	180	200	230	250	300	350	400	450	500	550	600
m (kg)	-	2,4	2,9	2,9	3,2	3,6	3,85	4,4	4,8	5,6	6,2	7,3	8,6	9,9	11,1	12,4	13,8	14,9

Weights of single-wall oval cross-section flue liners of 1 m length

Table 2.

Wall thickness, mm	**0,6**	**0,6**	**0,6**	**0,6**
Dimensions (mm)	110x180	110x220	120x230	120x240
m (kg)	2,3	2,65	2,8	2,95

5.5. WEIGHTS OF SINGLE-WALL AND DOUBLE-WALL LINEAR ELEMENTS

Weigths of double-wall circular cross-section chimneys of 1 m length with 25 mm insulation (for P1 T200 and N1 T450 systems)

Table 3.

Wall thickness, mm	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,8**
d, mm	80	100	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	130	150	180	200	210	230	250	300	350	400	450	500	550	600	650
m, kg	4,0	4,8	6,0	6,8	7,5	8,0	8,9	11,5	13,4	15,5	17,5	19,5	21,5	23,5	28,8
Wall thickness, mm	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,8**
d, mm	80	100	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	130	150	180	200	210	230	250	300	350	400	450	500	550	600	650
m, kg	4,2	5,0	6,3	7,2	7,8	8,4	9,3	11,5	13,4	15,5	17,5	19,5	21,5	23,5	28,8
Wall thickness, mm	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**
d, mm	80	100	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	130	150	180	200	210	230	250	300	350	400	450	500	550	600	650
m, kg	-	5,4	6,9	7,8	8,6	9,2	10,2	12,6	14,7	16,9	19,2	21,5	23,5	25,8	28,8
Wall thickness, mm	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**
d, mm	80	100	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	130	150	180	200	210	230	250	300	350	400	450	500	550	600	650
m, kg	-	5,9	7,6	8,5	9,3	10,2	11,2	13,9	16,2	18,8	21,4	23,8	26,4	29,0	31,7

Weigths of double-wall circular cross-section chimneys of 1 m length with 50 mm insulation (for N1 T450 and T600 systems)

Table 3A.

Wall thickness, mm	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,5**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,8**
d, mm	80	100	115	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	180	200	215	230	250	260	280	300	350	400	450	500	550	600	650	700
m, kg	6,9	8,0	8,8	9,5	10,5	11,0	12,2	13,0	16,5	19	21,9	24,5	27,5	30,0	32,8	38,7
Wall thickness, mm	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,6**	**0,8**
d, mm	80	100	115	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	180	200	215	230	250	260	280	300	350	400	450	500	550	600	650	700
m, kg	7,1	8,2	9,1	9,8	10,9	11,3	12,6	13,4	16,5	19	21,9	24,5	27,5	30,0	32,8	38,7
Wall thickness, mm	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**	**0,8**
d, mm	80	100	115	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	180	200	215	230	250	260	280	300	350	400	450	500	550	600	650	700
m, kg	-	8,6	9,7	10,4	11,5	12,1	13,4	14,3	17,6	20,3	23,3	26,2	29,5	32,0	35,2	38,7
Wall thickness, mm	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**	**1,0**
d, mm	80	100	115	130	150	160	180	200	250	300	350	400	450	500	550	600
D, mm	180	200	215	230	250	260	280	300	350	400	450	500	550	600	650	700
m, kg	-	9,1	10,3	11,1	12,2	12,8	14,3	15,3	18,9	21,8	25,2	28,4	31,8	34,9	38,3	41,6

5.6. QUANTITY OF RIVETS REQUIRED FOR CONNECTING THE ELEMENTS

Table 4.

T200, T450 with 25 mm insulation

External pipes of double-wall chimney manufactured of:	Wall thickness of internal element (mm)	Diameter of internal element (mm)	Quantity of rivets per connection (pcs.)	Amount of vertically installed elements (m)
Stainless steel 1.4301	0,5÷1,0	80-200	3	20
	0,6÷1,0	250-350	4	10
	0,6÷1,0	400-600	5	10
Stainless steel 1.4509	0,5÷1,0	80-160	3	20
	0,5÷1,0	180-200	4	20
	0,6÷1,0	250-350	4	10
	0,6÷1,0	400-600	5	10

T450, T600 with 50 mm insulation

External pipes of double-wall chimney manufactured of:	Wall thickness of internal element (mm)	Diameter of internal element (mm)	Quantity of rivets per connection	Amount of vertically installed elements (m)
Stainless steel 1,4301	0,5÷1,0	80-130	3	20
	0,5÷1,0	150-200	4	20
	0,6÷1,0	250-350	4	10
	0,6÷1,0	400-600	5	10
Stainless steel 1,4509	0,5÷1,0	80-150	3	20
	0,5÷1,0	160-200	4	20
	0,6÷1,0	250-350	4	10
	0,6÷1,0	400-600	6	10
Elements of circular cross-section flue liners manufactured of:				
Stainless steel 1,4301; 1,4404	0,5÷1,0	80-130	2	20
	0,5÷1,0	150-200	3	20
	0,6÷1,0	230-300	4	15
	0,6÷1,0	350-600	5	15
Elements of oval cross-section flue liners manufactured of:				
Stainless steel 1,4301; 1,4404	0,6	110x180	4	20
	0,6	110x220	4	20
	0,6	120x230	4	20
	0,6	120x240	4	20

Table 4A.

5.7. FIXING CONNECTING ELEMENTS WITH CLAMPING RINGS

External pipes of double-wall chimeny manufactured of:	Wall thickness of internal element (mm)	Diameter of internal element (mm)	Amount of vertically installed elements (m)
Stainless steel 1.4301 and 1.4509	0,5÷1,0	80-200	20
	0,6÷1,0	250-300	10
Elements of circular cross-section flue liners manufactured of:			
Stainless steel 1.4301 and 1.4404	0,5÷1,0	80-200	20
	0,5÷1,0	230-400	15

6. RECOMMENDATIONS ON CHIMNEY OPERATION AND USE

The national laws, fire safety regulations and requirements of this instruction manual of the manufacturer shall be followed in order to ensure the safe and long-term operation and maintenance of chimneys, flue liners and connecting flue pipe systems.

The suitable chimney system shall be selected for every heating appliance individually, taking into account the operating characteristics of the heating appliance and the type of the fuel used. All the system elements shall be used strictly in accordance with their intended purpose.

The chimney systems manufactured by SAURESTA UAB are designed to operate under natural draught (N1), wet (W) and dry (D) operating conditions (when during operation of the chimney, temperature of its inner surface is higher than dew point temperature). The dew point is the temperature, at which the moisture starts condensing on the surface.

Wet system (W) is designed to convey the products of combustion of gaseous, liquid or solid fuel.

Dry system (D) is designed to convey the products of combustion of gaseous and liquid fuel (with the exception of fuel with a sulphur content of ≥0.2 % by mass) and solid fuel, without the use of peat and coal.

Combustion of wood waste containing the hazardous materials is prohibited as it generates aggressive substances, which may cause the corrosion of the chimney and heating appliance.

Combustion of plastic, rubber, household waste and construction waste, also the materials containing oil products and chemical impurities, is also prohibited.

The surface of double-wall chimney must be protected by a cover or a grid to protect a human or an animal from accidental contact with the hot surface. Before the start of the heating season, the chimneys and furnaces shall be necessarily cleaned out of soot, and cleaning shall be repeated at least every three months during the heating season.

Special tools made of stainless steel or polymer materials must be used for cleaning. The use of black metal tools to clean the chimneys is prohibited.

BE WARNED that a dirty, damaged chimney is a potential cause of chimney fires.

SAURESTA
Metal chimney systems

THANK YOU
FOR CHOOSING OUR PRODUCTS!