SLOVENSKI STANDARD
SIST EN 1856-1:2003

01-september-2003

Dimniki – Zahteve za kovinske dimnike – 1. del: Proizvodi za sistemske dimnike

Chimneys - Requirements for metal chimneys - Part 1: System chimney products

Abgasanlagen - Anforderungen an Metall-Abgasanlagen - Teil 1: Bauteile für System-Abgasanlagen

Conduits de fumée - Prescriptions pour les conduits de fumée métalliques - Partie 1: Composants de systemes de conduits de fumée

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Contents

Foreword

This document (EN 1856-1:2003) has been prepared by Technical Committee CEN/TC 166, "Chimneys", the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2003, and conflicting national standards shall be withdrawn at the latest by March 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

Annexes A, B, C and D are normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard has been prepared to be a harmonised standard to provide means of conforming to the essential requirements of the Construction Products Directive and associated EFTA regulations.

The generic word "chimney", when used in this standard, refers to systems with metallic liner used to convey the products of combustion from any appliance to the outside atmosphere, and thus includes all other terms of common use in the trade, such as: vents, flues, shafts, exhaust systems, ducts, etc.

This standard addresses the durability against corrosion by the use of a minimum material specification for the flue liner as well as an interim solution for testing products for durability against corrosion. Three corrosion resistance tests and their requirements have been adopted from existing corrosion testing being undertaken in various member states (see annex A).

Is intended to review the interim solution within a period of 5 years with the intention to develop a unique test method for durability against corrosion as a final solution.

This standard describes chimney components, from which system chimneys can be assembled as illustrated in Figure 1.

1 Scope

This standard specifies the performance requirements for single- and multi-wall system chimney products with metallic liners (chimney sections, chimney fittings and terminals, including supports) used to convey the products of combustion from appliances to the outside atmosphere. It also specifies the requirements for marking, manufacturer's instructions, product information and evaluation of conformity. Metal liners and metal connecting flue pipes not covered here, are included in prEN 1856-2:1996.

This standard does not apply to structurally independent (free standing or self-supporting) chimneys.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 573-3	*Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition.*
EN 1443:2003	*Chimneys - General requirements.*
EN 1859:2000	*Chimneys - Metal chimneys - Test methods.*
EN 10088-1	*Stainless steel - Part 1: List of stainless steels.*
prEN 12391	*Chimneys - Metal chimneys.*
EN 13384-1:2002	*Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one appliance.*
EN ISO 3651-2	*Determination of resistance to intergranular corrosion of stainless steels. Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels. Corrosion test in media containing sulfuric acid (ISO 3651-2:1998).*

ISO 2859-1 *Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply:

3.1
appliance outlet
position where the products of combustion exit from the appliance (see Figure 1)

3.2
chimney
structure consisting of a wall or walls enclosing a flue or flues

[EN 1443:2003]

3.3
chimney accessory
chimney component not conveying products of combustion

[EN 1443:2003]

3.4
chimney component
any part of a chimney

[EN 1443:2003]

3.5
chimney designation
shortened description of a specific chimney type, which clearly distinguishes it from any other types

3.6
chimney fitting
chimney component conveying products of combustion except a chimney section (see Figure 1)

[EN 1443:2003]

3.7
chimney section
straight chimney component conveying products of combustion (see Figure 1)

[EN 1443:2003]

3.8
cladding
additional non-structural outer wall around a chimney for protection against heat transfer or weathering, or for decorative purposes (see Figure 1)

[EN 1443:2003]

3.9
connecting flue pipe
component or components connecting the heating appliance outlet and the chimney (see Figure 1)

[EN 1443:2003]

3.10
corrosion load
combination of condensate and corrosion resistance classes necessary for the different operating conditions and types of fuel

3.11
custom built chimney
chimney that is installed or built on-site using a combination of compatible chimney components that may be from one or different sources

[EN 1443:2003]

3.12
design load (DL)
load which a chimney or its components are designed to be subjected to, under normal operating conditions, when installed as per manufacturer's installation instruction

3.13
dry operating condition
condition when a chimney is designed to operate normally with the temperature of the inner surface of the flue liner above the water dew point

[EN 1443:2003]

3.14
enclosure
barrier that, when built around a chimney, will give additional safety in case of fire and can provide additional heat transfer resistance (see Figure 1)

[EN 1443:2003]

3.15
external installation
part of a chimney, which is located outside the building

3.16
flexible pipe
metal liner, or metal connecting flue pipe having a single or double skin construction, designed to bend in any direction without permanent deformation

3.17
flue
passage for conveying the products of combustion to the outside atmosphere (see Figure 1)

[EN 1443:2003]

3.18
flue gas
gaseous portion of the products of combustion conveyed in a flue

[EN 1443:2003]

3.19
flue liner
wall of a chimney consisting of components the surface of which is in contact with products of combustion (see Figure 1)

[EN 1443:2003]

3.20
heating appliances
unit generating products of combustion which need to be conveyed to the outside atmosphere (see Figure 1)

[EN 1443:2003]

3.21
insulation
material or air gap between the flue liner and the outer wall, designed to increase thermal resistance of the chimney (see Figure 1)

3.22
internal installation
part of a chimney, which is located inside a building

3.23
joint
connection between two components (see Figure 1)

[EN 1443:2003]

3.24
manufacturer instructions
product written information which is provided for use by the buyer or installer

3.25
metal chimney
chimney with its flue liner made of metal, which may have additional surrounding structural elements and accessories, as well as insulation

3.26
metal liner
rigid or flexible flue liner made of metal

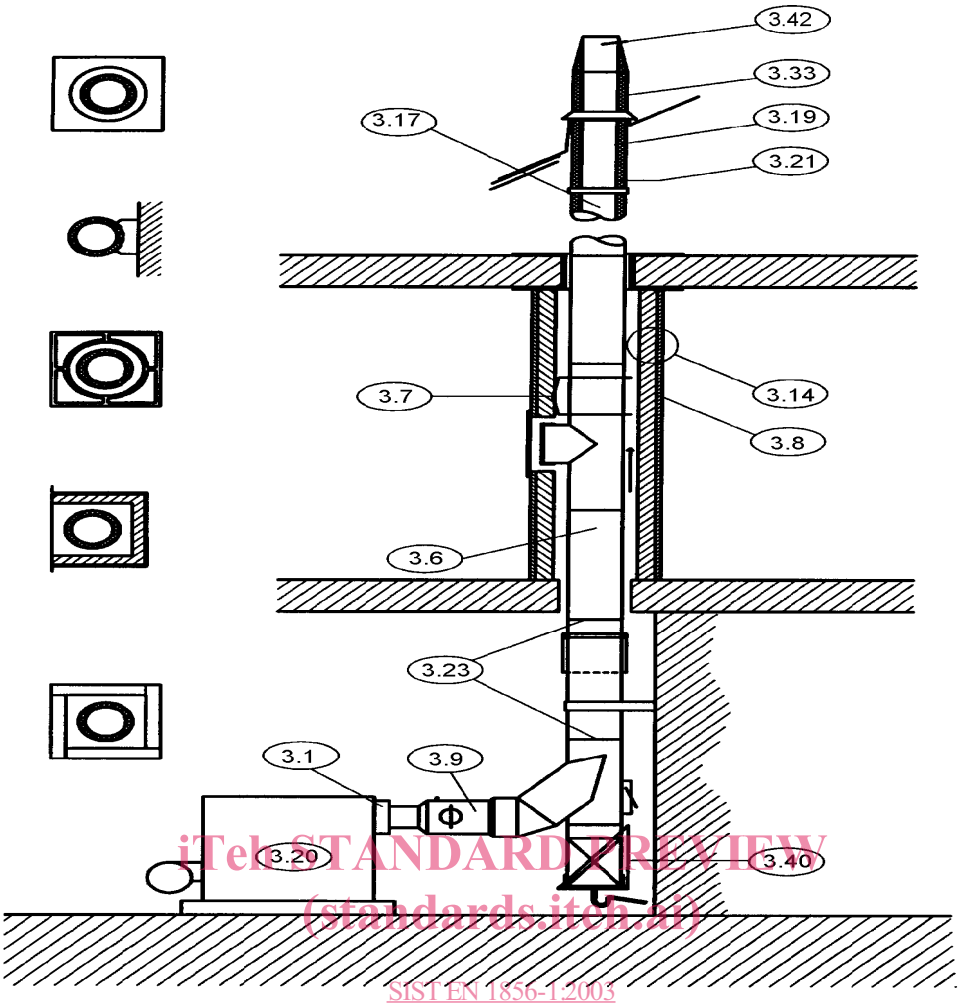

Figure 1 — Terminology. chimney components and chimney accessories

3.27
minimum declared wall thickness
value for the minimum thickness of the liner wall as stated by the manufacturer for the type test

3.28
multi-wall chimney
chimney consisting of a flue liner and at least one additional wall

[EN 1443:2003]

3.29
multi-wall metal chimney
chimney of two walls or more, all made of metal

3.30
negative pressure chimney
chimney designed to operate with the pressure inside the flue less than the pressure outside the flue

[EN 1443:2003]

3.31
nominal size
whole number representing the value of the internal diameter of the flue liner, expressed in millimetres

3.32
non enclosed chimney
chimney which is installed without any enclosure or cladding

3.33
outer wall
external wall of a chimney, the surface of which comes in contact with ambient or the external environment, or is within cladding or enclosure (see Figure 1)

[EN 1443:2003]

3.34
positive pressure chimney
chimney designed to operate with the pressure inside the flue greater than the pressure outside the flue

[EN 1443:2003]

3.35
relining
process of restoring or replacing the flue liner of a chimney

[EN 1443:2003]

3.36
resistance to fire
the ability of a chimney to prevent ignition of adjacent combustible material, and to prevent the spread of fire to adjacent areas

3.37
single-wall chimney
chimney where the flue liner is the chimney

[EN 1443:2003]

3.38
sootfire
combustion of the flammable residue deposited on the flue liner

[EN 1443:2003]

3.39
structurally independent chimney
chimney which is not attached to buildings, masts or other support structure

3.40
support
chimney accessory used to fix, or transfer the load of, chimney components to structural elements (building, mast, etc.) (see Figure 1)

3.41
system chimney
chimney that is installed using a combination of compatible chimney components, obtained or specified from one manufacturing source with product responsibility for the whole chimney

[EN 1443:2003]

3.42
terminal
fitting installed at the outlet of a chimney (see Figure 1)

[EN 1443:2003]

3.43
test assembly
complete assembly of all parts necessary to enable the specific performance criteria to be assessed, comprising test chimney, test structures, and measuring equipment (as specified in the test method)

3.44
test chimney
assembly of the chimney components (as specified in the test method), necessary to the assessment of a specific performance criteria of a metal system chimney product

3.45
test structure
assembly of the additional materials (non-chimney components) to enable the test chimney to be assessed for the specific performance criteria

3.46
thermal resistance of a chimney
resistance to heat transfer through the wall or walls of the chimney

[EN 1443:2003]

3.47
wet operating condition
condition when the chimney is designed to operate normally with the temperature of the inner surface of the flue liner at or below the water dew point

[EN 1443:2003]

4 Manufacturer's declaration for type test

The manufacturer shall provide the relevant information from 7.2 and, in addition, shall declare:

a) the type of metals from which the chimney fittings or sections are made, according to EN 10088-1 and EN 573-3, and the nominal and minimum wall thickness;

b) the internal diameter of the chimney fittings or sections and the nominal product size;

c) the minimum wall thickness after manufacture, the installed length, liner external circumference, total mass and design loads of the fitting or section and, if appropriate, the insulation density or mass.

5 Dimensions and tolerances

5.1 The thickness of the material from which the components are made shall be not less than the minimum wall thickness according to 4 a).

5.2 The declared internal diameter of the fitting or section shall be not less than ± 5 mm from the nominal size. The measured internal diameter of the fitting or section shall not be less than the diameter declared by the manufacturer [see 4 b)].

5.3 The external circumference of the liner of the fitting or section shall be within $^{+5}_{0}$ mm up to 600 mm internal diameter and within $^{+13}_{0}$ mm over 600 mm internal diameter, of that declared by the manufacturer [see 4 c)].

5.4 The installed length of a fitting or section (measured on an assembly including at least one joint) shall be within ± 5 mm of that declared by the manufacturer [see 4 c)].

5.5 The density of insulation in a fitting or a section shall be within $^{+30}_{0}$ % of that declared by the manufacturer [see 4 c)].

6 Performance requirements

Unless otherwise stated, performance requirements for fittings shall be the same as those for chimney sections.

6.1 Mechanical resistance and stability

6.1.1 Compressive strength

6.1.1.1 Chimney sections and fittings

The manufacturer shall declare the relevant design loads.

When tested according to the test method described in EN 1859 a multi-wall chimney section or fitting shall withstand a load of at least three times the manufacturer's declared design load.

When tested according to the test method described in EN 1859, single- and multi-wall chimney sections or fittings where the flue liner is load bearing, shall withstand a load of at least four times the manufacturer's declared design load.

6.1.1.2 Chimney support

The manufacturer shall declare the relevant design loads.

When tested according to the test method described in EN 1859, the maximum displacement of the test chimney at the support shall not be greater than 5 mm, in the direction of the load when the manufacturer's declared design load is applied.

The support shall withstand an intensity of loading of at least three times the manufacturer's declared design load.

6.1.2 Tensile strength

The manufacturer shall declare the relevant design loads.

When a chimney section is tested according to the test method of EN 1859, the chimney section shall withstand a load of at least 1,5 × the manufacturer's declared design load.

6.1.3 Lateral strength

6.1.3.1 Non-vertical installation

When a chimney section, declared by the manufacturer as suitable for non-vertical installation, is tested according to the test method described in EN 1859, the deflection of any part of the test chimney shall not be more than 2 mm/m in distance between supports.

6.1.3.2 Components subject to wind load

When chimney components declared by the manufacturer as suitable for external installation are tested according to the test method of EN 1859, the test chimney shall withstand a minimum load of 1,5 kN/m^2 of projected outer surface area.

6.2 Resistance to fire

The manufacturer shall declare the minimum distance to combustible material and the requirements of 6.4.1 shall be met.

6.2.1 Sootfire resistance

When a chimney made of sections and/or fittings designated as sootfire resistant is tested according to the thermal shock test method described in EN 1859, the maximum surface temperature of combustible materials adjacent to the test chimney, at the distance declared, shall not exceed 100°C when related to an ambient temperature of 20°C and shall meet the gas tightness given in 6.3.

The distance declared shall not exceed the criteria for normal operating conditions.

6.3 Hygiene, health and environment. Gas tightness

When a chimney is tested according to the test methods described in EN 1859, the leakage rate shall not be greater than that given in Table 1, both before and after the thermal performance test at normal operating condition and, where appropriate, the resistance to sootfire test (see annex I of EN 1859:2000).

Table 1 — Leakage rate

Pressure type	Test pressure Pa	Leakage rate/Flue surface area $l \cdot s^{-1} \cdot m^{-2}$
N1	40	< 2,0
P1	200	< 0,006
P2	200	< 0,120
H1	200 and 5 000	< 0,006
H2	200 and 5 000	< 0,120

6.4 Safety in use

6.4.1 Thermal performance at normal operating conditions

When a chimney made of sections and/or fittings is tested according to the heat stress test method described in EN 1859, the maximum surface temperature of combustible materials adjacent to the test chimney, at the distance declared, for the nominal working temperature, shall not be greater than 85°C, when related to an ambient temperature of 20°C and shall meet the gas tightness given in 6.3.

6.4.2 Accidental human contact

Where accidental human contact of a chimney is possible the outer wall surface temperature of the chimney shall not be greater than the appropriate value given in Table 2.

Table 2 — Maximum outer wall surface temperatures

Material of outer wall surface	Maximum allowed temperature °C
Metal-bare	70
Metal-painted	80
Metal-enamelled	86
Metal-plastic covered	90
NOTE The values in Table 2 are based on the criteria in EN 563 relating to a 1 s burn threshold.	