SLOVENSKI STANDARD
oSIST prEN 1856-2:2019

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Dimniki - Zahteve za kovinske dimnike - 2. del: Kovinske tuljave in dimniški priključki

Chimneys - Requirements for metal chimneys - Part 2: Metal flue liners and connecting flue pipes

Abgasanlagen - Anforderungen an Metall-Abgasanlagen - Teil 2: Innenrohre und Verbindungsstücke aus Metall

Conduits de fumée - Prescriptions pour les conduits de fumée métalliques - Partie 2 : Tubages et éléments de raccordements métalliques

Ta slovenski standard je istoveten z: **prEN 1856-2**

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English Version

Chimneys - Requirements for metal chimneys - Part 2: Metal flue liners and connecting flue pipes

Conduits de fumée - Prescriptions pour les conduits de fumée métalliques - Partie 2 : Tubages et éléments de raccordements métalliques

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 166.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

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European foreword

This document (prEN 1856-2:2019) has been prepared by Technical Committee CEN/TC 166 “Chimneys”, the secretariat of which is held by ASI.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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

This document will supersede EN 1856-2:2009.

The main changes in comparison to EN 1856-2:2009 are:

— adoption of the template for harmonized standards under the EU Construction Products Regulation (305/2011/EU) meaning a clearer definition of the Scope, rewording in Clause 4 "Product characteristics", Clause 5 "Testing, assessment and sampling methods" and Clause 7 "Product classification and designation", and adoption of the template for Clause 6 "Assessment and verification of constancy of performance";

— adoption of the revised "Corrosion tests" specified in prEN 1856-1:2019.

Introduction

The generic word “chimney”, when used in this document, refers to all products used to convey the products of combustion from appliances 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.

For addressing the durability against corrosion, a unique corrosion test has been introduced, as described in prEN 1856-1:2019, Annex A; the material table with minimum material specification of the former edition has been taken over.

1 Scope

This document specifies the characteristics of performance for rigid or flexible metal flue liners, rigid metal connecting flue pipes and their fittings used to convey the products of combustion from appliances to the outside atmosphere (including their supports).

This document specifies sootfire resistant flue liners, connecting flue pipes and fittings for combustion appliances burning solid, liquid and gaseous fuels and non-sootfire resistant flue liners, connecting flue pipes and fittings for combustion appliances burning liquid and gaseous fuels only.

NOTE This means that flue liners, connecting flue pipes and fittings designated "O" are not suitable for combustion appliances burning solid fuel.

Vitreous enamelled connecting flue pipes are also covered by this document.

Rigid flue liners can be used as flue liners for renovation or adaptation of existing chimneys and as flue liners of custom built chimneys.

Flexible metal flue liners described in this document are exclusively for renovation or adaptation of existing chimneys. Flexible connecting flue pipes and extensible flexible products designed to be compressed or extended along their length are excluded from the scope of this document.

This document also specifies the characteristics for marking, manufacturer's instructions, product information and evaluation of conformity.

Single wall and multi-wall system chimney products (chimney sections, chimney fittings and terminals, including supports) are covered by prEN 1856-1:2019, even if used as liners for existing chimneys or connecting flue pipes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 573-3:2013, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition and form of products*

EN 1443:2019, *Chimneys — General requirements*

prEN 1856-1:2019, *Chimneys — Requirements for metal chimneys — Part 1: System chimney products*

EN 13216-1:2019, *Chimneys — Test methods for system chimneys — Part 1: General test methods*

EN 10025-5:2004, *Hot rolled products of structural steels — Part 5: Technical delivery conditions for structural steels with improved atmospheric corrosion resistance*

EN 10088-1:2014, *Stainless steels — Part 1: List of stainless steels*

EN 10131:2006, *Cold rolled uncoated and zinc or zinc-nickel electrolytically coated low carbon and high yield strength steel flat products for cold forming — Tolerances on dimensions and shape*

EN 10209:2013, *Cold rolled low carbon steel flat products for vitreous enamelling — Technical delivery conditions*

EN 10346:2015, *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*

EN 13384-1:2015[1)], *Chimneys - Thermal and fluid dynamic calculation methods - Part 1: Chimneys serving one heating appliance*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 14241-1:2013, *Chimneys — Elastomeric seals and elastomeric sealants — Material requirements and test methods — Part 1: Seals in flue liners*

EN 15287-1:2007+A1:2010, *Chimneys — Design, installation and commissioning of chimneys — Part 1: Chimneys for non-roomsealed heating appliances*

3 Terms, definitions, symbols, units and abbreviated terms

For the purposes of this document, the terms and definitions given in EN 1443:2019 and prEN 1856-1:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
bending radius
minimum radius measured on the inner side of a flexible flue liner when bent

3.2
double skin flexible flue liner
flexible flue liner consisting of two layers of metal, where the inner layer forming the flue is flat and covers the corrugations

3.3
flue liner kit
flue liner that is installed using a combination of compatible flue liner components, obtained or specified as a kit from one manufacturing source with product responsibility for the whole flue liner including all its components

Note 1 to entry: A flue liner kit is not considered a system chimney.

4 Product characteristics

4.1 Dimensions and tolerance

4.1.1 The thickness of materials from which the flue liners, connecting flue pipes and fittings are made shall be not less than the minimum declared. The tolerance for material thickness shall not be more than ± 10 % of the nominal thickness.

4.1.2 The declared internal diameter of the flue liner, connecting flue pipe and fitting shall not vary by more than ± 5 mm from the nominal size.

1) This document is impacted by the amendment EN 13384-1:2015/prA1:2018.

When measured in accordance with the procedure explained in 5.1 the internal diameter of the flexible flue liner shall not be less than the declared diameter.

For rigid connecting flue pipe, the characteristics given in prEN 1856-1:2019, 4.2.2 shall apply.

For flexible flue liners, the internal diameter shall be measured in accordance with 5.1.

Oval flexible liners shall only be factory made and the ovalization ratio shall not exceed 1,5 maximum.

4.1.3 The installed length of rigid flue liners or rigid connecting flue pipes (measured on an assembly including at least one joint) shall be in accordance with prEN 1856-1:2019, 4.2.4.

4.2 Mechanical resistance and stability

4.2.1 Rigid flue liners and their fittings

Rigid flue liners and their fittings shall comply with prEN 1856-1:2019, 4.3.1, 4.3.2 and 4.3.3 except wind load.

4.2.2 Connecting flue pipes and their fittings

Connecting flue pipes and their fittings shall comply with prEN 1856-1:2019, 4.3.1, 4.3.2 and 4.3.3 except wind load.

4.2.3 Flexible flue liners

4.2.3.1 General

Flexible flue liners shall comply with the characteristics of 4.2.3.2 to 4.2.3.7.

4.2.3.2 Compressive strength of fittings and supports

The relevant design load of fittings and supports shall be declared.

The compressive strength characteristics shall be in accordance with prEN 1856-1:2019, 4.3.1.1 and 4.3.1.2.

4.2.3.3 Tensile strength

The relevant design load of flexible flue liners shall be declared.

The flexible flue liner, when tested in accordance with 5.3, shall meet the gas tightness requirement of 4.4.

4.2.3.4 Crushing resistance

When tested in accordance with 5.4, the outside diameter of the flexible flue liner shall not have been reduced to less than 75 % of its original nominal diameter and shall meet the gas tightness requirement of 4.4.

4.2.3.5 Flexibility

When tested in accordance with 5.5, the flexible flue liner shall meet the gas tightness requirement of 4.4.

When tested in accordance with 5.5, the inner layer of the double skin flexible flue liner shall remain overlapped at the minimum declared bending radius.

Oval flexible liners shall be subjected to the test method of 5.5 in both axes of the oval shape.

4.2.3.6 Torsion strength

When a flexible flue liner is tested in accordance with 5.6, it shall meet the gas tightness requirement of 4.4.

4.2.3.7 Pulling force

Before the thermal performance test, as per 5.7.4.1.1, it shall be checked that the pulling force measured shall be less than 0,5 kN (see also Figure 4).

4.3 Reaction to fire

The reaction to fire shall be declared for chimneys, flue liners, connecting flue pipes, components and accessories. Classification may be carried out via testing according to the relevant product standard and in accordance with EN 13501-1:2018.

NOTE Metal chimney liners and connecting flue pipes might be classified A1 according to Commission Decision [96/603/EC (2)] and need no further testing.

4.4 Resistance to fire

4.4.1 Sootfire resistance classes

The sootfire resistance class of the chimney or product shall be declared.

Sootfire resistance classes are:

— O for chimneys, flue liners, connecting flue pipes, components and accessories without sootfire resistance;

— G for chimneys, flue liners, connecting flue pipes, components and accessories with sootfire resistance.

For a sootfire resistant flue liner or connecting flue pipe, the characteristics of 4.4.2 shall be fulfilled. Under a declared normal operating condition, the characteristics of 4.4.3 shall be fulfilled for the designated temperature class. Additionally, for both classes G and O, the gas tightness given in 4.5 shall be met.

4.4.2 Sootfire resistance

4.4.2.1 Rigid flue liners and their fittings

When a rigid flue liner and its fittings, designated as sootfire resistant, is tested according to 5.7.4.2 and 5.7.5.2, it shall meet the gas tightness characteristics defined in 4.5.

4.4.2.2 Connecting flue pipes and their fittings

The minimum distance to combustible material shall be declared, either measured (M) according to 5.7 or calculated (NM) as at least three times their nominal diameter but not less than 375 mm (as specified in EN 15287-1:2007+A1:2010, 4.3.9.3, 3rd paragraph, first sentence for connecting flue pipes naturally ventilated) and the characteristics of 4.4.3 shall be met.

The maximum surface temperature of combustible material adjacent to a rigid connecting flue pipe and its fittings designated as sootfire resistant, at the declared distance, shall not exceed 100 °C when related to an ambient temperature of 20 °C. When a rigid connecting flue pipe and its fittings designated as sootfire resistant are tested to the test method described in 5.7.4.3 and 5.7.5.2, it shall also meet the gas tightness requirement of 4.5.

The rigid connecting flue pipes to be tested shall be the largest diameter in the manufacturer's range, up to and including 200 mm. The distance to combustible material for rigid connecting flue pipes larger than that tested shall be increased by a factor. For diameters from 201 to 300 the factor shall be 1 time the distance to combustible material determined for the 200 mm product, for diameters from 301 to 450 the factor shall be 1,5, and those diameters from 451 to 600 shall apply a factor of 2, and above 600 the factor shall be 4.

4.4.2.3 Flexible flue liners and their fittings

When a flexible flue liner and its fittings, designated as sootfire resistant, are tested according to the test method described in 5.7.5.2, they shall meet the gas tightness characteristics defined in 4.5. The test sample shall allow the test ball defined in 5.7.4.1.2 to move freely down.

4.4.3 Thermal performance at normal operating conditions

4.4.3.1 Rigid flue liners and their fittings

When a flue liner and its fittings are tested according to the thermal performance test method described in 5.7.5, they shall meet the gas tightness of 4.5.

4.4.3.2 Connecting flue pipes and their fittings

The minimum distance to combustible material shall be declared (see 7.2.1).

The maximum surface temperature of combustible material adjacent to a rigid connecting flue pipe and its fittings, at the declared distance, shall not exceed 85 °C when related to an ambient temperature of 20 °C. When a rigid connecting flue pipe and its fittings are tested to the test method described in 5.7.4.3 and 5.7.5.1, it shall also meet the gas tightness requirement of 4.5.

4.4.3.3 Flexible flue liners and their fittings

When a flexible flue liner and its fittings are tested according to the thermal performance test described in 5.7.4.1 and 5.7.5.1, they shall meet the gas tightness of 4.5. The test sample shall allow the test ball of 5.7.4.1.2 to move freely down.

4.5 Gas tightness

When tested in accordance with 5.2 for flexible flue liners and their fittings or with EN 13216-1:2019, 5.4 for rigid flue liners and rigid connecting flue pipes and their fittings, the leakage rate shall not be greater than those specified in Table 1. In addition, for positive pressure connecting flue pipes, leakage rate test shall also be performed on the smallest and largest diameter without thermal performance test.

Table 1 — Leakage rate

Pressure Class	Pressure[a] Pa	Type of use	Test pressure	Leakage rate $l \cdot s^{-1} \cdot m^{-2}$
N 1	≤ 0	for negative pressure chimneys	40	≤ 2,0
N 2	≤ 0	for negative pressure chimneys	20	≤ 3,0
P 1	≤ 200	for low positive pressure chimneys	200	≤ 0,006
P 2	≤ 200	for low positive pressure chimneys	200	≤ 0,120
M 1	≤ 1 500	for medium positive pressure chimneys	1 500	≤ 0,006
M 2	≤ 1 500	for medium positive pressure chimneys	1 500	≤ 0,120
H 1	≤ 5 000	for high positive pressure chimneys	5 000	≤ 0,006
H 2	≤ 5 000	for high positive pressure chimneys	5 000	≤ 0,120

[a] Pressure at steady-state condition under normal operating conditions.

4.6 Safety in use

4.6.1 Accidental human contact

In case of accidental human contact for a connecting flue pipe, individual member states regulations are applicable.

4.6.2 Thermal resistance

Where connecting flue pipes are insulated, the declared thermal resistance value, shall be determined in accordance with prEN 1856-1:2019, 4.7.2.

4.6.3 Condensate resistance (vapour phase)

The characteristics of prEN 1856-1:2019, 4.7.3 shall apply when it is declared that the rigid or flexible flue liner can be installed with external insulation.

Liners and connecting flue pipes designated as negative pressure and wet which have a liner with a leakage rate 7 times smaller than the pass mark for the N1 class, or those designated P, M or H may be judged to be wet designated without undertaking the water vapour diffusion test, provided that the product passes the condensate penetration resistance requirement of 4.6.4.

4.6.4 Condensate penetration (liquid phase)

Rigid and flexible flue liners, rigid connecting flue pipes and their fittings designated for wet operating conditions (W) shall be subjected to the characteristics of prEN 1856-1:2019, 4.7.4 and their outer surface shall remain dry.

4.6.5 Flow resistance

For rigid flue liners and their fittings, connecting flue pipes and their fittings and flexible flue liners and their fittings, the characteristics of prEN 1856-1:2019, 4.7.6.1 and 4.7.6.2 shall apply.

4.7 Durability

4.7.1 Durability against corrosion

4.7.1.1 General

The characteristics of prEN 1856-1:2019, 4.8.1.1 and 4.8.1.2 shall apply, where prEN 1856-1:2019, Table 5 shall be replaced by Tables 3 and 5 of this document.

In addition, the material specification of the outer skin of the double skin flue liners and connecting flue pipes shall be declared.

When tested in accordance with EN 10209:2013, the adherence level of the coating of vitreous enamelled connecting flue pipes shall not exceed level 3. This test shall be performed after thermal performance test defined in 5.7 and Figure 7.

4.7.1.2 Durability against corrosion of connecting flue pipes

Durability against corrosion shall be declared as follows:

— corrosion class 1, 2 or 3 as given in EN 1443:2019, Table 4, on the basis of the results of the test method described in prEN 1856-1:2019, Annex A, or

— "nt" (not tested) on the basis of material type (according to Table 3) and thickness of the connecting flue pipe. This is only possible for dry operating conditions (D) and wet for class 1 (see Table 2).

NOTE 1 The allowed corrosion resistance class for products which have a declaration on the basis of material type and thickness is dependent on individual member states regulations where they exist.

NOTE 2 Table 2 is given to clarify the possible designations of corrosion resistance classes.

Corrosion designation shall be as described in Table 2.

Table 2 — Designation of corrosion resistance of connecting flue pipes

Products designated to ...	Corrosion resistance class 1 according to EN 1443:2019	Corrosion resistance class 2 according to EN 1443:2019	Corrosion resistance class 3 according to EN 1443:2019
Dry operating conditions (D)	1 [a] nt [b]	2 [a] nt [b]	3 [a] nt [b]
Wet operating conditions (W)	1 [a] nt [b, c]	2 [a] nt not possible	3 [a] nt not possible

[a] 1, 2, 3 means "corrosion tested". For additional information, see prEN 1856-1:2019, Tables A.3 and A.4.

[b] nt means "not tested" (previously named Vm).

[c] Only for temperature classes ≤ T120.