SLOVENSKI STANDARD
SIST EN 1856-2:2009

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Dimniki - Zahteve za kovinske dimnike - 2. del: Kovinske tuljave in dimniġki priklјuļ ki

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 relatives aux conduits de fumée métalliques - Partie 2: Tubages et éléments de raccordement métalliques

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Foreword

This document (EN 1856-2:2009) 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of an identical text or by endorsement, at the latest by December 2009, and conflicting national standards shall be withdrawn at the latest by March 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1856-2:2004.

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 EC Directive 89/106/EEC.

For relationship with EC Directive 89/106/EEC, see informative Annex ZA, which is an integral part of this document.

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Introduction

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

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.

This document addresses the durability against corrosion by the use of material specifications for the metal flue liners and connecting flue pipes as well as an interim solution for testing products. Three corrosion resistance tests have been adopted from existing corrosion testing being undertaken in various member states (see Annex A of EN 1856-1:2009).

1 Scope

This document specifies the performance requirements 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).

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 requirements for marking, manufacturer's instructions, product information and evaluation of conformity.

Single wall and multi-wall system chimney products are covered by EN 1856-1.

2 Normative references

The following referenced documents are indispensable for the application 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, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition and form of products*

EN 1443, *Chimneys — General requirements*

EN 1856-1:2009, *Chimneys — Requirements for metal chimneys — Part 1: System chimney products*

EN 1859:2009, *Chimneys — Metal chimneys — Test methods*

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

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

EN 10154, *Continuously hot-dip Aluminium-Silicon (AS) coated steel strip and sheet — Technical delivery conditions*

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

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1856-1:2009 and the following apply.

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

4 Manufacturer's declaration for type test

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

a) the type of metals from which the flue liners and connecting flue pipes are made, according to EN 573-3, EN 10025-5, EN 10088-1, EN 10154 and EN 10209, and the nominal and minimum skin/wall thickness(es);

b) the internal diameter of the flue liners and connecting flue pipes and the nominal product size;

c) the minimum thickness of rigid flue liners or rigid connecting flue pipes, the length of rigid flue liners or rigid connecting flue pipes as installed, rigid flue liner and connecting flue pipes external circumference, mass and design loads of the fittings or rigid flue liner sections;

d) manufacturer declared design load for tensile strength for flexible flue liners (corresponding to the maximum length of suspended flexible flue liner, with a minimum of 10 m or more if declared by the manufacturer).

5 Dimensions and tolerances

5.1 The thickness of materials from which the flexible flue liner is made shall be not less than that declared by the manufacturer (see 4a)). The thickness of rigid flue liners and rigid connecting flue pipes shall be in accordance with 5.1 of EN 1856-1:2009.

5.2 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.

When measured in accordance with the procedure explained in A.1.1 the internal diameter of the flexible flue liner shall not be less than the manufacturer's declared diameter (see 4b)).

For rigid connecting flue pipe, the requirements given in 5.2 of EN 1856-1:2009 shall apply.

For flexible flue liners, the internal diameter shall be measured in accordance with A.1.

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

5.3 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 EN 1856-1:2009.

6 Performance requirements

6.1 Mechanical resistance and stability

6.1.1 Rigid flue liners and rigid connecting flue pipes and fittings

Rigid flue liners and rigid connecting flue pipes and fittings shall comply with 6.2.1, 6.2.2 and 6.2.3 of EN 1856-1:2009 except wind load.

6.1.2 Flexible flue liners

6.1.2.1 General

Flexible flue liners shall comply with the following requirements.

6.1.2.2 Compressive strength of fittings and supports

The manufacturer shall declare the relevant design load of fittings and supports.

The compressive strength requirements shall be in accordance with 6.2.1.1 and 6.2.1.2 of EN 1856-1:2009.

6.1.2.3 Tensile strength

The manufacturer shall declare the relevant design load of flexible flue liners.

The flexible flue liner, when tested in accordance with A.3, shall meet the gas tightness requirement of 6.3.

6.1.2.4 Crushing resistance

When tested in accordance with A.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 6.3.

6.1.2.5 Flexibility

When tested in accordance with A.5.2, the flexible flue liner shall meet the gas tightness requirement of 6.3.

When tested in accordance with A.5.2, the inner layer of the double skin flexible flue liner shall remain overlapped at the minimum bending radius declared by the manufacturer.

Oval flexible liners shall be subjected to the test method of A.5.2 in both axes of the oval shape.

6.1.2.6 Torsion strength

When a flexible flue liner is tested in accordance with A.6, it shall meet the gas tightness requirement of 6.3.

6.1.2.7 Pulling force

Before the thermal performance test, as per 6.4.1.1 (see also A.7), it shall be checked that the pulling force measured in A.7.3.1.1 shall be less than 0,5 kN.

6.2 Resistance to fire

6.2.1 Rigid flue liners and fittings

When a rigid flue liner and its fittings, designated as sootfire resistant, is tested according to 4.5.3.2 of EN 1859:2009 with the exception of the test rig (Figures 4 and 5) which shall be replaced by the test rig described in Annex A, it shall meet the gas tightness requirements defined in 6.3.

6.2.2 Rigid connecting flue pipes and fittings

The manufacturer shall declare the minimum distance to combustible material, either measured according to Annex A or calculated as at least three times their nominal diameter but not less than 375 mm (as specified in EN 15287-1:2007, 4.3.9.3, paragraph 3, first sentence for connecting flue pipes naturally ventilated) and the requirements of 6.4.1 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 distance declared by the manufacturer, 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 A.7.3.3 and A.7.4, it shall also meet the gas tightness requirement of 6.3.

6.2.3 Flexible flue liners and fittings

When a flexible flue liner and its fittings, designated as sootfire resistant, are tested according to the test method described in A.7.4.3, they shall meet the gas tightness requirements defined in 6.3. The test sample shall allow the test ball defined in A.7.3.1.2 to move freely down.

6.3 Gas tightness

When tested in accordance with A.2 for flexible flue liners and their fittings or with 4.4 of EN 1859:2009 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.

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
N2	20	< 3,0
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

6.4.1.1 Rigid flue liners and fittings

When a flue liner and its fittings are tested according to the heat stress test method of EN 1859 with the exception of the test rig (Figures 4 and 5) which shall be replaced by the test rig described in A.7.2, they shall meet the gas tightness of 6.3.

6.4.1.2 Rigid connecting flue pipes and fittings

The manufacturer shall declare the minimum distance to combustible material (see 7.2.1).

The maximum surface temperature of combustible material adjacent to a rigid connecting flue pipe and its fittings, at the distance declared by the manufacturer, 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 A.7.3.3 and A.7.4, it shall also meet the gas tightness requirement of 6.3.

6.4.1.3 Flexible flue liners and fittings

When a flexible flue liner and its fittings are tested according to the heat stress test method described in A.7.4.2, they shall meet the gas tightness of 6.3. The test sample shall allow the test ball of A.7.3.1.2 to move freely down.

6.4.2 Accidental human contact

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

6.4.3 Thermal resistance

Where connecting flue pipes are insulated, their thermal resistance value, declared by the manufacturer, shall be determined in accordance with 6.7.3 of EN 1856-1:2009.

6.4.4 Water vapour diffusion resistance

The requirements of 6.7.4 of EN 1856-1:2009 shall apply when the manufacturer declares 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 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 6.4.5.

Insulated rigid connecting flue pipes shall conform to 6.5.4 of EN 1856-1:2009.

6.4.5 Condensate penetration resistance

Rigid and flexible flue liners, rigid connecting flue pipes and their fittings designated for wet operating conditions (W) shall be subjected to the requirements of 6.6.5 of EN 1856-1:2009 and their outer surface shall remain dry.

6.4.6 Flow resistance

6.4.6.1 Rigid flue liners, rigid connecting flue pipes and fittings

The requirements of 6.6.7.1 and 6.6.7.2 of EN 1856-1:2009 shall apply.

6.4.6.2 Flexible flue liners and fittings

The requirements of 6.6.7.1 and 6.6.7.2 of EN 1856-1:2009 shall apply.

6.5 Durability

6.5.1 Durability against corrosion

The requirements of 6.7.1 and 6.7.2 of EN 1856-1:2009 shall apply, where the Table 4 shall be replaced by Tables 2 and 3 of this European Standard.

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, 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 A.7.