SLOVENSKI STANDARD
SIST EN 1856-2:2004

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Dimniki ï Zahteve za kovinske dimnike ï 2. del: Kovinske tuljave in dimniġki priklju ki

Chimneys - Requirements for metal chimneys - Part 2: Metal 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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Contents

Foreword

This document (EN 1856-2:2004) 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of an identical text or by endorsement, at the latest by January 2005, and conflicting national standards shall be withdrawn at the latest by April 2006.

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.

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

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 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 1856-1:2003).

It 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.

1 Scope

This document specifies the performance requirements for rigid or flexible metal liners, rigid connecting flue pipes and rigid 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 liners can be used as flue liners for renovation or adaptation of existing chimneys and as flue liners of custom built chimneys.

Flexible metal liners described in this document are exclusively for renovation or adaptation of existing chimneys.

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

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.

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.*

EN 1443, *Chimneys - General requirements*.

EN 1856-1:2003, *Chimneys - Requirements for metal chimneys - Part 1: System chimney products*.

EN 1859:2000, *Chimneys – Metal chimneys - Test methods.*

EN 10025, *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 10209:1996, *Cold rolled low carbon steel flat products for vitreous enamelling – Technical delivery conditions*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1856-1:2003 and the following apply.

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

3.2
double skin flexible flue liner
flexible 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 liners and connecting flue pipes are made, according to EN 573-3, EN 10025, EN 10088-1, EN 10154 and EN 10209, and the nominal and minimum skin/wall thickness.

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

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

d) Tensile design load for flexible liners (corresponding to the maximum length of suspended flexible liner, 20 m minimum or more if declared by the manufacturer).

5 Dimensions and tolerances

5.1 The thickness of materials from which the flexible liner is made shall be not less than that declared by the manufacturer [see 4 a)]. The thickness of rigid liners and rigid connecting flue pipes shall be in accordance with 5.1 of EN 1856-1:2003.

5.2 The declared internal diameter of the 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 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 1856-1:2003 shall apply.

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

5.3 The installed length of rigid liners or rigid connecting flue pipes (measured on an assembly including at least one joint) shall be in accordance with EN 1856-1.

6 Performance requirements

6.1 Mechanical resistance and stability

6.1.1 Rigid liners and rigid connecting flue pipes and fittings

Rigid liners and rigid connecting flue pipes and fittings shall comply with 6.1.1, 6.1.2 and 6.1.3 of EN 1856-1:2003 except wind load.

6.1.2 Flexible liners

6.1.2.1 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 6.1.1.2 of EN 1856-1:2003.

6.1.2.2 Tensile strength

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

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

6.1.2.3 Crushing resistance

When tested in accordance with A.4, the outside diameter of the flexible 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.

6.1.2.4 Flexibility

When tested in accordance with A.5.2, the flexible 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 liner shall remain overlapped at the minimum bending radius declared by the manufacturer.

6.1.2.5 Torsion strength

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

6.1.2.6 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 liners and fittings

When a rigid liner and its fittings, designated as sootfire resistant, is tested according to 4.5.3.2 of EN 1859:2000 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

When a rigid connecting flue pipe and its fittings, designated as sootfire resistant, are tested according to the test method described in A.7.3.3 and A.7.4, the maximum surface temperature of combustible material adjacent to the test sample at the distance declared by the manufacturer shall not exceed 100°C when related to an ambient temperature of 20°C and shall meet the gas tightness requirements defined in 6.3.

6.2.3 Flexible liners and fittings

When a flexible 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 liners and their fittings or 4.4 of EN 1859:2000 for rigid 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 $l \times s^{-1} \times m^{-2}$
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 liners and fittings

When a 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

When a rigid connecting flue pipe and its fittings are tested according to 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, the maximum surface temperature of combustible material adjacent to the test sample at the distance declared shall not exceed 85°C when related to an ambient temperature of 20°C and shall meet the gas tightness of 6.3.

In addition, vitreous enamelled connecting flue pipe shall not exhibit any cracking or any sign of flaking of their surface after heat stress test according to EN 10209.

6.4.1.3 Flexible liners and fittings

When a flexible liner and its fittings are tested according to 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 6.4.3 of EN 1856-1:2003.

6.4.4 Water vapour diffusion resistance

The requirements of 6.4.4 of EN 1856-1:2003 shall apply when the manufacturer declares that the rigid or flexible liner can be installed with external insulation.

Insulated rigid connecting flue pipes shall conform to 6.4.4 of EN 1856-1:2003.

6.4.5 Condensate penetration resistance

Rigid and flexible liners, rigid connecting flue pipes and their fittings designated for wet operating conditions (W) shall be subjected to the requirements of 6.4.5 of EN 1856-1:2003 and their outer surface shall remain dry.

6.4.6 Flow resistance

6.4.6.1 Rigid liners, rigid connecting flue pipes and fittings

The requirements of 6.4.7.1 and 6.4.7.2 of EN 1856-1:2003 shall apply.

6.4.6.2 Flexible liners and fittings

The requirements of 6.4.7.1 and 6.4.7.2 of EN 1856-1:2003 shall apply.

6.5 Durability

6.5.1 Durability against corrosion

The requirements of 6.5.1 and 6.5.2 of EN 1856-1:2003 shall apply, where the Table 4 shall be replaced by Table 2 of this document.

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

When tested in accordance with Annex D of EN 10209:1996, 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.

Table 2 — Material specification

Material type	Material No.	Symbol
00	Cast iron	
01	Normal steel EN 10025	S 235 JRG 2
05	Aluminium coated steel	EN 10154
10	EN AW – 4047A	EN AW Al Si 12A[1)]
11	EN AW - 1200	EN AW-AL 99,0A
13	EN AW - 6060	EN AW-Al MgSi
20	1.4301	X5CrNi 18-10
30	1.4307	X2CrNi 18-9
40	1.4401	X5CrNiMo 17-12-2
50	1.4404 [2)]	X2CrNiMo 17-12-2
60	1.4432	X2CrNiMo 17-12-3
70	1.4539	X1NiCrMoCu 25-20-5
80	Double sided vitreous enamelled steel	

1) Cu < 0,1 %, Zn < 0,15 %.

2) Equivalent for material no. 1.4404 = 1.4571 (symbol X6CrNiMoTi 17-12-2).

Example:

L 40045 represents a liner made of 1.4401 stainless steel with a thickness of 0,45 mm.

6.5.2 Freeze thaw resistance

Metal liners and connecting flue pipes are considered to satisfy freeze thaw resistance requirements.

7 Product information

7.1 Manufacturer's instructions

The manufacturer‘s instructions shall be available in the language of each country where the product is placed on the market.