SLOVENSKI STANDARD
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Chimneys - Accessories - Part 1: Chimney silencers - Requirements and test methods

Abgasanlagen - Zubehörteile - Teil 1: Schalldämpfer für Abgasanlagen - Anforderungen und Prüfverfahren

Conduits de fumée - Accessoires - Partie 1 : Silencieux - Exigences et méthodes d'essai

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Chimneys - Accessories - Part 1: Chimney silencers - Requirements and test methods

Conduits de fumée - Accessoires - Partie 1 : Silencieux - Exigences et méthodes d'essai

Abgasanlagen - Zubehörteile - Teil 1: Schalldämpfer für Abgasanlagen - Anforderungen und Prüfverfahren

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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 16475-1:2016) 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, 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.

EN 16475-1 is a part of the series of standards for “Chimneys — Accessories” and consists of:

— *Part 1 – Silencers (this part)*

— *Part 2 - Exhaust fans*

— *Part 3 - Draught regulators, standstill opening devices and combined secondary air devices*

— *Part 4 - Flue dampers*

— *Part 5 - Explosion/implosion relief devices*

— *Part 6 - Access components*

— *Part 7 – Rain caps*

Introduction

In November 2009 CEN/TC 166 assigned TG 1 of CEN/TC 166/WG 1 the task to develop this standard for chimney accessories and issued a preliminary work item.

1 Scope

This European Standard specifies requirements and test methods for flue gas silencers made of metal that are used as accessories in order to reduce the noise level of combustions appliances.

The standard covers silencers in the connecting flue pipes and on top of chimneys.

This standard does not cover silencers installed as chimney sections. This standard excludes active silencers.

Components tested together with the liner or system chimney are not covered by this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1443, *Chimneys — General requirements*

EN 1602, *Thermal insulating products for building applications — Determination of the apparent density*

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

EN 1856-2:2009, *Chimneys — Requirements for metal chimneys — Part 2: Metal flue liners and connecting flue pipes*

EN 1859:2009+A1:2013, *Chimneys — Metal chimneys — Test methods*

EN 14297, *Chimneys — Freeze-thaw resistance test method for chimney products*

EN 14303:2016, *Thermal insulation products for building equipment and industrial installations — Factory made mineral wool (MW) products — Specification*

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

EN 13470, *Thermal insulating products for building equipment and industrial installations — Determination of the apparent density of preformed pipe insulation*

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

EN ISO 7235:2009, *Acoustics — Laboratory measurement procedures for ducted silencers and air-terminal units — Insertion loss, flow noise and total pressure loss (ISO 7235:2003)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443, EN 1856-1, EN 1856-2, EN 1859 and the following apply.

3.1
silencer
product used in connecting flue pipes or on top of chimney for reducing noise emission caused by heating appliances and emergency generators

3.2
flow resistance of a silencer
pressure loss in a silencer due to the flow of the flue gas at a given temperature and velocity

3.3
coefficient of flow resistance
coefficient due to directional and / or cross sectional and / or mass flow change in the flue

3.4
sootfire safe accessory (As)
accessory that may not perform its intended function during and after a sootfire but does not prevent the safe operation or change the designation "G" of the chimney or connecting flue pipe

Note 1 to entry: "As" is used only for accessories and not for chimneys, flue liners and connecting flue pipes.

Note 2 to entry: Sootfire safe accessories are considered as replaceable without dismantling the chimney.

Note 3 to entry: Measures to be taken after the event of a sootfire are found in 8.3.2.

3.5
insertion loss
noise reduction expressed as the reduction level of sound power propagating through a duct due to the insertion of a silencer

3.6
nominal diameter (size)
numerical designation of size which is a convenient round number equal to or approximately equal to the inner diameter in millimetres of the circular flue liner

3.7
nominal flow rate
amount of air which flows at the nominal velocity through a duct with nominal diameter

3.8
nominal velocity
velocity in a duct which characterises the velocity used in the test (the actual test velocity may differ from the nominal velocity, because the actual inside diameter differs from the nominal diameter)

3.9
continuously welded silencer
housing is welded according to a continuous welding procedure that allows get at least H1 leakage class

3.10
non-continuously welded silencer
silencer not manufactured in accordance with 0

EXAMPLE An example for a non-continuously welded silencer is a modular silencer.

4 Product characteristics

4.1 General

The silencer shall fulfil the following requirements against temperature, condensate, corrosion resistance and soot fire resistance capability appropriate to the designation.

4.2 Dimensions and tolerances

The thickness of material of the silencer shall be not less than that declared by the manufacturer.

The declared internal dimensions of the flue connection shall not vary by more than ± 5 mm from the nominal size. The measured internal dimension of the flue connection shall be not less than the manufacturer's declared dimension.

4.3 Mechanical resistance and stability

4.3.1 Design load

The manufacturer shall declare the relevant design loads.

4.3.2 Wind load

When the manufacturer declares the silencer for outside installation, it shall be tested for wind loads in accordance with 5.2.2.2. The silencer shall withstand a minimum wind load of 1,5 kN/m² of the projected surface area.

4.4 Thermal performance

4.4.1 Reaction to fire

Products covered by this document are deemed to meet the requirements for reaction to fire, without the need for testing provided that they satisfy the definitions given in Commission Decision 96/603//EC (2).

4.4.2 Fire resistance (internal to external)

4.4.2.1 General

The manufacturer shall declare the distance to combustible material, the gas tightness and the insertion loss of the silencer.

4.4.2.2 Heat stress

The silencer shall be tested in accordance with 5.3.1 for the designated temperature class, see Table 3.

The silencer shall be designated O, if the requirements of 4.5.1 and 4.10 are met.

4.4.2.3 Sootfire resistance

The silencer shall be tested in accordance with 5.3.2.

The silencer shall be designated G, if the requirements of 4.5.1 and 4.10 are met.

The silencer shall be designated As, if it is tested in accordance with 5.3.2 and only the declared insertion loss of 4.10 is no longer fulfilled.

4.4.2.4 Distance to combustible

The manufacturer shall declare the minimum distance of the silencer to combustible material:

a) O(xx)M stands for “measured value” as determined in accordance with the test method in EN 1856-2:2009, A.7.3.3. When related to ambient temperature of 20° C, the maximum surface temperature of combustible materials adjacent to the test silencer shall not exceed 85° C at the distance declared.

b) As(xx)M, G(xx)M stands for “measured value” as determined in accordance with the test method in EN 1856-2:2009, A.7.3.3. When related to ambient temperature of 20° C, the maximum surface

temperature of combustible materials adjacent to the test silencer shall not exceed 85° C during heat stress test and shall not exceed 100°C during the heat shock test, both at the distance declared.

c) O(xx)NM, As(xx)NM, G(xx)NM stands for "not measured value" as determined in EN 1856-2:2009, A.7.3.3 or calculated 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, paragraph 3, first sentence for connecting flue pipes naturally ventilated).

4.5 Hygiene, health and environment

4.5.1 Gas tightness

The gas tightness shall be tested in accordance with 5.4.1 and the class declared in accordance with Table 2. If the jointing method is taken from a chimney/connecting flue pipe in accordance with EN 1856-1 or EN 1856-2 the gas tightness of the connection is deemed to be satisfied.

The gas tightness of the housing for not continuously welded silencer shall be tested in accordance with the test methods described in EN 1859 the leakage rate shall not be greater than that given in Table 1.

The gas tightness of continuously welded silencers is deemed to satisfying the leakage class up to H1.

For gas tightness testing all condensate drains should be closed.

Table 1 — Leakage rate

Class	Test pressure *Pa*	Leakage rate/Flue surface area $l \cdot s\text{-}1 \cdot m\text{-}^2$
N1	40	< 2,0
P1	200	< 0,006
P2	200	< 0,120
M1	1 500	< 0,006
M2	1 500	< 0,120
H1	5 000	< 0,006
H2	5 000	< 0,120

4.5.2 Condensate penetration resistance (liquid phase)

When tested in accordance with 5.4.2 no condensate shall appear on the outer surface of the silencer.

The silencer shall be installed according to the manufacturer's instructions in the thermal test assembly of EN 1856-2:2009, Figure A.5, attaching the spray assembly to the top of the test chimney, and providing a drain for the condensate at the bottom.

The declaration of condensate resistance does not refer to any noise reduction performance.

4.5.3 Water vapour penetration test (vapour phase)

Silencer can be designated W (wet) without undertaking the water vapour diffusion test, provided that the product passes the condensate penetration resistance requirement of 4.5.2.

4.5.4 Corrosion resistance

The corrosion resistance of the silencer shall be equivalent to the corrosion resistance of the chimney/connecting flue pipe to which it is connected