

**Chimneys - Metal Chimneys - Test Methods**

This document is a preview generated by EVS

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1859:2009 sisaldab Euroopa standardi EN 1859:2009 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 31.07.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 27.05.2009.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 1859:2009 consists of the English text of the European standard EN 1859:2009.

This standard is ratified with the order of Estonian Centre for Standardisation dated 31.07.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 27.05.2009.

The standard is available from Estonian standardisation organisation.

ICS 91.060.40

### Standardite reprodutseerimis- ja levitamisoigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:  
Aru 10 Tallinn 10317 Eesti; [www.evs.ee](http://www.evs.ee); Telefon: 605 5050; E-post: [info@evs.ee](mailto:info@evs.ee)

### Right to reproduce and distribute Estonian Standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:  
Aru str 10 Tallinn 10317 Estonia; [www.evs.ee](http://www.evs.ee); Phone: +372 605 5050; E-mail: [info@evs.ee](mailto:info@evs.ee)

English Version

## Chimneys - Metal chimneys - Test methods

Conduits de fumée - Conduits de fumée métalliques -  
Méthodes d'essais

Abgasanlagen - Metall-Abgasanlagen - Prüfverfahren

This European Standard was approved by CEN on 1 May 2009.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

# Contents

Page

Foreword.....	4
<b>1</b> <b>Scope</b> .....	<b>5</b>
<b>2</b> <b>Normative references</b> .....	<b>5</b>
<b>3</b> <b>Definitions</b> .....	<b>5</b>
<b>4</b> <b>Test methods for metal chimney products</b> .....	<b>5</b>
4.1 <b>Compressive strength</b> .....	<b>5</b>
4.1.1 <b>Sections and Fittings</b> .....	<b>5</b>
4.1.2 <b>Chimney support</b> .....	<b>6</b>
4.2 <b>Tensile strength</b> .....	<b>6</b>
4.2.1 <b>Test assembly</b> .....	<b>6</b>
4.2.2 <b>Test procedure and results</b> .....	<b>6</b>
4.3 <b>Lateral strength</b> .....	<b>6</b>
4.3.1 <b>Fittings in non-vertical orientation</b> .....	<b>6</b>
4.3.2 <b>Wind load</b> .....	<b>7</b>
4.4 <b>Gas tightness</b> .....	<b>7</b>
4.4.1 <b>Test assembly</b> .....	<b>7</b>
4.4.2 <b>Procedure and results</b> .....	<b>7</b>
4.5 <b>Thermal performance test</b> .....	<b>7</b>
4.5.1 <b>Apparatus</b> .....	<b>7</b>
4.5.2 <b>Test environment and conditioning</b> .....	<b>10</b>
4.5.3 <b>Test procedure</b> .....	<b>10</b>
4.5.4 <b>Results</b> .....	<b>12</b>
4.6 <b>Thermal resistance</b> .....	<b>13</b>
4.6.1 <b>Test assembly</b> .....	<b>13</b>
4.6.2 <b>Test procedure</b> .....	<b>13</b>
4.6.3 <b>Results</b> .....	<b>14</b>
4.7 <b>Water vapour diffusion resistance</b> .....	<b>14</b>
4.7.1 <b>Conditioning</b> .....	<b>14</b>
4.7.2 <b>Test assembly</b> .....	<b>14</b>
4.7.3 <b>Test procedure</b> .....	<b>14</b>
4.7.4 <b>Results</b> .....	<b>15</b>
4.8 <b>Condensate resistance test</b> .....	<b>15</b>
4.8.1 <b>Test apparatus</b> .....	<b>15</b>
4.8.2 <b>Test sample</b> .....	<b>15</b>
4.8.3 <b>Measuring parameters</b> .....	<b>15</b>
4.8.4 <b>Test procedure</b> .....	<b>15</b>
4.8.5 <b>Test results</b> .....	<b>15</b>
4.9 <b>Rainwater resistance</b> .....	<b>15</b>
4.9.1 <b>Chimney sections</b> .....	<b>15</b>
4.9.2 <b>Rainwater terminal</b> .....	<b>16</b>
4.10 <b>Terminal flow resistance</b> .....	<b>17</b>
4.10.1 <b>Conditioning</b> .....	<b>17</b>
4.10.2 <b>Test assembly</b> .....	<b>17</b>
4.10.3 <b>Procedure</b> .....	<b>17</b>
4.10.4 <b>Results</b> .....	<b>17</b>
4.11 <b>Aerodynamic behaviour of terminal under wind conditions</b> .....	<b>17</b>
4.11.1 <b>Conditioning</b> .....	<b>17</b>
4.11.2 <b>Test assembly</b> .....	<b>18</b>
4.11.3 <b>Procedure</b> .....	<b>18</b>
4.11.4 <b>Results</b> .....	<b>18</b>

<b>4.12</b>	<b>Flow resistance of fittings .....</b>	<b>18</b>
<b>4.12.1</b>	<b>Determination of flow conditions .....</b>	<b>18</b>
<b>4.12.2</b>	<b>Test assembly .....</b>	<b>19</b>
<b>4.12.3</b>	<b>Execution of the measurements .....</b>	<b>19</b>
<b>4.12.4</b>	<b>Calculation of the friction value .....</b>	<b>19</b>
<b>5</b>	<b>Test report .....</b>	<b>20</b>
<b>Annex A</b> (normative)	<b>Method for measuring ambient temperature .....</b>	<b>34</b>
<b>Annex B</b> (normative)	<b>Method for hot gas temperature measurements .....</b>	<b>35</b>
<b>Annex C</b> (informative)	<b>Method for metal surface temperature measurements .....</b>	<b>36</b>
<b>Annex D</b> (normative)	<b>Method for combustible wood surface temperature measurements .....</b>	<b>37</b>
<b>Annex E</b> (normative)	<b>Locations of thermocouples for surface temperature measurements .....</b>	<b>38</b>
<b>E.1</b>	<b>Test structure, surface temperatures .....</b>	<b>38</b>
<b>E.2</b>	<b>Test chimney, surface temperatures .....</b>	<b>38</b>
<b>E.2.1</b>	<b>General .....</b>	<b>38</b>
<b>E.2.2</b>	<b>Test chimney, freestanding .....</b>	<b>38</b>
<b>E.2.3</b>	<b>Test chimney, corner installation .....</b>	<b>38</b>
<b>E.2.4</b>	<b>Test chimney, corner installation, enclosed .....</b>	<b>38</b>
<b>Annex F</b> (normative)	<b>Simplified calculation of thermal resistance for circular flues .....</b>	<b>41</b>
<b>Annex G</b> (informative)	<b>Method for applying an evenly distributed load (horizontal) .....</b>	<b>43</b>
<b>Annex H</b> (informative)	<b>Possible test sequence .....</b>	<b>44</b>
<b>Annex I</b> (informative)	<b>Techniques for flue gas volume flow measurements .....</b>	<b>45</b>
<b>Bibliography</b> .....		<b>46</b>

## Foreword

This document (EN 1859:2009) 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 November 2009, and conflicting national standards shall be withdrawn at the latest by November 2009.

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 will supersede EN 1859:2000

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

## 1 Scope

This European Standard describes test methods for metal chimney products.

## 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 1443:2003, *Chimneys - General requirements*

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

EN 60068-2-59, *Environmental testing - Part 2 - Test methods - Test Fe: Vibration, Sine beat method (IEC 60068-2-59:1990)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

ISO 3966, *Measurement of fluid flow in closed conduits. Velocity area method using Pitot static tubes*