

SVENSK STANDARD

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Gaseldade värmepannor –

Del 2-1: Särskild standard för typ C-utrustning och typ B2-, B3- och B5-utrustning med nominell effekttillförsel ej överstigande 1000 kW

Gas-fired central heating boilers –

Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW

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Denna standard ersätter SS-EN 15502-2-1:2012, utgåva 1.

The European Standard EN 15502-2-1:2012+A1:2016 has the status of a Swedish Standard. This document contains the official English version of EN 15502-2-1:2012+A1:2016.

This standard supersedes the Swedish Standard SS-EN 15502-2-1:2012, edition 1.

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EUROPEAN STANDARD

EN 15502-2-1:2012+A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2016

ICS 91.140.10; 27.060.30

Supersedes EN 15502-2-1:2012

English Version

Gas-fired central heating boilers - Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW

Chaudières de chauffage central utilisant les combustibles gazeux - Partie 2-1 : Norme spécifique pour les appareils de type C et les appareils de types B2, B3 et B5 dont le débit calorifique nominal est inférieur ou égal à 1 000 kW

Heizkessel für gasförmige Brennstoffe - Teil 2-1: Heizkessel der Bauart C und Heizkessel der Bauarten B2, B3 und B5 mit einer Nennwärmebelastung nicht größer als 1 000 kW

This European Standard was approved by CEN on 18 August 2012 and includes Amendment 1 approved by CEN on 18 June 2016.

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
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European foreword

This document (EN 15502-2-1:2012+A1:2016) has been prepared by Technical Committee CEN/TC 109 “Central heating boilers using gaseous fuels”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by June 2017, and conflicting national standards shall be withdrawn at the latest by June 2017.

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 includes Amendment 1 approved by CEN on 18 June 2016.

This document supersedes $\boxed{A_1}$ EN 15502-2-1:2012 $\boxed{A_1}$.

The start and finish of text introduced or altered by amendment is indicated in the text by tags $\boxed{A_1}$ $\boxed{A_1}$.

This document has been prepared under $\boxed{A_1}$ Mandates M/535 and M/066 given to CEN $\boxed{A_1}$ 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 $\boxed{A_1}$ informative Annexes ZB, ZC and ZD $\boxed{A_1}$, which are integral parts of this document.

It supports essential requirements as meant in Article 3 of EU Directive 2009/142/EC, relating to appliances burning gaseous fuels and the verification methods valid for production and measurements, as meant in Article 5.2 of EU Directive 92/42/EEC, relating to the efficiency requirements for new hot water boilers fired with liquid or gaseous fuels, with an output of (4 – 400) kW.

Changes in this standard:

Many minor changes are introduced due to the harmonisation between the various standards. This includes the definitions that are used. Some definitions are modified as some standards mentioned the same words with a different meaning.

The user is advised to compare the text he is used to (including the definitions) with the current version.

Most aspects were already introduced for some boiler types, but are now valid for a larger group of boilers.

a) Examples of modifications due to harmonisation:

- 1) Requirements for materials used for the flue function (8.101, 8.102, 8.103);
- 2) The soundness of the combustion circuit (8.2.2);

b) New or generally reworded requirements:

- 1) Air proving (5.4.8, 5.4.9, 8.11.101);
- 2) Adjustment of gas air ration controllers (8.11.101);
- 3) Risk assessment (11);
- 4) Auxiliary energy use (10);
- 5) $\boxed{A_1}$ Variation in gas quality (Annex XC) $\boxed{A_1}$;
- 6) The water trap requirements for condensing boilers (5.4.13);
- 7) Requirements for boiler cascades (8.101);

$\boxed{A_1}$

- 8) The requirements for type $C_{(10)}$ and $C_{(11)}$ boilers with a $\Delta p_{\max, \text{saf}(\min)}$ of 25 Pa which are now added to this standard. $\boxed{A_1}$

EN 15502 is composed of the following parts:

- EN 15502-1, *Gas-fired heating boilers — Part 1: General requirements and tests*;
- EN 15502-2-1, *Gas-fired central heating boilers — Part 2-1: Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW (the present document)*;
- prEN 15502-2-2, *Gas-fired central heating boilers — Part 2-2: Specific standard for type B1 appliances of a nominal heat input not exceeding 70 kW*.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

A gas-fired heating boiler is an appliance using gas as fuel designed to heat water with the purpose of providing heat to a building (or portion of a building) from one point to multiple rooms using heat emitters such as radiators and convectors to transmit the heat from the water to the room. The boiler may also be used to provide domestic hot water via an indirect hot water storage tank.

The basic function of gas-fired heating boiler is to generate heat by direct heat transfer in a heat exchanger, from the combustion gasses to the water.

The boiler may include in one design more than one function. It may include for example:

- a) a sanitary hot water function;
- b) a function to supply the combustion air from the outside of the building;
- c) a function to dispose the combustion products to the outside of the building.

Ⓐ Boilers may be designed to be connected to specific parts of a building, for instance to create a function as described above under b) and c). Especially the connections to building parts to provide the functions mentioned under b) and c) are relevant.

The boiler may be designed to be supplied in more than one part. If the boiler is designed to be supplied in multiple parts, the boiler is the assembly of various parts according to the technical instructions. Ⓐ

This European Standard was established to deal with aspects related to:

- d) safety;
- e) rational use of energy;
- f) fitness for purpose.

Matters related to quality assurance systems, tests during production, and certificates of conformity of auxiliary devices are not dealt with in this series of European Standards.

Relationship between this document and EN 15502-1, Gas-fired heating boilers — Part 1: General requirements and tests:

This European Standard is to be used in conjunction with Ⓐ EN 15502-1:2012+A1:2015 Ⓐ and follows the numbering structure of Ⓐ EN 15502-1:2012+A1:2015 Ⓐ.

This European Standard refers to clauses of Ⓐ EN 15502-1:2012+A1:2015 Ⓐ or adapts clauses by stating in the corresponding clause:

- shall be according to Ⓐ EN 15502-1:2012+A1:2015 Ⓐ, (clause number) with the following modification
- shall be according to Ⓐ EN 15502-1:2012+A1:2015 Ⓐ, (clause number) with the following addition
- Ⓐ EN 15502-1:2012+A1:2015 Ⓐ, (clause number) is replaced by the following;
- Ⓐ EN 15502-1:2012+A1:2015 Ⓐ, (clause number) is not applicable.

A1 This European Standard adds clauses or subclauses to the structure of EN 15502-1:2012+A1:2015 which are particular to this standard. It should be noted that these clauses and subclauses are not indicated as an addition. Clauses, subclauses and annexes which are additional to those in EN 15502-1:2012+A1:2015 are numbered starting from 101, or designated as Annex XA, XB, XC, etc.

Annex V lists those existing standards which are replaced by this standard in combination with EN 15502-1.

After the DOW on 2015-10-31 (3 years after the DAV of both EN 15502-1 and EN 15502-2-1) the standards specified in Annex V, for the appliance types covered in EN 15502-2-1, were withdrawn by CEN.

Annex V also lists those existing appliance types for which CEN/TC 109 standards are intended to be replaced by EN 15502-2-2. The standards (that are intended to be replaced by EN 15502-2-2) listed in Annex V will be used until EN 15502-2-2 specifies that the standards are withdrawn for the appliance types indicated. **A1**

1 Scope

This European Standard specifies, the requirements and test methods concerning, in particular, the construction, safety, fitness for purpose, and rational use of energy, as well as the classification and marking of gas-fired central heating boilers that are fitted with atmospheric burners, fan assisted atmospheric burners or fully premixed burners, and are hereafter referred to as “boilers”.

Where the word boiler is used, it needs to be read as the boiler including its connecting ducts, ducts and terminals, if any.

A1 This European Standard covers gas-fired central heating boilers from the types C₁ up to C₉ and the types B₂, B₃ and B₅:

NOTE For further background information on appliance types see CEN/TR 1749:2014. **A1**

- a) that have a nominal heat input (on the basis of net calorific value) not exceeding 1 000 kW;
- b) that use one or more combustible gases of the three gas families at the pressures stated in EN 437;
- c) where the temperature of the heat transfer fluid does not exceed 105 °C during normal operation;
- d) where the maximum operating pressure in the water circuit does not exceed 6 bar;
- e) which may or may not give rise to condensation under certain circumstances;
- f) which are declared in the installation instructions to be either a “condensing” boiler or a “low temperature boiler” or a “standard boiler”; if no declaration is given the boiler is to be considered a “standard boiler”;
- g) which are intended to be installed either indoors or outdoors in a partially protected place;
- h) which may include the facility to produce hot water, either by the instantaneous or storage principle, the whole being marketed as a single unit;
- i) which are designed for either sealed water systems or for open water systems;
- j) which are either modular boilers, or non- modular boilers.

A1 This European Standard also covers gas-fired condensing central heating boilers from the types C₍₁₀₎ that are equipped with a gas-air ratio control and that have a $\Delta p_{\max, \text{saf}(\min)}$ of 25 Pa, and C₍₁₁₎ boilers that have condensing boiler modules that are equipped with a gas-air ratio control and that have a $\Delta p_{\max, \text{saf}(\min)}$ of 25 Pa. **A1**

This European Standard provides requirements for boilers with known constructions. For boilers with any alternative constructions, which might not fully be covered by this standard, the risk associated with this alternative construction needs to be assessed.

An example of an assessment methodology, based upon risk assessment and which covers the essential requirements of the Gas Appliance Directive, is given in Clause 11.

This European Standard does not cover all the requirements for:

Ⓐ

k) Appliances that are intended to be connected to gas grids where the quality of the distributed gas is likely to vary to a large extent over the lifetime of the appliance (see Annex XC); Ⓐ

l) Appliances using flue dampers;

Ⓐ

m) Appliances of the types B₂₁, B₃₁, B₅₁, C₂₁, C₄₁, C₅₁, C₆₁, C₇₁, C₈₁, C₍₁₂₎ and C₍₁₃₎; Ⓐ

n) C₇ appliances that have a nominal heat input (on the basis of net calorific value) exceeding 70 kW;

o) Appliances incorporating flexible plastic flue liners;

Ⓐ

p) C₍₁₀₎ boilers:

- 1) without a gas-air ratio control, or
- 2) which are non-condensing appliances, or
- 3) which have a maximum safety pressure difference at minimum heat input not equal to 25 Pa ($\Delta p_{\max, \text{saf}(\min)}$);

q) C₍₁₁₎ boilers that have boiler modules:

- 1) without a gas-air ratio control, or
- 2) which are non-condensing appliances, or
- 3) which have a maximum safety pressure difference at minimum heat input not equal to 25 Pa ($\Delta p_{\max, \text{saf}(\min)}$); Ⓐ

r) Appliances intended to be connected to a (common) flue having mechanical extraction.

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.

In this standard the normative references of Part 1 are valid. Furthermore the following normative references are valid.

EN 437:2003+A1:2009, *Test gases — Test pressures — Appliance categories*

EN 513:1999, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors — Determination of the resistance to artificial weathering*

SS-EN 15502-2-1:2012+A1:2017 (E)

EN 573-1:2004, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 1: Numerical designation system*

ⓘ deleted text ⓘ

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 10088-1:2005, *Stainless steels — Part 1: List of stainless steels*

EN 13216-1:2004, *Chimneys — Test methods for system chimneys — Part 1: General test methods*

EN 13501-1:2007, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 14241-1:2005, *Chimneys — Elastomeric seals and elastomeric sealants — Material requirements and test methods — Part 1: Seals in flue liners*

EN 14471:2005, *Chimneys — System chimneys with plastic flue liners — Requirements and test methods*

ⓘ

EN 14989-1, *Chimneys — Requirements and test methods for metal chimneys and material independent air supply ducts for roomsealed heating applications — Part 1: Vertical air/flue terminals for C6-type appliances* ⓘ

ⓘ

EN 15502-1:2012+A1:2015, *Gas-fired heating boilers — Part 1: General requirements and tests* ⓘ

ⓘ

CEN/TS 16134, *Chimney terminals — General requirements and material independent test methods* ⓘ

EN ISO 178:2010, *Plastics — Determination of flexural properties (ISO 178:2010)*

EN ISO 179-1:2010, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1:2010)*

EN ISO 527-1:1996, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1:1993 including Corr 1:1994)*

EN ISO 527-2:1996, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994)*

EN ISO 1183-1:2004, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2004)*

EN ISO 1183-2:2004, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method (ISO 1183-2:2004)*

EN ISO 1183-3:1999, *Plastics — Methods for determining the density of non-cellular plastics — Part 3: Gas pycnometer method (ISO 1183-3:1999)*

EN ISO 9969:2007, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969:2007)*

ISO 37:2005, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188:2011, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 815-1:2008, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 815-2:2008, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures*

ISO 1817:2011, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 2781:2008¹⁾, *Rubber, vulcanized or thermoplastic — Determination of density*

ISO 6914:2008, *Rubber, vulcanized or thermoplastic — Determination of ageing characteristics by measurement of stress relaxation in tension*

ISO 7619-1:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 7619-2:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 2: IRHD pocket meter method*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in **A1** EN 15502-1:2012+A1:2015 **A1**, EN 437:2003+A1:2009 and the following apply. They are numbered in accordance with the specific groups they belong to.

3.1.3.101

ducts support

accessory used to fix, or transfer the load of, air supply and combustion products evacuation ducts to structural elements (building, etc.)

3.1.3.102

overheat combustion products temperature

maximum temperature of the combustion products in case of overheat, at the exit of the boiler where it is intended to be connected to a duct, flue or chimney

1) This document is impacted by the following amendment: ISO 2781:2008/Amd 1:2010, Precision data.

SS-EN 15502-2-1:2012+A1:2017 (E)

3.1.3.103

nominal working combustion products temperature

maximum temperature of the combustion products in case of normal functioning, at the exit of the boiler where it is intended to be connected to a duct, flue or chimney

Note 1 to entry: Normal functioning is considered to reflect the situation of running the boiler at inlet/outlet temperatures of 70/90 °C, or just at the point that the control thermostat is switching.

3.1.3.104

condensing operation mode of flue system

operation mode where, under normal operation conditions, condensate is produced in the combustion products circuit

3.1.3.105

terminal

part of the combustion circuit fitted external to the building which has the function of the air supply inlet and/or combustion products outlet of the appliance

3.1.3.106

fitting piece

device which allows the fitting of:

A1

- a) the air supply and combustion products evacuation ducts to a single common duct for type C₂ boilers;
- b) the air supply and combustion products evacuation ducts to two ducts of a common duct system for type C₄, C₁₀ boilers and for type C₁₁ boiler modules; **A1**
- c) type C₆ boilers to a system for air supply and combustion products evacuation that is approved and marketed independently from the boiler;
- d) the combustion products evacuation duct to a chimney that is part of the building for type C₈ boilers;
- e) the air supply duct to a chimney that is part of the building for type C₉ boilers;
- f) type B₂ boilers to a system for combustion products evacuation that is approved and marketed independently from the boiler;
- g) the combustion products evacuation duct to a shared duct system for type B₃ boilers

3.1.3.107

terminal guard

device that protects the terminal from mechanical damage from outside influences

3.1.3.108

secondary flue

part of the flue of a type C₇ boiler between the draught diverter/air inlet in the roof space loft and the combustion products outlet above the roof

3.1.3.109

roof space loft

ventilated part of a building between the uppermost inhabitable space of the building and the roof

3.1.3.110

modular boiler

boiler consisting of an assembly of two or more generally identical modules, each of which consists of a heat exchanger, burner, control and safety devices

Note 1 to entry: The assembly has a single flue outlet and a common gas connection, common electricity supply connection and common flow and return water temperature connections. Each module is capable of independent operation.

3.1.3.111

combustion chamber

enclosure inside which combustion of the air-gas mixture takes place

3.1.3.112

completely surrounded combustion circuit

combustion circuit where the air supply circuit completely surrounds the combustion gas carrying part of the combustion circuit

3.1.3.113

separate combustion and air supply circuits

combustion circuit where the air supply circuit does not completely surround the combustion gas carrying part of the combustion circuit

3.1.3.114

flue outlet

part of the boiler through which the combustion products are evacuated to the flue system

3.1.3.115

combustion products circuit

circuit from the combustion chamber to the combustion products outlet of the appliance

3.1.3.116

protected combustion chamber

combustion chamber which is constructed such that an ignition in the combustion chamber does not ignite an gas/air mixture outside the combustion chamber



3.1.3.117

common duct

duct to which multiple boilers or boiler modules are connected

3.1.10.101

appliance

appliances' means appliances burning gaseous fuels used for cooking, heating, hot water production, refrigeration, lighting or washing and having, where applicable, a normal water temperature not exceeding 105 °C