

# SVENSK STANDARD

## SS-EN 303-2:2017

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### **Värmepannor –**

### **Del 2: Värmepannor med fläktbrännare – Särskilda krav för pannor med förstoftningsolja-brännare**

### **Heating boilers –**

### **Part 2: Heating boilers with forced draught burners – Special requirements for boilers with atomizing oil burners**

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Denna standard ersätter SS-EN 15034:2006, utgåva 1; SS-EN 15034:2006/AC:2011, utgåva 1; SS-EN 303-2, utgåva 1 och SS-EN 303-2/A1, utgåva 1.

The European Standard EN 303-2:2017 has the status of a Swedish Standard. This document contains the official version of EN 303-2:2017.

This standard supersedes the Swedish Standard SS-EN 15034:2006, edition 1; SS-EN 15034:2006/AC:2011, edition 1; SS-EN 303-2, edition 1 and SS-EN 303-2/A1, edition 1.

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EUROPEAN STANDARD

**EN 303-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2017

ICS 91.140.10

Supersedes EN 15034:2006, EN 303-2:1998

English Version

## Heating boilers - Part 2: Heating boilers with forced draught burners - Special requirements for boilers with atomizing oil burners

Chaudières de chauffage - Partie 2: Chaudières avec brûleurs à air soufflé - Prescriptions spéciales pour chaudières avec brûleurs fioul à pulvérisation

Heizkessel - Teil 2: Heizkessel mit Gebläsebrennern - Spezielle Anforderungen an Heizkessel mit Ölzerstäubungsbrennern

This European Standard was approved by CEN on 26 June 2017.

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**SS-EN 303-2:2017 (E)**

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## European foreword

This document (EN 303-2:2017) has been prepared by Technical Committee CEN/TC 57 “Central heating boilers”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

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

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 Regulation (EU) No 813/2013.

For relationship with EU Regulation(s), see informative Annex ZA, which is an integral part of this document.

This document supersedes EN 303-2:1998 and EN 15034:2006.

The main technical changes compared to EN 303-2:1998 are the following:

- a) Complete new structure;
- b) Technical changes related to ecodesign and energy labelling:
  - 1) 4.2, boiler efficiency and seasonal space heating efficiency;
  - 2) 4.4, limitation of the emissions;
  - 3) 4.5, standby heat loss;
  - 4) 4.6, auxiliary electrical consumption;
  - 5) 4.7, sound power level.
- c) Additions related to ecodesign and energy labelling:
  - 1) Annex ZA.

The following structure is intended for the standards for heating boilers:

- EN 303-1, *Heating boilers — Part 1: Heating boilers with forced draught burners — Terminology, general requirements, testing and marking*
- EN 303-2, *Heating boilers — Part 2: Heating boilers with forced draught burners — Special requirements for boilers with atomizing oil burners*
- EN 303-3, *Heating boilers — Part 3: Gas fired central heating boilers — Assembly comprising a boiler body and a forced draught burner*

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- EN 303-4, *Heating boilers — Part 4: Heating boilers with forced draught burners — Special requirements for boilers with forced draught oil burners with outputs up to 70 kW and a maximum operating pressure of 3 bar — Terminology, special requirements, testing and marking*
- EN 303-5, *Heating boilers — Part 5: Heating boilers for solid fuels, manually and automatically stoked, — nominal heat output of up to 500 kW - Terminology, requirements, testing and marking*
- EN 304, *Heating boilers — Test code for heating boilers for atomizing oil burners*
- EN 303-6, *Heating boilers - Part 6: Heating boilers with forced draught burners; specific requirements for the domestic hot water operation of combination boilers with atomizing oil burners of nominal heat input not exceeding 70 kW*

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



## 1 Scope

This European Standard is applicable to boilers used for central heating in accordance with EN 303-1:2017 up to a nominal heat output of 1 000 kW and EN 303-4 up to a nominal heat output of 70 kW with forced draught burners in accordance with EN 267 that are designed for operating with liquid fuels.

The performance requirements of this standard apply to type testing to heating boilers (standard, low temperature and condensing boilers) which are tested on a test rig in accordance with the test code given in EN 304.

This standard applies also to room sealed boilers as defined in EN 15035 regarding efficiency and emissions.

This standard can also be used as the basis for evaluation of boiler-/burner units.

## 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 267:2009+A1:2011, *Automatic forced draught burners for liquid fuels*

EN 303-1:2017, *Heating boilers - Part 1: Heating boilers with forced draught burners - Terminology, general requirements, testing and marking*

EN 303-4:1999, *Heating boilers - Part 4: Heating boilers with forced draught burners - Special requirements for boilers with forced draught oil burners with outputs up to 70 kW and a maximum operating pressure of 3 bar - Terminology, special requirements, testing and marking*

EN 304:2017, *Heating boilers - Test code for heating boilers for atomizing oil burners*

EN 15035:2006, *Heating boilers - Special requirements for oil fired room sealed units up to 70 kW*

EN 15036-1:2006, *Heating boilers - Test regulations for airborne noise emissions from heat generators - Part 1: Airborne noise emissions from heat generators*

EN 15316-4-1:2017, *Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass), Module M3-8-1, M8-8-1*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 303-1:2017 and the following apply.

### 3.1 General terms and definitions

#### 3.1.1

##### **range rated boiler**

appliance where the heat output is fixed in a given range

#### 3.1.2

##### **modulating boiler**

appliance where the heat output is varying in a given range automatically

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### 3.1.3

#### standby heat loss

$P_{\text{stby}}$

the heat loss of a boiler space heater, boiler combination heater in operating mode without heat demand, expressed in kW

### 3.1.4

#### combination boiler (combi boiler)

boiler designed both for central heating and for the production of domestic hot water

Note 1 to entry: Depending on its type of domestic hot water production, the combination boiler is classified in accordance with the manufacturer's declaration as instantaneous type or storage type.

## 3.2 Terms and definitions relevant to eco-design and labelling regulations terms

### 3.2.1

#### sound power level

$L_{\text{WA}}$

A-weighted sound power level, indoors, expressed in dB(A)

### 3.2.2

#### package

unit of boilers or combination boilers, temperature control and/or solar devices means a package offered to the end-user containing one or more boilers or combination boilers combined with one or more temperature controls and/or one or more solar devices

Note 1 to entry: Definition based on Labelling Regulation 811/2013 Article 2 - (19) and (20).

## 4 Performance requirements

### 4.1 General

All the following performance tests are carried out using an oil forced draught burner in accordance with EN 267.

Multi-stage or modulating burners shall operate within the output range of the boiler.

If the boiler was already tested with a forced draught burner for gaseous fuels in accordance with EN 303-1:2017 and EN 303-3, the tests described in 4.2 and 4.6 need not be performed.

For assembly criteria see Annex A.

### 4.2 Boiler efficiency

#### 4.2.1 Air ratio for efficiency measurement

The air ratio  $\lambda$  for the efficiency measurement shall comply with the following:

- less than 100 kW: with the requirements of Figure 1 in the tolerance  $\pm 10\%$  of  $\lambda$
- from 100 kW up to 1 000 kW:  $1,18 \leq \lambda \leq 1,22$

#### 4.2.2 Boilers of heat output $\leq 70$ kW

The seasonal space heating energy efficiency shall not fall below 86 % based on GCV.

### 4.2.3 Boilers of heat output > 70 kW and ≤ 400 kW

The useful efficiency at nominal heat output shall not fall below 86 % based on GCV, and the useful efficiency at 30 % of the nominal heat output shall not fall below 94 % based on GCV.

### 4.2.4 Boilers of heat output > 400 kW and ≤ 1000 kW

**Table 1 — Efficiency requirements for boilers above 400 kW**

Type of boiler	Full load efficiency (%) <sup>a</sup>		Part load efficiency (%) <sup>a</sup>	
	NCV	GCV	NCV	GCV
Standard	89,2	84,2	87,8	82,8
Low temperature	91,4	86,2	91,4	86,2
Condensing	93,6	88,3	96,6	91,1

<sup>a</sup> The efficiency based on GCV is equal to the efficiency based on NCV divided by 1,06.

### 4.3 Draught requirements and gas side resistance

The gas side resistance and draught shall be determined during the efficiency performance test at nominal load.

For boilers which operate with negative pressure in the combustion chamber, the values of draught requirements shown in Figure 2 shall be met or the corresponding technical documentation and/or manual shall be made available.

For boilers which are operated with positive pressure in the combustion chamber, the values for the flue gas resistance shown in Figure 3 shall be met or the corresponding technical documentation and/or manual shall be made available.

### 4.4 Emission values

During the tests in accordance with 4.2 (at nominal heat output) the smoke number shall not exceed 1 (see EN 267).

The concentration of unburnt hydrocarbons in the flue gases shall not exceed 10 ppm, except during the first 20 s after release of the fuel. The measurement shall be carried out by a flame ionization detector (FID).

The emissions of CO while operating the boiler at minimum continuous output and nominal output, shall not exceed 60 mg/kWh on NCV or 56 mg/kWh on GCV.

The emissions of nitrogen oxides, expressed in nitrogen dioxide, shall not exceed:

- For boilers with  $P_N \leq 400$  kW: 120 mg/kWh fuel input in terms of GCV.
- For boilers with  $P_N > 400$  kW: 250 mg/kWh fuel input in terms of GCV.

### 4.5 Standby heat loss

If the default value of EN 15316-4-1 is not used the standby heat loss for boilers shall be measured in accordance with EN 304.

NOTE For boilers up to 70 kW, the value is used in the calculation of the seasonal space heating energy efficiency.