SLOVENSKI STANDARD
oSIST prEN 303-2:2016

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Kotli za gretje - 2. del: Kotli z ventilatorskimi gorilniki - Posebne zahteve za kotle z razprševalnimi oljnimi gorilniki

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

Heizkessel - Teil 2: Heizkessel mit Gebläsebrenner; Spezielle Anforderungen an Heizkessel mit Ölzerstäubungsbrennern

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

Ta slovenski standard je istoveten z: **prEN 303-2**

ICS:

27.060.10	Gorilniki na tekoče in trdo gorivo	Liquid and solid fuel burners
91.140.10	Sistemi centralnega ogrevanja	Central heating systems

oSIST prEN 303-2:2016 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 303-2

April 2016

ICS 91.140.10

Will supersede EN 303-2:1998

English Version

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

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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 303-2:2016) has been prepared by Technical Committee CEN/TC 57 “Central heating boilers”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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*

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, hand and automatically fired, with a nominal heat output of up to 300 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*

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

— Complete new structure

— Technical changes related to ecodesign and energy labelling:

  a) 5.2, boiler efficiency and seasonal space heating efficiency;

  b) 5.4, limitation of the emissions;

  c) 5.5, standby heat loss;

  d) 5.6, auxiliary electrical consumption;

  e) 5.7, sound power level.

— Additions related to ecodesign and energy labelling:

  f) Annex ZA;

This document has been prepared under a standardization request M/535, given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to

requirements of Commission Regulation (EC) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters;

For relationship with EU Directive(s) and Commission Regulations, see informative Annex ZA which is an integral parts of this document.

1 Scope

This European Standard is applicable to boilers used for central heating in accordance with prEN 303-1:2016 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 prEN 304:2016.

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, *Atomizing oil burners of monobloc type — Testing*

prEN 303-1:2016, *Heating boilers — Part 1: Heating boilers with forced draught burners — Terminology, general requirements, testing and marking*

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*

prEN 304:2016, *Heating boilers — Test code for heating boilers for atomizing oil burners*

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

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

EN 15316-4-1, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating generation systems, combustion systems (boilers)*

3 Terms, definitions and symbols

3.1 General terms and definitions

For the purposes of this document, the terms and definitions given in prEN 303-1:2016 and the following apply.

3.1.1
range rated boiler
is fixed to one heat output in a given range

3.1.2
modulating boiler
is working in a given range automatically

3.1.3
standby heat loss
means the heat loss of a boiler space heater, boiler combination heater in operating modes without heat demand

3.1.4
standby mode power consumption
means the power consumption of a heater in standby mode

3.1.5
standby mode
means a condition where the heater is connected to the mains power source, depends on energy input from the mains power source to work as intended and provides only the following functions, which may persist for an indefinite time: reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or information or status display

3.1.6
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.

3.1.7
condensing boiler
boiler in which, under normal operating conditions and at certain operating water temperatures, the water vapour in the combustion products is partially condensed, in order to make use of the latent heat of this water vapour for heating purposes (always with nozzle for condensate drainage)

[SOURCE: prEN 303-1:2016, 3.22]

3.1.8
low temperature boiler
boiler which can work continuously with a water supply temperature of 35 °C to 40 °C, producing condensation in certain circumstances without imparing the boiler's operation and without the necessity of condensate drainage (no nozzle for condensate drainage foreseen

Note 1 to entry: See also prEN 303–1:2016, 3.223.2

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

3.2.1
auxiliary electricity consumption
means the annual electricity required for the designated operation of a boiler space heater, boiler combination heater or cogeneration space heater, calculated from the electric power consumption at full load (el_{max}), at part load (el_{min}), in standby mode (P_{SB}) and default operating hours at each mode, expressed in kWh in terms of final energy

3.2.2
seasonal space heating energy efficiency
ratio between the space heating demand for a designated heating season, supplied by the boiler and the annual energy consumption based on GCV required to meet this demand

3.2.3
water heating energy efficiency
ratio between the useful energy in drinking or sanitary water provided by a combination boiler and the energy required for its generation based on GCV

3.2.4
sound power level
A-weighted sound power level, indoors

3.2.5
package
package of boilers or combination boilers, temperature control and 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).

3.2.6
maximum load profile
load profile for combination water boilers with the greatest reference energy that a combination boiler is able to provide while fulfilling the temperature and flow rate conditions of that load profile

3.2.7
seasonal space heating energy efficiency in active mode
for fuel boiler space heaters and fuel boiler combination heaters, a weighted average of the useful efficiency at rated heat output and the useful efficiency at 30 % of the rated heat output, expressed in % (active mode)

3.3 Symbols

Term	Symbol	Unit
standby heat loss	P_{stby}	kilowatt (kW)
standby mode power consumption	P_{SB}	kilowatt (kW)
seasonal space heating energy efficiency	η_s	percent (%)
water heating energy efficiency	η_{WH}	percent (%)
sound power level	L_{WA}	dB(A)
seasonal space heating energy efficiency in active mode	η_{son}	percent (%)

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 prEN 303-1:2016 and EN 303-3, the tests described in 3.2 and 3.6 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 λ for the efficiency measurement shall comply:

— < 100 kW with the requirements of Figure 1 in the tolerance: ± 10 % of λ

— ≥ 100 kW up to 1 000 kW: 1,18 ≤ λ ≤ 1,22

4.2.2 Boilers of heat output ≤ 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

	Full load efficiency (%)		Part load efficiency (%)	
Type of boiler	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

NOTE 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 are 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 proportion 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: