SLOVENSKI STANDARD
SIST EN 303-2:1999

01-december-1999

Nadomešča:
SIST EN 303-2:1997

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

Chaudieres de chauffage - Partie 2: Chaudieres avec bruleurs a air soufflé - Prescriptions spéciales pour chaudieres avec bruleurs à fioul à pulvérisation

Ta slovenski standard je istoveten z: **EN 303-2:1998**

ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems

SIST EN 303-2:1999 **en**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 303-2

October 1998

ICS

Supersedes EN 303-2:1992

Descriptors: central heating, boilers, atomizing burners, liquid fuel appliances, specifications, thermal properties, thermal tests

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 Gebläsebrenner - Spezielle Anforderungen an Heizkessel mit Ölzerstäubungsbrennern

This European Standard was approved by CEN on 6 June 1998.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 303-2:1998 E

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 57 "Central heating boilers", the secretariat of which is held by DIN.

This European Standard supersedes EN 303-2:1992.

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 April 1999, and conflicting national standards shall be withdrawn at the latest by April 1999.

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

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

prEN 303–1
Heating boilers – Part 1: Heating boilers with forced draught burners – Terminology, general requirements, testing and marking

prEN 303–2
Heating boilers – Part 2: Heating boilers with forced draught burners – Special requirements for boilers with atomizing oil burners

prEN 303–3
Heating boilers – Part 3: Gas fired central heating boilers – Assembly comprising a boiler body and a forced draught burner

prEN 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 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

The following requirements were taken into account and/or amended:

a) limitation of the emissions;

b) energy economy;

c) prevention of burning;

d) minimal boiler efficiency for full-load (100 %) and part-load (30 %) in figure 1;

e) taking-over of the formulas for calculation for boiler efficiency at full-/part-load;

f) declaration of tolerances for the air ratio in figure 1;

g) Extension of the heat output from 300 kW up to 1000 kW.

If the boiler was already tested with a forced draught burner for gaseous fuels in accordance with EN 303–1 and EN 303–3, the tests described in 3.2 and 3.6 need not be performed.

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

1 Scope

This standard is applicable to heating boilers in accordance with prEN 303–1 up to a nominal heat output of 1000 kW and prEN 303–4 up to a nominal heat output of 70 kW with atomizing oil burners in accordance with EN 267 which are designed for operating with liquid fuels.

The requirements of this standard apply to type testing to heating boilers which are tested on a test rig in accordance with the test code given in EN 304.

This standard specifies the necessary heating technical requirements for heating boilers with liquid fuels.

NOTE: This Standard can also be used as the basis for evaluation of package boiler-/burner units.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 267
Atomizing oil burners of monobloc type – testing

prEN 303–1
Heating boilers – heating boilers with forced draught burners – Part 1: Terminology, general requirements, testing and marking

prEN 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 304
Heating boilers – test code for heating boilers for atomizing oil burners

3 Performance requirements

3.1 General

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

The boiler shall meet the requirements shown in figures 1 to 5 for the nominal heat output or heat output range. Multi-stage or modulating burners shall operate within the output range of the boiler. If the manufacturer states that the boiler also heats the room in which the boiler is installed, the output to the room shall be stated separately and can be taken into account when calculating the overall efficiency.

For assembly criteria see annex C.

3.2 Boiler efficiency

3.2.1 The boiler efficiency shall not be less than the appropriate values in figure 1 for the nominal heat output and/or range of outputs.

When comparing test results with the values in figure 2, the following tolerances for the excess air λ shall apply:

< 300 kW: $\pm$ 10 %

≥ 300 kW up to 1000 kW: $\lambda = 1{,}18$ up to $1{,}22$

3.2.2 For heat output range ≤ 400 kW the boiler efficiency shall be (see figure 1):

a) efficiency at full-load (nominal heat output) (P_n):

$\geq 84 + 2 \cdot \log P_n$;

b) efficiency at part-load ($0{,}3 \cdot P_n$):

$\geq 80 + 3 \cdot \log P_n$.

3.2.3 For heat output range > 400 kW the boiler efficiency shall be (see figure 1):

a) efficiency at full load (P_n):

≥ 89,2 %;

b) efficiency at part-load (0,3 · P_n):

≥ 87,8 %.

3.3 Draught requirements and gas side resistance

The gas side resistance and draught shall be determined during the test in accordance with 3.1 and 3.2.

For boilers which operate with negative pressure in the combustion chamber, the values of draught requirements shown in figure 3 are normally to be regarded as limits. They are also guide values for the determination of the chimney size.

For boilers which are operated with positive pressure in the combustion chamber, the values for the gas side resistance shown in figure 4 are to be regarded as limits.

If these values of gas side resistance or draught requirements are exceeded reference shall be made to this in the technical literature.

3.4 Exit gas temperature

For boilers which, when operating at the nominal output or within their range of outputs have a flue gas temperature less than 160 °C the boiler manufacturer shall make recommendations regarding the flue installation.

3.5 Emission values

During the tests in accordance with 3.1 (at nominal heat output) the smoke number shall not exceed 1 (see EN 267).

The proportion of unburnt hydrocarbons in the exit flue gases shall not exceed 10 ppm, except during the first 20 seconds after entry of the fuel. The measurement shall be effected by a flame ionization detector (FID).

The amount of pollution created by the combustion process shall be limited. This requirement is met if - while operating the boiler at minimum and maximum nominal outputs, the values given in table 1 are not exceeded.

Table 1: Emission limit values

NO_x mg/kWh	CO mg/kWh
250	110

NOTE: For purpose designed package boiler-/burner units see also annex A.

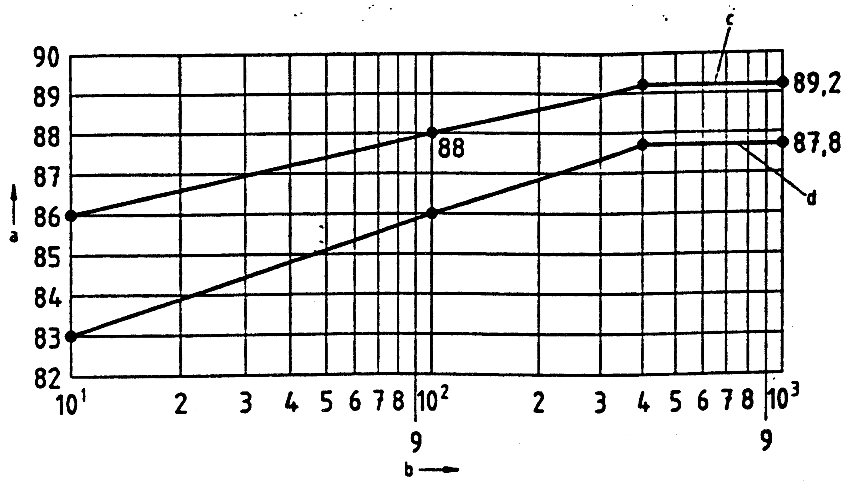
The emission values are determined using gas oil with a viscosity of 4 mm²/s to 6 mm²/s (cSt) at 20 °C.

3.6 Standby loss

For boilers with a nominal heat output > 400 kW the standby loss shall not exceed the values given in figure 5. The values shall be determined at the nominal heat output of the boiler. For a boiler with a heat output range this applies to the maximum value of heat output.

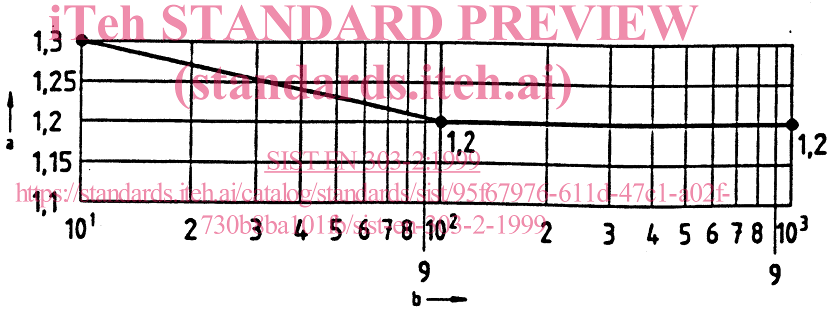
The tests are normally carried out with burners without air dampers. If an air damper is used this shall be stated in the test report.

Boilers which also heat the room in which they are installed need not meet the values given in figure 5. For boilers with integral hot water production, the standby loss can be 0,005 %-points higher than given in figure 5.



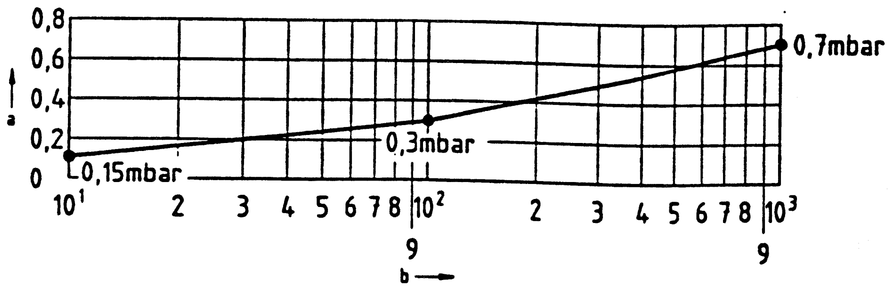
a Boiler efficiency in %
b Heat output P_n in kW
c Nominal heat output
d Part-load

Figure 1: Efficiency requirements



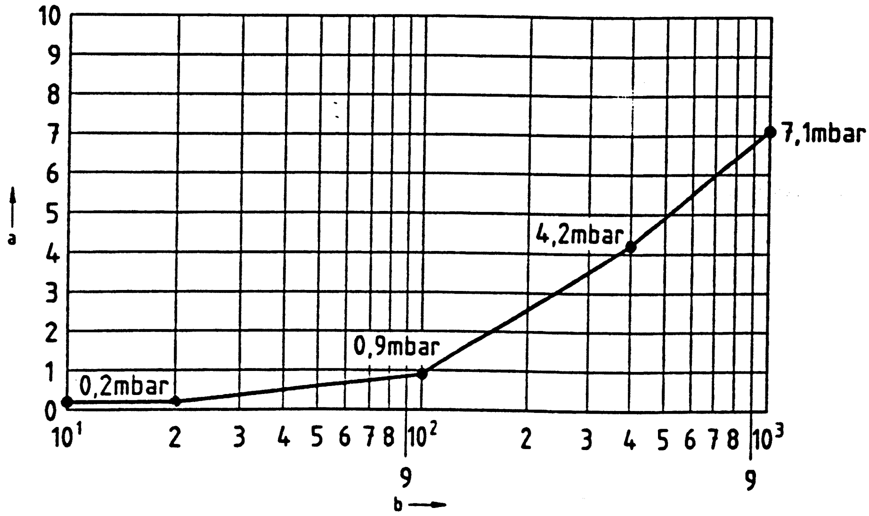
a Excess air
b Heat output P_n in kW

Figure 2: Excess air requirements



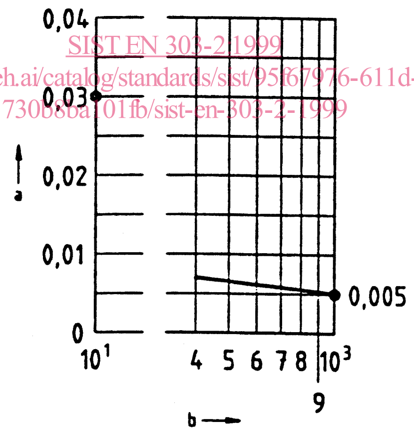
a Maximum draught in mbar
b Heat output P_n in kW

Figure 3: Draught requirements for boilers operated with negative pressure



a Pressure differential in mbar
b Heat output P_n in kW

Figure 4: Maximum flue gas resistance for boilers operated with a positive pressure



a Standby loss q_B
b Heat output P_n in kW

Figure 5: Standby loss