SLOVENSKI STANDARD
SIST EN 15034:2007

01-februar-2007

Kotli za gretje – Oljni kondenzacijski kotli za gretje

Heating boilers - Condensing heating boilers for fuel oil

Heizkessel - Öl-Brennwertkessel

Chaudieres de chauffage - Chaudieres de chauffage a condensation au fioul

Ta slovenski standard je istoveten z: **EN 15034:2006**

ICS:

97.100.40 Grelniki na tekoļ e gorivo Liquid fuel heaters

SIST EN 15034:2007 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15034

November 2006

ICS 97.100.40

English Version

Heating boilers - Condensing heating boilers for fuel oil

Chaudières de chauffage - Chaudières de chauffage à condensation au fioul

Heizkessel - Öl-Brennwertkessel

This European Standard was approved by CEN on 22 September 2006.

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.

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Ref. No. EN 15034:2006: E

Contents

Foreword

This document (EN 15034:2006) 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of an identical text or by endorsement, at the latest by May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

1 Scope

This European Standard applies to oil-fired heating boilers, which are declared by the manufacturer to be condensing boilers up to a nominal heat output of 1 000 kW supplied as a unit with an atomizing oil burner which meets the requirements of EN 267.

NOTE This European Standard defines three classes of oil fired boilers with efficiency requirements higher than those given for low temperature boilers in the Boiler Efficiency Directive (BED) 94/42/EEC.

This European Standard completes/modifies EN 303-1, EN 303-2 and EN 304 and specifies supplementary requirements for condensing boilers.

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 303-1:1999, *Heating boilers — Part 1: Heating boilers with forced draught burners — Terminology, general requirements, testing and marking*

EN 303-2:1998, *Heating boilers — Part 2: Heating boilers with forced draught burners — Special requirements for boilers with atomizing oil burners*

EN 304:1992, *Heating boilers — Test code for heating boilers for atomizing oil burners*

EN 1443, *Chimneys — General requirements*

EN 60730-2-9, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9:2000, modified)*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
condensate
liquid formed from combustion products during the condensation process

3.2
nominal condensing output
(P)
value of useful output declared by the manufacturer, in kW and corresponding to the operation of the boiler in a 50 °C/30 °C water temperature regime

3.3
maximum allowable working temperature
temperature that the material can withstand over a long period of time

3.4
condensing boiler
boiler that, under normal operating conditions and at certain operating water temperatures, partially condenses the water vapour in the combustion products in order to make use of the latent heat of water vapour for heating purposes and also satisfy the efficiency requirements of this European standard

3.5
nominal output
(P_N)
value of the useful output declared by the manufacturer, in kW and corresponding to the operation of the boiler in a 80 °C/60 °C water temperature regime

4 Requirements

4.1 Construction requirements

4.1.1 General

In addition to EN 303-1:1999, clause 4.1, the following requirements shall apply.

4.1.2 Materials in contact with condensate

All parts of the heating boiler likely to come into contact with condensation shall be constructed of sufficiently corrosion resistant materials or materials protected by a suitable coating, in order to ensure a reasonable life for a boiler that is installed, used and maintained in accordance with the manufacturer's instructions. Fuel quality requirements shall be declared by the manufacturer.

4.1.3 Removal of condensation

Condensation produced during boiler operation, including condensation formed in the flue and its connecting pipes, which shall be removed by means of a discharge pipe (or pipes).

The internal diameter of the outside connection of the condensation discharge system shall be at least 13 mm.

The disposal system, forming part of the boiler or supplied with the boiler, shall be such that:

— it can be easily inspected and cleaned in accordance with the manufacturer's instructions;

— it cannot transmit combustion products into the room where the boiler is installed; this requirement is satisfied if the disposal system incorporates a water trap;

— water trap has a seal of at least 25 mm at the maximum pressure in the combustion chamber at the maximum flue length specified by the manufacturer.

Surfaces in contact with condensates (except purpose provided drains, water traps and siphons) shall be designed to prevent condensation retention.

4.1.4 Control of the combustion products temperature

If the combustion products circuit contains materials that are likely to be affected by heat or is intended to be connected to a flue (including seals) that is likely to be affected by heat from the combustion products, the boiler shall incorporate a device to prevent the combustion products temperature exceeding the maximum allowable working temperature for the material as declared by the manufacturer.

The device for limiting the combustion products temperature shall be a safety temperature cut off. The safety temperature limiter shall comply with the requirements of EN 60730-2-9 for type 2 devices.

The device for limiting the combustion products temperature may be omitted if the combustion products temperature in no case is higher than the allowable temperature of the materials used in the combustion products circuit.

If the flue gas system is not supplied with the appliance, the device for limiting the combustion products temperature may be supplied as an option to be fitted by the installer. Mounting the device shall be well defined.

4.1.5 Chemical composition of the condensate

If the manufacturer states the chemical composition of the condensate it shall be checked at the end of the test of 5.3.

4.2 Operational requirements

4.2.1 General

In addition to EN 303-2:1998, clause 3, the following requirements shall apply.

4.2.2 Verification of the nominal condensing output

If the manufacturer states the nominal condensing output it is verified under the test conditions of 5.2.

4.2.3 Formation of condensation

When the boiler operates under the conditions of 5.3, condensation shall only form at the points intended for this purpose and shall be readily drained.

Condensation shall not find its way into parts of the boiler which are not intended to have formation, collection and discharge of condensation, nor may the condensation cause any nuisance to the operation, the boiler and the surroundings.

4.2.4 Temperature of combustion products

Under the conditions of 5.4 the temperature of the combustion products shall not exceed the maximum allowable working temperature for the materials of the combustion circuit and the flue materials, specified by the boiler manufacturer.

Operation of the safety temperature cut off according to 4.1.4 shall cause a non-volatile lock-out of the boiler.

4.3 Heating requirements

4.3.1 Normal conditions

The combustion requirements are those specified in EN 303-2 and EN 304. The test shall also be carried out when the boiler is operating in the condensing mode (50 °C/30 °C).

4.3.2 Special conditions

The condensation discharge blockage test, as described in 5.5.2, shall be performed unless the manufacturer fixes a warning note on the boiler that the condensation discharge has to be checked and cleaned once a year. In the maintenance manual the inspection and cleaning has to be described in detail.

4.4 Efficiencies requirements

4.4.1 Useful efficiency at full load

Under the test conditions specified in 5.6.1, the useful efficiency at the nominal heat input, shall be at least:

$$91 + \lg P_N \text{ (in \%; required for Level I+II)} \quad (1)$$

$$87{,}5 + 1{,}5 \times \lg P_N \text{ (in \%; required for Level III)} \quad (2)$$

where

P_N is the nominal output.

NOTE These formulae are applicable up to 1 000 kW.

4.4.2 Useful efficiency at part load

Under the test conditions specified in 5.6.2, the useful efficiency at 30 % of the nominal heat input, shall be at least:

Table 1 — Level of performance for energy efficiency

Level of performance	Energy efficiency	mode of operation	Water temperatures [a]
I	$99 + \lg (P_N) < \eta_A$	Condensing	average return temperature: (30 ± 0,5) °C
II	$94 + \lg (P_N) < \eta_B < 99 + \lg (P_N)$	Condensing	average return temperature: (30 ± 0,5) °C
III	$87,5 + 1,5 \lg (P_N) < \eta_C < 94 + \lg (P_N)$	—	mean boiler water temperature 40°C

where

η_A is the efficiency for level I;

η_B is the efficiency for level II;

η_C is the efficiency for level III.

NOTE These formulae are applicable up to 1 000 kW.

[a] Test methods for level III are necessary to fulfil the requirements of the boiler efficiency directive up to 400 KW, test methods for level I and level II are optional.

5 Test methods

5.1 General

All the tests are carried out under the conditions laid down in boiler standards EN 303-2 and EN 304, unless otherwise stated.

If the actual test conditions differ from the reference conditions (20 °C, 70 % relative humidity, 1 013,25 mbar) and/or the return water temperature differs from the specified value, the correction formulae given in Annex A are used to correct the determined useful efficiency for the tests outlined in 5.2 and 5.6.2.

5.2 Verification of the nominal condensing output

The water rate is adjusted so as to obtain a return water temperature of (30 ± 0,5) °C and a temperature difference between flow and return temperature of (20 ± 2) °C.

5.3 Formation of condensation

The boiler shall operate continuously for 4 h under the test conditions of 5.2.

It shall be verified that the requirement of 4.2 3 is fulfilled.

5.4 Temperature of combustion products

The boiler shall be installed as specified in the general test conditions of boiler standards EN 303-2 and EN 304. The boiler thermostat shall be put out of operation. Where fitted, the control to limit the temperature of combustion products remains in operation.