
Heizkessel mit Gebläsebrenner - Spezielle Anforderungen an die trinkwasserseitige Funktion von Kombi-Kesseln mit Ölzerstäubungsbrennern mit einer Nennwärmeleistung kleiner als oder gleich 70 kW

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

Chaudières de chauffage - Partie 6: Chaudières avec brûleurs à air soufflé - Exigences spécifiques à la fonction eau chaude sanitaire des chaudières à deux services avec brûleurs fioul à pulvérisation dont le débit calorifique nominal est inférieur ou égal à 70 kW

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English version

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This European Standard was approved by CEN on 21 November 1999.

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.

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

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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 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2000, and conflicting national standards shall be withdrawn at the latest by July 2000.

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.

The following structure is intended for the European 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: Special heating boilers for solid fuels, hand and automatically stoked, 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

Annex A of this European Standard is informative.

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1 Scope

This standard supplements EN 303-1, EN 303-2, EN 303-4 and EN 304/A1 hereafter called boiler standards. It specifies the supplementary requirements and tests for the construction, safety, rational use of energy, fitness for purpose, classification and marking related to the domestic hot water operation of oil-fired combination boilers of nominal heat output not exceeding 70 kW.

The domestic hot water is produced on either the instantaneous or storage principle. The domestic hot water production is integrated or coupled, the whole being marketed as a single unit.

This standard does not apply to appliances which operate independently of each other - a boiler and a water heater - even if they have a common flue. Neither does the standard apply to a boiler and water storage tank which are not included within the same casing.

This standard only covers type testing.

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 303-1:1999

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 304/A1

Heating boilers – Test code for heating boilers for atomizing oil burners; Amendment A1

ISO 7-1

Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation

ISO 228-1

Pipe threads where pressure-tight joints are not made on the threads – Part 1: Dimensions, tolerances and designation

ISO 274

Copper tubes of circular section – Dimensions

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 combination boiler: boiler designed both for central heating and for the production of domestic hot water. Depending on its type of domestic hot water production, the combination boiler is classed as follows, in accordance with the manufacturer's declaration:

- instantaneous type

A combination boiler which can continuously supply the specific domestic hot water rate "D" stated by the manufacturer.

- storage type

A combination boiler which can intermittently supply the specific domestic hot water rate "D" stated by the manufacturer.

3.2 "summer" operating mode: operating mode in which the boiler only provides heating of the domestic water.

3.3 specific rate: the domestic hot water rate declared by the manufacturer, corresponding to a mean temperature rise of 30 K, that the boiler can supply in two successive delivery periods.

Symbol: D ,
Unit: litres per minute (l/min).

3.4 nominal domestic hot water heat input: the value of the heat input in the domestic hot water mode indicated by the manufacturer.

Symbol: Q_{nw} ,
Unit: kilowatts (kW).

3.5 maximum water service pressure: the maximum pressure permitted in the domestic water circuit, as declared by the manufacturer.

Symbol: PMS ,
Unit: bar.

3.6 tank: reservoir of domestic water.

3.7 thermal store: heat reservoir sited mainly in heating water, as opposed to the domestic hot water storage in the tank.

3.8 pressure relief valve: a valve that opens automatically at a given pressure to discharge hot water.

3.9 thermostatic control of the domestic hot water operation: means of control in which the fuel rate is subordinated to a thermostatic device controlling the domestic hot water temperature, the set point of the device may be adjustable.

3.10 temperature holding thermostat: a device which maintains the water in the tank or the thermal store at a given temperature.

3.11 low inertia thermometer: means a measuring instrument with a response time such that 90 % of the final temperature rise, in the range 15 °C to 100 °C, is obtained within 5 s when the sensor is plunged into still water.

4 Constructional requirements

It is checked that the assembly meets the constructional requirements by visual examination of the boiler and possibly the tank, and also by inspection of the technical file.

4.1 Materials and method of construction of components of the domestic water circuit

Materials shall be appropriate for their use, under intended application and at the maximum water pressure stated by the manufacturer.

The requirements relating to thermal insulation and its use specified in the standards about boilers only apply to parts of the domestic water circuit likely to come into contact with flames or sited close to the combustion products outlet.

The materials of the parts containing domestic water shall not affect the quality of the domestic water in respect of either health or taste.

The whole of the domestic hot water circuit shall be made up of corrosion resistant materials or shall be protected against corrosion.

4.2 Domestic water connections

Threaded connections shall comply with ISO 228-1 or ISO 7-1.

If copper tubes are used for the connection, the end of the tube shall comply with ISO 274.

In accordance with the manufacturer's instructions, the domestic water circuit shall be able to be drained, without the discharge of water compromising electrical safety.

4.3 Soundness of the domestic water circuit

The domestic hot water circuit and the heating circuit shall be separate. If an actuator or a control has a sliding shaft or a link with the diaphragm separating the heating water circuit and the domestic water circuit there shall be an air vent between these circuits. The area of this aperture shall be at least 19 mm² and it shall be possible to introduce a 3,5 mm pin gauge into it.

4.4 Adjusting, control and safety devices for the domestic hot water circuit

The domestic hot water circuit shall be fitted with control and safety devices necessary to comply with the requirements "Thermostats and limiting devices" of 4.1.5.15 of EN 303-1:1999.

The tank shall be fitted with a device for controlling the water temperature. This device shall allow a temperature to be attained which is sufficient to prevent the build up of bacteria (see 5.2.3.3).

When local installations require a temperature relief valve operating at 100 °C, any device controlling the temperature of the domestic hot water shall act before this valve.

5 Operational requirements

5.1 General

If the nominal heat input in domestic hot water mode exceeds the nominal heat input in the central heating mode, the combination boiler shall be tested according to the EN 303-2 at the nominal heat input in the domestic hot water mode.

A combination boiler certified with an atomizing oil burner will also meet the requirements of this standard if the same boiler is fixed with a forced draught burner for gaseous fuels.

5.2 Safety of the domestic hot water circuit

5.2.1 Instantaneous and storage types

5.2.1.1 Soundness of parts containing domestic water

Under the test conditions of 6.2.1.1, the parts containing domestic water shall withstand the test pressure without permanent distortion or soundness defects, with respect to the outside or the heating circuit.

5.2.1.2 Overheating of the domestic hot water by the heating circuit

Under the test conditions of 6.2.1.2, the domestic hot water temperature shall not exceed 95 °C.

5.2.1.3 Failure of the domestic hot water temperature control device

Under the test conditions of 6.2.1.3, in the domestic water mode and in the event of failure of the normal control the requirements for safety limiter (see 4.1.5.15 of EN 303-1:1999) concerning the limit thermostat or the safety temperature limiter shall be met.

5.2.2 Instantaneous type

5.2.2.1 Maximum domestic hot water temperature

Under the test conditions of 6.2.2.1, the domestic hot water temperature shall not exceed 95 °C.

5.2.2.2 Overheating of the domestic hot water

Under the test conditions of 6.2.2.2, the domestic hot water temperature shall not exceed 95 °C.

5.2.3 Storage type

5.2.3.1 Maximum temperature of the domestic hot water

Under the test conditions of 6.2.3.1, the domestic hot water temperature shall not exceed 95 °C.

5.2.3.2 Overheating of the domestic hot water

Under the test conditions of 6.2.3.2 for boilers in which part of the tank is in contact with products of combustion, the domestic hot water temperature shall not exceed 95 °C.

5.2.3.3 Temperature of the domestic hot water

Under the test conditions of 6.2.3.3, it shall be possible to adjust to or obtain a domestic hot water temperature of at least 60 °C in the tank.

5.3 Rational use of energy

5.3.1 Useful efficiency

The considered useful efficiency is that measured in the central heating mode.

5.3.2 Losses

The losses of the boiler and the tank (where applicable) measured under the test conditions of 6.3.2 shall be less than the value given by the following formula:

$$q_s = 0,014 \times \sqrt[3]{V^2} + 0,02 \times Q_{nw}$$

where:

- q_s are the losses of the boiler and the tank in kilowatts (kW);
- V is the water capacity of the tank (including the water in any integral heat exchanger) and/or the thermal store (if applicable) in litres (l);
- Q_{nw} is the nominal domestic hot water heat input of the boiler, in kilowatts (kW).

5.4 Fitness for purpose

5.4.1 Instantaneous and storage types - Specific water rate

Under the test conditions of 6.4.1, the measured value of the specific rate shall not be more than 5 % below the value D stated by the manufacturer on the data plate.

5.4.2 Instantaneous type

5.4.2.1 Nominal domestic hot water heat input

Under the test conditions of 6.4.2.1, the nominal domestic hot water heat input shall be obtained or may be adjusted to within ± 5 %.

5.4.2.2 Water pressure to obtain the nominal heat input

Under the test conditions of 6.4.2.2, the heat input obtained shall be at least 95 % of the heat input obtained in 6.4.2.1.

5.4.2.3 Obtaining the domestic hot water temperature

Under the conditions of 6.4.2.3, it shall be possible to achieve or adjust to a water rate that corresponds to a temperature of between 50 °C and 80 °C for boilers with a thermostatic control or a temperature rise at the boiler outlet of between 45 K and 65 K for boilers with proportioning control.

5.4.2.4 Heating-up time of the domestic hot water

Under the test conditions of 6.4.2.4, the heating-up time shall not exceed 2 min.

6 Test methods

6.1 General

6.1.1 Test conditions

Unless otherwise specified, the general test conditions of the standards about boilers are supplemented as stated below:

- cold water: (10 ± 2) °C;
- hot water: 50 °C or as near as possible;
- central heating water (if necessary): see standards about boilers (flow 80 °C - return 60 °C).

For the tests:

- the domestic water pressure is the difference between the static inlet and outlet pressures of the boiler measured as close as possible to the boiler;
- the inlet and outlet temperatures of the domestic water are measured in the centre of the flow and as close as possible to the boiler.

In certain tests, a low inertia thermometer is used.

6.1.2 Adjustment of the domestic water pressure

The domestic water pressure shall be adjusted to the required value within a tolerance of ± 4 %.