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Heating boilers - Room sealed operations for boilers for fuel oil

Heizkessel - Ölbefeuerte Kessel für den raumluftunabhängigen Betrieb

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Foreword

This document (prEN 15035:2004) 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.

1 Scope

This European Standard applies to type C_{X3} central heating boilers as specified in 4.1, equipped with atomising oil burners:

— type C_{13}, C_{33}, and C_{53} boilers, including their combustion air supply and combustion products evacuation ducts and their terminals;

— type C_{43} boilers including their connection ducts but without the chimney, which is erected as a shared duct system and which is part of the building;

— type C_{63} boilers, including the connecting piece as specified in 3.7, if not integrated into the boiler;

— type C_{83} boilers, including their connection ducts but without the chimney, which is part of the building;

— that have a nominal useful heat output below or equal to 70 kW;

— where the temperature of the water does not exceed 100 °C during normal operation;

— where the maximum water-side operating pressure does not exceed 8 bar.

This European Standard is intended to establish specific requirements and test methods for type C atomising oil burner central heating boilers with respect to construction, safety, fitness for purpose, rational use of energy, classification and marking.

The European Standard covers only standard tests.

For boilers that produce hot water by drum or exchanger, integrated or juxtaposed, (by accumulation of instant production), this standard only applies to hot water re heating system components that are not subject to operating conditions applicable to the boiler heating system.

This European Standard covers units consisting of boilers equipped with burners that meet the requirements of EN 267, with the following exceptions:

— maximum NO_x and CO emission values, estimated for boilers according to the classes defined in standard EN 303-2;

— air factor value, defined by the manufacturer and stated in the boiler's technical specifications;

— marking and/or burner data plate, which may provide information for the boiler data plate;

— installation recommendations for installing the burner on the boiler, included in the boiler operating instructions.

This European Standard gives additional requirements only for room sealed operations and does not contain all requirements applicable to standard, low temperature and condensation 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, *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 or boilers with atomising oil burners.*

EN 304, *Heating boilers — Test code for heating boilers for atomising oil burners.*

EN 304:1992/A1, *Heating boilers — Test code for heating boilers for atomising oil burners (Amendment 1).*

EN 304:2003/A2, *Heating boilers — Test code for heating boilers for atomising oil burners (Amendment 2).*

EN 267, *Forced draught oil burners — Definitions, requirements, testing, marking.*

EN 1443, *Chimneys — General requirements.*

EN 1856-1, *Chimneys — Requirements for metal chimneys — Part 1: System chimney products.*

prEN 1856-2, *Chimneys — Requirements for metal chimneys — Part 2: Metal liners and connection flue pipes.*

EN 1857, *Chimneys — Components — Concrete flue liners.*

prEN 13063-1, *Chimneys — System chimneys with clay/ceramic flue liners — Part 1: Requirements and test methods for sootfire resistance.*

prEN 13063-2, *Chimneys — System chimneys with clay/ceramic flue liners — Part 2: Requirements and test methods under wet conditions.*

prEN 13384-1, *Chimneys — Thermal and fluid dynamic calculation methods — Part 1: Chimneys serving one appliance.*

prEN 13384-2, *Chimneys — Thermal and fluid dynamic calculation methods — Part 2: Chimneys serving more than one heating appliance.*

prEN 14241-1, *Chimneys — Elastomeric seals and elastomeric sealants — Material requirements and test methods — Part 1: Seals in flue liners.*

prEN 14471, *Chimneys — System chimneys with plastic flue liners — Requirements and test methods.*

3 Terms and definitions

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

3.1
required draught
difference in pressure between the static pressure of the air in the area in which the boiler is installed and the static pressure of combustion products leaving the boiler (combustion products measuring cuff) required to ensure good working order

For the purposes of this standard, this definition applies only to type C_{13}–C_{83} boilers or units.

3.2
room-sealed boiler
boiler in which the combustion circuit is sealed off from the area in which the boiler is installed

3.3
combustion circuit
circuit including the air supply duct, burner, combustion chamber, heat exchanger, combustion products evacuation duct and either the connection piece or terminal connection (where applicable)

3.4
air supply and combustion products evacuation ducts
means for transporting combustion air to the burner and combustion products to the terminal or connection piece

It is necessary to distinguish between:

— completely surrounded ducts: the combustion products evacuation duct is surrounded by combustion air throughout its length;

— separate ducts: the combustion products evacuation duct and the combustion air supply duct are neither concentric nor completely surrounded ducts.

3.5
terminal
a device fitted to the outside of the building, to which are connected:

— the air supply and combustion products evacuation ducts for type C_{13} and C_{33} boilers (one or two devices);

— the air supply duct on the one hand and the combustion products evacuation duct on the other hand for type C_{53} boilers;

— the air supply duct for type C_{83} boilers (one device).

3.6
terminal guard
the device that protects the terminal from mechanical damage from outside influences

3.7
connection piece
a device which allows the fitting of a sealed boiler to any system for combustion air supply and combustion products

4 Classification of boilers)

4.1 General

A Type C boiler is one in which the combustion circuit is sealed from the inhabitable area of the building in which the boiler is installed.

The air supply and the combustion products evacuation ducts and the terminal or the fitting piece which is used to connect the boiler to a chimney or duct system are part of the boiler unless otherwise stated. They admit fresh air from outside the inhabitable part of the building to the burner as well as discharge the products of combustion to the outside.

Boilers are classified into several types according to the mode of evacuation of the combustion products and supply of the combustion air (see examples attached in annex A).

The types are defined by two subscripts:[1)]

— the first subscript number is based upon the possible installation of the boiler with respect to the mode of air supply and evacuation of the combustion products. (see 4.2).

— the second subscript number is based upon the presence and position of an integral fan in the boiler.(see 4.2.7).

4.2 Type of installation of the boiler

4.2.1 Type C_1

A type C boiler which is connected via its ducts to a horizontally installed terminal at the wall or on the roof. The orifices of the ducts are either concentric or close enough to come under similar wind conditions.

4.2.2 Type C_3

A type C boiler which is connected via its ducts to a vertically installed terminal. The orifices of the ducts are either concentric or close enough to come under similar wind conditions.

4.2.3 Type C_4

A type C boiler which is fitted via its ducts possibly by means of a fitting piece to a shared duct system consisting of a duct for the supply of the combustion air and a duct for the discharge of the combustion products. The orifices of this shared duct system are either concentric or close enough to come under similar wind conditions.

4.2.4 Type C_5

A type C boiler which is connected via its separate ducts to two terminals that may terminate in zones of different pressure.

4.2.5 Type C_6

A type C boiler which is intended to be connected to a separately approved and marketed system for the supply of combustion air and discharge of the combustion products.

4.2.6 Type C_8

A type C boiler which is connected via its ducts possibly by means of a fitting piece to an air supply terminal and fitted to an individual or shared chimney.

4.2.7 Presence and position of a fan

— A type C boiler that does not incorporate a fan is identified by the second subscript number "1" (e.g. C_{11}).

— A type C boiler that does incorporate a fan downstream of the combustion chamber/ heat exchanger is identified by the second subscript number "2" (e.g. C_{12}).

[1)] Boilers in which the combustion circuit is under positive pressure and surrounded by the combustion air circuit may require identification by an additional subscript, in accordance with national regulations, if they are intended to be installed in non-ventilated areas.

— A type C boiler that does incorporate a fan upstream of the combustion chamber/ heat exchanger is identified by the second subscript number "3" (e.g. C_{13}).

For heating boilers equipped with atomising oil burners only C_{X3} appliances are existing.

5 Constructional requirements

5.1 General

Boilers covered by this standard shall respect the requirements concerning the materials and construction method indicated in EN 303-1or EN 303-4 or for condensing boilers, see WI 00057021. These additional requirements are described in the following chapters.

5.2 Materials and construction methods

5.2.1 Combustion products evacuation and air supply ducts

The quality of materials and the shape and size of the components (ducts, seals) shall ensure that in an appropriate assembly, in the conditions specified by the manufacturer with respect to maintenance, and taking into account the relevant thermal, chemical and mechanical constraints, the ducts are reliable and able to function satisfactorily for an acceptable length of time.

The manufacturer shall provide proof that the materials used for ducts and seals meet applicable thermal, chemical and mechanical requirements. This is fulfilled, if products according prEN 13063-1 to prEN 13063-2, EN 1856-1 to EN 1856 -2 and prEN 14471 designated P1and W 2 are used.

All combustion products evacuation ducts shall meet the relevant requirements of the CPD

5.2.2 Condensate discharge

5.2.2.1 Materials in contact with condensate

All parts of the heat exchanger(s) and other parts of the boiler likely to come into contact with condensate 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.

5.2.2.2 Removal of condensate

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

The internal diameter of the outside connection of the condensate 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;

— a 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 condensate retention.

5.3 Soundness

5.3.1 Soundness of the combustion circuit

Parts which have to be removed during routine service and affect the soundness of the boiler and/or its ducts, shall be sealed by mechanical means, excluding pastes, liquids and tapes. The need for replacement of the seals, following a cleaning or servicing operation as stated by the manufacturer, is permitted.

The service instructions shall show clearly how to replace parts which may affect the soundness of the combustion circuit.

If parts of the casing, which forms part of the combustion circuit, is to be removed by user, then a clear instruction and approbiate warning in the user instruction shall be provided.

A warning label on the inside of such panel may be used.

After correct reassembly of parts in accordance with these instructions, maximum leakage rates contained in this standard shall not exceed.

Where the boiler case forms part of the combustion circuit and it can be removed without the use of tools:

— either the appliance shall not operate; or

— there shall be no leakage higher the values given in table 1 when the case is replaced correctly as decribed in the manufacturers manual.

The ducts, bends, if any, and the terminal or adapter shall fit together correctly and shall form a stable assembly. Parts intended to be dismantled for periodic servicing shall be designed and arranged so that soundness is unaffected after re-assembly.

Any adapter shall allow a sound connection to be made to the system intended for the evacuation of combustion products and supply of air.

5.3.2 Supply of combustion air and evacuation of the combustion products

5.3.2.1 General

All boilers shall be designed so that there is an adequate supply of combustion air during ignition and over the whole range of possible heat inputs stated by the manufacturer.

5.3.2.2 Air supply and combustion products evacuation ducts

The assembly of the various parts during installation shall be such that no work is necessary other than adjusting the length of the air supply and combustion products evacuation ducts. Adjusting the length of the ducts shall not normally involve cutting them, unless this method is specifically recommended by the manufacturer. In this case, cutting must be carried out in the specific conditions recommended by the manufacturer to ensure soundness.

In all cases, such adaptation shall not impair the correct operation of the boiler.

It shall be possible to connect the boiler, the air supply and combustion products evacuation ducts and the terminal or fitting piece using ordinary tools if necessary. All necessary accessories and the fitting instructions shall be supplied by the manufacturer.