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Gas-fired storage water heaters for the production of domestic hot water – Amendment A3

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English version

Gas-fired storage water heaters for the production of domestic hot water

Appareils de production d'eau chaude par accumulation pour usages domestiques utilisant les combustibles gazeux

Gasbeheizte Vorrats-Wasserheizer zur Warmwasserbereitung für den sanitären Gebrauch

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 48.

This draft amendment A3, if approved, will modify the European Standard EN 89:1999. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 89:1999/prA3:2004) has been prepared by Technical Committee CEN/TC 48 "Domestic gas-fired water heaters", the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

The object of this amendment to EN 89 is to indicate additions, modifications and deletions to this standard relating to:

— measurements of NO_x emissions of the on/off appliances. Requirements on NO_x emissions measurement for modulating appliances are not included in this amendment ;

— align some requirements and tests for type C appliances with those defined in EN 483.

1 Scope

In the first indent, add types C_{51}, C_{72}, C_{73}, C_{81} connected to an individual flue duct, C_{82} and C_{83}.

Delete the first indent of the 3rd paragraph.

2 Normative references

Add the following text:

"CR 1404 Determination of emissions from gas appliances during type tests".

3.7.4 terminal

Amend the definition as follows:

Device fitted to the outside of the building, to which are connected:

— the air supply and combustion products evacuation ducts for type C_1 and C_3 appliances (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_5 appliances (two devices);

— the air supply duct for type C_8 appliances (one device).

Add the following definitions:

3.7.10 terminal guard

Device that protects the terminal from mechanical damage from outside influences.

3.7.11 secondary flue

Part of the flue of a type C_7 appliance between the draught diverter/air inlet in the loft and the combustion products outlet above the roof.

3.7.12 roof space; loft

Ventilated part of a building between the uppermost habitable space of the building and the roof.

4.3.2.5 Type C_5

Delete:

"This standard does not cover this type of appliance." at the end of the definition of type C_{51}.

Add the following clauses :

4.3.2.7 Type C_7

A type C appliance which is connected via its vertical ducts and a draught diverter, located in the roof space, to a secondary flue. The combustion air is taken from the roof space.

Type C_{72}

A type C_7 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{73}

A type C_7 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

4.3.2.8 Type C_8

A type C appliance 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.

Type C_{81}

A natural draught type C_8 appliance[1]).

Type C_{82}

A type C_8 appliance incorporating a fan downstream of the combustion chamber/heat exchanger.

Type C_{83}

A type C_8 appliance incorporating a fan upstream of the combustion chamber/heat exchanger.

5.1.2 Supplementary markings

After the first subclause, add:

" The appliance may carry supplementary marking concerning the class of NO_x emissions of the appliance".

5.2.1.4 For installation of the combustion products evacuation circuit

In d), add the following indents:

"- for type C_1 appliances

* the information if and how the terminal shall be placed on the wall and/or on the roof;

* the instruction that the terminal outlets from separate ducts shall fit inside a square of 50 cm;

— for type C_2 appliances :

the characteristics of the shared duct systems to which the appliance can be connected;

— for type C_3 appliances :

the instruction that the terminal outlets from separate ducts shall fit inside a square of 50 cm ;

— for type C_4 appliances:

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[1] A type C_{81} appliance will not generally be included within the scope of European Standards for gas appliances.

* the minimum and maximum pressure loss permitted in the air supply and combustion products evacuation ducts, or the minimum and maximum length of these ducts;

* the combustion products temperature and mass rate at the maximum and minimum heat input with the maximum length of ducts, if necessary;

* the characteristics of the shared duct systems to which the appliance can be connected;

— for type C_5 appliances:

the instruction that the terminals for the supply of combustion air and for the evacuation of combustion products shall not be installed on opposite walls of the building;

— for type C_6 appliances:

* the minimum and maximum pressure loss permitted in the air supply and combustion products evacuation ducts, or the minimum and maximum length of these ducts;

* the combustion products temperature and mass rate at the maximum and minimum heat input;

* the instruction that the appliance shall only be installed with a terminal that complies with the requirements of prEN 1856-1 (see Annex N);

* the method of calculating the pressure loss in the air supply and combustion products evacuation ducts, starting from the values of the temperature and mass rate of the combustion products in relation to the CO_2 concentration;

— for type C_7 appliances:

the instruction that the draught-diverter and the air intake have to be installed in the roof space of the building;

— for type C_8 appliances:

the characteristics of the chimney to which the appliance can be connected.

5.2.2.3 For type C appliances

Add the following indent :

"- for type C_7 appliances the roof space shall not be used as living area."

6.1.6.2.2 Type C appliances

Replace the first paragraph by:

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

Where the appliance 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 of combustion products into the room where the appliance is installed when the case is replaced incorrectly."

6.1.7.3 Type C_1 and C_3 appliances:

Replace the title of this clause by "Type C appliances".

Replace the text of the clause by :

"6.1.7.3.1 General

All appliances 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. A gas/air ratio control is permitted.

Unless otherwise stated, fan assisted appliances may be fitted with a means of adjustment in the combustion circuit intended to adapt the appliance to the pressure losses in the installed ducts either by restrictors or by setting the means of adjustment to predetermined positions in accordance with detailed instructions from the manufacturer.

According to the appliance type, the manufacturer shall supply any terminal and/or fitting piece, with the appliance for test.

6.1.7.3.2 Air supply and combustion products evacuation ducts[2)]

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 (possibly by cutting them). Such adaptation shall not impair the correct operation of the appliance.

It shall be possible to connect the appliance, 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.

The terminal outlets from separate ducts for the supply of combustion air and the evacuation of combustion products:

— shall fit inside a square of 50 cm for type C_1 and C_3 appliances;

— may terminate in zones of different pressure for type C_5 appliances, but not on opposite walls of the building;

6.1.7.3.3 Terminal

No opening in the external surfaces of the terminal shall permit the entry of a 16 mm diameter ball applied with a force of 5 N.

Any horizontal terminal shall be designed in such a way that any condensate is discharged away from the wall.

6.1.7.3.4 Terminal guard

If the manufacturer prescribes, in the installation instructions, a protective guard for the terminal for use when the outlets for evacuation of the combustion products open on to a walkway, this device shall be supplied to the laboratory for test.

The dimensions of the terminal guard, when installed in accordance with the manufacturer's instructions, shall be such that the distance between any part of the guard and the terminal, except the wall plate, exceeds 50 mm. The guard shall not have any sharp edges likely to cause injury.

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2) In accordance with national regulations sampling points in the combustion circuit may be required.

6.1.7.3.5 Fitting piece

For appliances of types C_2, C_4 and C_8, the fitting piece shall be designed so that it is possible to obtain the distances specified by the manufacturer for the projection of the ends of the combustion air supply and combustion products evacuation ducts into the common duct, whatever the total thickness (flue and cladding) of the common duct.

6.1.7.3.6 Special requirements for certain components of appliances with a fan

6.1.7.3.6.1 Fan

Direct access to the rotating parts of a fan shall be prevented. The parts of a fan in contact with combustion products shall be effectively protected against corrosion unless they are of corrosion resistant material; furthermore they shall withstand the temperature of the combustion products.

6.1.7.3.6.2 Air monitoring device

Except for appliances with gas/air ratio controls, before each fan start it shall be checked that there is no simulation of air flow in the absence of air flow.

The supply of combustion air shall be checked by one of the following methods:

— supervision of the combustion air pressure or the combustion products pressure. This supervision of pressure is only allowed for appliances fitted with a constant speed fan during the operation of the main burner and where the combustion products evacuation duct is surrounded by combustion air throughout its length, which shall not exceed 3 m. In addition the following requirements shall be fulfilled:

  — the ducts shall not have adjustable or removable restrictions; and

  — the pressure loss of the heat exchanger shall not exceed 0,05 mbar.

— continuous supervision of the combustion air rate or the combustion products rate. In this system, the supervision device is activated directly by the flow of combustion air or combustion products This is also valid for appliances with more than one fan speed in which the flows associated with each fan speed are monitored by separate supervision devices

— gas/air ratio control;

Only for appliances where the combustion products circuit is completely surrounded by the air supply circuit or for separate ducts when the leakage rates of the combustion products evacuation ducts meets the requirements of 7.2.2.2.1.2 he following two indirect supervision methods are also allowed:

  — indirect supervision (e.g. fan speed supervision) when there is an air monitoring device which proves the supply of combustion air at least once at each start up;

  — supervision of the minimum and maximum air or combustion products rates with two rate supervision devices.

6.1.7.3.6.3 Gas/air ratio controls

Gas/air ratio controls shall be designed and constructed so that reasonably foreseeable damage does not give rise to a change capable of affecting safety.

Control tubes may be made of metal with suitable mechanical connections or of other materials with at least equivalent properties and in this case are considered immune to breakage, accidental disconnection and leakage after initial soundness checks. As such they are not subject to the tests in 7.16.2.4.2.

Control tubes for air or combustion products shall have a minimum cross-sectional area of 12 mm^2 with a minimum internal dimension of 1 mm. They shall be located and fixed so that any retention of condensate is avoided and positioned such that creasing, leakage or breakage is prevented. Where more than one control tube is used the relevant connection position for each shall be obvious. Provided that evidence is given and precautions are taken to avoid condensation in the control tubes, the minimum cross sectional area of air control tubes shall be 5 mm^2.

6.1.7.4 Type C_{21} appliances

Delete this clause.

6.1.7.5 Requirements for fan-assisted appliances

Delete this clause.

6.4 Discharge of condensate

At the end of the first paragraph, replace "C_{11}" *by* "C"

7.1.5.2 Installation requirements

Replace the text of the clause by :

"a) general

For all tests, except where otherwise stated in the particular clauses, the appliance is installed, used and put into operation under the conditions specified in the manufacturer's instructions.

In particular, wall-mounted appliances are installed on a vertical test panel of plywood, or of a material with the same thermal characteristics, in accordance with the information in the technical instructions.

The sample of the combustion products is taken in the plane perpendicular to the direction of flow of the combustion products, and at a distance L from the extreme end of the combustion products duct (see examples in Figures 4, 5 and 6):

— for circular ducts: $L = D_i$

— for rectangular ducts: $L = \frac{4S}{C}$

where

D_i is the internal diameter of the combustion products evacuation duct, in mm;

S is the cross-sectional area of this duct, in mm^2;

C is the circumference of this duct, in mm.

The sampling probe is positioned so as to obtain a representative sample of the combustion products.

b) for type B appliances

Except where otherwise stated, a type B_1 appliance is subjected to the draught created by a test flue of height 1 m, with an internal diameter equal to the smallest diameter stated by the manufacturer in the technical instructions and compatible with those given in Table A.6.