



SLOVENSKI STANDARD
oSIST prEN 15420:2006
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Plinski kotli za centralno gretje - Tip kotlov C z imensko močjo nad 70 kW do vključno 1000 kW

Gas-fired central heating boilers - Type C boilers of nominal heat input exceeding 70 kW, but not exceeding 1000 kW

Heizkessel für gasförmige Brennstoffe - Heizkessel der Bauart C mit einer Nennwärmebelastung größer als 70 kW aber nicht größer als 1.000 kW

Chaudières de chauffage central utilisant les combustibles gazeux - Chaudières de type C dont le débit calorifique nominal est supérieur à 70 kW, mais inférieur ou égal à 1000 kW

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ICS

English Version

Gas-fired central heating boilers - Type C boilers of nominal heat input exceeding 70 kW, but not exceeding 1000 kW

Chaudières de chauffage central utilisant les combustibles gazeux - Chaudières de type C dont le débit calorifique nominal est supérieur à 70 kW, mais inférieur ou égal à 1000 kW

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 109.

If this draft becomes a European Standard, 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.

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COMITÉ EUROPÉEN DE NORMALISATION
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prEN 15420:2005 (E)**Foreword**

This document (prEN 15420:2005) has been prepared by Technical Committee CEN/TC 109 "Central heating boilers using gaseous fuels", the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

It was established to deal with aspects related to:

- safety;
- rational use of energy;
- fitness for purpose.

Other types of boilers are dealt with in separate standards.

This draft European standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports and supports Essential Requirements of EU Directive(s).

For relationship with EU Directives 90/396/EEC "Approximation of the laws of Member States concerning gas appliances" and 92/42/EEC "Efficiency requirements for new hot water boilers fired with liquid or gaseous fuels" see informative annex ZA, which is an integral part of this standard.

This standard covers only type testing.

Matters related to quality assurance systems, tests during production and to certificates of conformity to auxiliary devices are not dealt with in this standard.

It is impractical to use the full range of test gases to EN 437 for type testing since their availability, for inputs over 300 kW, may present problems for test houses and manufacturers. Informative annex O gives guidance on the use of gases for tests in order to ensure conformity with EU Directive 90/396/EEC "Approximation of the laws of Member States concerning gas appliances."

1 Scope

This standard specifies the requirements and test methods concerning, in particular the construction, safety, fitness for purpose, and rational use of energy, as well as the classification and marking of gas-fired central heating boilers that are fitted with atmospheric burners, fan assisted atmospheric burners or fully premixed burners, and are hereafter referred to as "boilers".

This standard applies to boilers of type C, as listed in 4.2:

- that use one or more combustible gases of the three gas families at the pressures stated in Tables 14 and 15;
- that have a nominal heat input (on the basis of net calorific value) exceeding 70 kW, but not exceeding 1000 kW, including modular boilers;
- where the temperature of the heat transfer fluid does not exceed 105 °C during normal operation;
- where the maximum operating pressure in the water circuit does not exceed 6 bar;
- which can give rise to condensation under certain circumstances.

The standard applies to boilers designed for sealed water systems or for open water systems.

The standard does not contain all the requirements necessary for boilers:

- intended to be installed in the open or in living rooms;
- permanently fitted with more than one flue outlet;
- of the condensing type;
- intended to be connected to a common flue having mechanical extraction;
- type C₄₁, C₅₁, C₆₁, C₇ and C₈₁ boilers;
- fitted with a forced draught burner in accordance with EN 676;
- producing hot water for domestic purposes.

This standard only covers type testing.

2 Normative references

This standard includes provisions from other publications, either by dated or undated reference. These normative references are quoted in the appropriate places in the text and the publications are listed below. For the dated references, amendments or revisions later than one or other of the publications only apply to this standard if they were incorporated in it by amendment or revision. For undated references, the last edition of the publication to which reference is made applies.

EN 88, *Pressure governors for gas appliances for inlet pressures up to 200 mbar*

EN 125, *Specification for flame supervision devices for gas burning appliances — Thermoelectric flame supervision devices*

EN 126, *Multi-functional controls for gas burning appliances*

EN 257, *Mechanical thermostats for gas burning appliances*

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EN 297, *Gas-fired central heating boilers — Type B₁₁ and B_{11BS} boilers fitted with atmospheric burners of nominal heat input not exceeding 70 kW*

EN 298, *Automatic burner control systems for gas burners and gas burning appliances with or without fans*

EN 437, *Test gases — Test pressures — Appliance categories*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-1, *Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 2: Cast iron flanges*

EN 1092-3, *Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated – Part 3: Copper alloy flanges*

EN 1561, *Founding — Grey cast irons*

EN 1643, *Valve proving systems for automatic shut off valves for gas burners and gas burning appliances*

EN 1854, *Pressure sensing devices for gas burners and gas burning appliances*

EN 10029, *Hot rolled steel plate 3 mm thick or above — Tolerances on dimensions, shape and mass*

EN 12067-1, *Gas/air ratio controls for gas burners and gas burning appliances – Part 1: Pneumatic types*

EN 12067-2, *Gas/air ratio controls for gas burners and gas burning appliances – Part 2: Electronic types*

EN 50165, *Electrical equipment of non-electric heating appliances for household and similar purposes - Safety requirements*

EN 60335-1, *Safety of household and similar electrical appliances — Part 1: General requirements*

EN 60529, *Degrees of protection provided by enclosures (IP code)*

EN 60730-2-9, *Automatic electrical controls for household and similar use — Part 2: Particular requirements for heat-sensing controls*

EN 60742, *Isolating transformers and safety isolating transformers — Requirements*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

EN ISO 4063, *Welding and allied processes. Nomenclature of processes and reference numbers*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances*

ISO 857, *Welding, brazing and soldering processes - Vocabulary — Bilingual edition*

ISO 2553, *Welded, brazed and soldered joints — Symbolic representation on drawings*

CR 1404, *Determination of emissions from appliances burning gaseous fuels during type testing*

CR 1749, *European scheme for the classification of gas appliances according to the method of evacuation of the products of combustion (types)*

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3 Definitions

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

3.1 Combustible gases

3.1.1

test gases

gases intended for the verification of the operational characteristics of appliances using combustible gases. They consist of reference gases and limit gases

3.1.2

reference gases

test gases with which appliances operate under nominal conditions, when they are supplied at the corresponding normal pressure

3.1.3

limit gases

test gases representative of the extreme variations in the characteristics of the gases for which appliances have been designed

3.1.4

reference conditions

these correspond to 15 °C , 1 013,25 mbar, unless otherwise specified

3.1.5

relative density

ratio of the masses of equal volumes of dry gas and dry air under the same conditions of temperature and pressure: 15 °C or 0 °C and 1 013,25 mbar

Symbol: d

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3.1.6

calorific value

quantity of heat produced by the complete combustion, at a constant pressure equal to 1 013,25 mbar, of a unit volume or mass of gas, the constituents of the combustible mixture being taken at reference conditions and the products of combustion being brought back to the same conditions

A distinction is made between:

— the gross calorific value : the water produced by combustion is assumed to be condensed

Symbol: H_s

— the net calorific value : the water produced by combustion is assumed to be in the vapour state

Symbol: H_i

Unit:

— either in megajoules per cubic metre (MJ/m³) of dry gas under the reference conditions;

— or in megajoules per kilogram (MJ/kg) of dry gas.

prEN 15420:2005 (E)**3.1.7****wobbe index**

ratio of the calorific value of a gas per unit volume and the square root of its relative density under the same reference conditions. The Wobbe index is said to be gross or net according to whether the calorific value used is the gross or net calorific value

Symbols: gross Wobbe index: W_g

net Wobbe index: W_i

The Wobbe indices are expressed:

- either in megajoules per cubic metre (MJ/m^3) of dry gas under the reference conditions;
- or in megajoules per kilogram (MJ/kg) of dry gas

3.1.8**gas pressure**

static pressure of the moving gas, relative to the atmospheric pressure, measured at right angles to the direction of flow of the gas

Symbol: p

Unit: millibar (mbar)

3.1.9**test pressures**

gas pressures used to verify the operational characteristics of appliances using combustible gases. They consist of normal and limit pressures.

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3.1.10**normal pressure**

pressure under which the appliances operate in nominal conditions when they are supplied with the corresponding reference gas

Symbol: p_n

3.1.11**limit pressures**

pressures representative of the extreme variations in the appliance supply conditions

Symbols: maximum pressure: p_{\max}

minimum pressure: p_{\min}

3.1.12**pressure couple**

combination of two distinct gas distribution pressures applied by reason of the significant difference existing between the Wobbe indices within a single family or group in which

- the higher pressure corresponds only to gases of low Wobbe index;
- the lower pressure corresponds to gases of high Wobbe index.

3.2 Constituent parts of the boiler

3.2.1 Gas supply

3.2.1.1

gas inlet connection

part of the boiler intended to be connected to the gas supply

3.2.1.2

gas circuit

assembly of parts of the boiler that carry or contain the combustible gas between the boiler gas inlet connection and the point at which air is admitted

3.2.1.3

restrictor

device with one or more orifices, which is placed in the gas circuit so as to create a pressure drop and thus bring the gas pressure at the burner to a predetermined value for a given supply pressure and given rate

3.2.1.4

injector

a component that admits gas into the burner

3.2.1.5

gas rate adjuster

component allowing the gas rate of the burner to be brought to a predetermined value according to the supply conditions

The action of operating this component is called "adjustment of the gas rate"

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3.2.1.6

range rating device

component on the boiler intended to be used by the installer to adjust the heat input of the boiler, within the range of maximum and minimum heat inputs stated by the manufacturer, to suit the actual heat requirements of the installation

3.2.1.7

primary aeration adjuster

device enabling the primary aeration of a burner to be set to the desired value according to the supply conditions

3.2.1.8

sealing an adjuster or a control

arrangements made to make evident any attempt to change its adjustment (e.g. breakage of a device or of a sealing material)

A control or adjuster which is sealed is considered to be non-existent.

3.2.1.9

putting an adjuster or a control out of service

action intended to put an adjuster or control (rate, pressure, etc.) out of service

3.2.1.10 Burners

3.2.1.10.1

main burner

a burner that is intended to assure the thermal function of the boiler and is generally called "the burner"

prEN 15420:2005 (E)**3.2.1.10.2****premixed burner**

burner in which the gas and a quantity of air at least equal to that theoretically necessary for complete combustion are mixed before the flame ports

3.2.1.10.3**ignition device**

any means (flame, electrical ignition device or other device) used to ignite the gas at the ignition burner or at the main burner

3.2.1.10.4**manual ignition device**

device by means of which the burner is ignited following manual intervention

3.2.1.10.5**automatic ignition device**

automatic device which ignites the ignition burner or the main burner directly

3.2.1.10.6**ignition burner**

burner intended to ignite a main burner

3.2.1.10.7**permanent ignition burner**

ignition burner that operates continuously throughout the whole period that the boiler is in use

3.2.1.10.8**intermittent ignition burner**

ignition burner that is ignited before and extinguished at the same time as the main burner

3.2.1.10.9**alternating ignition burner**

ignition burner which is extinguished as soon as ignition of the main burner is effected. It re-ignites at the main burner flame just before the latter goes out

3.2.1.10.10**interrupted ignition burner**

ignition burner which operates only during the ignition sequence

3.2.2 Air supply and combustion products evacuation**3.2.2.1****combustion circuit**

circuit including the air supply duct, the combustion chamber, the heat exchanger, the combustion products evacuation duct and either the fitting piece or the connection to the terminal, if any

3.2.2.2**combustion products circuit**

circuit including the combustion chamber, the heat exchanger and the circuit permitting evacuation of the combustion products to the flue, up to and including the flue outlet

3.2.2.3**combustion chamber**

enclosure inside which combustion of the air-gas mixture takes place

3.2.2.4**flue outlet**

part of the boiler through which the combustion products are evacuated to the flue system

3.2.2.5**air supply and combustion products evacuation ducts**

means for transporting combustion air to the burner and combustion products to the terminal or fitting 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

3.2.2.6**terminal**

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

- the air supply and combustion products evacuation ducts for type C₁ and C₃ 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 C₅ boilers (two devices);
- the air supply duct for type C₈ boilers (one device)

3.2.2.7**terminal guard**

device that protects the terminal from mechanical damage from outside influences

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3.2.2.8**fitting piece**

device which allows the fitting of:

- the air supply and combustion products evacuation ducts to a single shared duct for type C₂ boilers;
- the air supply and combustion products evacuation ducts to two ducts of a shared duct system for type C₄ boilers;
- type C₆ boilers to a system for air supply and combustion products evacuation that is approved and marketed independently from the boiler;
- the combustion products evacuation duct to a chimney that is part of the building for type C₈ boilers

The fitting piece may be part of the boiler or of the air supply and/or combustion products evacuation system

3.2.3 Adjusting, control and safety devices**3.2.3.1****pressure governor**

device which maintains the downstream pressure constant to within fixed limits independent of variations, within a given range, of the upstream pressure and the gas rate