SLOVENSKI STANDARD
SIST EN 656:2001

01-februar-2001

Plinski kotli za centralno ogrevanje – Tip kotlov B z imensko močjo nad 70 kW do vključno 300 kW

Gas-fired central heating boilers - Type B boilers of nominal heat input exceeding 70 kW but not exceeding 300 kW

Heizkessel für gasförmige Brennstoffe - Heizkessel des Typs B mit einer Nennwärmebelastung größer als 70 kW aber gleich oder kleiner als 300 kW

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Chaudieres de chauffage central utilisant les combustibles gazeux - Chaudieres de type B dont le débit calorifique nominal est supérieur a 70 kW mais inférieur ou égal a 300 kW

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SIST EN 656:2001 **en**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English version

Gas-fired central heating boilers - Type B boilers of nominal heat input exceeding 70 kW but not exceeding 300 kW

Chaudières de chauffage central utilisant les combustibles gazeux - Chaudières de type B dont le débit calorifique nominal est supérieur à 70 kW mais inférieur ou égal à 300 kW

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This European Standard was approved by CEN on 13 December 1998.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 109 "Central heating boilers using gaseous fuels", the secretariat of which is held by NNI.

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 April 2000, and conflicting national standards shall be withdrawn at the latest by April 2000.

This European Standard 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).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

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.

Amendments are being prepared and will complete EN 656 eventually.

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 only covers type testing.

The test gases, test pressures and appliance categories given in this European standard are in accordance with those specified in EN 437.

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

Boilers exceeding 70 kW are typically installed in a room separated from living rooms and provided with appropriate ventilation directly to the outside. They need not be fitted with a combustion products discharge safety device, even when fitted with a draught diverter, but appropriate warnings on the packaging and in the instructions shall clearly indicate the limit on the use of this type of boiler.

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In conformity with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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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 B, 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 (net CV basis) exceeding 70 kW, but not exceeding 300 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.

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;
- where the combustion circuit is sealed with respect to the room where the boiler is installed;
- of the condensing type;
- of the low temperature type;
- intended to be connected to a common flue having mechanical extraction;
- fitted with a forced draught burner in accordance with EN 676;
- producing hot water for domestic purposes.

This standard only covers type testing.

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2 Normative references

This European 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 where they have been 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 161	Automatic shut-off valves for gas burners and gas appliances
EN 257	Mechanical thermostats for gas burning appliances
EN 297	Gas-fired central heating boilers - Type B_{11} 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 437:1993 + A1:1997)
EN 1057	Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications
EN 1561	Founding - Grey cast irons
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 23166	Codes for the representation of names of countries (ISO 3166:1993)
EN 24063	Welding, brazing, soldering and braze welding of metals - Nomenclature of processes and reference numbers for symbolic representation on drawings (ISO 4063:1990)
EN 50165	Electrical equipment of non-electric heating appliances for household and similar purposes - Safety requirements
EN 60335-1:1991	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
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads - Part 1: Designation, dimensions and tolerances
ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Designation, dimensions and tolerances
ISO 274	Copper tubes of circular section - Dimensions
ISO 857	Welding, brazing and soldering processes - Vocabulary - Bilingual edition

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ISO 2553	Welded, brazed and soldered joints - Symbolic representation on drawings
ISO 7005-1	Metallic flanges - Part 1: Steel flanges
ISO 7005-2	Metallic flanges - Part 2: Cast iron flanges
ISO 7005-3	Metallic flanges - Part 3: Copper flanges and composite flanges
CR 1404	Determination of emissions from appliances burning gaseous fuels during type testing
CR 1472	General guidance for the marking of gas appliances
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 comprise the reference and the limit gases. [3.2 of EN 437:1993]

3.1.2 reference gases: Test gases on which appliances operate under nominal conditions, when they are supplied at the corresponding normal pressure. [3.3 of EN 437:1993]

3.1.3 limit gases: Test gases representative of the extreme variations in the characteristics of the gases for which appliances have been designed. [3.4 of EN 437:1993]

3.1.4 reference conditions: These correspond to 15 °C and 1 013,25 mbar, unless otherwise specified. [3.9 of EN 437:1993]

3.1.5 relative density: The ratio of the masses of equal volumes of dry gas and dry air under the same conditions of temperature and pressure: 15 °C and 1 013,25 mbar.

Symbol: d

[3.10 of EN 437:1993]

3.1.6 calorific value: The quantity of heat produced by the complete combustion at constant pressure of 1 013,25 mbar of unit volume or mass of gas, the constituents of the combustible mixture being taken at reference conditions and the combustion products being brought to the same conditions.

A distinction is made between:

- gross calorific value in which the water produced by combustion is assumed to be condensed
  Symbol: H_s
- net calorific value in which the water produced by combustion is assumed to be in the vapour state
  Symbol: H_i

Unit:

- either megajoule per cubic metre (MJ/m^3) of dry gas at the reference conditions;
- or megajoule per kilogram (MJ/kg) of dry gas.

[3.11 of EN 437:1993/A1:1997]

3.1.7 Wobbe index: The ratio of the calorific value of a gas per unit volume to 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 gross or net.

Symbols: gross Wobbe index: W_s; net Wobbe index: W_i

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Unit:

- either megajoule per cubic metre (MJ/m^3) of dry gas at the reference conditions;
- or megajoule per kilogram (MJ/kg) of dry gas.

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[3.12 of EN 437:1993/A1:1997]

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. [3.5 of EN 437:1993]

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3.1.10 normal pressure: Pressure under which appliances operate in nominal conditions when they are supplied with the corresponding reference gas.

Symbol: p_n

[3.6 of EN 437:1993]

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}

[3.7 of EN 437:1993]

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 gas 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.

[3.8 of EN 437:1993]

3.2 Constituent parts of the boiler

3.2.1 Gas supply

3.2.1.1 gas inlet connection: The part of the boiler intended to be connected to the gas supply.

3.2.1.2 gas circuit: An assembly of parts of the boiler that carry or contain the combustible gas between the boiler gas inlet connection and the burner(s).

3.2.1.3 restrictor: A 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: A 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".

3.2.1.6 range rating device: A 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: A device enabling the primary aeration of a burner to be set to the desired value according to the supply conditions.

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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 consdered to be non-existent.

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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.

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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".

3.2.1.10.2 premixed burner: A 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.

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

3.2.1.10.5 automatic ignition device: An automatic device which ignites the ignition burner or the main burner directly.

3.2.1.10.6 ignition burner: A burner intended to ignite a main burner.

3.2.1.10.7 permanent ignition burner: An ignition burner that operates continuously throughout the whole period that the boiler is in use.

3.2.1.10.8 intermittent ignition burner: An ignition burner that is ignited before and extinguished at the same time as the main burner.

3.2.1.10.9 alternating ignition burner: An 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: An ignition burner which operates only during the ignition sequence.

3.2.2 Combustion circuit

3.2.2.1 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.

3.2.2.2 combustion chamber: An enclosure inside which combustion of the air-gas mixture takes place.

3.2.2.3 flue outlet: The part of the boiler through which the combustion products are evacuated to the flue system.

3.2.2.4 draught diverter: A device, placed in the combustion products circuit of the boiler, that is intended to maintain the quality of combustion within certain limits and to keep the combustion stable under certain conditions of updraught and downdraught.

3.2.2.5 flue stabilizer: An opening in the combustion products circuit which serves to stabilize the flow of combustion products. It is fitted with a device which monitors the evacuation of combustion products in order to maintain the quality of combustion within certain limits and to keep the combustion stable under certain conditions of updraught and downdraught.

3.2.2.6 damper: A device placed in the air inlet or the flue outlet to control the volume flow.

3.2.3 Adjusting, control and safety devices

3.2.3.1 pressure governor: A 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.

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3.2.3.2 adjustable pressure governor: A pressure governor fitted with a means of adjusting the downstream pressure.

This means is considered as an "adjusting device".

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https://standards.iteh.ai/catalog/standards/sist/3343529e-985e-4846-8432-

3.2.3.3 volume governor: A device which maintains a rate between fixed limits, independent of upstream and downstream pressures, within a range of given values.

3.2.3.4 water rate monitoring device: A device that shuts off the gas supply to the main burner when the water rate through the boiler is less than a predetermined value and automatically reopens the gas supply when the water rate reaches this value.

3.2.3.5 flame supervision device: A device that, in response to a signal from the flame detector, keeps the gas supply open and shuts it off in the absence of the supervised flame.

3.2.3.6 control thermostat: A device enabling the water temperature to be kept automatically, within a given range, at a predetermined value.