

SLOVENSKI STANDARD

oSIST prEN 303-5:2018

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Kotli za gretje - 5. del: Kotli na trdna goriva z ročnim in samodejnim polnjenjem z imensko močjo do 500 kW - Terminologija, zahteve, preskušanje in označevanje

Heating boilers - Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW - Terminology, requirements, testing and marking

Heizkessel - Teil 5: Heizkessel für feste Brennstoffe manuell und automatisch beschickte Feuerungen, Nennwärmeleistung bis 500 kW - Begriffe, Anforderungen, Prüfungen und Kennzeichnung (standards.iteh.ai)

Chaudières de chauffage - Partie 5 : Chaudières spéciales pour combustibles solides, à chargement manuel et automatique, puissance utile inférieure ou égale à 500 kW - Définitions, exigences, essais et marquage

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English Version

**Heating boilers - Part 5: Heating boilers for solid fuels,
manually and automatically stoked, nominal heat output of
up to 500 kW - Terminology, requirements, testing and
marking**

Chaudières de chauffage - Partie 5 : Chaudières
spéciales pour combustibles solides, à chargement
manuel et automatique, puissance utile inférieure ou
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Heizkessel - Teil 5: Heizkessel für feste Brennstoffe,
manuell und automatisch beschickte Feuerungen,
Nennwärmeleistung bis 500 kW - Begriffe,
Anforderungen, Prüfungen und Kennzeichnung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 57.

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
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 303-5:2018) 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.

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).

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

In comparison with EN 303-5:2012, the following technical changes have been made:

- a) the scope was extended to condensing boilers with a heat output for ≤ 500 kW;
- b) the scope was extended to boilers with room sealed operation at a heat output for ≤ 70 kW;
- c) usable fuel to non-wood biomass and further solid fuels have been extended;
- d) requirements for materials, weld joints and wall thicknesses have been revised and adapted to condensing and room sealed operations;
- e) risk analysis was implemented;
- f) general and electrical safety requirements have been revised and adapted to condensing and room sealed applications;
- g) emission class;
- h) tests were revised and new tests for condensing boilers, room sealed operations, secondary emission reduction systems and safety requirements were added;
- i) Annexes were re-structured;
- j) Consideration was given to the essential requirements of the Machinery Directive 2006/42/EC and COMMISSION REGULATION (EU) 2015/1189 and COMMISSION REGULATION (EU) 2015/1187 (Energy labelling).

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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*

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- EN 303-5, *Heating boilers — Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW — Terminology, requirements, testing and marking*
- EN 303-6, *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*
- EN 303-7, *Heating boilers — Part 7: Gas-fired central heating boilers equipped with a forced draught burner of nominal heat output not exceeding 1 000 kW*
- EN 304, *Heating boilers — Test code for heating boilers for atomizing oil burners.*

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Introduction

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned, and the extent to which hazards, hazardous situations and hazardous events are covered, are indicated in the scope of this document.

This standard deals with boilers which are within the Scope Machinery Directive and boilers that are outside of the Scope Machinery Directive.

The manufacturer is responsible for identifying all additional hazards outside of the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

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1 Scope

1.1 General

This European Standard applies to heating boilers including safety devices up to a nominal heat output of 500 kW which are designed for the burning of solid fuels only and are operated according to the instructions supplied with the boiler and misuse reasonably foreseeable by the manufacturer.

This European Standard applies also for solid fuel boilers up to 70 kW nominal heat output taking the combustion air from outside the building.

This European Standard deals with significant hazards, hazardous situations and events relevant to heating boilers used as intended and under the conditions specified in the technical documentation of the boiler (see Clause 4).

The boilers may operate under natural draught or forced draught. The fuel feed may work manually or automatically. The boilers may operate in non-condensing operation or condensing operation.

NOTE This European Standard deals with boilers which are within the scope of the Machinery Directive 2006/42/EC or outside of the scope of the Machinery Directive 2006/42/EC (manual stoked natural draught boiler).

This European Standard contains requirements and test methods for safety, combustion performance, operating characteristics, marking and maintenance of heating boilers. It also covers all external equipment that influences the safety systems (e.g. back burning safety device, integral fuel hopper).

This European Standard covers only boilers that include burners as a unit. The standard applies to the combination of a boiler body with a solid fuel burner according to EN 15270 as a unit only when the whole unit is tested in accordance with this European Standard.

Heating boilers in accordance with this European Standard are designed for central heating installations where the heat carrier is water and the maximum allowable temperature is 110 °C, and which can operate at a maximum allowable operating pressure of 6 bars. For heating boilers with a built-in or attached water heater (storage or continuous flow heater), this European Standard only applies to those parts of the water heater which are necessarily subject to the operating conditions of the heating boiler (heating part).

This European Standard does not apply to:

- heating boilers and other heating appliances which are also designed for the direct heating of the place of installation, also according to the European regulation 2015/1185/EU;
- cooking appliances;
- the design and construction of external fuel storage and transportation devices prior to the safety devices of the boiler;
- manual stoked straw bale boilers;
- CHP appliances.

This European Standard specifies the necessary terminology for solid fuel heating boilers, the control and safety related requirements, the design requirements, the technical heating requirements (considering the environmental requirements) and testing, as well as the marking requirements.

This European Standard is not applicable to heating boilers which are tested before the date of its publication as an EN (European Standard).

1.2 Fuels

These boilers may burn either fossil fuels, biogenic fuels or other fuels such as peat, as specified for their use in the technical documentation, in accordance with the requirements of this European Standard.

Solid fuels included in this European Standard are categorised as follows.

— Biogenic fuels

Biomass in a natural state, in the form of:

- **log wood** with moisture content M25, according to EN ISO 17225-5;
- **chipped wood \leq M35** (wood chipped by machine, usually up to a maximum length of 15 cm) with moisture content from M15 to M35, according to EN ISO 17225-4;
- **chipped wood $>$ M35** according to EN ISO 17225-4;
- **wood pellets** according to EN ISO 17225-2;
- **wood briquettes** according to EN ISO 17225-3;
- **sawdust** with moisture content \leq M50;
- **non-woody biomass**, such as straw, miscanthus, reeds, kernels and grains according to EN ISO 17225-6.

— Fossil fuels

- **a** bituminous coal;
- **b** brown coal;
- **c** coke;
- **d** anthracite.

— Other solid fuels

- Other solid fuels such as peat or processed fuels according to EN ISO 17225-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 304, *Heating boilers — Test code for heating boilers for atomizing oil burners*

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EN 1561, *Founding — Grey cast irons*

EN 1563, *Founding — Spheroidal graphite cast irons*

EN 10025-1, *Hot rolled products of structural steels — Part 1: General technical delivery conditions*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

EN 10028-2, *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10028-3, *Flat products made of steels for pressure purposes — Part 3: Weldable fine grain steels, normalized*

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

EN 10088-2, *Stainless steels — Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 10095, *Heat resisting steels and nickel alloys*

EN 10120, *Steel sheet and strip for welded gas cylinders*

EN 10204, *Metallic products — Types of inspection documents*

EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain steels — Part 1: Technical delivery conditions*

EN 10210-2, *Hot finished structural hollow sections of non-alloy and fine grain steels — Part 2: Tolerances, dimensions and sectional properties*

EN 10216-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10222-2, *Steel forgings for pressure purposes — Part 2: Ferritic and martensitic steels with specified elevated temperature properties*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

EN 10255, *Non-alloy steel tubes suitable for welding and threading — Technical delivery conditions*

EN 12619, *Stationary source emissions — Determination of the mass concentration of total gaseous organic carbon — Continuous flame ionisation detector method*

EN 12828, *Heating systems in buildings — Design for water-based heating systems*

EN 13284-1, *Stationary source emissions — Determination of low range mass concentration of dust — Part 1: Manual gravimetric method*

EN 13384-1:2002+A2:2008, *Chimneys — Thermal and fluid dynamic calculation methods — Part 1: Chimneys serving one heating appliance*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 14597, *Temperature control devices and temperature limiters for heat generating systems*

EN 14789, *Stationary source emissions — Determination of volume concentration of oxygen — Standard reference method: Paramagnetism*

EN 14792, *Stationary source emissions — Determination of mass concentration of nitrogen oxides — Standard reference method: chemiluminescence*

EN 15058, *Stationary source emissions — Determination of the mass concentration of carbon monoxide — Standard reference method: non-dispersive infrared*

EN 15259, *Air quality — Measurement of stationary source emissions — Requirements for measurement sections and sites and for the measurement objective, plan and report*

EN 15270, *Pellet burners for small heating boilers — Definitions, requirements, testing, marking*

EN 15456, *Heating boilers — Electrical power consumption for heat generators — System boundaries — Measurements*

EN 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1)*

EN 60335-2-102:2006, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

EN 60730-1, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1)*

EN 60730-2-5, *Automatic electrical controls — Part 2-5: Particular requirements for automatic electrical burner control systems (IEC 60730-2-5)*

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

EN 61000-6-2, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) — Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3)*

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

EN ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges (ISO 228-2)*

EN ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers (ISO 4063)*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1)*

EN ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2)*

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EN ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100)*

EN ISO 13919-1, *Welding — Electrons and laser beam welded joints — Guidance on quality levels for imperfections — Part 1: Steel (ISO 13919-1)*

EN ISO 13919-2, *Welding — Electron and laser beam welded joints — Guidance on quality levels for imperfections — Part 2: Aluminium and its weldable alloys (ISO 13919-2)*

EN ISO 17225-Series, *Solid biofuels — Fuel specifications and classes*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

CEN/TS 15883, *Residential solid fuel burning appliances — Emission test methods*

ISO 7-2, *Pipe threads where pressure-tight joints are made on the threads — Part 2: Verification by means of limit gauges*

ISO 857-1, *Welding and allied processes — Vocabulary — Part 1: Metal welding processes*

ISO 7005-1, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

ISO 7005-2, *Metallic flanges — Part 2: Cast iron flanges*

ISO 7005-3, *Metallic flanges — Part 3: Copper alloy and composite flanges*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 303-1:1999+A1:2003, and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

maximum allowable operating pressure

highest pressure at which the boiler can be operated safely

Note 1 to entry: The maximum operating pressure is less than the test pressure and the type test pressure.

3.2

test pressure

pressure to which all boilers and their parts are subjected during production at the manufacturers plant or during setting up by the installer

3.3

type test pressure

pressure to which the heating boilers and their parts are first subjected before the start of mass production at the manufacturing plant

3.4**maximum allowable temperature**

maximum allowable water temperature of the heating boiler limited by safety devices

3.5**operating temperature**

temperature range at which the boiler can be operated under normal operating conditions, according to the setting on the boiler water temperature controller and the manufacturer's specifications

3.6**heat output**

Q

usable heat to water output delivered by a boiler per unit time in accordance with the requirements of this European Standard

Note 1 to entry: The heat output data for solid fuel boilers are the average values over a related test period which are established in accordance with the requirements of this European Standard.

3.7**nominal heat output**

Q_N

maximum continuous heat output specified by the manufacturer for a specific fuel in accordance with the requirements of this European Standard

3.8**minimum heat output**

Q_{\min}

minimum heat output which is maintained automatically by the control device specified by the manufacturer for each type of fuel in accordance with the requirements of this European Standard

Note 1 to entry: The minimum heat output can be achieved in intermittent operation.

3.9**minimum continuous heat output**

$Q_{\min C}$

minimum continuous heat output which is maintained automatically by the control device specified by the manufacturer for each type of fuel in accordance with the requirements of this European Standard

3.10**heat output range**

range of output between minimum and nominal to which the boiler can be adjusted and meets the requirements of this European Standard

Note 1 to entry: The heat output range lies between nominal heat output and minimum heat output.

3.11**partial load**

T

quotient of heat output in the heat output range over the nominal heat output, expressed in percentage

Note 1 to entry: $T = \frac{Q}{Q_N} \times 100 \%$

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