



**SLOVENSKI STANDARD**  
**SIST EN 50465:2015/A1:2020**

**01-januar-2020**

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**Plinske naprave - Kombinirane ogrevalne in pogonske naprave z imensko močjo do vključno 70 kW - Dopolnilo A1**

Gas appliances - Combined heat and power appliance of nominal heat input inferior or equal to 70 kW

Gasgeräte - Geräte zur Kraft-Wärme-Kopplung mit einer Nennwärmebelastung kleiner oder gleich 70 kW

Appareils à gaz - Appareils produisant de la chaleur et de l'électricité combinées dont le débit calorifique nominal est inférieur ou égal à 70 kW

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**Ta slovenski standard je istoveten z: EN 50465:2015/A1:2019**

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**ICS:**

27.070	Gorilne celice	Fuel cells
97.100.99	Grelniki, ki uporabljajo druge vire energije	Heaters using other sources of energy

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EUROPEAN STANDARD

EN 50465:2015/A1

NORME EUROPÉENNE

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ICS 27.070; 97.100.20

English Version

## Gas appliances - Combined heat and power appliance of nominal heat input inferior or equal to 70 kW

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This amendment A1 modifies the European Standard EN 50465:2015; it was approved by CENELEC on 11 February 2019. CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CEN-CENELEC Management Centre or to any CEN and CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

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## European foreword

This document (EN 50465:2015/A1:2019) has been prepared by CEN/CLC/JTC 17 “Fuel cell gas appliances”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-05-22
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-11-22

It should be noted that the following changes have been incorporated in this Amendment:

- a) Adoptions to follow the guidelines for developing harmonized standards (“Vademecum on European standardisation in support of Union legislation and policies (*commission staff working document SWD(2015) 205 final*)” have been implemented, e.g. normative references have been updated to dated references all over the standard by revising Clause 2 with dated references, which apply to all normative references throughout the standard text.
- b) Requirements for risk assessment according to the (EU) 2016/426 (GAR) have been introduced to 5.1.
- c) Requirements for the calculation of the “Annual energy consumption” have been introduced.
- d) Additional requirements for sound power level and additional items for marking, installation and operating instructions have been introduced, which are addressed by the 2009/125/EC (ErP).  
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- e) Additional information for the market surveillance have been introduced (Annex J), which are addressed by the ErP.
- f) An informative Annex K has been introduced, which is giving information for definition and test methods for the “Specific Energy Consumption”, it is recommended to be used as a basis for future review of the Energy Labelling Regulation.
- g) Annex ZZA concerning (EU) 2016/426 (GAR) and Annexes ZZB and ZZC concerning regulations 811/2013 and 813/2013 under Directive 2010/30/EU have been introduced.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

For the relationship with EU Directive(s) see informative Annexes ZZA, ZZB and ZZC, which are an integral part of this document.

## 1 Modification to the Scope

**Replace** the first paragraph of the Scope with the following:

This document specifies the requirements and test methods for the construction, safety, fitness for purpose, rational use of energy, sound power measurement and together with requirements for the marking and advice on the end of life disposal of a micro combined heat and power appliance; hereafter referred to as "mCHP appliance".

## 2 Modification to clause 2, "Normative references"

**Replace** Clause 2 by the following:

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.

NOTE This standard uses only dated references as for undated references in the main body of the standard, the version referred to in this clause applies.

EN 88-1:2011+A1:2016, *Pressure regulators and associated safety devices for gas appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

EN 125:2010+A1:2015, *Flame supervision devices for gas burning appliances - Thermoelectric flame supervision devices*

EN 126:2012, *Multifunctional controls for gas burning appliances*

EN 161:2011+A3:2013, *Automatic shut-off valves for gas burners and gas appliances*

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 437:2003+A1:2009, *Test gases - Test pressures - Appliance categories*

EN 513:1999, *Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors - Determination of the resistance to artificial weathering*

EN 549:1994, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 573-1:2004, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 1: Numerical designation system*

EN 1057:2006+A1:2010, *Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-1:2007+A1:2013, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 2: Cast iron flanges*

EN 1092-3:2003, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 3: Copper alloy flanges*

EN 1092-3:2003/AC:2007, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 3: Copper alloy flanges*

EN 1092-4:2002, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 4: Aluminium alloy flanges*

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CR 1404:1994, *Determination of emissions from appliances burning gaseous fuels during type-testing*

EN 1561:2011, *Founding - Grey cast irons*

EN 1856-1:2009, *Chimneys - Requirements for metal chimneys - Part 1: System chimney products*

EN 1856-2:2009, *Chimneys - Requirements for metal chimneys - Part 2: Metal flue liners and connecting flue pipes*

EN 10029:2010, *Hot-rolled steel plates 3 mm thick or above - Tolerances on dimensions and shape*

EN 10088-1:2014, *Stainless steels - Part 1: List of stainless steels*

EN 10226-1:2004, *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 10226-2:2005, *Pipe threads where pressure tight joints are made on the threads - Part 2: Taper external threads and taper internal threads - Dimensions, tolerances and designation*

EN 12067-2:2004, *Gas/air ratio controls for gas burners and gas burning appliances - Part 2: Electronic types*

EN 13203-1:2015, *Gas fired domestic appliances producing hot water - Part 1: Assessment of performance of hot water deliveries*

EN 13216-1:2004, *Chimneys - Test methods for system chimneys - Part 1: General test methods*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests*

EN 13611:2015, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 13611:2015/AC:2016, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 14459:2015, *Safety and control devices for burners and appliances burning gaseous or liquid fuels - Control functions in electronic systems - Methods for classification and assessment*

EN 14471:2013+A1:2015, *Chimneys - System chimneys with plastic flue liners - Requirements and test methods*

EN 15036-1:2006, *Heating boilers - Test regulations for airborne noise emissions from heat generators - Part 1: Airborne noise emissions from heat generators*

EN 50438:2013, *Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks*

EN 50549-1:2018, *Requirements for generating plants to be connected in parallel with distribution networks – Part 1: Connection to a LV distribution network – Generating plants up to and including Type B*

EN 50549-2:2018, *Requirements for generating plants to be connected in parallel with distribution networks – Part 2: Connection to a MV distribution network - Generating plants up to and including Type B*

EN 55014-1:2006, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*

EN 55014-1:2006/A1:2009, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*



- EN 55014-1:2006/A2:2011, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission*
- EN 55014-2:2015, *Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity - Product family standard*
- EN 60335-1:2012, *Household and similar electrical appliances - Safety - Part 1: General requirements*
- EN 60335-2-102:2016, *Household and similar electrical appliances - Safety - Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections*
- EN 60529:1991, *Degrees of protection provided by enclosures (IP Code)*
- EN 60529:1991/A1:2009, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989/A1:1999)*
- EN 60529:1991/A2:2013, *Degrees of protection provided by enclosures (IP Code)*
- EN 60730-2-9:2010, *Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls*
- EN 61000-3-2:2014, *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)*
- EN 61000-3-3:2013, *Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection*
- EN 61000-3-11:2000, *Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current  $\leq 75$  A and subject to conditional connection*
- EN 61000-3-12:2011, *Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current  $> 16$  A and  $\leq 75$  A per phase*
- EN 61000-6-1:2007, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments*
- EN 61000-6-3:2007, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments*
- EN 61000-6-3:2007/A1:2011, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments*
- EN 62282-3-100:2012, *Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety*
- EN ISO 178:2010, *Plastics - Determination of flexural properties (ISO 178:2010)*
- EN ISO 178:2010/A1:2013, *Plastics - Determination of flexural properties (ISO 178:2010/Amd 1:2013)*
- EN ISO 179-1:2010, *Plastics - Determination of Charpy impact properties - Part 1: Non-instrumented impact test (ISO 179-1:2010)*
- EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*
- EN ISO 527-1:2012, *Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1:2012)*

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EN ISO 527-2:2012, *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:2012)*

EN ISO 1183-1:2012, *Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2012)*

EN ISO 1183-2:2004, *Plastics - Methods for determining the density of non-cellular plastics - Part 2: Density gradient column method (ISO 1183-2:2004)*

EN ISO 1183-3:1999, *Plastics - Methods for determining the density of non-cellular plastics - Part 3: Gas pycnometer method (ISO 1183-3:1999)*

EN ISO 2553:2013, *Welding and allied processes - Symbolic representation on drawings - Welded joints (ISO 2553:2013)*

EN ISO 3166-1:2014, *Codes for the representation of names of countries and their subdivisions - Part 1: Country codes (ISO 3166-1:2013)*

EN ISO 4063:2010, *Welding and allied processes - Nomenclature of processes and reference numbers (ISO 4063:2009, Corrected version 2010-03-01)*

EN ISO 8256:2004, *Plastics - Determination of tensile-impact strength (ISO 8256:2004)*

EN ISO 9969:2016, *Thermoplastics pipes - Determination of ring stiffness (ISO 9969:2016)*

EN ISO 16852:2016, *Flame arresters - Performance requirements, test methods and limits for use (ISO 16852:2016)*

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

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ISO 37:2017, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 188:2011, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 262:1998, *ISO general purpose metric screw threads — Selected sizes for screws, bolts and nuts*

ISO 815-1:2014, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 815-2:2014, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures*

ISO 857-2:2005, *Welding and allied processes — Vocabulary — Part 2: Soldering and brazing processes and related terms*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 2781:2008, *Rubber, vulcanized or thermoplastic — Determination of density*

ISO 6914:2013, *Rubber, vulcanized or thermoplastic — Determination of ageing characteristics by measurement of stress relaxation in tension*

ISO 7619-1:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 7619-2:2010, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 2: IRHD pocket meter method*

### 3 Modification to Clause 3, "Terms and definitions"

Add the following definition:

#### 3.15

#### annual energy consumption

$Q_{HE}$

net annual energy consumption of a heater required for space heating to meet the reference annual heating demand for a designated heating season, expressed in GJ in terms of GCV

### 4 Modification to subclause 5.1, General construction

Replace 7th paragraph of subclause 5.1 with the following:

"The design and the construction shall be based on a risk assessment to ensure that

- a) all reasonably foreseeable hazards, hazardous situations and events throughout the anticipated mCHP appliance's lifetime, have been identified;
- b) the risk for each of these hazards has been estimated from the combination of probability of occurrence of the hazard and of its foreseeable severity;
- c) the two factors which determine each one of the estimated risks (probability and severity) have been eliminated or reduced to a level not exceeding the acceptable risk level as far as practically possible through
  - 1) inherently safe design of the construction and its methods, or
  - 2) passive control of energy releases without endangering the surrounding environment (e.g. burst disks, release valves, thermal cut-off devices) or by safety related control functions, and
  - 3) for residual risks which could not have been reduced by the measures according to 1) and 2) the provision of labels, warnings, or requirements of special training, considering that such measures need to be understood by the persons which are in the area of the hazards.

If not stated elsewhere in this standard safety related measures are explicitly given in the measures required for functional safety and the allocation of the class of control function shall be determined and designed in accordance with

- EN 60335-2-102 in conjunction with EN 60335-1, on an appliance level, and
- EN 60730-1 on a control level.

NOTE The following hazards can be addressed:

- mechanical hazards: sharp surfaces, tripping hazards, moving masses and instability, strength of materials and liquids or gases under pressure;
- electrical hazards: contact of persons with live parts, short-circuits, high voltage;
- thermal hazards: hot surfaces, release of high temperature liquids or gases, thermal fatigue;
- fire and explosion hazards: flammable gases or liquids, potential for explosive mixtures during normal or abnormal operating conditions, potential for explosive mixtures during fault conditions;
- malfunction hazards: unsafe operation of installation related equipment due to failures of software, control circuit or protective/safety components or incorrect manufacturing or misoperation;
- material and substance hazards: material deterioration, corrosion, embrittlement, toxic releases, choking hazards (e.g. by replacing oxygen by inert purge gases);

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- waste disposal hazards: disposal of toxic materials, recycling, disposal of flammable liquids or gases;
- environmental hazards: unsafe operation in hot/cold environments, rain, flooding, wind, earthquake, external fire, smoke."

**5 Modification to subclause 5.3.2 "Connection to the gas pipe"**

*Replace 3rd paragraph with the following:*

If flanges are used, they shall comply with the relevant requirements of EN 1092-1, EN 1092-2, EN 1092-3, or EN 1092-4, concerning the relevant flange types and their facings, dimensions, tolerances, threading, bolt sizes, flange jointing face surface finish, materials, pressure and temperature ratings and approximate flange masses.

**6 Modification to subclause 5.10 "Operational safety in the event of failure of the energy supply for the control systems"**

*Replace 1st paragraph with the following:*

If the mCHP appliance uses an energy supply for the control systems, the control system shall tolerate failure of the auxiliary energy or following its restoration without occurring hazardous situations.

**7 Modification to subclause 5.12 "Conversion to different gases"**

*Replace 1st paragraph 8th indent with the following:*

- changes of configuration parameters by data exchange (for requirements see EN 13611);

**8 Modification to subclause 5.13.2.4 "Welded seams and welding fillers"**

*Replace 8th paragraph with the following:*

The terms given in Table 7 are in accordance with EN ISO 2553; the reference numbers of welding processes are respectively in accordance with ISO 857-2 and EN ISO 4063.

**9 Modification to subclause 5.18 "Design"**

*Modify the title to the following:*

**5.18 Additional design requirements****10 Modification to subclause 5.20 "Electrical equipment"**

*Replace 1st paragraph with the following:*

The electrical equipment of the mCHP appliance shall comply with EN 60335-2-102.

**11 Modification to subclause 5.21.1 "General"**

*Replace 10th paragraph with the following*

Rubbers used in adjusting, supervision, control and safety devices shall conform those requirements given in EN 549 which are applicable to the parameters provided by the design specifications, e.g. temperature class, hardness class and ozone resistance.

**12 Modification to subclause 5.21.6 "Remote control"**

*In Subclause 5.21.6.1, General, Delete 5th paragraph*

*Replace 6th paragraph with the following*