SLOVENSKI STANDARD
SIST EN 12309-2:2015

01-september-2015

Nadomešča:
SIST EN 12309-1:1999

Absorpcijske in adsorpcijske plinske naprave za gretje in/ali hlajenje z grelno močjo do vključno 70 kW - 2. del: Varnost

Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 2: Safety

Gasbefeuerte Sorptions-Geräte für Heizung unde/oder Kühlung mit einer Nennwärmebelastung nicht über 70 kW - Teil 2: Sicherheit

Appareils à sorption à chauffage direct au gaz pour chauffage et/ou refroidissement d'un débit calorifique sur PCI inférieur à 70 kW - Partie 2: Sécurité

Ta slovenski standard je istoveten z: **EN 12309-2:2015**

ICS:

23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne črpalke	Heat pumps

SIST EN 12309-2:2015 **en,fr,de**

EUROPEAN STANDARD

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English Version

Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 2: Safety

Appareils à sorption fonctionnant au gaz pour le chauffage et/ou le refroidissement de débit calorifique sur PCI inférieur à 70 kW - Partie 2 : Sécurité

Gasbefeuerte Sorptions-Geräte für Heizung und/oder Kühlung mit einer Nennwärmebelastung nicht über 70 kW - Teil 2: Sicherheit

This European Standard was approved by CEN on 14 February 2015.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 12309-2:2015) has been prepared by Technical Committee CEN/TC 299 “Gas-fired sorption appliances, indirect fired sorption appliances, gas-fired endothermic engine heat pumps and domestic gas-fired washing and drying appliances”, the secretariat of which is held by UNI.

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 November 2015, and conflicting national standards shall be withdrawn at the latest by November 2015.

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

This document supersedes EN 12309-1:1999.

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, Annex ZB and Annex ZC, which are integral parts of this document.

EN 12309 comprises the following parts under the general title, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW*:

— Part 1: Terms and definitions;

— Part 2: Safety;

— Part 3: Test conditions;

— Part 4: Test methods;

— Part 5: Requirements;

— Part 6: Calculation of seasonal performances;

— Part 7: Specific provisions for hybrid heating appliances;

— Part 8: Environmental aspects.

EN 12309-1 and EN 12309-2 supersede EN 12309-1:1999, whereas EN 12309-1 and EN 12309-3, EN 12309-4, EN 12309-5, EN 12309-6 and EN 12309-7 supersede EN 12309-2:2000. EN 12309-1, EN 12309-2, EN 12309-3, EN 12309-4, EN 12309-5, EN 12309-6 and EN 12309-7 have been prepared to address the essential requirements of the European Directive 2009/142/EC relating to appliances burning gaseous fuels (see EN 12309-2:2015, Annex ZA, for safety aspects and EN 12309-5:2014, Annex ZA, for rational use of energy aspects).

These documents are linked to the following European Directives:

— Energy Related Products Directive (2009/125/EC) in terms of tests conditions, tests methods and seasonal performances calculation methods under Mandate M/495 (see EN 12309-5:2014, Annex ZB);

For the relationship with EU Directive(s), see EN 12309-2:2015, Annex ZA, and EN 12309-5:2014, Annex ZA, Annex ZB and Annex ZC. These documents will be reviewed whenever new mandates could apply.

EN 12309-8, Environmental aspects, deals with the incorporation of the Resolution BT 27/2008 regarding CEN approach on addressing environmental issues in product and service standards.

This document deals particularly with the operational safety of the appliance.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

1.1 Scope of EN 12309 series

Appliances covered by this European Standard include one or a combination of the following:

— gas fired sorption chiller;

— gas fired sorption chiller/heater;

— gas fired sorption heat pump.

This European Standard applies to appliances only when used for space heating and cooling with or without heat recovery.

This European Standard applies to appliances having flue gas systems of type B and C (according to CEN/TR 1749) and to appliances designed for outdoor installations. EN 12309 does not apply to air conditioners, it only applies to appliances having:

— integral burners under the control of fully automatic burner control systems;

— closed system refrigerant circuits in which the refrigerant does not come into direct contact with the water or air to be cooled or heated;

— mechanical means to assist transportation of the combustion air and/or the flue gas.

The above appliances can have one or more primary or secondary functions (i.e. heat recovery - see definitions in EN 12309-1:2014). In the case of packaged units (consisting of several parts), the standard applies only to those designed and supplied as a complete package.

The appliances having their condenser cooled by air and by the evaporation of external additional water are not covered by this European Standard.

Installations used for heating and/or cooling of industrial processes are not within the scope of these standards.

NOTE All the symbols given in this text are used regardless of the language used.

1.2 Scope of this Part 2 to EN 12309

This part of EN 12309 deals with the safety of gas-driven sorption heat pumps as defined in EN 12309-1. Only types B12 for outdoor installations, B13 for outdoor installations, B22 for outdoor installations, B23 for outdoor installations, C12 and C13, C32 and C33 are covered in this European Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

EN 88-2:2007, *Pressure regulators and associated safety devices for gas appliances - Part 2: Pressure regulators for inlet pressures above 500 mbar up to and including 5 bar*

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 257:2010, *Mechanical thermostats for gas-burning appliances*

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

EN 378-2:2008+A2:2012, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation*

EN 378-3:2008+A1:2012, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 3: Installation site and personal protection*

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

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 1254-2:1998, *Copper and copper alloys - Plumbing fittings - Part 2: Fittings with compression ends for use with copper tubes*

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

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

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

EN 12309-1:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 1: Terms and definitions*

EN 12309-3:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 3: Test conditions*

EN 12309-4:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 4: Test methods*

EN 12309-5:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 5: Requirements*

EN 14459:2007, *Control functions in electronic systems for gas burners and gas burning appliances - Methods for classification and assessment*

EN 60335-1:2012, *Household and similar electrical appliances - Safety - Part 1: General requirements (IEC 60335-1:2010, modified)*

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 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60730-2-9:2010, *Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9:2008, modified)*

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

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

ISO 1182:2010, *Reaction to fire tests for products — Non-combustibility test*

ISO 3864-2:2004, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12309-1:2014 and the following apply.

3.1
automatic recycling

automatic process by which, after loss of flame during operation, the gas supply is interrupted and the full start procedure is re-initiated automatically

4 Classification

Appliances can be classified according to:

— the gases they use;

— the mode of air supply and evacuation of combustion products;

— the temperatures of their heat transfer media;

— their denomination.

4.1 Classification of appliances

4.1.1 Classification of gases

Gases are classified into three families, divided into groups according to the value of the Wobbe index. Families and groups of gas used in this standard are in accordance with those of the EN 437:2003+A1:2009.

4.1.2 Classification according to the mode of air supply and evacuation of the combustion products

The types of appliances as defined in CEN/TR 1749 are applicable.

4.1.3 Classification according to the temperatures of the heat transfer media

4.1.3.1 General

The classification according to the temperatures of the heat transfer media is formed in such a way that the heat transfer media are indicated together with their temperatures (in °C). A short classification is formed in such a way that a characteristic letter is used for the heat transfer medium: A for air, W for water and B for brine.

For the purposes of this standard, all references to the term “absorber” shall be taken to mean “adsorber” where the function of the appliance is based on adsorption.

4.1.3.2 Cooling mode

When the appliance is operating in the cooling mode, the temperatures indicated in the first place refer to the indoor heat exchanger and the temperatures in the second place to the outdoor heat exchanger.

Air and water/brine temperatures for the indoor heat exchangerindoor heat exchanger are inlet temperatures. Water/brine temperatures for the outdoor heat exchanger are outlet temperatures.

EXAMPLE A27/W7 means an inlet temperature of air for the indoor heat exchangerindoor heat exchanger of 27 °C and an outlet temperature of water for the outdoor heat exchanger of 7 °C.

4.1.3.3 Heating mode

When the appliance is operating in the heating mode, the values indicated in the first place refer to the outdoor heat exchanger and the values in the second place to the indoor heat exchanger.

Air and water/brine temperatures for the outdoor heat exchanger are inlet temperatures. Water/brine temperatures for the indoor heat exchanger are outlet temperatures.

EXAMPLE B0/W50 means an inlet temperature of brine for the outdoor heat exchanger of 0 °C and an outlet temperature of water for the condenser/absorber of 50 °C.

4.1.4 Classification according to denomination

4.1.4.1 Cooling mode

Appliances designed to operate in the cooling mode are denominated in such a way that the heat transfer medium for the indoor heat exchanger is indicated first, followed by the heat transfer medium for the outdoor heat exchanger. Examples of such appliances are given in Table 1.

Table 1 — Examples of appliances designed to provide cooling

Heat transfer medium		Denomination
Indoor heat exchanger	Outdoor heat exchanger	
Air	Water [a]	Air Cooled Liquid Chiller Air Cooled Liquid Chiller Heater
Water [a]	Water [a]	Water Cooled Liquid Chiller Water Cooled Liquid Chiller Heater
Brine	Water [a]	Brine Cooled Liquid Chiller Brine Cooled Liquid Chiller Heater
[a] This description also applies where the water contains additives to prevent corrosion as specified in the appliance's instructions.		

4.1.4.2 Heating mode

For the purposes of this standard, appliances designed to operate in the heating mode are denominated in such a way that the heat transfer medium for the outdoor heat exchanger is indicated first, followed by the heat transfer medium for the indoor heat exchanger. Examples of such appliances are given in Table 2.

Table 2 — Examples of appliances designed to provide heating

Heat transfer medium		Denomination
Outdoor heat exchanger	Indoor heat exchanger	
Air	Water [a]	Air/water Heat pump
Water [a]	Water [a]	Water/water Heat Pump
Brine	Water [a]	Brine/Water Heat Pump
[a] This description also applies where the water contains additives to prevent corrosion as specified in the appliance's instructions.		

5 Construction and design requirements

5.1 General

5.1.1 Conversion to different gases

The following operations are allowed in order to convert from a gas of one family or group to a gas of another family or group:

a) adjustment of the gas rate of the main burner and ignition burner;

b) change of injectors or restrictor;

c) change of the ignition burner or its components;

d) change of the gas rate modulation system;

e) putting out of service and sealing a gas rate adjuster and/or a regulator;

f) changes of configuration parameters by data exchange (for requirement see EN 14459).

For each of the operations mentioned above the appliance shall be tested with each of the gases. These operations shall be possible without having to interfere with the connections of the appliance to its pipe-work (gas, water, duct system).

5.1.2 Materials and method of construction

When the appliance is installed in accordance with the appliance's instructions, all components, including the heat exchangers and the refrigerant circuit, shall withstand the mechanical, chemical and thermal conditions to which they may be subjected in the course of normal use.

In addition, the appliance shall be designed in such a way that if condensation takes place, this shall not:

— affect the operational safety;

— drop outside the appliance.

This requirement does not apply to the flow of condensate which is produced at the outlet of the combustion products evacuation duct or from a purpose made condensate discharge system.

Copper shall not be used for gas carrying parts where its temperature is likely to exceed 100 °C.

Asbestos or materials containing asbestos shall not be used.

Solder with a melting point below 450 °C after application shall not be used for gas carrying parts. Hard solder containing cadmium in its formulation shall not be used in the construction of the appliance.

Where appropriate, materials used on the appliance shall be non-combustible in accordance with the requirements of ISO 1182.

5.1.3 Accessibility for maintenance and use

Parts that are intended to be removable for maintenance or cleaning shall be readily accessible, promote assembly and be difficult to assemble incorrectly. Such parts shall be impossible to assemble incorrectly where incorrect assembly would create a hazardous condition or result in damage to the appliance and its controls.

It shall be possible to clean the combustion vessel and the parts in contact with combustion products in accordance with the appliance’s instructions without using special tools unless these are supplied as necessary accessories with the appliance.

Access shall be possible to all handles, buttons etc. required during normal use of the appliance, without having to remove any part of the case. For this purpose, the opening of a door or access panel is permitted.

Constructional parts accessible during use and maintenance shall be free from sharp edges and corners that might cause damage or personal injury during use or maintenance.

5.1.4 Thermal insulation

Any thermal insulation shall retain its insulating properties under the influences of temperature and ageing. The insulation shall withstand the normally expected thermal and mechanical stresses. The insulation of parts associated with the combustion products circuit shall be non combustible. All insulation shall be securely located and protected against mechanical damage, condensate and vermin.