SLOVENSKI STANDARD
oSIST prEN 12309-5:2012

01-oktober-2012

Absorpcijske in adsorpcijske plinske naprave za gretje in/ali hlajenje z grelno močjo do vključno 70 kW - 5. del: Zahteve

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

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Gasbefeuerte Sorptions-Geräte für Heizung und/oder Kühlung mit einer Nennwärmebelastung nicht über 70 kW - Teil 5: Anforderungen

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Appareils à sorption à chauffage direct au gaz pour chauffage et/ou refroidissement d'un débit calorifique sur PCI inférieur à 70 kW - Partie 5: Exigences

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ICS:

23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne črpalke	Heat pumps
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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Will supersede EN 12309-2:2000

English Version

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

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 299.

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SIST EN 12309-5:2015

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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Ref. No. prEN 12309-5:2012: E

oSIST prEN 12309-5:2012

Contents

Page

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
https://standards.iteh.ai/catalog/standards/sist/0d00a4a1-0185-4704-8098-

oSIST prEN 12309-5:2012

Foreword

This document (prEN 12309-5:2012) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 12309-2:2000.

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 appliances;

— Part 8: Environmental aspects.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
09-5:2015
https://standards.iteh.ai/catalog/standards/sist/6d06a4a1-0f83-4704-b096-
6e50d6d4b/sist-en-12309-5-2015

Parts 1 and 2 to EN 12309 will supersede EN 12309-1:1999, whereas Part 1 and Parts 3 to 7 of EN 12309 will supersede EN 12309-2:2000. Parts 1 to 7 have been prepared to address the essential requirements of the European Directive 2009/142/EC relating to appliances burning gaseous fuels (see informative Annex ZA of EN 12309-2:20xx for safety aspects and Annex ZA of prEN 12309-5:2012 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 Annex ZB of prEN 12309-5:2012);

— Promotion of the Use of Renewable Energy Directive (2009/28/EC – Annex VII) (see Annex A of prEN 12309-5:2012).

For the relationship with EU Directive(s), see informative Annexes ZA and ZB in EN 12309-2:20xx and in prEN 12309-5:2012, which are an integral part of this document. These documents will be reviewed whenever new mandates could apply.

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

oSIST prEN 12309-5:2012

1 Scope

1.1 Scope of EN 12309 series

Appliances covered by EN 12309 include one or a combination of the following:

— gas-fired sorption chiller;

— gas-fired sorption chiller/heater;

— gas-fired sorption heat pump.

EN 12309 applies to appliances only when used for space heating and cooling with or without heat recovery. Appliances can be monovalent, bivalent or hybrid types.

EN 12309 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 applies to appliances that can be single ducted or double ducted.

EN 12309 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/brine or air to be cooled or heated,

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

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The above appliances can have one or more primary or secondary functions (i.e. heat recovery - see definitions in prEN 12309-1:2012) and EN 12309 applies to all such functions providing that the function concerned is dependent on circulation of fluid (refrigerant and/or solution) within the absorption, adsorption or refrigerant circuit(s).

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NOTE 1 Any appliance function that is not dependent on circulation of the fluid within the absorption, adsorption, or refrigerant circuit(s) should be assessed separately.

EN 12309 is applicable to appliances that are intended to be type tested. Requirements for appliances that are not type tested would need to be subject to further consideration.

In the case of packaged units (consisting of several parts), EN 12309 applies only to those designed and supplied as a complete package.

EN 12309 does not apply to air conditioners.

The appliances having their condenser cooled by air and by the evaporation of external additional water are not covered by EN 12309.

Installations used for heating and/or cooling of industrial processes are not within the scope of EN 12309.

NOTE 2 All the symbols given in this text should be used regardless of the language used.

1.2 Scope of this Part 5 to EN 12309

This part of EN 12309 specifies the requirements for gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW.

This part of EN 12309 deals particularly with the requirements about declaration of energy efficiency performance by the manufacturer.

oSIST prEN 12309-5:2012

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.

prEN 12309–1:2012, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 1: Terms and definitions*

EN 12309–2:20xx, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 2: Safety*

prEN 12309–3:2012, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 3: Test conditions*

prEN 12309–4:2012, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 4: Test methods*

prEN 12309–6:2012, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 6: Calculation of seasonal performances*

prEN 12309–7:2012, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW – Part 7: Specific provisions for hybrid appliances*

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 12309-1:2012 apply.

SIST EN 12309-5:2015
https://standards.iteh.ai/catalog/standards/sist/6d06a4a1-0f83-4704-b096-d706e50d6d4b/sist-en-12309-5-2015

4 Requirements

4.1 Cooling capacity rating and energy performance

4.1.1 Primary functions

The manufacturer shall declare the rated cooling capacity corresponding to Standard Rating conditions given in prEN 12309-3:2012, Table 3, together with the gas utilization efficiency under the same conditions. When measured under the appropriate test conditions given in prEN 12309-3:2012, and in accordance with the methods of test described in prEN 12309-4:2012, it shall be verified that the rated cooling capacity, the gas utilization efficiency are not less than those declared by the manufacturer.

If the manufacturer declares rated cooling capacities or gas utilization efficiency corresponding to Application Rating conditions given in prEN 12309-3:2012, Table 3, these shall also be verified. When measured under the appropriate test conditions given in prEN 12309-3:2012, and in accordance with the methods of test described in prEN 12309-4:2012, it shall be verified that the corresponding rated cooling capacity and, if applicable, the gas utilization efficiency are not less than those declared by the manufacturer.

If, in addition, the manufacturer declares a rated cooling capacity or gas utilization efficiency for the primary function which relates to conditions other than those given in prEN 12309-3:2012, the claim(s) shall be verified under the conditions specified in the manufacturer's instructions for installation and adjustment.

4.1.2 Secondary functions

No specific manufacturer declarations are included in this European Standard for secondary function(s). However, if the manufacturer claims a rated heating capacity, he shall at least declare the corresponding gas efficiency and the conditions (water temperature and flow rate) under which the claims are made. It shall be

oSIST prEN 12309-5:2012

verified under these conditions and under prEN 12309-4:2012 appropriate test procedure that these claims are not less than those declared.

If the secondary function is heat recovery, the rated heat recovery capacity claimed by the manufacturer shall correspond to the appropriate test conditions given in prEN 12309-3:2012, Table 4. When measured under the appropriate test conditions given in prEN 12309-3:2012 and in accordance with the methods of test described in prEN 12309-4:2012, it shall be verified that the rated heat recovery capacity is not less than that declared by the manufacturer.

4.2 Heating capacity rating and energy performance

4.2.1 Primary functions

The manufacturer shall declare the rated heating capacity corresponding to test conditions given in prEN 12309-3:2012, Table 5 or Table 6, or given in prEN 12309-7:2012 for hybrid appliances, together with the gas utilization efficiency under the same conditions. When measured under the appropriate test conditions given in prEN 12309-3:2012 or given in prEN 12309-7:2012 for hybrid appliances, and in accordance with the method of test described in prEN 12309-4:2012, it shall be verified that the rated heating capacity and the gas utilization efficiency are not less than those declared by the manufacturer.

If the manufacturer declares rated heating capacities or gas utilization efficiency corresponding to Application Rating conditions given in prEN 12309-3:2012, Table 5 or Table 6, these shall also be verified. When measured under the appropriate test conditions given in prEN 12309-3:2012, and in accordance with the methods of test in prEN 12309-4:2012, it shall be verified that the corresponding rated heating capacity and, if applicable, the gas utilization efficiency are not less than those declared by the manufacturer.

iTeh STANDARD PREVIEW

If, in addition, the manufacturer declares a rated heating capacity or gas utilization efficiency for the primary function which relates to conditions other than those given in this European Standard, the claim(s) shall be verified under the conditions specified in the manufacturer's instructions for installation and adjustment.

(standards.iteh.ai)
SIST EN 12309-5:2015
https://standards.iteh.ai/catalog/standards/sist/6d06a4a1-0f83-4704-b096-

4.2.2 Secondary functions

No specific manufacturer declarations are included in this European Standard for secondary function(s). However, if the manufacturer claims a rated cooling capacity, he shall at least declare the corresponding gas utilization efficiency and the conditions (water/brine temperature and flow rate) under which the claims are made. It shall be verified under these conditions and appropriate test procedure as defined in prEN 12309-4:2012 that these claims are not less than those declared.

5 Marking and instructions

5.1 Data plate

In addition to the information required in EN 12309-2:20xx, the data plate shall include the following information according to the appliance denomination:

— for air or water cooled chillers and chiller/heaters, the rated cooling capacity of the primary function, expressed in kilowatt, corresponding to the Standard Rating condition given in prEN 12309-3:2012, Table 3;

— for all types of heat pumps (air, water/brine), the rated heating capacity of the primary function expressed in kilowatt corresponding to the Standard Rating condition given in prEN 12309-3:2012 or given in prEN 12309-7:2012 for hybrid appliances, the type of output temperature level (low medium, high and very high), and the Seasonal Primary Energy Ratio as given in prEN 12309-6:2012 or prEN 12309-7:2012 at least for the *average climate* of the above mentioned primary function.

In case of secondary functions being provided, then the corresponding rated capacities shall be declared.

oSIST prEN 12309-5:2012

5.2 Technical instructions for installation and adjustment

5.2.1 General

In addition to the information required in EN 12309-2:20xx, the technical instructions for installation and adjustment shall include the information given in 4.2.1 and 4.2.2 as appropriate.

5.2.2 Cooling mode

If the appliance is capable of operating in the cooling mode, the instructions shall include the following:

— for air or water cooled chillers and chiller/heaters, the rated cooling capacity of the primary function, expressed in kilowatt, corresponding to the Standard Rating condition given in prEN 12309-3:2012, Table 3;

— the gas utilization efficiency ($GUE_{c,NCV}$) of the above-mentioned primary functions under the same Standard Rating conditions; the manufacturer has the option to declare gas utilization efficiency ($GUE_{c,GCV}$) according to GCV of fuel, provided it is clearly stated.

If the manufacturer claims a cooling capacity or gas utilization efficiency in relation to the primary function for conditions other than those given prEN 12309-3:2012, these conditions (temperatures, flow rates, pressure differences, etc.) shall be specified in the instructions.

If the manufacturer claims a cooling capacity or gas utilization efficiency in relation to the secondary function, which is not heat recovery, the corresponding GUE and the conditions (temperatures, flow rates, pressure differences, etc.) under which this claim(s) is said to be valid shall be specified in the instructions.

iTeh STANDARD PREVIEW
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5.2.3 Heating mode

If the appliance is capable of operating in the heating mode, the instructions shall include the following:

SIST prEN 12309-5:2012
https://standards.iteh.ai/catalog/standards/sist/6d06a4a1-0f83-4704-b096-

— rated heating capacity of the primary function expressed in kilowatt corresponding to the Standard Rating conditions given in prEN 12309-3:2012 or given in prEN 12309-7:2012 for hybrid appliances and the corresponding type of output temperature level (low, medium, high and very high),

— the gas utilization efficiency of the above-mentioned primary function under the same Standard Rating conditions (i.e. $GUE_{h,NCV}$) (or given in prEN 12309-7:2012 for hybrid appliances); the manufacturer has the option to declare gas utilization efficiency according to GCV of fuel (i.e. $GUE_{h,GCV}$), provided it is clearly stated,

— the Seasonal Primary Energy Ratio as given in prEN 12309-6:2012 or given in prEN 12309-7:2012 for hybrid appliances at least for the average climate of the above mentioned primary function.

If the manufacturer claims a heating capacity or gas utilization efficiency in relation to the primary function for conditions other than those given prEN 12309-3:2012 or given in prEN 12309-7:2012 for hybrid appliances, the corresponding GUE and the corresponding output temperature level (low, medium, high or very high), these conditions (temperatures, flow rates, pressure differences, etc.) shall be specified in the instructions.

If the manufacturer claims a heating capacity or gas utilization efficiency in relation to the secondary function, the corresponding GUE and the conditions (temperatures, flow rates, pressure differences, etc.) under which this claim(s) is said to be valid shall be specified in the instructions.

oSIST prEN 12309-5:2012

Annex A
(normative)

Calculation of Renewable Energy from gas-fired sorption heat pumps according to EU directive on the promotion of the use of energy from renewable sources (2009/28/EC)

The amount of aero-thermal, geo-thermal or hydro-thermal energy captured by gas-fired sorption heat pumps and expressed in terms of primary energy to be considered energy from renewable sources for the purposes of EU Directive 2009/28/EC, ERES, shall be calculated in accordance with the following formula:

$$ERES = Q_{usable} \times (1 - \eta / (SPER_{h,GCV})$$

where

Q_{usable} is the estimated total usable heat delivered by heat pumps per year

$SPER_{h,GCV}$ is the estimated average seasonal primary energy ratio of heat pumps and calculated according to prEN 12309-6:2012 or to prEN 12309-7:2012 for hybrid appliances.

η is the ratio between total gross production of electricity and the primary energy consumption for electricity production and shall be calculated as an EU average based on Eurostat data.

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SIST EN 12309-5:2015
https://standards.iteh.ai/catalog/standards/sist/6d06a4a1-0f83-4704-b096-d706e50d6d4b/sist-en-12309-5-2015