GAASITOITEL ABSORPTSIOONSEADMED KÜTTEKS JA/VÕI JAHUTUSEKS KUNI 70 KW KASULIKU SOOJUSKOORMUSEGA. OSA 6: SESOONSE SOORITUSVÕIME ARVUTAMINE

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

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12309-6:2025 sisaldab Euroopa standardi EN 12309-6:2025 ingliskeelset teksti.	This Estonian standard EVS-EN 12309-6:2025 consists of the English text of the European standard EN 12309-6:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.04.2025.	Date of Availability of the European standard is 23.04.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 27.080, 91.140.30

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12309-6

April 2025

ICS 27.080; 91.140.30

Supersedes EN 12309-6:2014

English Version

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

Appareils à sorption fonctionnant au gaz pour le chauffage et/ou le refroidissement de débit calorifique sur PCI inférieur ou égal à 70 kW - Partie 6 : Calcul des performances saisonnières

Gasbefeuerte Sorptions-Geräte für Heizung und/oder Kühlung mit einer Nennwärmebelastung nicht über 70 kW - Teil 6: Berechnung der saisonalen Effizienzkennzahlen

This European Standard was approved by CEN on 24 February 2025.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

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

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

Ref. No. EN 12309-6:2025 E

Contents

Page

European foreword

This document (EN 12309-6:2025) 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 October 2025, and conflicting national standards shall be withdrawn at the latest by October 2025.

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

This document supersedes EN 12309-6:2014.

EN 12309-6:2025 includes the following significant technical changes with respect to EN 12309-6:2014:

— terminology has been aligned to Commission Regulation (EU) No 813/2013 of 2 August 2013 and Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013;

— heating temperature profile 45 °C has been eliminated;

— optional testing points have been added.

This document comprises parts under the general title, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW*. A list of all parts in a series can be found on the CEN website.

This document will be reviewed whenever new mandates could apply.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annexes ZA and ZB, which are integral parts of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

1.1 Scope of EN 12309

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

— gas-fired sorption chiller;

— gas-fired sorption chiller/heater;

— gas-fired sorption heat pump.

This document applies to appliances designed to be used for space heating or cooling or refrigeration with or without heat recovery.

This document applies to appliances having flue gas systems of Type B and Type C (according to EN 1749:2020) and to appliances designed for outdoor installations, including Type A. 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 12309-1:2023).

In the case of packaged units (consisting of several parts), this document 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 EN 12309.

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

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

1.2 Scope of this Part 6 to EN 12309

This part of EN 12309 specifies the calculation methods of seasonal performances for gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW. It deals in particular with the calculation methods of reference seasonal performances in cooling and heating mode for monovalent and bivalent appliances.

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 12309-1:2023, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 1: Terms and definitions*

EN 12309-3:2024, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 3: Requirements, test conditions and test methods*

EN 15502-1:2021+A1:2023, *Gas-fired heating boilers — Part 1: General requirements and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12309-1:2023 apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

4 Calculation methods for reference *SGUE* and *SAEF* in cooling mode

4.1 General

The calculation of the reference Seasonal Gas Utilization Efficiency ratio in cooling mode (*SGUE*c) and reference Seasonal Auxiliary Energy factor in cooling mode (*SAEF*c) follows from the application of the bin method, where the part load Gas Utilization Efficiency ratio in cooling mode (*GUE*c) and Auxiliary Energy Factor in cooling mode (*AEF*c) at each bin temperature is determined via linear interpolation of the respective part load values at the reference part load conditions A, B, C and D.

The part load conditions A, B, C, D provide the part load ratios and the temperature test conditions at four reference outdoor air dry bulb temperatures: 35 °C, 30 °C, 25 °C and 20 °C.

The part load ratio corresponding to a given outdoor temperature T_j is defined according to Formula (1):

$$PLRc\left(Tj\right) = \left(Tj - 16\right) / \left(35 - 16\right) \quad (1)$$

At part load condition A, the declared capacity of the appliance is assumed equal to the building load (i.e. capacity ratio = 100 %).

At part load conditions B, C and D, the declared capacity of the appliance is higher than the building load. The capacity ratio (*CR*), i.e. the ratio of the cooling load (P_c) over the declared capacity (*DC*) of the appliance at the same temperature conditions, is lower than one. In such conditions, the *GUE*c and *AEF*c are affected by both temperature test conditions and capacity ratio. The methods for the determination of *GUE*c and *AEF*c are defined in EN 12309-3:2024.

4.2 Part load conditions

4.2.1 General

For the indoor heat exchanger both fan coil and floor cooling applications are considered.

For the fan coil application, appliances which do, and do not, allow variations of the outlet water temperature with the outdoor temperature are considered. Variable outlet temperatures shall only be applied when the programming unit provides an outdoor air temperature dependent modification of the outlet temperature.