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PÄIKESE-VEESALVESTITE NÄITAJATE MÄÄRAMISE
KATSEMEETODID

Thermal solar systems and components - Custom built
systems - Part 3: Performance test methods for solar
water heater stores

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12977-3:2018 sisaldab Euroopa standardi EN 12977-3:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 12977-3:2018 consists of the English text of the European standard EN 12977-3:2018.
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English Version

**Thermal solar systems and components - Custom built
systems - Part 3: Performance test methods for solar water
heater stores**

Installations solaires thermiques et leurs composants -
Installations assemblées à façon - Partie 3 : Méthodes
d'essai des performances des dispositifs de stockage
des installations de chauffage solaire de l'eau

Thermische Solaranlagen und ihre Bauteile -
Kundenspezifisch gefertigte Anlagen - Teil 3:
Leistungsprüfung von Warmwasserspeichern für
Solaranlagen

This European Standard was approved by CEN on 29 October 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 12977-3:2018) has been prepared by Technical Committee CEN/TC 312 “Thermal solar systems and components”, the secretariat of which is held by ELOT.

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of an identical text or by endorsement, at the latest by October 2018, and conflicting national standards shall be withdrawn at the latest by October 2018.

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 12977-3:2012.

This document has been prepared under the Mandate M/534 “Standardisation request to the European standardisation organisations pursuant to Article 10(1) of Regulation (EU) No 1025/2012 of the European Parliament and of the Council in support of implementation of Commission Regulation (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks and Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device” which was given to CEN by the European Commission and the European Free Trade Association.

For relationship with EU Directive(s), see informative Annex ZA, ZB and ZC, which are integral parts of this document.

EN 12977 is currently composed with the following parts:

- *Thermal solar systems and components — Custom built systems — Part 1: General requirements for solar water heaters and combisystems;*
- *Thermal solar systems and components — Custom built systems — Part 2: Test methods for solar water heaters and combisystems;*
- *Thermal solar systems and components — Custom built systems — Part 3: Performance test methods for solar water heater stores;*
- *Thermal solar systems and components — Custom built systems — Part 4: Performance test methods for solar combistores;*
- *Thermal solar systems and components — Custom built systems — Part 5: Performance test methods for control equipment.*

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The test methods for stores of solar heating systems as described in this European Standard are required for the determination of the thermal performance of small custom built systems as specified in EN 12977-1:2018.

The test method described in this European Standard delivers a complete set of parameters, which are needed for the simulation of the thermal behaviour of a store being part of a small custom built solar heating system.

For the determination of store parameters such as the thermal capacity and the heat loss rate, the method standardized in EN 12897 can be used as an alternative.

NOTE 1 The already existing test methods for stores of conventional heating systems are not sufficient with regard to solar heating systems. This is due to the fact that the performance of solar heating systems depends much more on the thermal behaviour of the store (e.g. stratification, heat losses), than conventional systems do. Hence, this separate document for the performance characterization of stores for solar heating systems is needed.

NOTE 2 For additional information about the test methods for the performance characterization of stores, see [1] in Bibliography.

1 Scope

This European Standard specifies test methods for the performance characterization of stores which are intended for use in small custom built systems as specified in EN 12977-1:2018.

Stores tested according to this document are commonly used in solar heating systems. However, the thermal performance of all other thermal stores with water as a storage medium can also be assessed according to the test methods specified in this document.

The document applies to stores with a nominal volume between 50 l and 3 000 l.

This document does not apply to combistores. Performance test methods for solar combistores are specified in EN 12977-4:2018.

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

EN 12897, *Water supply - Specification for indirectly heated unvented (closed) storage water heaters*

EN ISO 9488:1999, *Solar energy - Vocabulary (ISO 9488:1999)*

ISO 9459-5, *Solar heating — Domestic water heating systems — Part 5: System performance characterization by means of whole-system tests and computer simulation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 9488:1999 and the following apply.

3.1

ambient temperature

mean value of the temperature of the air surrounding the store

3.2

charge

process of transferring energy into the store by means of a heat source

3.3

charge connection

pipe connection used for charging the storage device

3.4

combistore

one store used for both domestic hot water preparation and space heating