



SLOVENSKI STANDARD

SIST ENV 12977-1:2002

01-november-2002

Toplotni sončni sistemi in sestavni deli - Neserijsko izdelani sistemi - 1. del: Splošne zahteve

Thermal solar systems and components - Custom built systems - Part 1: General requirements

Thermische Solaranlagen und ihre Bauteile - Kundenspezifisch gefertigte Anlagen - Teil 1: Allgemeine Anforderungen

Installations solaires thermiques et leurs composants - Installations assemblées a façon - Partie 1: Exigences générales

ITIH STANDARD PREVIEW
(standards.iteh.ai)
SIST ENV 12977-1:2002
<https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002>

Ta slovenski standard je istoveten z: ENV 12977-1:2001

ICS:

27.160	Sončna energija	Solar energy engineering
91.140.10	Sistemi centralnega ogrevanja	Central heating systems
91.140.65	Oprema za ogrevanje vode	Water heating equipment

SIST ENV 12977-1:2002

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST ENV 12977-1:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002>

EUROPEAN PRESTANDARD
PRÉNORME EUROPÉENNE
EUROPÄISCHE VORNORM

ENV 12977-1

April 2001

ICS 27.160

English version

Thermal solar systems and components - Custom built systems - Part 1: General requirements

Installations solaires thermiques et leurs composants -
Installations assemblées à façon - Partie 1: Exigences
générales

Thermische Solaranlagen und ihre Bauteile -
Kundenspezifisch gefertigte Anlagen - Teil 1: Allgemeine
Anforderungen

This European Prestandard (ENV) was approved by CEN on 12 March 2001 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST ENV 12977-1:2002](https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002)

<https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	2
Introduction.....	3
1 Scope.....	5
2 Normative references	5
3 Terms and definitions	6
4 Symbols and abbreviations	8
5 System classification.....	8
6 Requirements	9

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 312 "Thermal solar systems and components", the secretariat of which is held by ELOT.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

[SIST ENV 12977-1:2002](https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002)

<https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002>

Introduction

Drinking water quality

In respect of potential adverse effects on the quality of drinking water intended for human consumption, caused by the product covered by this Prestandard it should be noted that:

- a) This Prestandard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;
- b) while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

Factory Made and Custom Built solar heating systems

The standards EN 12976-1 and EN 12976-2 as well as ENV 12977-1 to ENV 12977-3 distinguish two categories of solar heating systems: **Factory Made** solar heating systems and **Custom Built** solar heating systems. The classification of a system as Factory Made or Custom Built is a choice of the final supplier, in accordance to the following definitions:

Factory Made solar heating systems are batch products with one trade name, sold as complete and ready to install kits, with fixed configuration. Systems of this category are considered as a single product and assessed as a whole.

If a Factory Made Solar Heating System is modified by changing its configuration or by changing one or more of its components, the modified system is considered as a new system for which a new test report is necessary. Requirements and test methods for Factory Made solar heating systems are given in EN 12976-1 and EN 12976-2.

Custom Built solar heating systems are either uniquely built, or assembled by choosing from an assortment of components. Systems of this category are regarded as a set of components. The components are separately tested and test results are integrated to an assessment of the whole system. Requirements for Custom Built solar heating systems are given in ENV 12977-1, test methods are specified in ENV 12977-2 and ENV 12977-3. Custom Built solar heating systems are subdivided into two categories:

- **Large Custom Built systems** are uniquely designed for a specific situation. They are in general designed by HVAC engineers, manufacturers or other experts.
- **Small Custom Built systems** offered by a company are described in a so called assortment file, in which all components and possible system configurations, marketed by the company, are specified. Each possible combination of a system configuration with components from the assortment is considered as **one** Custom Built system.

Table 1 shows the division for different system types.

Table 1 - Division for factory made and custom built solar heating systems

Factory Made Solar Heating Systems (EN 12976-1, -2)	Custom Built Solar Heating Systems (ENV 12977-1, -2, -3)
Integral collector-storage systems for domestic hot water preparation	Forced-circulation systems for hot water preparation and/or space heating, assembled using components and configurations described in a documentation file (mostly small systems)
Thermosiphon systems for domestic hot water preparation	
Forced-circulation systems as batch product with fixed configuration for domestic hot water preparation	Uniquely designed and assembled systems for hot water preparation and/or space heating (mostly large systems)

NOTE 1 Forced circulation systems can be classified either as Factory Made or as Custom Built, depending on the market approach chosen by the final supplier.

NOTE 2 Both Factory Made and Custom Built systems are performance tested under the same set of reference conditions as specified in annex B of EN 12976-2:2000 and annex A of ENV 12977-2:2001. In practice, the installation conditions may differ from these reference conditions.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ENV 12977-1:2002](https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002)

<https://standards.iteh.ai/catalog/standards/sist/e3d73e59-8be1-4f6a-bd16-b1968c54b236/sist-env-12977-1-2002>

1 Scope

This European Prestandard specifies requirements on durability, reliability and safety of small and large custom built solar heating systems with liquid heat transfer medium for residential buildings and similar applications. The Prestandard contains also requirements on the design process of large custom built systems.

2 Normative references

This European Prestandard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 253	Preinsulated bonded pipe systems for underground hot water networks - Pipe assembly of steel service pipes, polyurethane thermal insulation and outer casing of polyethylene
EN 307	Heat exchangers - Guidelines to prepare installation, operating and maintenance instructions required to maintain the performance of each type of heat exchanger.
EN 806-1	Specifications for installations inside buildings conveying water for human consumption - Part 1: General
EN 809	Pumps and pump units for liquids - General safety requirements
EN 1151	Pumps - Rotodynamic pumps - Circulation pumps having an electrical effect not exceeding 200 W for heating installations and domestic hot water installations - Requirements, testing, marking
EN 1717	Protection against pollution of potable water in drinking water installations and general requirements of devices to prevent pollution by backflow
ENV 1991-2-3	Eurocode 1 - Basis of design and actions on structures - Part 2 - 3: Action on structures - Snow loads
ENV 1991-2-4	Eurocode 1: Basis of design and actions on structures - Part 2 - 4: Action on structures - Wind actions
prEN 12828:1997	Heating systems in buildings – Design and installation of water heating systems
prEN 12897:1997	Water supply - Specification for indirectly heated unvented (closed) hot water storage systems
EN 12975-1	Thermal solar systems and components - Solar collectors – Part 1: General Requirements
EN 12975-2	Thermal solar systems and components – Solar collectors – Part 2: Test methods

EN 12976-1:2000	Thermal solar systems and components - Factory made systems – Part 1: General requirements
ENV 12977-2:2001	Thermal solar systems and components - Custom built systems – Part 2: Test methods
ENV 12977-3	Thermal solar systems and components – Custom built systems – Part 3: Performance characterization of stores for solar heating systems
EN 60335-1	Safety of household and similar electrical appliances - Part 1: General requirements (IEC 60335-1:1991 modified)
EN 60335-2-21:1999	Safety of household and similar electrical appliances - Part 2: Particular requirements for storage water heaters (IEC 60335-2-21:1997 + corrigendum 1998, modified)
ENV 61024-1:1995	Protection of structures against lightning - Part 1: General principles (IEC 61024-1:1990, modified)
EN ISO 9488	Solar energy – Vocabulary (ISO 9488:1999)
ISO 9459-1:1993	Solar heating - Domestic water heating systems - Part 1: Performance rating procedure using indoor test methods
ISO/TR 10217	Solar energy - Water heating systems - Guide to material selection with regard to internal corrosion

3 Terms and definitions SIST ENV 12977-1:2002

For the purposes of this Prestandard, the terms and definitions given in EN 12975-1, EN 12976-1 and EN ISO 9488 apply together with the following.

3.1

assortment

complete list of components (collectors, stores, controllers, pumps etc.) which a company offers for its solar heating systems. For the purpose of this Prestandard the assortment is restricted to components used for small custom built solar heating systems marketed by a company

3.2

assortment file

technical documentation file for small custom built systems of a company which includes:

- the complete assortment for small custom built systems
- the complete description of all system configurations
- the complete description of all marketed combinations of system configurations and components including the component dimensions and number of units
- further technical information

3.3

collector array

group of collectors that are closely connected in series, in parallel or in combination of both modes, with one hydraulic input and one hydraulic output

3.4

expansion line

for systems with closed expansion vessels, the connecting line between the collectors and the pressure expansion vessel

For systems with open expansion vessels, the connecting line between the collector array and the open expansion vessel

3.5

large custom built system

solar heating system for the purpose of hot water preparation and/or space heating. It is designed for a specific situation by combining various components to a unique system.

NOTE 1 In general, large custom built systems are designed by HVAC engineers, manufacturers or other experts.

NOTE 2 In general the collector area is greater than 30 m² and the store volume is greater than 3 m³.

3.6

safety line

systems with closed expansion vessels: connecting line between the collector array and the safety valve

Systems with open expansion vessels: connecting line between the collector array and the open expansion vessel

3.7

small custom built system

modular solar heating system of the remote storage type for the purpose of hot water preparation and/or space heating. The system has a well identified configuration (see definition in 3.8). It is assembled from components chosen from the market and described in an assortment file prepared by a company

NOTE 1 In general the assortment file includes the possible system configurations, the assortment of components and their possible combinations and dimensions. The 'company' may be the manufacturer of all or of parts of the components in the assortment; this company may also be only a consulting engineer who just produces the technical documentation and purchases the components from suppliers.

NOTE 2 In general the collector area is greater than 1 m² and less than 30 m² and the store volume is less than 3 m³.

NOTE 3 The system can be tested by experimentally testing the components and predicting the system performance for different combinations of components by computer simulation.