



SLOVENSKI STANDARD
oSIST prEN 12975:2018

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Sprejemniki sončne energije - Splošne zahteve

Solar collectors - General requirements

Kollektoren - Allgemeine Anforderungen

Capteurs solaires - Exigences générales

Ta slovenski standard je istoveten z: prEN 12975

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EUROPEAN STANDARD
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English Version

Solar collectors - General requirements

Capteurs solaires - Exigences générales

Kollektoren - Allgemeine Anforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 312.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 12975:2018) has been prepared by Technical Committee CEN/TC 312 “Thermal solar systems and components”, the secretariat of which is held by ELOT.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12975-1:2006+A1:2010.

This document has been prepared under mandates given to CEN by the European Commission and the European Free Trade Association, and supports the essential requirements related with solar collectors of the Regulation (EU) No 305/2011 of the European Parliament and of the council of 9 March 2011 (Construction Products Regulation, CPR), of the Commission Delegated Regulations (EU) No 811/2013 and (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 (Energy Labelling Directive), of the Commission Regulations (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of 21 October 2009 (Ecodesign Directive), and under the general mandate of the Directive 2014/68/EU of the European Parliament and of the council of 15 May 2014 (Pressure Equipment Directive, PED), and under the general mandate for the Low Voltage Directive (LVD) 2014/35/EU, and under the general mandates for the Machinery Directive, Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006.

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For relationship with these EU Directives and Regulations, see informative Annexes ZA to ZG, which are integral parts of this document.

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prEN 12975:2018 (E)**1 Scope**

This document is applicable to all types of fluid heating solar collectors. This European Standard specifies performance requirements for fluid heating solar collectors with respect to durability, reliability, safety and thermal performance. This European Standard includes provisions for the assessment and verification of constancy of performance to these requirements.

This document deals with the collector module and not with assemblies. This document is not applicable to those devices in which a thermal storage unit is an integral part to such an extent that the collection process cannot be separated from the storage process for making the collector thermal performance measurements.

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 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using data from external fire exposure to roofs tests*

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 3743-2, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 2: Methods for special reverberation test rooms (ISO 3743-2)*

EN ISO 3747, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering/survey methods for use in situ in a reverberant environment (ISO 3747)*

EN ISO 9488, *Solar energy — Vocabulary (ISO 9488)*

EN ISO 9806:2017, *Solar energy — Solar thermal collectors — Test methods (ISO 9806:2017)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

ISO 3741, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Precision methods for reverberation test rooms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 9488 and EN ISO 9806:2017 apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Symbols and abbreviations

For the purposes of this European Standard, the symbols, abbreviations and units given in EN ISO 9488 and EN ISO 9806:2017 apply.

5 Requirements

5.1 General

Collectors shall be tested according to 5.3. For the declarations of performance of a solar collector as required in the Z-Annexes, additional tests (5.4) or conversions of test results into other formats may be required (A.1).

5.2 Safety

Materials to be used in the collector and in the installation incorporating collectors shall be chosen taking into account the expected maximum local temperatures with respect to e.g. melting, burning, self-ignition, or any other kind of degradation.

5.3 Required tests

Collectors shall be tested according to Table 1 of EN ISO 9806:2017 considering the provision of Clause 5 of EN ISO 9806:2017. The measurement of the pressure drop (Clause 27 of EN ISO 9806:2017) is recommended but not mandatory. The results shall be reported as required in the corresponding clauses and in Annex A of EN ISO 9806:2017.

None of the findings of the performed tests shall be rated as “major failure” according to Clause 17 of EN ISO 9806:2017.

5.4 Additional tests for the purpose of the Z-annexes

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5.4.1 Fire safety

Reaction to fire: If required, collectors that are not classified without testing shall be tested according to EN 13501-1 applying the standards therein as applicable and following Annex C for the selection, preparation, mounting, fixing as well as Annex ZA for the field of application of the collector.

External fire performance: If required, collectors embedded in the roof shall be tested and classified in accordance with EN 13501-5 applying the standards therein, as applicable and Annex D for the selection, preparation mounting and fixing and field of application of the collector.

5.4.2 Release of dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this European Standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at https://ec.europa.eu/growth/tools-databases/cp-ds_en

5.4.3 Surface temperature

Harmful surface temperatures on a solar thermal collector are linked to a malfunction of the collector that are rated as major failure according to Clause 17 of EN ISO 9806:2017. The surface temperatures of parts that are associated with the transmission of heat are excluded. No findings with a rating as “2 - major failure” according to Clause 17 of EN ISO 9806:2017 thus confirms that no harmful temperatures on the surface of the collector are expected.

prEN 12975:2018 (E)**5.4.4 Electrical safety**

If required, collectors co-generating or using electricity shall comply with the specific requirements of the applicable standards and regulations for such products (See also Annex ZG).

5.4.5 Sound level

If applicable, the sound level shall be tested and the results shall be reported according to either ISO 3741, EN ISO 3743-2 or EN ISO 3747

5.5 Classification of collectors with respect to their hydraulic system

Collectors shall be classified with respect to their intended use and their intended fluids (Group 1 or Group 2 fluids)¹ into one or several collector classes defined in Table 1 — Collector classes with respect to the hydraulic system.

Table 1 — Collector classes with respect to the hydraulic system

Collector class	Definition
Class 0	Low pressure collectors (PS < 0,5 bar over atmosphere) and all collectors that are not classified in another class listed in this table including air collectors.
Class A1(F1)	Collectors made of one pipe which are not intended for generation of steam or super-heated water in the primary circuit using Group 1 fluids and DN ≤ 25 mm
Class Ax1(F1)	Collectors made of one pipe which are not intended for generation of steam or super-heated water in the primary circuit using Group 1 fluids and DN > 25 mm
Class A1(F2)	Collectors made of one pipe which are not intended for generation of steam or super-heated water in the primary circuit using Group 2 fluids and DN ≤ 32 mm
Class Ax1(F2)	Collectors made of one pipe which are not intended for generation of steam or super-heated water in the primary circuit using Group 2 fluids and DN > 32 mm
Class A2(F1)	Collectors made of several pipes which are not intended for generation of steam or super-heated water in the primary circuit using Group 1 fluids and PS·V ≤ 25 bar·litres
Class Ax2(F1)	Collectors made of several pipes which are not intended for generation of steam or super-heated water in the primary circuit using Group 1 fluids and PS·V > 25 bar·litres
Class A2(F2)	Collectors made of several pipes which are not intended for generation of steam or super-heated water in the primary circuit using Group 2 fluids and PS·V ≤ 50 bar·litres
Class Ax2(F2)	Collectors made of several pipes (e.g. harp) which are not intended for generation of steam or super-heated water in the primary circuit using

¹ As defined in the Directive 2014/68/EU of the European Parliament and of the Council, Article 13 §1.

Collector class	Definition
	Group 2 fluids and $PS \cdot V > 50 \text{ bar} \cdot \text{litres}$
Class B	Collectors intended for generation of steam or super-heated water in the primary circuit with $V > 2 \text{ litres}$

5.6 Classification of collectors with respect to their intended place of installation

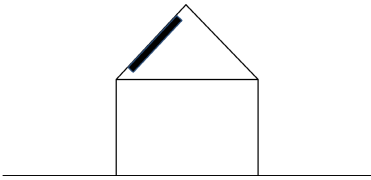
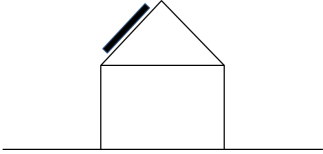
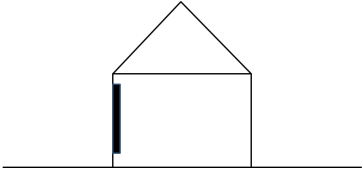
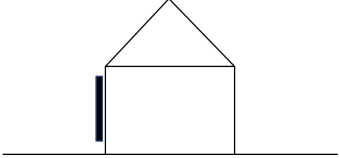
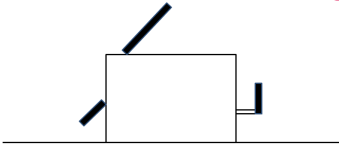
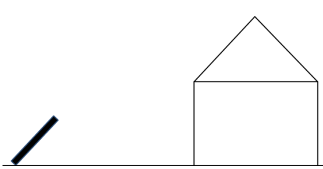
Collectors shall be classified with respect to their intended place of installation as defined in Table 2 — Installation categories (IC). Classification in one or several classes is possible.

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Table 2 — Installation categories (IC)

Collector class	Definition
	Category RI (Roof integrated) Collectors intended to be integrated into the roof as part of the outer building shell fulfilling building shell functions (e.g. preventing from ingress of rain)
	Category RE (Roof external) Collectors intended to be attached to the roof, which are not part of the outer building shell having no additional function related with the building.
	Category FI (Façade integrated) Collectors intended to be integrated in the façade as part of the outer building shell fulfilling building shell functions (e.g. preventing from ingress of rain)
	Category FE (Façade external) Collectors intended to be attached to the façade, which are not part of the outer building shell having no additional function related with the building.
	Category EB (External of the building) The collectors are mounted onto the building and form an additional functional layer exterior to its envelope (e.g. balconies, balustrades, on stand on flat roof, etc.).
	Category OB (Off the building) Collectors not intended to be used close to the building, such as greenfield process-heat collectors or collectors for power plants. Collector of category OB do not need to be CE marked

6 Assessment and verification of constancy of performance - AVCP

6.1 General

The compliance of solar collectors with the requirements of this standard and with the performances declared by the manufacturer in the DoP shall be demonstrated by:

- determination of the product type
- factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performances.

6.2 Type testing

6.2.1 General

All performances related to characteristics included in this standard shall be determined when the manufacturer intends to declare the respective performances, unless the standard gives provisions for declaring them without performing tests.

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP system on the same product or products of similar design, construction and functionality, such that the results are applicable to the product in question.

NOTE 1 Same AVCP system means testing by an independent third party.

For the purposes of assessment, the manufacturer's products may be grouped into families, where it is considered that the results for one or more characteristics from any one product within the family are representative for that same characteristics for all products within that same family. Instructions about how to group products into families are given in Annex B.

NOTE 2 Products may be grouped in different families for different characteristics.

NOTE 3 It is advised to make reference to the assessment method standards to allow the selection of a suitable representative sample.

In addition, the determination of the product type shall be performed for all characteristics included in the standard for which the manufacturer declares the performance:

- at the beginning of the production of a new or modified solar collector (unless a member of the same product range), or
- at the beginning of a new or modified method of production (where this may affect the stated properties); or

they shall be repeated for the appropriate characteristics, whenever a change occurs in the solar collector design, in the raw material or in the supplier of the components, or in the method of production (subject to the definition of a family), which would affect significantly one or more of the characteristics.

Where components are used whose characteristics have already been determined, by the component manufacturer, based on assessment methods of other product standards, these characteristics do not need to be re-assessed. The specifications of these components shall be documented.

Products bearing regulatory marking in accordance with appropriate harmonized European specifications may be presumed to have the performances declared in the DoP, although this does not replace the responsibility on the solar collector manufacturer to ensure that the solar collector as a whole is correctly manufactured and its component products have the declared performance values.

6.2.2 Test samples, testing and compliance criteria

The number of samples of solar collectors to be tested/assessed shall be in accordance with Table 3 — Number of samples to be tested and compliance criteria