

Thermal solar systems and components — Solar collectors —

Part 1: General requirements

The European Standard EN 12975-1:2000 has the status of a
British Standard

ICS 27.160

National foreword

This British Standard is the official English language version of EN 12975-1:2000.
The UK participation in its preparation was entrusted to Technical Committee RHE/25, Solar heating, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 18, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 December 2000

© BSI 12-2000

ISBN 0 580 36748 7

Amendments issued since publication

Amd. No.	Date	Comments

English version

Thermal solar systems and components - Solar collectors - Part 1: General requirements

Installations solaires thermiques et leurs composants -
Capteurs solaires - Partie 1: Exigences générales

Thermische Solaranlagen und ihre Bauteile - Kollektoren -
Teil 1: Allgemeine Anforderungen

This European Standard was approved by CEN on 4 October 2000.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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.



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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	3
Introduction	3
1 Scope	4
2 Normative references.....	4
3 Terms and definitions.....	4
4 Symbols and units	4
5 Durability and reliability	4
6 Safety	7
7 Collector identification.....	7
Annex A (informative) Information on conformity assessment	9
Annex B (informative) Description of solar collectors materials and manufacture	13
Annex C (informative) Environmental protection.....	16
Annex D (informative) Tests to be repeated in collector design modifications.....	17
Bibliography	18

Foreword

This European Standard 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 April 2001, and conflicting national standards shall be withdrawn at the latest by April 2001.

The annexes A, B, C and D are informative.

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

Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this standard, it is pointed out that:

- a) This standard 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) It should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

1 Scope

This European Standard specifies requirements on durability (including mechanical strength), reliability and safety for liquid heating solar collectors. It also includes provisions for evaluation of conformity to these requirements.

It is not applicable to those collectors in which the thermal storage unit is an integral part of the collector to such an extent, that the collection process cannot be separated from the storage process for the purpose of making measurements of these two processes. It is not applicable to tracking concentrating solar collectors.

Collectors that are custom-built (built in, roof integrated collectors that do not comprise factory made modules and are assembled directly on the place of installation) cannot be tested in their actual form for durability, reliability and thermal performance according to this standard. Instead, a module with the same structure as the ready collector is tested. The module gross area in the case of custom built collectors shall be at least 2 m².

2 Normative references

This European Standard 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 9488	Solar Energy - Vocabulary (ISO 9488:1999)
prEN 12975-2:2000	Thermal solar systems and components – Solar collectors – Part 2: Test methods

3 Terms and definitions

For the purposes of this standard the terms and definitions given in EN ISO 9488 apply.

4 Symbols and units

For the purposes of this standard the symbols and units given in EN ISO 9488 and prEN 12975-2:2000 apply.

5 Durability and reliability

5.1 Materials and design

Information about the materials and manufacture of solar collectors, including the materials they are manufactured of and their resistance to all influences which they might meet in service, retaining their operational ability are given in Annex B.

5.2 Required tests

The collector shall be subjected to the following series of tests:

- a) Internal pressure for absorber (see 5.2 of prEN 12975-2:2000);
- b) High temperature resistance (see 5.3 of prEN 12975-2:2000);
- c) Exposure (see 5.4 of prEN 12975-2:2000);
- d) External thermal shock. May be combined with the high temperature resistance or exposure test (see 5.5 of prEN 12975-2:2000);
- e) Internal thermal shock. May be combined with the high temperature resistance or exposure test (see 5.6 of prEN 12975-2:2000);
- f) Rain penetration, only for glazed collectors (see 5.7 of prEN 12975-2:2000);
- g) Mechanical load (see 5.9 of prEN 12975-2:2000);
- h) Thermal performance (see clause 6 of prEN 12975-2:2000);
- i) Freeze resistance, only in the cases specified in 5.8 of prEN 12975-2:2000);
- j) Final inspection (see 5.11 of prEN 12975-2:2000).

The optional test for impact resistance (see 5.10 of prEN 12975-2:2000) shall be carried out if requested. The result shall be recorded.

NOTE Some tests are performed twice. The test sequence and more details are given in 5.1 of prEN 12975-2:2000.

5.3 Pass criteria

5.3.1 General

The pass criteria for the reliability tests are given for each test in 5.3.2 to 5.3.10. The term "no major failure", denotes that none of the following occurs:

- Absorber leakage or such deformation that permanent contact between absorber and cover is established;
- Breaking or permanent deformation of cover or cover fixing;
- Breaking or permanent deformation of collector fixing points or collector box;
- Vacuum loss, such that vacuum or subatmospheric collectors may no more be classified as such, according to the definition in EN ISO 9488 (only applicable for vacuum and subatmospheric collectors);
- Accumulation of humidity inside the collector.

5.3.2 Internal pressure for absorber

The test pressure shall be as specified in 5.2 of prEN 12975-2:2000. In the case of absorbers made of organic materials, climate class A conditions (Table 2 of prEN 12975-2:2000) shall be applied. After the internal pressure test, the collector shall not show any major failure as defined in 5.3.1.

5.3.3 High temperature resistance

When tested in accordance with 5.3 of prEN 12975-2:2000, the collector shall not show any major failure as defined in 5.3.1.