
Solar energy — Collector fields — Check of performance

*Energie solaire — Champs de capteurs — Vérification de la
performance*



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 180, *Solar energy*, Subcommittee SC 4, *Systems - Thermal performance, reliability and durability*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 312, *Thermal solar systems and components*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies procedures for checking the performance of solar thermal collector fields. Measured performance is compared with calculated performance - and conditions for conformity are given.

Three levels for accuracy in the checking can be chosen:

- Level I - giving possibility for giving a very accurate estimate (with low safety retention, e.g. $f_{\text{safe}} = 0,95$) - but with requirements for use of expensive measurement equipment.
- Level II/III - allowing for a less accurate estimate (with higher safety retention, e.g. $f_{\text{safe}} = 0,90$) - but possibility to use less expensive measurement equipment.

Solar energy — Collector fields — Check of performance

1 Scope

This document specifies two procedures to check the performance of solar thermal collector fields. This document is applicable to glazed flat plate collectors, evacuated tube collectors and/or tracking, concentrating collectors used as collectors in fields.

The check can be done on the thermal power output of the collector field and also be on the daily yield of the collector field.

The document specifies for the two procedures how to compare a measured output with a calculated one.

The document applies for all sizes of collector fields.

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.

ISO 9060, *Solar energy — Specification and classification of instruments for measuring hemispherical solar and direct solar radiation*

ISO 9488, *Solar energy — Vocabulary*

ISO 9806, *Solar energy — Solar thermal collectors — Test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9488 and the following 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/>

3.1

transversal plane

plane defined by the normal to the plane of the collector and the line orthogonal to the concentrator axis, or the shortest symmetry line for flat biaxial geometries

4 Symbols

A_G	Gross area of collector as defined in ISO 9488	m^2
A_{GF}	Gross area of collector field	m^2
$a_{1,\Delta Q}$	Heat loss coefficient at $(\vartheta_m - \vartheta_a) = 0$	$\text{W}/(\text{m}^2 \cdot \text{K})$
$T_{\Delta Q}$	Temperature dependence of the heat loss coefficient	$\text{W}/(\text{m}^2 \cdot \text{K}^2)$