



SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

Task 57 Solar standards and certification

Version 1.1

Guideline for Implementing Certification Schemes
for
Solar Heating and Cooling Products



Jan Erik Nielsen

SolarKey int.

November 2018

Content

1	Introduction	3
2	What is Product Certification.....	3
2.1	Self declaration	3
2.2	3 rd party certification	4
3	What is a Solar Certification Scheme	5
4	Why make a Solar Certification Scheme	6
5	How to get started with a Solar Certification Scheme.....	6
5.1	Documentation of the need for solar certification.....	7
5.2	Establish organisational framework and certification scheme rules.....	8
5.3	Implementation of solar certification	8
5.4	Operation / financing.....	9
6	Levels of certification	9
6.1	Low level: Testing only	9
6.2	Medium level: Testing + factory production control	9
6.3	High level: Testing + quality management system + surveillance testing	9
7	A look into: “ISO/IEC 17067:2013: Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes”	11

Abbreviations

FPC:	Factory production control
QMS:	Quality management system

Special terms

Accreditation:	Kind of certification of test labs, inspectors/inspectin bodies and certification bodies including annual audit of the quality management systems
----------------	---

1 Introduction

This document gives an introduction to product certification schemes at a general level.

Guidelines for how to initiate and implement a certification scheme for solar heating and cooling products are given.

2 What is Product Certification

A product certificate (mark/label) is given to show that the product fulfils some specific requirements and/or have some specific characteristics.

Product certificates/labels/marks are well known from the market – e.g. the European CE marking and Energy Rating/Labelling from different parts of the world.

For some products - e.g. electrical products - focus could be on safety. For other products - e.g. energy using or producing products - focus could be on energy performance.

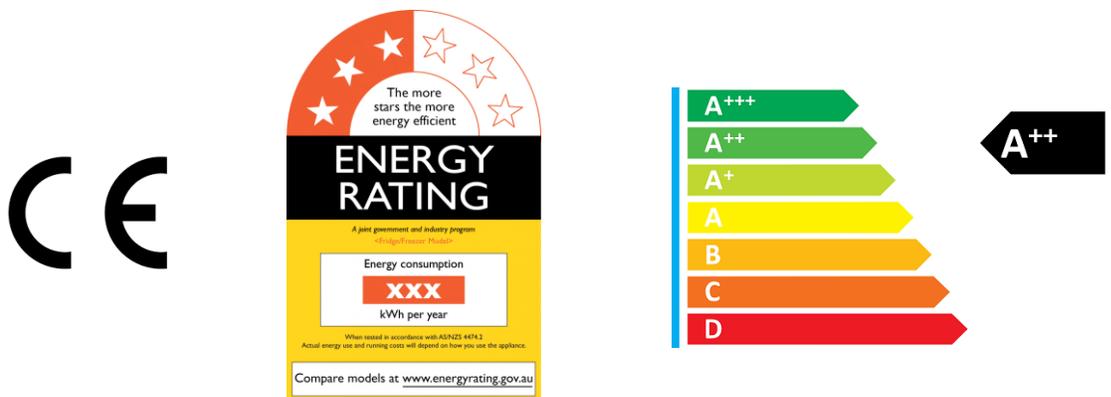


Figure 1. Examples of certificates / labels

The basis for certification schemes are usually standards giving the specific requirements for the products – and defining the test procedures for how to check if requirements are fulfilled.

The certificate/mark/label is then used to “show compliance with the standard” = *This product fulfils the standard.*

There two very different types of showing compliance:

- Self declaration
- 3rd party certification

2.1 Self declaration

As the name indicate, the certificate/label is declared by the manufacturer himself. He is then giving his signature and being responsible for the product to fulfil the conditions for the marking.

In principle this kind of certification should be combined with some spot check arrangements done by independent person/organisations to assure that the declarations are valid.

The image shows a sample of an EC Declaration of Conformity form. The form is titled "EC Declaration of Conformity" and is issued by Acme Widget Ltd. It references the Low Voltage Directive (2006/95/EC) and the Electromagnetic Compatibility Directive (2004/108/EC). The equipment is identified as a "Widget heater" with model number "Super 777" and serial number "001236". A table lists applicable standards such as EN 60335-1, EN 60335-2-30, BS EN 61000-6-1, BS EN 61000-6-3, BS EN 61000-3-2, and BS EN 61000-3-3. The form is signed by Nigel Watkins, Technical Director, on 1 April 2010. A large "EXAMPLE" watermark is overlaid on the document, and a CE mark with the number 10 is visible in the bottom right corner.

Figure 2. Example of self-declaration

2.2 3rd party certification

In 3rd party certification, a third party (i.e. an independent body) issue the right to use a mark/label based on specific control mechanisms. This 3rd party will be the certification body and the control mechanisms are specified in the certification scheme rules - together with product requirements, test methods – and requirement for the involved bodies (certification body, inspector, test lab).



Figure 3. Dummy stamp: CERTIFIED

The rest of the document will focus 3rd party certification.

3 What is a Solar Certification Scheme

A product certification scheme lays down the procedures and rules behind certifying a product. For solar thermal products these procedures and rules are described in the “Certification Scheme Rules” for the specific certification scheme for solar collectors and/or solar water heaters.

The solar certification scheme shall insure that the **products sold on the market complies with the standard** – and **not only the sample which has been tested**. So typically a 3rd party certification scheme has the following three elements:

- I. Sample testing to check if this sample complies with the requirements. Test samples are taken out of the production by independent party (e.g. inspector) – and tested by independent test lab.
- II. Requirement for the manufacturer to establish factory production control (quality management system) to assure that all product are made in the same way - and to the same specifications
- III. Inspection of production facilities by independent inspector - in order the check that all product are made in the same way - and to the same specifications

Hence, the rules typically contain:

Product requirements

- **requirements on performance** (normally just a requirement that performance shall be determined and published – so performance of products can be compared on equal basis)
- **requirements on safety**
- **requirements on reliability**

Test procedures

- **test procedures** for determination of **performance**
- **test procedures** for **safety**
- **test procedures** for **reliability**

Factory production control

- **requirements** for the quality management system (QMS) / factory production control (FPC) at the production site

Inspection procedures

- procedures for **factory inspection**

Requirements for involved bodies

- **requirements** for involved bodies (**certification body, inspector, test lab**)
 - experienced personnel
 - experience in solar heating/cooling products
 - experiences from similar activities
 - quality managements systems

- accreditation

For solar thermal products Solar Keymark, SRCC and Golden Sun are well-known certification schemes.



Figure 4. Examples of solar certification marks: Solar Keymark (EU), SRCC (US), Golden SUN (CN), SHAMCI (Arab Region)

4 Why make a Solar Certification Scheme

A solar certification scheme could be introduced if/when you want some control/information of the products. This could be if:

- The present market is “disturbed” by bad products / bad reputation
- In connection with introduction of a subsidy scheme or a funded programme – to secure that subsidy/funding is given to quality products

Some other reasons:

- Improve product quality/reliability in general
- Create trade barriers to imported products (if the national certification scheme do not accept testing and inspection already performed on imported products)

5 How to get started with a Solar Certification Scheme

Before initiating a certification scheme, the need for such scheme has to be documented.

If there is a need, the level of the requirements in the certification scheme shall be discussed. See Annex A for different levels.

5.1 Documentation of the need for solar certification

- Identify interested parties / stakeholders - be sure to involve local/regional industry as much as possible. Could be:
 - Manufacturers
 - Industry associations
 - Dealers
 - Installer associations
 - Authorities dealing with building and/or energy related regulation
 - Authorities dealing with energy related subsidy schemes
 - Representatives for funding programmes relevant for solar heating/cooling
 - Relevant test labs
 - Relevant inspection bodies
 - Relevant certification bodies
 - Relevant consultants
 - Project developers
 - Banks and/or other financial organisations
 - Insurance companies
 - Relevant departments of technical schools, universities, ...
 - ...
- Call for 1st stakeholders meeting/workshop/meeting
- Discuss here pros et contras of solar certification.
- After discussion, conclude if there is a need.
 - If yes:
 - Discuss organisational framework - appoint drafting committee (and responsible) for elaborating initial draft of working rules for the organisational framework. Could be simple: Maybe done by one certification body - but a “scheme development group” with representatives from other stakeholder groups should be associated.
 - Discuss which level of certification - appoint drafting committee (= scheme development group) for elaborating initial draft of certification scheme rules and procedures

- Discuss connection to potential subsidy scheme(s) -
- Go to 5.2
- If no: Go standby - maybe go back to 5.1 at some point in future

5.2 *Establish organisational framework and certification scheme rules*

- Call for 2nd stakeholders meeting
 - Make working rules for the organisational framework
 - Discuss draft of working rules elaborated by drafting committee under 4.1
 - Revise – agree on final draft
 - Vote on final draft
 - Establish/choose organisation - elect people for board and other functions if necessary
 - Make **certification scheme rules** – procedures/requirements in the certification scheme
 - Discuss draft for certification scheme rules made by “scheme development group”
 - Revise - agree on final draft
 - Vote on final draft
- Go to 5.3

5.3 *Implementation of solar certification*

- Promotion** – let people know about the certification scheme – and the benefits
 - Make web site
 - Make brochure(s)
 - Seminar / workshop for potential users of the certification
 - ...
- Connect to regulation
 - Discuss with regulative authorities how to make requirements for certification in the building regulation etc.
- Connect to subsidy scheme
 - Discuss with subsidy authorities how make requirement for certification in the subsidy scheme(s) – if any. So only certified products shall obtain subsidy.

- ❑
- ❑

5.4 Operation / financing

- ❑ Establish administration for:
 - ❑ Collecting of fees from licensees and maybe others
 - ❑ Maintaining website
 - ❑ Establishing and maintaining “List of certified products” – should be accessible from website
 - ❑ Organise (bi)annual meeting for maintaining the working rules and the scheme rules – and to exchange experience between involved parties.

6 Levels of certification

Depending on the level experience and “quality assurance infra structure” in the country/area, one can choose a corresponding level of certification.

If there are no accredited test labs, it makes no sense to require accreditation of test labs in certification scheme rules from the very beginning. But it might make sense to aim at accreditation in the long run.

6.1 Low level: Testing only

First level could be: Testing the product (solar collector) – the test sample(s) shall be taken independent party (e.g. test lab) to avoid “special made products”.

After some time, the test lab will gain experience enough to have accreditation.

6.2 Medium level: Testing + factory production control

At the next level a quality management system / factory production control is required – to assure that the products are made in the same way to the same specifications. The QMS / FPC shall then be inspected regularly (e.g. once a year) by independent and maybe accredited inspector.

If/when test labs and inspectors are accredited it make sense that the certification body have accreditation too.

6.3 High level: Testing + quality management system + surveillance testing

As a last step surveillance testing could be required – so re-testing e.g. every 2nd or 5th year. All involved bodies are now accredited.

Table 1 at the next page gives an overview of the different certification levels.

Level	3 rd party sampling	Initial testing	Quality management system at production site	Surveillance inspection of production site	Surveillance testing	Accreditation level
Low	From market From producer	ISO 9806				N (A)
Medium	From market From producer	ISO 9806	ISO 9000 or similar	Annually / Bi-annually		N (A, AA, AAA)
High	From market From producer	ISO 9806	ISO 9000 or similar	Annually	Every 2 – 5 years	AAA

Table 1. Different levels of certification scheme for collector certification. N: No accreditation, A: Accredited test lab, AA: A: Accredited test lab and inspector, AAA: A: Accredited test lab, inspector and certification body.

7 A look into: “ISO/IEC 17067:2013: Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes”

It is a very good idea to read the *ISO/IEC 17067:2013: Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes*

available from national standardisation bodies or the [ISO Store](#). Below some extract¹ from this.

6.3 Scheme owner

6.3.1 The following main types of scheme owners can be identified:

certification bodies which develop a product certification scheme for the sole use of their clients;

organizations such as a regulatory body or a trade association not being a certification body, which develop a product certification scheme in which one or more certification bodies participate.

NOTE: A group of certification bodies, perhaps in different countries, can together set up a certification scheme. In that case, it would be necessary for the certification bodies, as joint owners of the scheme, to create a management structure so that the scheme could be operated effectively by all participating certification bodies.

6.4 Development of product certification scheme

...

6.4.3 In developing a scheme, the scheme owner should have a clear understanding of the objectives of the scheme and the assumptions that underlie the need for, and the acceptance of, the scheme. To assist in this, the scheme owner should identify stakeholders and seek their opinions and participation in scheme development.

6.4.4 Before developing the specific content of the scheme (see 6.5), fundamental scheme principles should be agreed among the stakeholders. Such principles may include:

- confirmation of the ownership,*
- confirmation of the governance and decision making mechanisms that may or may not provide for direct involvement of stakeholders,*
- confirmation of the underlying business and funding model, and*
- providing an outline for monitoring and periodic review of the scheme.*

6.4.5 Once developed, the scheme owner should ensure that information about the scheme is made publicly available ...

...

¹ The quoting is done with permission from Danish Standards Foundation.

6.5 Content of a scheme

6.5.1 General

A product certification scheme should specify the following elements:

- a) the scope of the scheme, including the type of products covered;*
- b) the requirements against which the products are evaluated, by reference to standards or other normative documents; ...*
- c) the selection of the activities ...;*
- d) other requirements to be met by the client, e.g. the operation of a management system or process control activities to assure the demonstration of fulfilment of specified requirements is valid for the ongoing production of certified products;*
- e) the requirements for certification bodies and other conformity assessment bodies ...; (e.g. is accreditation required? - and if not then which requirements?)*
- ...*
- l) the resources required for the operation of the scheme, ...;*
- m) how the results of the determination (evaluation) and surveillance stages are to be reported ...;*
- n) the question of how non-conformities with the certification requirements, which include product requirements, are to be dealt with and resolved;*
- o) surveillance procedures, where surveillance is part of the scheme;*
- ...*
- q) content, conditions and responsibility for publication of the directory of certified products by the certification body or the scheme owner; ...*

6.5.2 Sampling

E.g. from the market or from the production site, ...

6.5.3 Acceptance of conformity assessment results

Conc. use of e.g. test results from “outside test labs” ...

6.5.5 Complaints and appeals to the scheme owner

...

6.5.6 Licensing and control of the mark

...

6.5.7 Surveillance

If surveillance is included, the scheme should define the ... surveillance functions. ...

6.5.8 Non-conforming products

...

6.5.11 Marketing

...

6.5.12 Fraudulent claim of certification

Actions and responsibilities for situations where certification under the scheme is being claimed fraudulently should be described.

...

So this was a teaser, as mentioned in the beginning of the section, it is recommended to get hold of this very informative standard, which indeed will be helpful in the process of establishing a certification scheme for solar heating / cooling products.

Note: A document is under preparation within the Task 57, which describes two specific “model certification schemes” for solar products.