

Specific CEN Keymark Scheme Rules for Solar Thermal Products

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0. Introduction

These Specific CEN Keymark¹ Scheme Rules for Solar Thermal Products are acting as a supplement to the CEN/CENELEC INTERNAL REGULATIONS –Part 4: Certification – 2001 [1].

Together these specific and general rules give the complete set of requirements for “Keymarking” solar thermal products covered by EN 12975 and EN 12976.

Therefore, in order to get the Solar Keymark one shall follow both the general rules and these specific rules.

The basic elements/requirements of the scheme are:

- A quality system (i.e. product related factory production control) covering the production line based on the EN ISO 9000 series of standards
- Third party initial inspection of the manufacturing site (and especially the quality system management)
- Third party initial type testing
- Third party periodic surveillance (i.e. periodic inspection)

The specific scheme rules are made in order to make the scheme operational for the involved parties. They are kept as close as possible to the minimum requirements for Keymark Scheme Rules as given in A.3.2 of [1].

Be sure always to have the latest version of these scheme rules, available at www.solarkeymark.org.

1. Definition of scope

1.1 Products covered by the scheme

The scheme covers the following products within the work programme of CEN/TC 312 for thermal solar systems and components:

- Solar thermal collectors
- Factory made solar thermal systems

1.2 List of European Standards concerned

The scheme refers to the normative requirements in the following European Standards:

- EN 12975: Thermal solar systems and components - Solar collectors
- EN 12976: Thermal solar systems and components - Factory made systems

The standards are available from the national standardisation bodies (see: www.cenorm.be/catweb/27.160.htm).

¹ The Keymark is a third-party certification system on the basis of European Standards, demonstrating to users and consumers conformity to the requirements of the relevant European Standard(s). It is granted after the satisfactory completion of a certification procedure, comprising product conformity tests (initial type tests), assessment of the documented factory production control for the related production line, production site inspection and surveillance.

2. Requirements and assessment procedures for bodies engaged in certification, testing and inspection

2.1 Requirements for certification, testing and inspection bodies

The general requirements are given in [1], part B.2.3.

The only deviations from these general requirements in this specific scheme are:

Re B.2.3.1: The certification body in agreement with the manufacturer (license applicant) employs any of the approved testing laboratories fulfilling the requirements in this scheme and listed in paragraph 8 “List of bodies for the implementation of the scheme”.

Re B.2.3.2: Evaluation of testing laboratories by the certification body is not an alternative to accreditation after the end of 2003 (tests performed without accreditation shall be finished and reported before 31/12 2003).

Re B.2.3.3: Temporarily the certification body, its testing laboratories and inspection bodies may receive temporary financial subsidy from independent national or European authorities to support their certification, testing or inspection activities in order to assist achieving the target given in the White Paper of the European Union: 100 million square meters of solar thermal collectors installed in EU in 2010. If certification bodies, testing laboratories and/or inspection bodies are directly or indirectly subsidised, such institutes shall apply a uniform price level towards all EU manufacturers and suppliers. From the beginning of 2006 no subsidies for these bodies shall be allowed. The Solar Keymark secretariat will follow and evaluate if these requirements are fulfilled.

2.2 Assessment of certification, testing and inspection bodies

The assessment of certification, testing and inspection bodies is given in [1], part B.2.5.

3. Specification of the manufacturer's application file

The manufacturer and/or applicant shall supply the certification body with the information required in the application form as shown in Annex B1 [1]. This application form can be downloaded from (www.solarkeymark.org).

This information must also include the documentation required in:

- paragraph 7. “Collector identification” of EN 12975-1
- paragraph 4.6 “Documentation” of EN 12976-1

4. Selection and submission of type test samples

4.1 Selection

The test samples for initial type testing are taken out of the current production or from the stock of the manufacturer. The inspector points out the test samples and records their serial numbers. The manufacturer shall prove through his factory production

control and quality management system conformity of the test sample with the series production of the type.

A type is generally defined as products with the same specifications for materials, sub-components, configurations and dimensions/sizes. However, some degrees of freedom are allowed concerning the type definition of solar collectors:

- If the manufacturer produces the “same” collector in different lengths and/or widths (i.e. the only difference between two collectors is the length and/or the width) the collector is considered the same type and only one sample of the smallest and one sample of the largest module shall be taken and tested². The largest module shall be subject to all the tests required in EN 12975-1 clause 5.2, and the smallest shall be subject to a thermal performance test (clause 6 of EN 12975-2). Thus, only one Solar Keymark license is necessary for the whole series of modules with different sizes. The performance figures used for this type shall be the performance figures corresponding to the measured instantaneous efficiency having the lowest integral in the interval of the reduced temperature³ from 0 – 0,1 K/(W/m²). In other words, the efficiency curve used for this type shall be the one embracing the smallest area.
- Custom built collectors (built in, roof integrated collectors that do not comprise factory made modules and are assembled directly on the place of installation) are handled as described in EN 12975-1, paragraph 1 “...*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*”. The manufacturer has to explain the conformity of the test module with the normal production and must provide a detailed description of the components. The inspector has to verify the conformity on-site.
- Very large collector modules may be treated as the custom built ones, see above, if testing of the full size module is not possible.

4.2 Submission

The inspector either takes with him the type test samples and delivers them to the testing laboratory, or he marks them with a permanent mark (alternatively seals their packing) and instructs the manufacturer to deliver them to the testing laboratory.

4.3 Changes in products – re-testing

The Keymark licence is not valid if a keymarked product is changed/modified. However, depending on the modifications, it might not be necessary to carry out a complete new initial type test. In order to keep the license, the manufacturer shall supply the certification body with a revised “manufacturers application file” noting that the product is a modification of an already keymarked product (specifying exactly which one) and specifying exactly which modification(s) will be made. The certification body will then assess the necessity of re-tests/supplementary tests on the basis of table D.1 in Annex D of EN 12975-1 (collectors) and table A.3 in Annex A of EN 12976-1 (systems). Depending on the degree of changes in the production

² The module sizes are compared based on gross area. Gross area is defined in EN 12975-2, Annex I. The inspector shall inspect all the different sizes of the type to verify conformity.

³ The reduced temperature is defined in EN 12975-2, paragraph 6.1.4.8.3, and the instantaneous efficiency in 6.1.4.8.4.2.

process, the certification body will evaluate if a new initial inspection of the production line is needed. If the certification body approves the new tests (and inspection), the manufacturer may mark the modified product.

Note: The fees for the modified product are the same as for a new product, but some expenses for testing and inspection might be saved. The manufacturer may keep the license for the original product.

Note: If the changes are only changes in sub-components/materials a new initial inspection should not be necessary.

4.4 Use of existing test reports

As a transitional arrangement in 2003 for the start-up of the Solar Keymark Scheme existing test reports may be accepted for the process of initial type testing if:

- the test reports fulfil the requirements in the standards listed in 1.2
- the test reports are delivered by an approved testing laboratory fulfilling the requirements in the scheme rules and listed in paragraph 8
- the date of the start of the testing period referred to in the test report is maximum one year before the date of the establishment of the Solar Keymark (the date of empowerment of the first certification body). Ex.: If the date of empowerment of the first certification body is January the 10th, 2003, test reports reporting a test period starting before January the 10th, 2002 will not be accepted
- the product tested has been taken out of the existing production line by an independent body
- the manufacturer under the responsibility of the certification body provides a declaration of conformity that the product for which the application applies is identical to the product tested and described in the test report and an inspection is performed to verify this declaration
- the manufacturer provides evidence to prove that he was and is running a certified quality management system (at least of the level of the EN-ISO 9000 series of standards) at the time when he produced the tested sample

5. Factory production control and initial inspection of manufacturing site

With the initial inspection it is checked whether the manufacturing site fulfils the requirements stated in B.1.5.2 in [1] and the similar but more specific requirements given in A.3 of Annex A in EN 12975-1 and EN 12976-1:

“The manufacturer should exercise a permanent control of production (e.g. a quality management system based on the relevant part of the EN ISO 9000 series of standards or other). The manufacturer should record the results of production control (manufacturer’s record). These records should include at least the following:

- *identification of the product under test*
- *the dates of sampling;*
- *the test methods applied;*
- *the test and inspection result;*
- *the date of the tests;*
- *the identification of the responsible authority within the manufacturer;*
- *calibration records;*

In case of second or third party surveillance, the records should be available to the second or third party for examination”

Furthermore B.1.5.3.1 of [1] should be taken into account for the initial inspection.

6. Surveillance

The surveillance procedures are given in B.1.5.4 of [1].

The test samples for surveillance testing are taken out of the current production or from the stock of the manufacturer. The inspector points out the test samples and records their serial numbers. The surveillance test is a physical inspection of the product and a comparison with the specifications of the original type tested sample.

6.1 Special test

A special test can be ordered through the certification body in justified cases by anyone if the fulfilment of the requirements of the certification program or the registered values of a certified product are doubted.

The special test is normally to be made as a type test and in agreement with the manufacturer by a second approved testing laboratory listed in paragraph 8. If only one or a few points of the certification program are failed by a product, the certification body decides in agreement with the testing laboratory if the special test can be made as a partial or supplementary test.

If the tested product does not fulfil the requirements and/or does not comply with the registered values⁴, the manufacturer has to carry the costs of the special test.

If the tested product fulfils the requirements and complies with the registered values, the costs have to be carried by the party which questioned the fulfilment of the requirements or registered values and ordered the test through the certification body.

If the special test shows that the failure of the product to conform to the requirements and/or registered values is due to random manufacturing error or transport damage,

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- Collectors: The integral of the measured instantaneous efficiency at the special test shall be more than 90% of the already registered integral in the interval of the reduced temperature from 0 – 0,1 K/(W/m²). The reduced temperature is defined in EN 12975-2, paragraph 6.1.4.8.3, and the instantaneous efficiency in 6.1.4.8.4.2.
- Systems:
 - Solar-plus-supplementary systems: The calculated $Q_{aux,net}$ based on the special test shall be less than 110% of the originally calculated $Q_{aux,net}$. $Q_{aux,net}$ is defined in EN 12976-2, paragraph 5.9.3.2. The calculations to be compared shall be based on the Würzburg climate data and the design load already given by the manufacturer (see: EN 12976-2, Annex B, table B.1).
 - Solar-only and solar preheat systems: The calculated f_{sol} based on the special test shall be more than 90% of the originally calculated f_{sol} . f_{sol} is defined in EN 12976-2, paragraph 5.9.3.3. The calculations to be compared shall be based on the Würzburg climate data and the design load already given by the manufacturer (see EN 12976-2 Annex B, table B.1).

the testing laboratory has to take a second sample. The result of this test is the obliging result for the special test.

The manufacturer or a person authorised by the manufacturer must have the opportunity to take part during the whole procedure of the special test. He must be informed of the results of the test without delay to have the chance to react directly.

If the special test states deviations from the requirements and/or the registered values, the certification body requires the manufacturer to rectify the faults within a certain limited time which should not exceed one month, depending on the extent and manner of the fabrication. Thereafter the testing laboratory performs a new special test, the extent and manner being determined by the certification body consulting the testing laboratory.

7. Supervised manufacturers testing

Procedures such as "supervised manufacturers' type testing" and/or "type testing at manufacturers' premises" are not included in these scheme rules.

Note: At the moment no manufacturer is doing the type testing itself. In the future it might be taken into consideration to specify the rules for such an option

8. List of bodies for the implementation of the scheme.

An updated list of empowered certification bodies and approved inspection bodies and testing laboratories is available at the Solar Keymark web site: www.solarkeymark.org.

9. Fees

By applying for the licence to use the Keymark, the manufacturer also agrees to meet the costs specified in [1], A.4.2.

10. Additional requirements for obtaining the license

Some large solar collectors have to be CE-marked, further information at: <http://www.solarkeymark.org>

11. References

- [1] CEN/CENELEC INTERNAL REGULATIONS – Part 4: Certification – 2001
- [2] EN ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories
- [3] EN 45011, General criteria for certification bodies operating product certification

How to get the references:

[1] is available from www.solarkeymark.org.

[2] and [3] are available from the national standardisation bodies.

ANNEX A – Solar Keymark Secretariat - informative

See more detailed proposal at www.solarkeymark.org/secretariat.asp.

Organisation

In organising the Solar Keymark Secretariat it is proposed to make use of already existing organisations: It is proposed that the industry through the European Solar Industry Federation, ESTIF (www.estif.org) points out a Solar Keymark Board for the secretariat.

The board acts as a reference body for the secretariat and conducts the supervision of the work performed by the secretariat including its financial and accounting activities. The board shall take decisions on implementation and changes of the mark scheme rules. The board has at least two annual meetings with the secretariat – at these meetings also involved third party bodies are invited.

Tasks

The tasks of the Solar Keymark Secretariat are:

- Establishing and running the secretariat with phone, fax, e-mail, address etc.
- Establishing and maintaining the web site (www.solarkeymark.org)
- Organising and reporting the two annual meetings with the board and involved third party bodies.
- Organising ad hoc technical meetings
- Assisting in promoting the Solar Keymark
- Maintaining a record of third party bodies operating (within) the Solar Keymark Scheme
- Maintaining a list of documents used in the Solar Keymark Scheme (relevant EN-standards, scheme rules, CCB documents, ...)
- Participation in CEN/TC312 meetings
- Communication with CCB
- Financial reporting to the board
- Organising exchange of experience among testing laboratories and industry on European level
- ...

Supplementary tasks could be:

- Technical assistance in matters of standardisation to ESIF
- ...

Financing

Fees from manufacturers (and maybe empowered bodies) finance the Solar Keymark Secretariat