

**SKN N0106.R5**

# **Specific CEN Keymark Scheme Rules for Solar Thermal Products**

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## 0. Introduction

These Specific CEN Keymark<sup>1</sup> Scheme Rules for Solar Thermal Products are acting as a supplement to the CEN/CENELEC INTERNAL REGULATIONS –PART 4: CERTIFICATION – 2006 [1] and CEN INTERNAL REGULATIONS - Part 3 TERMS OF REFERENCE OF THE CEN CERTIFICATION BOARD, 2006-9 [4].

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 sampled by independent body
- 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 4.2 of [1].

Be sure always to have the latest version of these scheme rules, available at [www.solarkeymark.org](http://www.solarkeymark.org).

## 1. Definition of scope

### 1.1 *Products covered by the scheme*

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

- Solar thermal collectors as defined in EN 12975
- Factory made solar thermal systems as defined in EN 12976

Collectors with different characteristics are considered as subtypes.

Systems with different characteristics are considered as subtypes.

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<sup>1</sup> 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.

## **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 scheme also refers to the procedure for calculating the output of a solar water heating system given in:

- EN 15316-4-3: Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 4-3: Heat generation systems, thermal solar systems.

The standards are available from the national standardisation bodies (list of standards available see: <http://www.cen.eu/eseach/>).

## **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 4.1.5:

*“Bodies engaged in certification, testing and inspection shall fulfil the requirements of the relevant standards for their operation, e.g. EN 45000 series and EN ISO/IEC 17000 series of standards, as well as the additional requirements defined in the Keymark scheme rules...”*

The additional requirements/rules in this specific scheme are:

- 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”.
- Evaluation of testing laboratories by the certification body is not an alternative to accreditation.
- 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 2010 no subsidies for these bodies shall be allowed. The Solar Keymark Network will follow and evaluate if these requirements are fulfilled.

- Certification bodies, testing laboratories and inspection bodies shall participate actively in the Solar Keymark Network, i.e. participate in the meetings relevant for their activities in Solar Keymark certification, testing and inspection.
- Certification bodies shall make test results public available in the harmonised format agreed upon by the Solar Keymark Network – See Annex B. Updated lists of certified products shall be sent to the Secretariat of the Solar Keymark Network each month.
- Inspection bodies shall use the harmonised inspection procedure and checklist agreed upon by the Solar Keymark Network – Annex A.
- Certification bodies shall collect a fee for each license issued to be transferred to the Secretariat of the Solar Keymark Network. Transfer shall take place within twelve months from the date of issuing the licence. The fee for the Solar Keymark Network is given in Annex C.

### **3. Specification of the manufacturer's application file**

The manufacturer and/or applicant shall supply the certification body with the information as required in the application form of the certification body. The application form is available from the certification body.

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 selection of products for initial type testing is made under the responsibility of the certification body. 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.

### **4.2 Collector “families”**

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 subtype (within the same collector “family”). In this case only one sample of the smallest and one sample of the largest module shall be taken and tested<sup>2</sup>. 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). The performance figures used for this type shall be the performance figures corresponding to the measured instantaneous efficiency having

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<sup>2</sup> The module sizes are compared based on aperture area. Aperture area is defined in EN 12975-2, Annex I. The inspector shall inspect all the different sizes of the type to verify conformity.

the lowest integral in the interval of the reduced temperature<sup>3</sup> from 0 – 0.1 K/(W/m<sup>2</sup>). In other words, the efficiency curve used for this subtype shall be the one embracing the smallest area.

### **4.3 Custom built collectors**

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 m<sup>2</sup>”. The manufacturer has to explain the conformity of the test module with the normal production and must provide a detailed description of the components. Very large collector modules may be treated as the custom built ones, see above, if testing of the full size module is not possible.

### **4.4 System “families”**

If the manufacturer produces the “same” system in different sizes, the different sizes of the system is considered being the same subtype (within the same system “family”). Detailed requirements for systems to be of the same subtype are given in Annex D.

Testing requirements for systems of the same subtype are:

- High temperature and safety tests (according to EN 12976) shall be performed on the sub system having the highest collector area to store volume ratio.
- All other tests (according to EN 12976 and including performance test) shall be performed on the “medium” sub system. Detailed testing requirements are given in Annex D.

Performance indicators for the system configurations which are not performance tested can be determined based on the performance test result on the “medium” system configuration according to the procedures described in Annex D.

### **4.5 Submission**

The inspector either takes with him the 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.

### **4.6 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 C.1 in Annex C of EN 12975-1 (collectors) and table A.3 in Annex A of

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<sup>3</sup> 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.

EN 12976-1 (systems) and taking into account decisions made at Solar Keymark Network meetings<sup>4</sup>. Depending on the degree of changes in the production 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.*

## **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 4.1.3 in [1]:

*“The manufacturer shall operate a quality system covering the production line of the product for which the licence to use the Keymark is granted and which should be based on the quality standards which are at least of the level of the EN ISO 9000 series of standards.*

*In granting the licence, the empowered certification body shall take into account the existence of any quality system certificate issued by a certification body that is accredited by a member of the European co-operation for Accreditation (EA).”*

The quality management system shall cover the production line according to inspectors criteria.

The inspection procedure and checklist given in Annex A1 shall be used.

## **6. Surveillance**

The general surveillance procedures are given in 4.1.4 of [1]:

*“Periodic surveillance by the empowered certification body including testing of samples from the production line or from the market and surveillance of the manufacturer's quality system.”*

and A.1.6.3 of [4]:

*“The factory inspections/assessments shall include the checking of the documentation of the related FPC at least once a year, as well as selecting samples for tests at least every second year ...”*

### **6.1 Surveillance test**

The surveillance test is a detailed physical inspection of the product and a comparison with the specifications of the original type tested sample. The procedure for the

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<sup>4</sup> An updated list of decisions from the Solar Keymark Network meetings is available from the [www.solarkeymark.org](http://www.solarkeymark.org). Included here are decisions made on those specific collector and system sub-components which can be interchanged without retesting.

detailed physical inspection given in Annex A shall be used. The surveillance test shall be done at least every second year. 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.

## **6.2 Special test**

Complaints concerning the conformity of a certified product are handled according to [1] section 5.4 (Complaints) and section 5.5 (Appeal procedures).

In this connection a special test can be ordered through the certification body by anyone, if the fulfilment of the requirements of the certification program or the registered values of a certified product is 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 challenged, the certification body decides after consulting 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 values<sup>5</sup>, the legal person holding the Keymark licence of the product in question 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, the testing laboratory has to take a second sample. The result of this test is the obliging result for the special test.

The legal person holding the Keymark licence or a person authorised by the legal person holding the Keymark licence must have the opportunity to take part during the

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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/m<sup>2</sup>). 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).

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 legal person holding the Keymark licence 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](http://www.solarkeymark.org).

## 9. Fees

By applying for the licence to use the Keymark, the manufacturer also agrees to meet:

1. the costs specified in [1]
2. the fees for the Solar Keymark Network specified in ANNEX C. These fees are not set and regulated by CEN but by the Solar Keymark network.

## 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 – 2006
- [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
- [4] CEN INTERNAL REGULATIONS - PART 3 TERMS OF REFERENCE OF THE CEN CERTIFICATION BOARD, 2006-9

How to get the references:

[1] and [4] is available from CEN ([www.ce.eu](http://www.ce.eu)) and the Solar Keymark web site ([www.solarkeymark.org](http://www.solarkeymark.org)).

[2] and [3] and the referenced standards (see section 1.2) are available from the national standardisation bodies.

## **ANNEX A. SOLAR KEYMARK SURVEILLANCE TEST & SOLAR KEYMARK FACTORY INSPECTION REPORT**

Normative annex.

Get updated version from:

- <http://www.estif.org/solarkeymark/schemerules.php>
- Empowered certification body

## **ANNEX B1. SOLAR KEYMARK COLLECTOR DATA SHEET**

Normative annex.

Get updated version from:

- <http://www.estif.org/solarkeymark/schemerules.php>
- Empowered certification body

## **ANNEX B2. SOLAR KEYMARK SYSTEM DATA SHEET**

Normative annex.

Get updated version from:

- <http://www.estif.org/solarkeymark/schemerules.php>
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## **ANNEX C. FEES FOR THE SOLAR KEYMARK NETWORK**

Normative annex.

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- <http://www.estif.org/solarkeymark/schemerules.php>
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## **ANNEX D. SOLAR KEYMARK SYSTEM FAMILIES**

Normative annex.

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