



Manual for ITC's clients, 2014



**Conformity assessment
of solar thermal collectors
for the SOLAR KEYMARK certification**



1. INTRODUCTION

This Manual aims at facilitating clients of the INSTITUTE FOR TESTING AND CERTIFICATION to prepare products, documents, and other preconditions necessary for conformity assessment of solar thermal collectors in order to obtain and keep the SOLAR KEYMARK certification mark.

The SOLAR KEYMARK (hereafter only 'SK') is a quality mark owned by CEN (European Office for Standards) and administered by SK Network: an organization associating all SK certification and inspection bodies, SK testing labs, representatives of collector industries, development and research, as well as representatives of national institutions tied with solar energy.

General information about SK, SK Network, the certification scheme (SK Scheme Rules), as well as a database of all SK certificates issued can be found at: www.estif.org/solarkeymarknew.

INSTITUTE FOR TESTING AND CERTIFICATION (hereafter only 'ITC') has been empowered, through an agreement concluded with CEN national representative, as **SOLAR KEYMARK Certification Body No 032** (SKCB 032).

All services described in this Manual are provided in accordance with EN ISO 17020, 17021, and 17065.

1.1 SOLAR KEYMARK scope

The SK relates only for solar thermal collectors (responding the scope of EN 12975-1) and not for collectors producing electrical energy (photovoltaic panels). It is, nevertheless possible, to obtain SK certificate for thermal part of so called hybrid collectors (i.e. collectors with thermal and photovoltaic part, usually called PV/T collectors). SK also regards only liquid heating collectors and excludes air collectors (i.e. those solar collectors that use air as the heat transfer fluid).

The SK can be awarded also for solar collector systems (responding the scope of EN 12976-1) – it means collectors, tanks, exchangers, piping, measuring elements, control units, etc. Certification of these systems is, nevertheless, out of ITC's empowerment.

1.2 SOLAR KEYMARK certification process

The SK certification process includes the following elements:

- Assessment of the manufacturer's documentation
- Sampling
- Testing selected samples in an empowered testing lab
- Initial inspection of the manufacturer's Factory Production Control system (FPC)
- Final assessment of conformity with all relevant requirements of the SOLAR KEYMARK Scheme Rules
- Issue of the certificate in case of positive result
- Regular payments of license fees by the certificate holder
- Regular surveillance inspections of FPC and testing of selected samples

2 BEFORE GETTING CERTIFIED

2. Enquiries

SKCB 032 answers (usually within two working days) all enquiries regarding SK and provides potential Clients necessary with explanations of the SK rules and preconditions for the certification. These consultations are provided free of charge. The contact point is at the address: solar@itczlin.cz.

2.2 Formal application

Each certification is administered as a SKCB 032's order. The order is based on a written application set by a SK supplier on a defined application form, which can be downloaded from: www.itczlin.cz/en/solar-keymark-certification.

The SK supplier is defined in CEN Internal Regulations, Part 4: Certification, THE KEYMARK SYSTEM., Chapter 2.5 – other entities are not expected to apply for SK certifications. After the order has been opened and registered, the supplier is called 'the Client'.

The applications can be delivered personally or sent to:

Institut pro testování a certifikace, a.s.
SOLAR KEYMARK Product Manager
třída Tomáše Bati 299, Louky
763 02 Zlín
CZECH REPUBLIC

Or to: solar@itczlin.cz

Sending applications by e-mail is welcomed. Nevertheless, the application form shall contain an original signature of a person authorized to act on behalf of the company (and a company stamp, if available). Electronically copied signatures are not accepted.

The application is reviewed by an assigned Order Manager (OM). This review is focused on:

- Completeness of information
- Consistency of information
- The scope of the application with respect to the scope of SKCB 032's empowerment

If this review discovers any imperfections or deficiencies, the OM asks the Client for adequate corrections or supplements. This process may repeat more times.

2.3 Order setup

If the application (and also all attachments) is found suiting, the OM starts the process of price calculation and capacity examination.

If more models of solar collectors are to be certified, the OM defines collector families and sub-types and determines the models to be tested (i.e. family or subtype representatives) according to [2], Chapter 4.2.

If testing is also required, the OM chooses one of the recognized SK testing laboratories, informs them about the parameters of models to be tested and the scope of testing and asks them for the testing price and delivery term of test results.

It is possible that the Client submits some test results not older than 12 months and provided officially by one of the SK testing laboratories. If this lab is recognized by SKCB 032 and bound with them by a subcontract agreement, registered by SK Network, and the tests have had adequate extent and sampling conditions, these results may be accepted by SKCB 032 as the basis for certification.

The OM informs the Client, without needless delay, about the certification price and about delivery term and conditions. The price includes also the license fees to be paid to CEN and SK Network.

The delivery term is usually related to the day of starting the works. This is understood as the following day after submitting all required documentation, delivering sample(s) for testing and payment of an advance payment (if required).

As soon as the price and conditions have been agreed with the Client, the OM registers the order in the ITC information system, prepares a contract proposal and sends it, without needless delay, to the Client.

3 CERTIFICATION

3.1 Documentation review

The technical documentation submitted by the Client contains at least these items to all certified products (see also Chapter 3 of [2]):

- Technical specifications (technical parameters, drawings, etc.)
- Physical and optical properties
- List of materials used in the solar collector
- Installation / User manuals
- Warnings and instructions aimed to personal safety
- Description of the collector according to the clause D.2 or E.2 of the standard EN 12975-2
- Copies / photos / drawings of marking plates (labelling)

Besides, it is recommended that the Client submits also the root document about their FPC system (e.g. a quality manual or an FPC manual. This requirement is not strict but getting acquainted with the general structure of the Client's FPC system enables better preparation of the inspector(s) and shortens the inspection time at Client's place).

The documentation may further contain other documents which may have impact on the processes of the certification or surveillances – e.g. certificates of quality management systems, product attestations, certificates or test reports.

The documentation is reviewed from the point of view of its:

- Completeness
- Integrity (e.g. precisely the same model names, parameter values, persons, addresses or technical terms quoted in different documents).
- Compliance with the requirements of relevant regulations (generally: compliance of technical documentation with [3], [4], and FPC documentation with Annex E to [2]).

3.2 Family representatives

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 are tested.

If the manufacturer produces the same collector with various thickness of the cover glass (i.e. the only difference between two collectors is the thickness of the glass) the collector is considered as the same subtype (within the same collector family).

In this case sample(s) of the collector with the thinnest cover glass and sample(s) of the collector with the thickest cover glass shall be tested.

The largest model or the model with the thinnest cover glass shall be subject to all the tests required in [4], Chapter 5.2. The smallest models or the model with the thickest cover glass shall be subject to a thermal performance test ([4], Chapter 6).

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 tempera-

ture from 0 – 0.1 K/W/m². This means that the efficiency curve used for this subtype shall be the one embracing the smallest area.

Custom-built collectors (i.e. 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 [3], Chapter 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. Very large collector modules may be treated as the custom built ones, see above, if testing of the full size module is not possible.

Durability and reliability tests shall be carried out on collectors representing the major features of the collector family.

3.3 Sampling

The selection of products for initial type testing is made under the responsibility of SKCB 032. 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.

A series production is understood when at least ten collectors are produced with the same materials and the same manufacturing technologies in the same way and all major production processes.

At least ten collectors of the same type more than the number of test samples picked shall be available in the stock for picking the sample(s) to be tested.

Photo- or video-sampling can be used as a remote sampling procedure (in order to reduce costs for personal visit of a SKCB 032 representative). Detailed procedures and requirements are described in the following SK Network documents:

- N0126 Remote Random Sampling of Collectors and Systems for SK Certification.
- N0127 Instructions for Completing Random Selection via Photographs.

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

3.4 Testing

The tests shall be carried out in one of the test laboratories recognized by SKCB 032. They shall be based on requirements stated in [3] and test methods stated in [4].

The recognized test laboratory shall deliver all relevant test reports and also the data sheet containing all essential parameters of the collector. The format and contents of this sheet is defined in Annex B1 to [2].

There are two models of SOLAR KEYMARK certification:

- SKCB 032 receives the application for certification including testing. Then the OM chooses one by the testing laboratories recognized by SKCB 032 and orders and controls the whole process of sampling and testing.
- SKCB 032 receives the application for certification excluding testing and the Client submits the test result as specified in 3.3.2. In this case the OM shall check whether all requirements for determination of the family representatives and sampling have been met and whether the body responsible for sampling has been the testing laboratory. If not, the results shall not be accepted and these steps shall be repeated.

3.5 Initial inspection of the FPC system

The manufacturer shall operate a Factory Production Control system covering the production process of the product to be certified, which should be based on the regulations concerning product quality at least on the level of EN ISO/IEC 9001 of standards.

The initial inspection of the FPC system shall check whether the manufacturing fulfils the general requirement stated in the previous paragraph. SKCB 032 shall take into account the existence of any quality system certificate issued by an accredited management system certification body.

Particular requirements on the FPC systems for solar collectors are specified in Annex E to [2]. The inspection procedure and checklist are specified in Annex A1 to [2].

The usual duration of the initial inspection is 2 inspection-days (e.g. one day inspection carried out by two inspectors). The following factors may have impact on increase of the inspection duration:

- More products or product groups certified
- Very large production site or number of staff
- More production locations or complicated logistics
- Subcontracting of critical processes or parts
- Staff speaking in other languages than Czech, English or German
- High number of complains or nonconforming products
- Many imperfections which shall be clarified and properly classified (are they non-conformities or not?)

The following factors may have impact to decrease of the inspection duration:

- Manufacturer holds a quality management system certificate (ISO 9001 or similar)
- Manufacture holds other SK certificate(s)
- Very small production site or number of staff
- Outsourcing of some processes to a company which holds other SK certificate(s)
- No complains and nonconforming products, good references from customers
- Regular tests carried out by an accredited laboratory
- Well structured and described FPC system (a part of the inspection can be carried out 'from documentation')

The output of the inspection is the Initial Inspection Report. It assesses all aspects described in previous paragraphs and includes one of the following conclusions:

- A – Certificate issue recommended without any reservations
- B – Certificate issue recommended with corrective actions ordered until the next surveillance inspection (only minor imperfections found).
- C – Certificate issue possible after evaluation of corrective actions (non-conformities found which can be quickly removed and which do not essentially infringe the FPC system)
- D – Refusal of certificate issue recommended (system non-conformities found)

The corrective actions shall be adopted by the Client. The inspection team shall not provide any advisory or take any responsibility for the Client's decisions.

Usual term for corrective actions in case of Conclusion C is 2 – 3 months. The leading inspector decides about evaluation of the corrective actions either 'from documentation' (which means submitting reports, test results, photographs, videos, or other records) or by a follow-up inspection.

If the leading inspector evaluates the corrective actions as 'adequate and removing the non-conformities', he/she issues an amendment to the original Inspection Report with Conclusions A or B.

3.6 OBL certification

Own Brand Labeller (OBL) can apply for SK certification only the certification body who has certified the relevant Original Equipment Manufacturer (OEM; see Chapter 14.3 of [2]).

The sampling, testing and the initial inspection of the FPC system can be adequately reduced. It is, nevertheless, always necessary to examine the relation between the OEM and OBL, especially their:

- Contractual relationship
- System of informing, reporting and feedbacks
- Accessibility of the OEM's production process and records for the OBL

General purpose of this examination is to assess whether the OBL is effectively capable to assure and guarantee the product quality and conformity as if they were OEM.

3.7 Decision on certification

In each of the cases described in Chapters 3.2 and 3.3, the SKCB 032 shall carefully study all documentation delivered by the testing laboratory and by the Client and its compliance with the requirements of [4] and other relevant regulations. In case of any doubts, the OM shall consult the laboratory on all non-compliant or unclear affairs. If their explanations are insufficient, the OM shall order (with the Client's approval) repeating of the disputed tests, if necessary with assistance of a SKCB 032's expert.

The OM shall carefully study all documentation delivered by the inspection team and either to confirm their conclusion or, usually after consultation with them, change it.

If the OM resolves that all requirements for the SOLAR KEYMARK certificate (i.e. complete and positive test results, conclusion A or B from the initial inspection, and the Client's commitment to keep all SK rules) have been fulfilled, he/she compiles the Final Report summarizing all findings, prepares a draft of the certificate, and submits the both documents to the Head of SKCB 032 for the final decision.

If the conformity assessment is negative (i.e. if the insufficiencies and non-conformities found during testing and inspection are so essential that they cannot be easily removed or repaired by corrective actions), only the Final Report with negative conclusion is prepared and the certification process is terminated.

In this case a completely new certification process shall be started if the Client applies for the certification again. The new certification can utilize the already existing positive test and/or inspection results provided they are not older than 12 months.

The Head of SKCB 032 checks the certification documents and, if there are no doubts about meeting all requirements for granting the SOLAR KEYMARK certificate, approves and signs the documents. If he/she has any unclearness, he/she consults the OM and possible measures or corrections of the conclusions are adopted.

3.8 Issue of final documents

If all activities tied with the SK certification have not been prepaid, another invoice for prepaying the rest of the contracted price is issued.

The total price also includes the fees for SK Network and for CEN in amounts specified in Annex C to [2] and in the document "Licence fee for the right to use the Keymark".

See:

www.cen.eu/cen/Services/ConformityAssessment/Certification/Keymark/Documents/KeymarkLicenceFee.pdf

If the official SK documents (i.e. the Final Report and the Certificate) have been signed, they are officially issued and sent to the Client by registered mail (or handed over personally, if the Client explicitly asks for it – in this case the acceptance of documents shall be confirmed by the Client in writing) together with the final invoice.

3.9 Appeals

The Client can appeal against the decision to the head of SKCB 032 within 1 month since its delivery.

The head of SKCB 032 appoints a group of assessors (at least two), which will review all facts regarding the certification case. The leader of this assessment group shall not be a person who has been involved in procession of the certification order in question.

The assessment group submits a report with their final conclusion about the appeal to the head of SKCB 032 in writing within three weeks since delivery of the appeal.

The head of SKCB 032 decides about the appeal within one week since delivery of the report and informs the Client about confirmation of the former decision or about its modification.

If the former decision has been modified, all necessary steps (i.e. issuing new documents) shall be done without needless delay.

If the former decision has been confirmed, the Client can appeal directly to CEN, as described in Chapter 5.5 of [1].

4 AFTER THE CERTIFICATION

4.1 Publishing data

The issued certificate is registered in ITC database of certificates. The database is open to public at: www.itczlin.cz/cert-en.php.

The standard data sheet is also sent to the SK Network Secretariat and then published in the database at: <http://solarkey.dk/solarkeymarkdata/qCollectorCertificates/ShowQCollectorCertificatesTable.aspx>.

4.2 License fees

The license fees for CEN and for SK Network are collected from certificate holders and transferred to the Secretariat of the SK Network and CEN (via their Czech representative).

The fee transfers are made once a year and they are based on invoices issued by SK Network and CEN.

4.3 Rules for certificate holders

The graphic representation of the KEYMARK logo is described in Chapter 3.6 and Annex A to [1].

Rules for certificate holders are described in Chapter 14 of [2] and also in Chapters 14 and 20 of [5]. The Client commits to keep these rules in a written agreement.



4.4 Surveillance

General surveillance procedures are described in Clause 4.1.4 of [1] and in Chapter 6 of [2].

It comprises:

- Testing of samples from the production line or from the market (at least every second year)
- Surveillance inspection of the manufacturer's FPC system (at least once a year)

If the Client holds a valid certificate for their quality management system (covering the scope of production of the certified collectors) issued by a certification body accredited by an IAF member, the surveillance inspections are carried out every second year.

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 detailed physical inspection given in Annex A2 to [2] shall be used.

The procedure for the inspection of the FPC system is the same as that for the initial inspection. Annexes A1 and E to [2] shall be used.

4.5 Changes in certificates and certified products

The SK certificate ceases to be valid if the certified product, its manufacturing process, or its FPC system has been essentially modified. However, depending on the modifications, it might not be neces-

sary to carry out a complete new initial type test. Detailed rules for possible reductions of the testing extent are described in Chapter 4.7 of [2].

The SK certificate becomes also invalid if any data quoted in the certificate (e.g. company name, address, or product brand names) have changed. In such cases the Certificate Holder shall apply for the change of the certificate. This application is processed as an ordinary order. The OM shall review that all conditions for issue of the original certificate are still valid. A Manufacturer's statement is required that there have been no significant changes in the certified product, its manufacturing process, or its FPC system.

4.6 Change of the SKCB

It is possible for a SK certificate holder to obtain a new certificate from another SKCB without re-testing and re-inspection. The procedure for changing the SKCB is specified in Chapter 11 of [2].

The 'old' certificate shall be withdrawn when new one is issued

This change of certificate should be done within 3 months after the request. All relevant test reports and inspection reports shall be provided to the new SKCB.

4.7 Certificate suspensions, withdrawals and renewals

The SK certificates have four basic statuses:

- Valid
- Invalid
 - Expired
 - Suspended
 - Withdrawn

If the certificate is not 'Valid', the certified products shall not be placed on the market as KEYMARKed ones.

The decisions about certificate suspensions, withdrawals and renewals are prepared and suggested by the OMs and approved by the head of SKCB 032.

Suspending of a certificate is understood as a contemporary status with a determined period. After this period (or sooner) it shall be followed by certificate withdrawal or renewal (i.e. returning in the 'Valid' status). This period should not exceed:

- 3 months if the suspension has been based on the PCB3020's finding (e.g. quality problems, non-conformities, complaints, or bad test results)
- 6 months if the suspension has been based on the Certificate Holder's application (e.g. temporary break of production)

The statuses of certificates and reasons for decisions about certificate suspensions or withdrawals are recorded and codified. The following abbreviations are used:

- ATNB – Client has transferred to another certification body
- AUDI – Client refuses audit or is not contactable
- CERT – Certificate scope reduced
- CONF – Failure to close non-conformities
- DEBT – Client has a bad debt
- EXPI – Finite validity terminated
- LEGA – Client is no longer the legal manufacturer
- MANU – Manufacturer has gone out of business
- OBLI – Client fails to meet contractual obligations
- OBSO – Product is obsolete (no longer placed on market)
- OTHE – Other: brief comment
- QMSF – Quality Management System failures
- QUAL – Compliance: product quality issues
- RECL – Product has been reclassified
- REIN – Certificate re-instated as issue now resolved
- REQU – Other conformity requirement not met
- SUBS – Substituted by a new certificate

- UNAP – Compliance: unapproved substantial changes
- VALI – Valid

4.8 Complaints

The procedure for appeals regarding the decisions of SKCB 032 is described in Chapter 3.9 of this Manual.

Other complaints (e.g. those regarding the quality of the certified products on the market or misusing the certificates) are processed in accordance with ITC Internal Directive No 0703.

Anybody can lodge a complaint. If the complaint solution requires some costs (e.g. for additional testing or inspection in the manufacturing plant), there is a general rule that these costs are paid by the party who has failed – it means either by the manufacturer (if the complaint has been justified), or by the complaint author. PCB3020 shall inform the complaint lodger about this policy before these costs arise. (Reviews of documents and procedures and conformity assessments as well as the administration of complaints are free of charge.

5 LIST OF TERMS AND ABBREVIATIONS

Abbreviation	Explanation
FPC	Factory Production Control
ITC	INSTITUTE FOR TESTING AND CERTIFICATION, Inc
OM	Order Manager
OBL	Own Brand Labeller
OEM	Original Equipment Manufacturer
SK	SOLAR KEYMARK
SKCB 032	SOLAR KEYMARK Certification Body No 032 (ITC)

6 LIST OF SOURCE DOCUMENTS

- [1] CEN/CENELEC: Internal Regulations, Part 4: Certification, THE KEYMARK SYSTEM.
- [2] SOLAR KEYMARK Network:
Specific CEN Keymark Scheme Rules for Solar Thermal Products.
- [3] EN 12975-1 Thermal solar systems and components –
Solar collectors – Part 1: General requirements
- [4] EN 12975-2 Thermal solar systems and components –
Solar collectors – Part 2: Test methods
- [5] Quality Manual of Accredited Product Certification Body No 3020 (ITC).