

# EUROPEAN SOLAR THERMAL STANDARDS AND SOLAR KEYMARK CERTIFICATION

J. E. Nielsen<sup>1</sup>

1. Secretary of the Solar Keymark Network

## ABSTRACT

This paper gives an update on European standards (EN's) and European certification (Solar Keymark) for solar thermal products:

- Solar Keymark certification covers now 80-90% of the European collector market
- Strong increase in Solar Keymark for complete compact systems expected.
- The European Standards are being revised just now to include more systems and components types and to adapt to European Directives (CE-marking).

## INTRODUCTION

The European Standards and the Solar Keymark certification have been introduced in order to:

- Assure quality of solar thermal products
- Open the EU market for solar thermal products

These aims have been achieved to a very large extent:

- 80-90 % of all collectors sold now in EU show Solar Keymark
- bad quality collectors have not been an issue for many years
- consumers have confidence in Solar Keymark
- non-certified products have difficult market conditions
- Collectors showing Solar Keymark are accepted all over EU (with minor add-on requirements in some Member States)

## EUROPEAN STANDARDS

Several European standards have been established in the solar thermal field during the last years - see table 1. Several revisions of the product standards are in the pipeline - see table 2 and 3.

The new collector standards will include improved durability test procedures and new test methods for e.g. air collectors. A procedure for calculating annual collector performance will be included too.

It is foreseen that part of the collector standard will be obligatory (CE-marking related to the Construction Products Directives (CPD)).

The standards for Factory made system will be adapted to the upcoming Energy Labelling and ECoDesign requirements.

Table 1. List of European standards published. The ENV 12977's are "preliminary standards".

Standard reference	Title
EN 12975-1:2006	Thermal solar systems and components - Solar collectors - Part 1: General Requirements
EN 12975-2:2006	Thermal solar systems and components - Solar collectors - Part 2: Test methods
EN 12976-1:2006	Thermal solar systems and components - Factory made systems - Part 1: General requirements
EN 12976-2:2006	Thermal solar systems and components - Factory made systems - Part 2: Test methods
EN 12977-3:2008	Thermal solar systems and components - Custom built systems - Part 3: Performance test methods for solar water heater stores
ENV 12977-1:2001	Thermal solar systems and components - Custom built systems - Part 1: General requirements
ENV 12977-2:2001	Thermal solar systems and components - Custom built systems - Part 2: Test methods

Table 2. Planned revisions of EN 12975 & -76.

Standard reference	Title: Thermal solar systems and components - ...	Plan for revision into <u>harmonized standards</u> ( <u>CE-marking related to CPD</u> )	Time schedule
prEN 12975-1	Solar collectors - Part 1: <i>General Requirements</i>	Include annex ZA (defining the obligatory part of the standard). Include necessary and high priority changes/improvements.	3 years
prEN 12975-2	Solar collectors - Part 2: <i>Test methods</i>	Include necessary and high priority changes/improvements.	3 years
prEN 12976-1	Factory made systems - Part 1: <i>General Requirements</i>	Include annex ZA (defining the obligatory part of the standard). Include necessary and high priority changes/improvements.	3 years
prEN 12976-2	Factory made systems - Part 2: <i>Test methods</i>	Include necessary and high priority changes/improvements. Incorporate EU-reference tapping cycle	3 years

Table 3. Planned revisions/restructuring of ENV 12977 series into CEN/TS documents (apart from Part 3, which has already been published as an EN, see table 1).

Standard reference.	Title: Thermal solar systems and components - ...	Status	Dates
prCEN/TS 12977-1	Custom built systems - - Part 1: <i>General requirements for solar water heaters and combisystems</i>	To be published	2009
prCEN/TS 12977-2	- Custom built systems – Part 2: <i>Test methods for solar water heaters and combisystems</i>	To be published	2009
prCEN/TS 12977-4	Thermal solar systems and components - Custom built systems - Part 4: <i>Performance test methods for solar combistores</i>	To be published	2009
prCEN/TS 12977-5	- Custom built systems - Part 5: <i>Performance test methods for control equipment</i>	To be published	2009

The ENV 12977 series has been revised (and restructured) and is now just about to be published as CEN/TS (TS: Technical Specification) - see table 3. It has been decided to develop the CEN/TS documents into European Standards (EN'S), making Solar Keymark available for custom built systems - including systems which provide space heating too.

An EN for how to calculate savings due to

installation of solar heating systems in buildings has been developed and published. This standard is part of the “package” of standards issued in connection to the EC Energy Performance of Building Directive. Finally there is a common ISO/EN standard for wording and definitions in the solar thermal field - see table 5.

Table 4. EN standard for calculating savings due to solar heating systems in buildings

Standard reference.	Title Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies	Status	Dates
EN 15316-4-3	– Part 4.3 Heat generation systems, thermal solar systems	Published	2007

Table 5. EN/ISO standard for wording and definitions in the solar thermal field (just recently opened for revision).

Standard reference.	Title	Status
EN/ ISO 9488:1999	Solar energy - Vocabulary	Published

## SOLAR KEYMARK



The initiative to develop a common European quality label for solar thermal products was taken by the European Solar Thermal Industry Federation, ESTIF in 1999. The - at that time new - CEN Keymark certification scheme (CEN/CENELEC, 2006) was chosen as “template” for the solar thermal product certification. Logo of the CEN Keymark is seen to the right

The CEN Keymark for solar thermal products “Solar Keymark” is a voluntary 3<sup>rd</sup> party certification mark stating conformity with the European Standards:

- EN12975 (collectors)
- EN12976 (“factory made systems”).

The main elements in the Solar Keymark are:

- Type testing - by accredited test lab of test sample - taken out of production /stock by 3<sup>rd</sup> party
- Annual inspection of factory production control
- Bi-annual detailed inspection of product.

The Keymark certification can be done only by certification bodies empowered by the CEN Certification Board.

## SOLAR KEYMARK STATUS

The number of Solar Keymark licenses issued has exploded in the last couple of years –the number of Solar Keymark licences is now (November 2009) close to 1000. It is estimated that far most (80-90%) of the collectors now sold in Europe show the Solar Keymark.

Solar Keymark is now widely accepted and recognised in - more or less - all national European certification schemes, subsidy schemes and regulations – however still some minor add-on requirements exist in a few member states:

- Spain requires also ISO 9001 certification of the factory production control (collectors)
- Germany requires (for collectors) a declaration that the products fulfil requirements in “Blue Engel” and a special calculation showing a collector performance > 525 kWh/m<sup>2</sup> per year.
- In France some insurance companies require national certification (CSTBat) to insure houses with solar thermal systems.

So far great success for collectors, but only slow development in numbers of certificates for systems. So far each and every system configuration had to be tested (i.e. each combination of tank volume and collector area) - and this has been too expensive and time consuming for the manufacturers.

BUT as pr October 2009, it has been possible to test only one-two systems in a “system family” (with many different tank and collector sizes); and have the whole range of system configurations certified - including the performance figures for all configurations. It is expected that this new flexibility will lead to much faster development in system certificates than seen up till now.

## SOLAR KEYMARK NETWORK & SECRETARIAT

The “Solar Keymark Network” acts (together with CEN) as the framework for the Solar Keymark scheme. Members of the network are:

- Industrial representatives
- Solar Keymark certification bodies
- Solar Keymark test labs and inspectors

The main tasks for the Solar Keymark Network are:

- organise regular meetings of the Solar Keymark Network (twice a year)
- exchange of experience and harmonisation of procedures
- define guidelines how to proceed in cases where the available standards and scheme rules are not detailed enough
- improve and further develop the Solar Keymark scheme rules
- act as a clearing body in case of conflicts
- organise round robin testing to assure quality of test results from all testing laboratories

The Solar Keymark Network is assisted by a Solar Keymark Network Secretariat held by the European Solar Industry Federation, ESTIF. The tasks of the secretariat are:

- advising manufacturers and distributors in how to obtain Solar Keymark license for their products
- maintaining the [www.solarkeymark.org](http://www.solarkeymark.org) website – including updated listing of:
  - product certificates
  - recognised Solar Keymark test labs & inspectors
  - empowered Solar Keymark certification bodies
  - latest versions of specific certification scheme rules
  - relevant standards
- issuing news with respect of recognition and acceptance of the Solar Keymark
- participating in the Solar Keymark Network meetings

- participating in CEN TC312 meetings
- participating in CEN TC312 Work Group meetings
- communicating with CEN CMC and CEN CCB
- editing updates of specific scheme rules
- promoting use of Solar Keymark to national authorities
- promoting use of Solar Keymark to industry

The chairman of the Solar Keymark Network is elected by the network - for the time being the chairman is Dr. H. Drück from University of Stuttgart.

Germany and France have expressed a need for a Keymark valid for custom built systems. However as Keymark requires EN standards, and as there at present are no EN standards for custom built systems this is not possible for the time being. But it is expected that the present (draft) CEN/TS 12977 series of standards for custom built systems will develop into real European standards within the next few years.

More information about the Solar Keymark is available at the: [www.solarkeymark.org](http://www.solarkeymark.org).

## SUMMARY AND CONCLUSIONS

On an international market, common standards and certification schemes plays an important role for a free market of quality products without technical trade barriers. This is seen in Europe where the common European Standards and the CEN Solar Keymark scheme have played their role in developing a large and open European market for quality solar collectors.

## REFERENCES

- CEN, EN 16316-4-3 Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies– Part 4.3 Heat generation systems, thermal solar systems, 2007.
- CEN/CENELEC Internal Regulations: Part 4 Certification - The Keymark System, CEN/CENELEC, 2006. ([www.cenorm.be/BOSS/supporting/reference+documents/ir4august2006.pdf](http://www.cenorm.be/BOSS/supporting/reference+documents/ir4august2006.pdf)).
- European Commission, ANNEX IV on Eco-design implementing measures for dedicated water heaters”. Draft v2, EC, Brussels 16/9 2008.