SOLAR HEATING & COOLING PROGRAMME
INTERNATIONAL ENERGY AGENCY

TASK 57

Solar Standards and Certification

Work Plan – Version 1.01

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CONTENT

0 Introduction/background

The Task will build on the good results and the network established in Task 43 “Solar Rating and Certification”.

In Task 43, roadmaps for the need of new test procedures and improvement of test procedures for solar thermal products were made and a new improved ISO standard for collector testing did materialize based on this work. However, there is still a need for improvements in this standard – new ideas on e.g. accelerated lifetime testing looks very promising - and some climate parameters might need adjustment e.g. to make the standard useable also in extremely hot and sunny climates. The standard has just been opened for revision to deal with these and other issues. This new task will support this work.

From questionnaires made in Task 43 we learned that in a number of countries, national standards (slightly or very) different from the ISO standards are used. It is the goal that with new improvements of the standards more countries will adapt the ISO standards directly. In this new Task, efforts will be made to try to convince countries to join the “ISO boat”.

The Task will also support the development of other relevant standards within the ISO TC 180.

The Global Solar Certification Network has been established in Task 43. Originally, the aim was to make ONE globally harmonized certification scheme. And actually we were very close! A well-advanced draft of such global certification scheme was elaborated and close to be agreed upon – but just before the meeting in China October 2014 some certification bodies got “cold feet” – and could in the end not accept such one global certification scheme for the time being. However, after some discussions it was agreed then – as a first step – to aim at mutual recognition of test and inspection reports. Therefore, the existing national and regional certification schemes stay – but the manufacturers can use test and inspection reports made under one certification scheme when he/she applies for certification in other schemes. The Global Solar Certification Network will then be the framework for this “mutual recognition” concept, the requirements and procedures are in place – and operation about to start. This new task will support the Kick-off of the operation of the Global Solar Certification Network.

If/when the GSCN is in operation quite some savings can be obtain by industry, see Annex A giving an example of **first years savings for a large manufacturer of 184 000 €**.

The draft for the global certification scheme rules will be further elaborated into a proposal for an ISO Technical Report for solar certification schemes – to work as a model for new national/regional certification schemes and as inspiration for improvements/harmonization of existing schemes.

1 Objective

The purpose and objectives of the task are to develop, improve and promote ISO standards on test procedures and requirements for solar thermal products - and to harmonize at international

level certification schemes in order to increase in general the level of quality and at the same time avoid the need for re-testing and re-inspection.

2 Scope

The scope is test procedures and standardization for solar thermal systems and components - and certification of solar thermal collectors

3 Process

The timeframe allocated is 3 years. This is the estimated time needed to get the Global Solar Certification Network in full sustainable operation mode and to make the concept of mutual acceptance known and used by the global oriented solar collector manufacturers. Also within three years, it is expected to have the final draft of the new revised collector test procedure standard (ISO/DIS 9806:201X)

Industry shall be involved by participation in the Task meetings, industry workshops and other information activities done during the Task (articles, website, etc.).

The three planned subtasks are:

- Subtask A: Kick-off of the operation of Global Solar Certification Network (GSCN)
- Subtask B: Improvements of test procedures – support and input to ISO
- Subtask C: Promotion and capacity building with respect to ISO standards and state-of-the-art certification schemes

Besides the subtasks above, the general tasks of management and dissemination will be done under the responsibility of the Operating Agent.

The task will support ISO/TC180[1] in their work on the ISO standards for solar systems and components – and promote the use of these standards in the IEA-SHC and ISO countries – having also in mind the perspective of possible future harmonized certification of more solar thermal products, e.g. compact solar water heaters.

4 Outcomes

The Task aims at the following outcomes:

- Implementation of the concept of “Global Solar Certification network”: Mutual recognition of test and inspection reports between members of the Network. This will save manufacturers and distributors acting on the global market for significant costs.
- Proposals for new and/or improved ISO standards for solar thermal products.
- More use of ISO 9806 and other solar thermal standards
- Better worldwide harmonization with respect to certification of solar collectors - and other solar thermal products.
- Removal/lowering of technical trade barriers.
- Lower costs for testing, inspections and certification for manufacturers operating on the global market → lower costs for quality solar thermal products → larger market for quality solar thermal products.

[1] ISO/TC 180 - Solar Energy deals with *“Standardization in the field of solar energy utilization in space and water heating, cooling, industrial process heating and air conditioning”.*

The Task will in this way work in the direction of less use of resources for heating (fossil fuels and biomass), increased energy supply security, less environmental impact and increased employment.

5 Participants

Contributors and participants in this task will be:

- Industry representatives
- Experts in solar thermal testing and standardisation (e.g. test labs)
- Experts in inspection and certification (e.g. certification bodies)

6 Subtasks

6.1 Subtask A: Kick-off of the operation of Global Solar Certification Network (GSCN)

Proposed lead: DE, Harald Drück, ITW, University of Stuttgart (Chairman of GSCN)

Countries

IEA-SHC countries, which are (interested in becoming) members of GSCN. Below are listed the IEA-SHC countries from where national experts have indicated interest in participation in GSCN:

- Australia
- Austria
- Canada
- China
- Denmark
- France
- Germany
- Italy
- Portugal
- Spain
- Sweden
- Switzerland

Objectives

The general objective of Subtask A is to kick-off the operation of the Global Solar Certification Network and implement the concept of mutual acceptance of test and inspection reports.

Activities

The following activities are planned. The activities will be done by GSCN manager, working groups and committees[2]:

A1. Management of GSCN (incl. internal working groups[2]); incl. organising plenary and board meetings (physical & web meetings)
A2. Further improvement of the GSCN working rules
A3. Acquisition and assessment of new network members (check if the agreed requirements for participation are fulfilled) / QAC

[2] Quality Assurance Committee (QAC), Certification body working group (CB-WG), Test lab working group (TL-WG), Industry working group (I-WG)

A4. Give assistance to manufacturers with respect to the mutual recognition of test reports and inspection reports – the concept will be tried out by participating manufacturers
A5. Maintain GSCN website and provide input/assistance for subtask C with regard to promotion of GSCN

Results:
The deliverables for Subtask A will be:

D-A1. Agendas and meeting reports from GSCN plenary meetings (twice a year) and board meetings (4 times per year)
D-A2. Improved GSCN working rules
D-A3. Accessed and approved members of the GSCN
D-A4. Test and/or inspection reports re-used by other certification bodies
D-A5. GSCN website, input to GSCN leaflets / brochures / presentations

Timing and Milestones - subtask A	2016				2017				2018			
A1. Management; incl. organising plenary and board meetings	B P	B	B P	B	B P	B	B P	B	B P	B	B P	B
A2. Further improvement of the GSCN working rules			U				U				U	
A3. Acquisition and assessment of new network members (check if the agreed requirements for participation are fulfilled) – to be done by the internal Quality Assurance Committee (QAC)		A1	…	…	…	…	…	…	…	…	…	…
A4. Give assistance to the mutual recognition of test reports and inspection reports – the concept will be tried out by participating manufacturers			C1	…	…	…	…	…	…	…	…	…
A5. Website updating …		W	…	…	…	…	…	…	…	…	…	…

B: GSCN Board meetings
P: GSCN Plenary meetings
U: update of working rules
W: Updated webpage for GSCN
A1: 1st member assessed and accepted
C1: First test and/or inspection report accepted by other certification body

6.2 Subtask B: Improvement of test procedures – support and input to ISO

Proposed lead: CN, He Zinian, Beijing Solar Energy Research Institute, (Chairman of ISO TC 180 WG 3)

Countries:
Countries, which are members of IEA-SHC and ISO/TC 180[3].

[3] Total list of countries in ISO/TC 180: See annex in the end of this work plan

Objectives
The general objective of Subtask B is to improve testing standards for solar thermal systems and components (with focus on ISO 9806) – giving input and support to ISO/TC 180 and working groups.

Activities:
Teams will be formed with the aim of coming up with specific proposals for new and improved test procedures — and with the aim of starting already within the task period several new "ISO work items" for revisions of existing standards and for completely new standards. On the table is so far:

B1. Accelerated ageing test of flat plate collectors and evacuated tubular collectors – and collector components and materials
B2. Mechanical load testing of collectors and supporting structures
B3. Building envelope integrated collectors and systems
B4. Other issues, e.g. test procedures for system reliability and safety, test procedures for systems for other applications: desalination, drying, disinfection
B5. Defining/discussing extreme conditions[4]

Results:
The deliverables corresponding to the activities given above for Subtask A will be:

D-B1. Draft proposal for test procedures for accelerated ageing test of flat plate collectors and evacuated tubular collectors
D-B2. Draft proposal for test procedures for structural testing of collector and supporting structures
D-B3. Recommendations related to test procedures for building envelope integrated collectors and systems
D-B4. Recommendations related to test procedures for e.g. system reliability and safety; new systems types / other applications
D-B5. Draft definitions for environmental extreme conditions

Timing and Milestones - subtask B	2016				2017				2018			
B1: Draft test procedures for accelerated ageing test of flat plate collectors and evacuated tubular collectors					D1			D2		FD		
B2: Draft test procedures for structural testing of collector supports building integrated collectors					D1			D2		FD		
B3: Draft test procedures for building envelope integrated collectors and systems					D1			D2		FD		
B4: Draft proposals for new test procedures for e.g. system reliability and safety; new systems types / other applications					D1			D2		FD		
B5: Draft definitions for extreme conditions					D1			D2		FD		
D1: First draft D2: Second draft FD: Final draft												

[4] *Note: "IEC 82, IEA PV" group on "extreme conditions" IEC 82, IEA PV"*

6.3 Subtask C: Promotion and capacity building with respect to ISO standards and state-of-the-art certification schemes

Lead: RECREE, Ashraf Kraidy

Countries
All task participants.

Objectives
The ISO standards for solar thermal products are becoming increasing popular throughout the globe; but still some countries stick to old national standards or even make new national standards. This subtask will work to convince stakeholders in such countries that the ISO standards are very well proven and useful – and give guidance for implementation.

The original ambitious aim of the last phase of IEA-SHC Task 43 was to elaborate a Global Solar Certification Scheme. Quite some efforts were used for this and a set of scheme rules were elaborated to a reasonable advanced draft stage. This subtask will — based on the draft certification scheme rules made in Task 43

Activities

C1 Make guidelines how to understand and use the ISO 9806 standard (update QAiST ISO 9806 guide)
C2 Participate in national and international conferences promoting ISO standards *(new ISO 9806 will be presented by subtask C participants in relevant conferences – industry associations will present at national events and through other channels – …)*
C3 Elaborate at least two model certification schemes, one corresponding to the level required for participation in the Global Solar Certification Network (GSCN) – and one with a lower level of requirements fitted for countries/regions without a very sophisticated certification and testing infrastructure

Results:
The corresponding deliverables of Subtask C will be:

D-C1. Guidelines on ISO 9806
D-C2. Papers and presentations at national and international conferences and workshops.
D-C3. Update of Task 43 questionnaire with indication of interest in use of international standards.
D-C4. Model certification schemes – “high level” and “medium level”

Timing and Milestones - subtask C	2016				2017				2018			
C1 Make guidelines how to understand and use the ISO 9806 standard					D1			D2		R		
C2 Participate in national and international conferences promoting ISO standards		NC		IC		NC		IC		NC		IC

C3	Elaborate at least two model certification schemes, one corresponding to the level required for participation in the Global Solar Certification Network (GSCN) – and one with a lower level of requirements fitted for countries regions without a very sophisticated certification and testing infrastructure					D1			D2		R		
IC: International Conference NC: National Conference D1: First draft D2: Second draft R: Report T: Training session													

7 Information Plan

The results shall be disseminated to the target groups:

- Industry associations
- Global actors within the field of solar thermal
- Relevant national and regional authorities
- Test labs
- Certification bodies
- National standardization groups
- International standardization groups (ISO, CEN, …)

The dissemination activities will be:

- Industry workshops
- Direct contact and discussions with key national stakeholders (industry associations, test labs, certification bodies, national authorities, ..)
- Articles
- Meetings in the framework for the global certification scheme
- Web site
- Brochure(s)
- Presentation(s)

8 Meetings

Expert kick-off meeting is planned for March 10-11 2016 in Berlin.
Expert meetings will be coordinated with meeting in Global Solar Certification Network, ISO TC180 meetings and other related international meetings/events.
Meeting frequency will be 2 per year.

Annex A. Example of savings to be obtained for manufacturers using the GSCN concept

A manufacturer has 8 certified collectors and operates in 3 “certification regions”. He would save 184 000 € in testing and inspection costs already first year! See table below.

Assuming a market lifetime of the products of 10 years the total savings would be 248 000 €.

Savings for manufacturers

	Manufacturer	A	
	No. certified products	8	
	No. certification regions	**3**	
COSTS WITHOUT GSCN	Initial testing	288	k€
	Annual inspection	12	k€
	Costs first year	300	k€
	Costs following years	12	k€/year
COSTS WITH GSCN	Initial testing	96	k€
	Re-issuing of test reports	12	k€
	Annual inspection	4	k€
	GSCN fee - initial	4	k€
	GSCN fee - annual	1.6	k€/year
	Costs first year	116	k€
	Costs following years	5.6	k€/year
SAVINGS WITH GSCN	**Savings first year**	**184**	**k€**
	Savings following years	**6.4**	**k€/year**

ASSUMPTIONS	
Initial testing	12 k€
Annual inspection	4 k€
Re-issuing test report	1.5 k€
GSCN fee - initial	0.5 k€
GSCN fee - annual	0.2 k€