

University of Stuttgart

Institute for Building Energetics, Thermotechnology and Energy Storage(IGTE)

• SKN_N0427R0



Report Revision of the special test procedure for collectors

25th Solar Keymark Network Meeting,
October 23 – 24, 2018, online

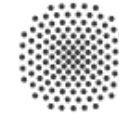
Stephan Fischer,
Harald Drück

IGTE

IGTE (established July, 2018)

Formally known as ITW/TZS

IGTE



Universität Stuttgart
Institut für Energiespeicherung

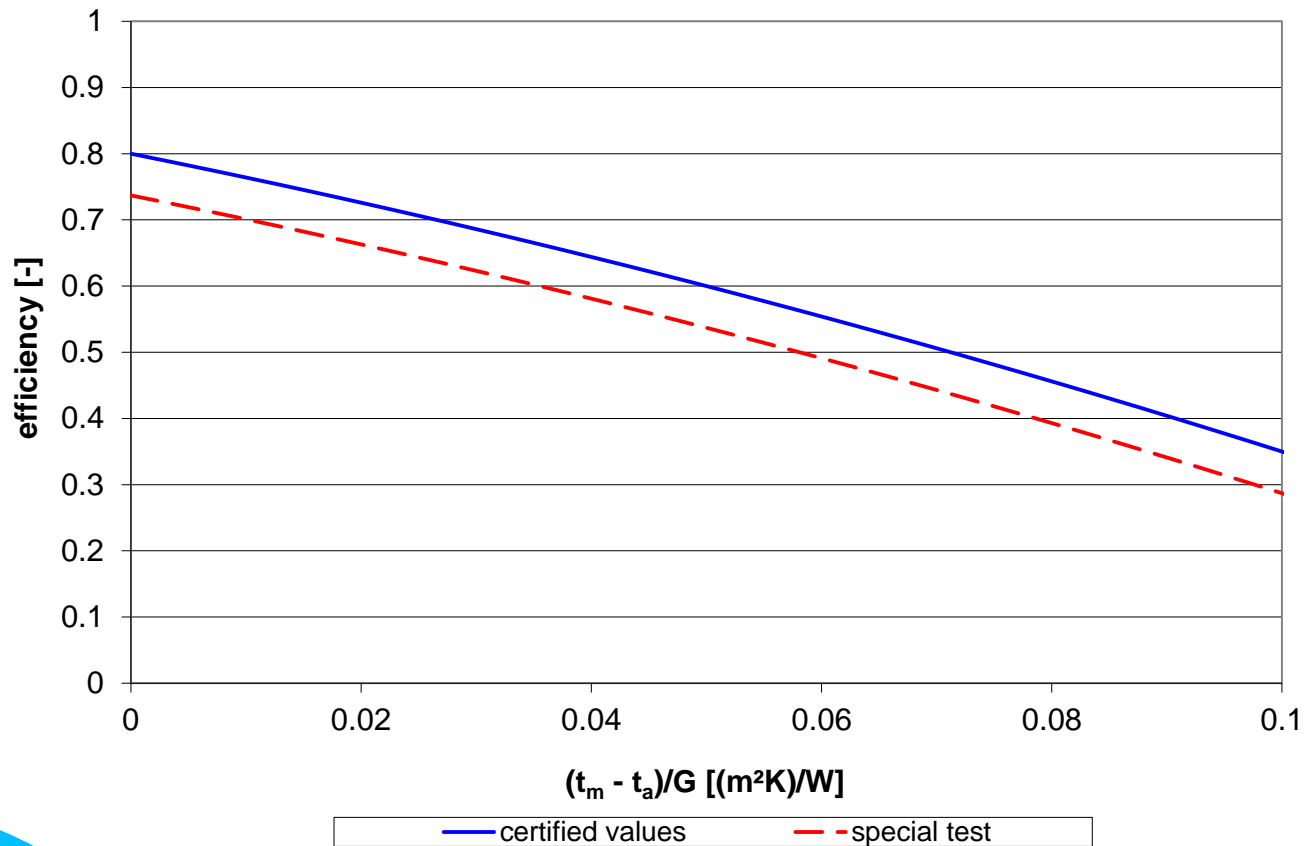
IGTE

Institute for Building Energetics, Thermotechnology and Energy Storage
Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung

- Solar Technology
- Energy Storage
- Testing and Inspection
- Solar & Energy Efficient Buildings
- Smart Cities
- Energy Efficiency
- Cooling Technology

The so called "10 % rule" described in the Solar Keymark Scheme Rule in section 6.3 Special test, 6.3.1 Compliance with registered values *Collectors (EN 12975)*:

“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.”



"10 % rule" not appropriate due to the following reasons:

- threshold of 10 % is too high to be applied successfully on doubtful results
- criteria of the instantaneous efficiency does not take into account the incidence angle modifier and thus does not give a complete picture of the thermal performance of the collector

- Use of the collector yield documented on the second page of the Solar Keymark data sheet for different mean temperatures and locations.



Precisely Right.



Page 2/2

Annex to Solar Keymark Certificate		Licence Number		011-7S2752 F									
Supplementary Information		Issued		2017-06-09									
Annual collector output in kWh/collector at mean fluid temperature $\vartheta_{m,r}$ based on ISO 9806:2013 test results													
Standard Locations		Athens		Davos		Stockholm		Würzburg					
Collector name	ϑ_m	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
FK 8200L 2H		2 374	1 704	1 131	1 806	1 259	807	1 325	873	536	1 449	951	575
FK 8230L 2H		2 750	1 974	1 310	2 092	1 459	934	1 535	1 011	621	1 679	1 101	667

Acceptance Criteria to be used in the process

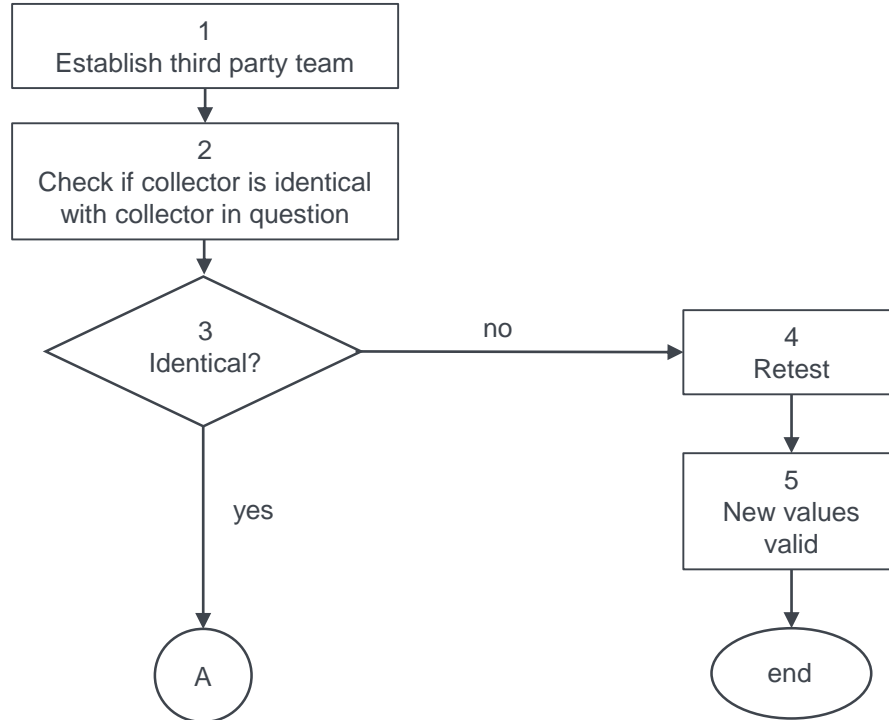
Based on Solar Keymark Data Sheet page 2

In case the following requirements are fulfilled for a retested collector the already registered values stay valid:

*“the annual collector output at Athens, Davos, Stockholm and Würzburg at a mean fluid temperature 25 °C shall exceed 98 % of the already registered values and
the annual collector output at Athens, Davos, Stockholm and Würzburg at a mean fluid temperature 50 °C shall exceed 96 % of the already registered values and
the annual collector output at Athens, Davos, Stockholm and Würzburg at a mean fluid temperature 75 °C shall exceed 92 % of the already registered values”*

Step 1+2

Ensure impartiality / Check if collectors are identical



Remarks:

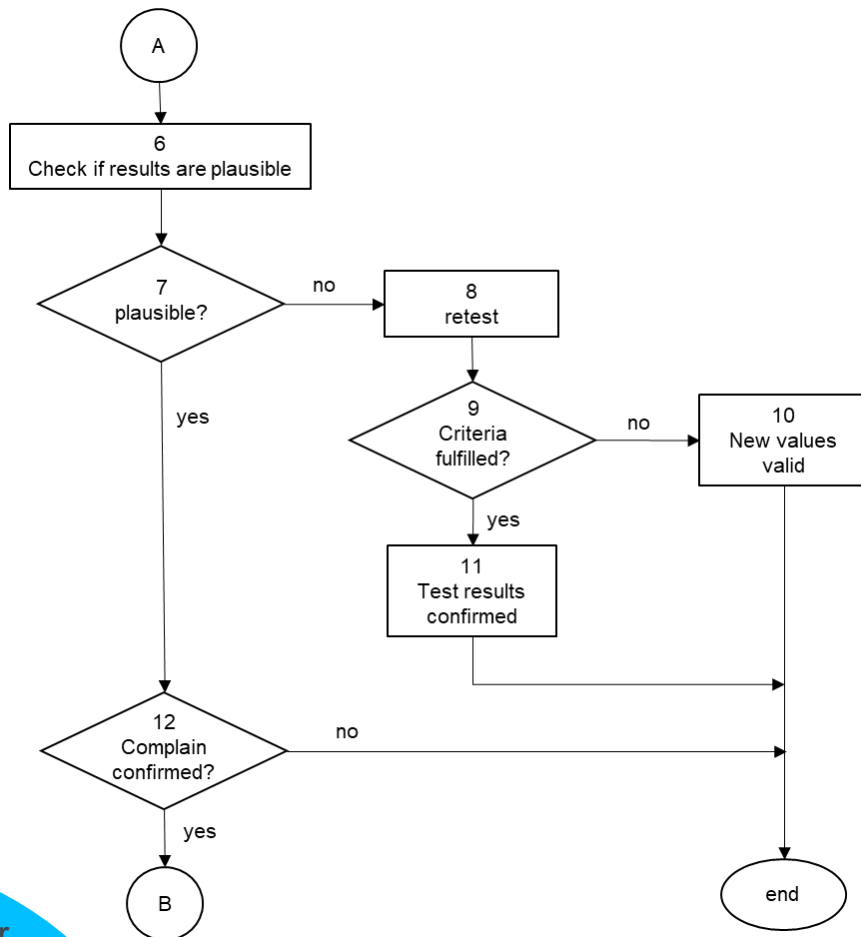
1: Establishment of third party team according to section 2.2.3 Solar Keymark Specific Scheme rules Version 31.

2: Check based on documents or physical collectors

5: Costs have to be borne by manufacturer of the collector whose results were challenged

Step 3

Check plausibility



Remarks:

6: Check based on technical specification, test report and data sheet

7: decision must be with a 2/3 majority within third party team

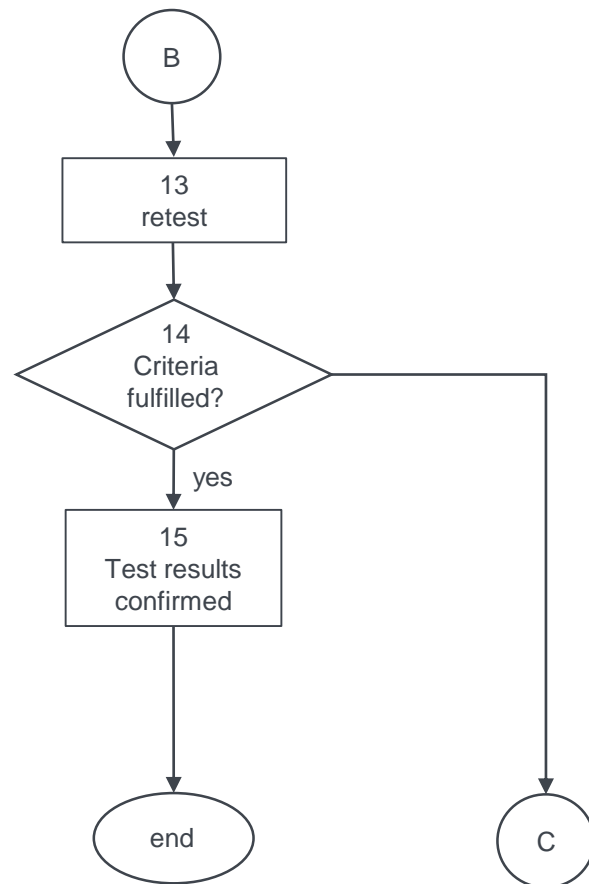
10: Costs have to be borne by the test laboratory and the certification body which carried out the intimal test and certified the collector whose results where challenged to 50% each

11: Costs have to be borne by complainant

12: Complainant must confirm complaint to proceed

Step 4

Retest despite of plausible results

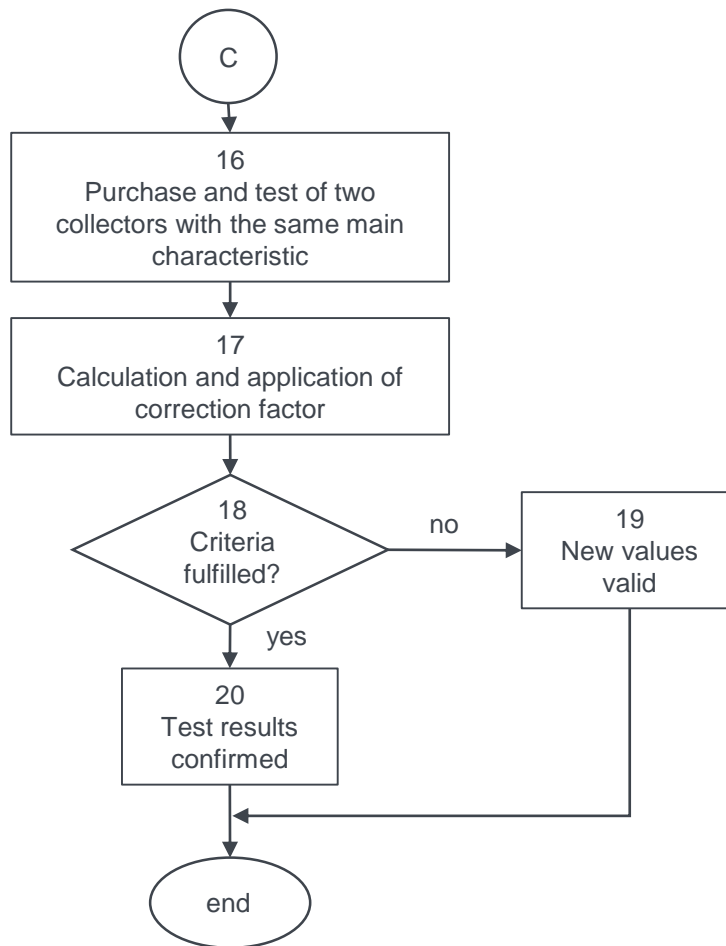


Remarks:

15: Costs have to been borne by complainant

Step 5

Taking into account different results of different test labs



Remarks:

16: test is carried out by test lab which carried out initial testing and a second test lab

17: Correction factor is used to equalize test results from two test labs

19: Costs have to be borne by the test laboratory and the certification body which carried out the initial test and certified the collector whose results were challenged to 50% each

20: Costs have to be borne by complainant

Using the results of the two tests a correction factor $c(\text{location, mean fluid temperature})$ for each location and mean fluid temperature is calculated using the following equation:

$$c(l, mft) = \frac{ACO(l, mft, 2)}{ACO(l, mft, 1)}$$

with

l : location

mft : mean fluid temperature

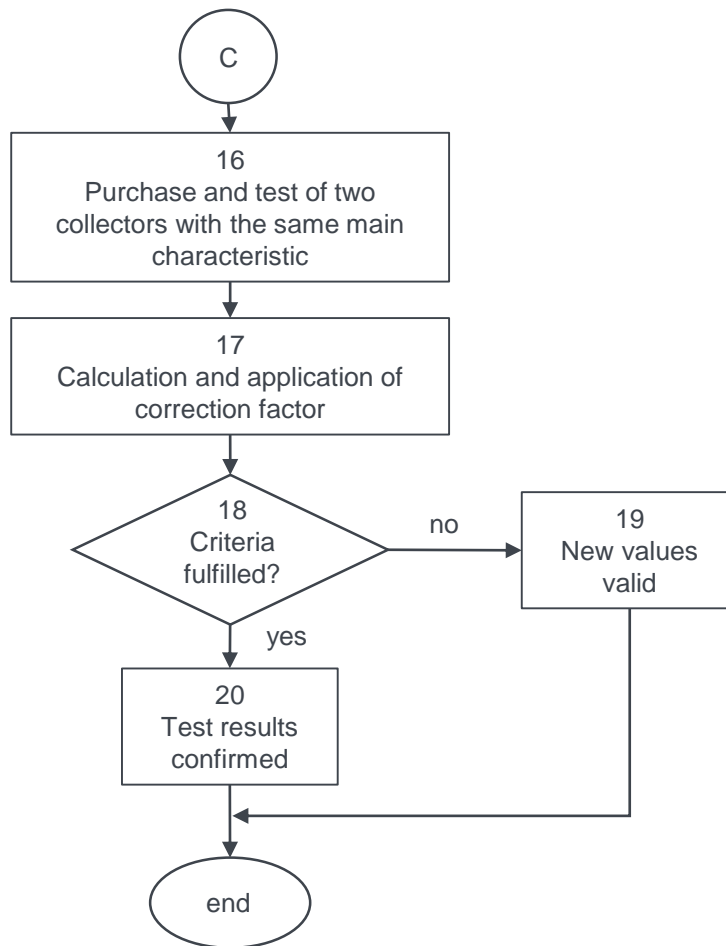
ACO : Annual collector output according second page of Solar Keymark data sheet

1 : test laboratory which carried out the initial testing

2 : test laboratory carrying out the second (current) test

Step 5

Taking into account different results of different test labs



Remarks:

16: test is carried out by test lab which carried out initial testing and a second test lab

17: Correction factor is used to equalize test results from two test labs

19: Costs have to be borne by the test laboratory and the certification body which carried out the initial test and certified the collector whose results were challenged to 50% each

20: Costs have to be borne by complainant

Next steps

- Finalise document and proposal for resolution
- Send out for vote by correspondence



University of Stuttgart

Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE)

Report

Revision of the special test procedure for collectors



Stephan Fischer

e-mail stephan.fischer@igte.uni-stuttgart.de

phone +49 (0) 711 685 - 63231

www.igte.uni-stuttgart.de

University of Stuttgart

Institut für Gebäudeenergetik, Thermotechnik und Energiespeicherung

Pfaffenwaldring 6

70569 Stuttgart

IGTE