



**Summary of Substantive Changes  
between the 2012 and the 2013 editions of  
SRCC Standard 100, “Minimum Standards for Solar Thermal Collectors”**

**Presented to the IAPMO Standards Review Committee on January 13, 2014**

**General:** The changes to this standard may have an impact on currently listed products. The major changes include:

- Removed SRCC specific requirements (see Sections 1.0, 5.1, 5.10.1, 6.1.2 and 6.6)
- Added conditions for up to 10 days of the exposure test to be simulated indoors (see Section 5.4)
- Revised the testing requirements for glazed and unglazed collectors (see Sections 5.10.1.1 and 5.10.1.2)
- Added conditions for testing air heating collectors (see Section 5.10.2)

Title: Revised the title as follows:

~~Test Methods and~~ Minimum Standards for ~~Certifying~~ Solar Thermal Collectors

Section 1.0, Purpose: Removed the SRCC specific requirement as follows:

~~...Any solar collector meeting the standards contained herein is eligible for certification by the Solar Rating & Certification Corporation (SRCC).~~

Section 5.0, Test Methods for Solar Collectors:

Section 5.1, ~~Random Selection~~ Test Specimen: Changed the section title as shown and removed SRCC specific requirements as follows:

~~Solar collectors being submitted for certification testing must be randomly selected by an SRCC designated representative. The manufacturer will make available, from existing stock at the manufacturing facility or at the manufacturer’s distribution location, five production unit collectors of the model to be tested, from which one will be selected for testing by SRCC in accordance with the procedure defined in RS-1, Random Selection Procedure. The manufacturer will then ship the selected collector to a laboratory with an SRCC accredited testing program at the manufacturer’s expense. The other four collectors will also be labeled and held in storage so that one can be used as a replacement if the original collector gets damaged in shipment or fails the initial pressure test. Collector shall be selected at random for testing and shall be as received from the manufacturer.~~

Section 5.4, Exposure Test: Added conditions allowing a portion of the exposure test to be simulated indoors as follows:

**5.4.1 Method of Testing**

A. The collector must be ...

B. Exposure conditions shall consist of 30 days of cumulative exposure to a minimum daily incident solar radiation flux of 17 MJ/m<sup>2</sup> day (1,500 Btu/ft<sup>2</sup> day) as measured in the plane of the collector aperture.



Part of the exposure test may be conducted indoors under a solar simulator, if the following conditions are met:

1. The minimum irradiance must meet ISO 9806-2, Table 4, Class B: 950 W/m<sup>2</sup> with a daily total of 18 MJ/m<sup>2</sup>
2. The ambient air temperature must be above 15°C
3. Irradiation must be continuous until at least 18 MJ/m<sup>2</sup> of radiation has been measured in the plane of the collector. Then the lamp(s) must be turned off until the absorber returns to ambient air temperature. This sequence will count as one day of exposure.
4. A maximum of ten days of the exposure test may be performed indoors.

Section 5.8, Pressure Drop Test: Clarified that the measured value is the pressure drop and added the requirement to include the flow rate used for the efficiency test as follows:

*The pressure drop across the collectors using a heat transfer fluid prescribed by the manufacturer shall be measured at sufficiently small flow rate intervals to accurately describe the flow-rate pressure drop characteristics from minimum through maximum design flow rates, and shall include the ISO recommended flow-rate flow rate used for the efficiency test. ...*

Section 5.10, Thermal Performance Test: Removed the SRCC specific requirement, and revised the testing requirements for glazed and unglazed collectors as follows:

#### 5.10.1 Testing Method

*Any test data that deviates from these standards shall be subject to acceptance by the SRCC Technical Director.*

#### 5.10.1 Liquid Heating

##### 5.10.1.1 Glazed collectors

*The test method used for glazed collectors shall conform to Specimens shall be tested in accordance with ISO 9806-1 with the following exceptions:*

- the preconditioning steady-state period and the test period ~~may~~ shall each be a minimum of 10 minutes, but no less than four times the ratio of the effective thermal capacity C of the collector to the thermal flowrate  $m(\dot{c})_f$  of the fluid through the collector.*
- the highest inlet test temperature shall be the lowest of:*
  - a. ~~the maximum feasible temperature the test laboratory can achieve (minimum of 90°C)~~*
  - b. the temperature at which the temperature rise across the collector is 1.5 to 2.0 °K degrees-C at the given ambient test conditions.*

##### 5.10.1.2 Unglazed collectors

*The test method used for unglazed collectors shall conform to Specimens shall be tested in accordance with ISO 9806-3 with the option that the test may be conducted at a flow rate up to 0.07 kg/s.m<sup>2</sup> (0.10 gpm/ft<sup>2</sup>). with the following exceptions:*

- The lowest inlet test temperature shall be between 1°K and 3°K above the collector environment dew point temperature at the time of the test.*
- The highest inlet test temperature shall be the temperature at which the temperature rise across the collector is between 1.0 and 1.5°K at the given ambient test conditions.*



Section 5.10.2, Air Heating: Specified conditions for testing air heating collectors as follows:  
*Specimens shall be tested in accordance with ASHRAE 93.*

*Air-heating collectors shall be tested at the higher of the flow rate specified by the collector manufacturer or the flow rate necessary for the temperature rise across the collector to be at least 10°K when operating with the inlet air temperature equal to the ambient air temperature under a solar irradiance of 900 W/m<sup>2</sup>.*

Section 6.1.2, Non-Glass and Non-Tempered Glass: Removed the SRCC specific requirement as follows:  
~~*The outer cover one test specimen shall be tested in accordance with ISO 9806-2, paragraph 12. Where if the outer cover is not tempered glass, the test of ISO 9806-2, paragraph 12 shall be conducted. If the outer cover is not flat, the impact shall be perpendicular to the curvature. The collector test specimen subjected to this test shall be randomly selected following the procedure in RS-1, but need not be the same one that undergoes the full test sequence.*~~

Section 6.6, Protection of Materials: Removed the SRCC specific requirements and clarified determination of material acceptability as follows:

~~*The Materials used in the construction of a solar collectors shall be capable of able to withstanding no less than 1000 hours per year at stagnation temperature without significant degradation over the design life. Stagnation temperature shall be determined in accordance with ISO 98062, Annex B.1 or B.2 ,repeated exposure to stagnation temperatures over the life of the collector. The “stagnation temperature” is defined in Annex B of ISO 9806-2 with  $G_s = 1100 \text{ W/m}^2$  and  $T_{\text{amb}} = 50^\circ\text{C}$ . ....  
...All materials used in the collector must be identified. At the Technical Director’s discretion, materials will be reviewed by the Design Review Team (DRT) for degradation potential. The applicant may be required to provide proof of the suitability of a material subjected to the stagnation conditions as defined, to the satisfaction of the DRT, prior to the material’s acceptance within a certified collector. An applicant may use mechanical or other means to reduce the expected stagnation temperature, provided the means can be proven to be passive and fail safe, to the satisfaction of the DRT. SRCC will use Approach 1 from Annex B.1 of ISO 9806-2 to establish the stagnation temperature. An applicant may, at its expense, request that the stagnation temperature be established using Approach 2 from Annex B.2 of ISO 9806-2.*~~