China PV Committee
Meeting Summary and Minutes
China Summer Standards Meetings 2014
June 13th, 2014, Friday, 09:00 - 17:30
Power Valley International Hotel, Power Valley Hall, 3F
No.1888, Chaoyang North Avenue, Baoding, China

Next Committee Meeting
Friday, September 12th, 2014

Table 1 Meeting Attendees
Co-Chairs: Guangchun Zhang (CanadianSolar)

<table>
<thead>
<tr>
<th>Company</th>
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<tr>
<td>48th Research Institute</td>
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### Table 2 Leadership Changes

<table>
<thead>
<tr>
<th>Group</th>
<th>Previous Leader</th>
<th>New Leader</th>
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<tbody>
<tr>
<td>Multi-wire Saws Task Force (new)</td>
<td></td>
<td>Jingying Jia (National Engineering Research Center for Photovoltaic Equipment)</td>
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<tr>
<td></td>
<td></td>
<td>Xianwu Cai (CETC 48th Institute)</td>
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<td></td>
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<td>Zhixin Li (LCT)</td>
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</tbody>
</table>

### Table 3 Ballot Results

**Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review. **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting.

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
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</thead>
<tbody>
<tr>
<td>Doc. 5382B</td>
<td>New Standard: Specification for Quasi-monocrystalline Silicon Wafers Used in Photovoltaic Solar Cells</td>
<td>Failed and return to TF for re-work</td>
</tr>
<tr>
<td>Doc. 5659</td>
<td>New Standard: Test Method Based on RGB for C-Si Solar Cell Color</td>
<td>Failed and return to TF for re-work</td>
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</table>

### Table 4 Authorized Ballots

<table>
<thead>
<tr>
<th>#</th>
<th>When</th>
<th>SC/TF/WG</th>
<th>Details</th>
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<tbody>
<tr>
<td>#5563A</td>
<td>Cycle 5-2014</td>
<td>PV Module Task Force</td>
<td>New Standard: Specification for Framing Tape for PV Modules</td>
</tr>
<tr>
<td>#5660</td>
<td>Cycle 5-2014</td>
<td>PV Module Task Force</td>
<td>Specification for Ultra-thin Glasses Used in Photovoltaic Modules</td>
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<tr>
<td>#5644</td>
<td>Cycle 5-2014</td>
<td>PV Module Task Force</td>
<td>New Standard: Terminology for Back Contact PV Cell and Module</td>
</tr>
<tr>
<td>#5426A</td>
<td>Cycle 5-2014</td>
<td>Crystalline Silicon Cell Task Force</td>
<td>Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells</td>
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Table 5 Authorized Activities

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<th>#</th>
<th>Type</th>
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<th>Details</th>
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<tr>
<td>#5724</td>
<td>SNARF</td>
<td>PV Silicon Wafer Task Force</td>
<td>New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells</td>
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<tr>
<td>#5725</td>
<td>SNARF</td>
<td>PV Module Task Force</td>
<td>New Standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly</td>
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<tr>
<td>#5727</td>
<td>SNARF</td>
<td>Crystalline Silicon Cell Task Force</td>
<td>New Standard: Test Method for the Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss</td>
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<tr>
<td>#5728</td>
<td>SNARF</td>
<td>Multi-wire Saws Task Force</td>
<td>New Standard: Test Method for the Wire Tension of Multi-wire Saws</td>
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<tr>
<td>#5729</td>
<td>SNARF</td>
<td>PV Power Station Equipment Integrated Performance Task Force</td>
<td>New Standard: Specification for Hotspot in Crystalline Silicon PV Modules in the Field</td>
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<tr>
<td></td>
<td>TFOF</td>
<td>Multi-wire Saws Task Force</td>
<td>Scope: Develop the standards of Multi-wire sawing in the PV industrial chain.</td>
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</table>

Note: SNARFs and TFOFs are available for review on the SEMI Web site at: http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF

Table 6 New Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
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<tbody>
<tr>
<td>ChinaPV-0614-01</td>
<td>PV Module TF</td>
<td>Review 3 published standards:</td>
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<tr>
<td></td>
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<td>• SEMI PV44-0513, Specification for Package Protection Technology for PV Modules</td>
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<td></td>
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<td>• SEMI PV45-0513, Test Method for the Content of Vinyl Acetate (VA) in Ethylene-Vinyl Acetate (EVA) Applied in PV Modules Using Thermal Gravimetric Analysis (TGA)</td>
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<td></td>
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<td>• SEMI PV47-0513, Specification for Anti-Reflective-Coated Glass, Used in Crystalline Silicon Photovoltaic Modules</td>
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Table 7 Previous Meeting Action Items

<table>
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<th>Item #</th>
<th>Assigned to</th>
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<th>Status</th>
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<tr>
<td>None</td>
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1 Welcome, Reminders, and Introductions
Committee co-chair Guangchun Zhang chair the meeting and welcome all attendees, all the attendees introduced themselves. Kris Shen called the meeting to order at 9:10 AM. The meeting reminders on antitrust issues, intellectual property issues and effective meeting guidelines were reviewed. Agenda was reviewed.

2 Review of Previous Meeting Minutes
Minutes were reviewed. No change was made.
Motion: To accept the minutes of the previous meeting as submitted
By / 2nd: Dengyuan Song (Yingli)/ Dazhou Yan (SINOSICO)
Discussion: None
Vote: 34-0. Motion passed
Attachment-1, China PV TC Minutes 20140320.pdf

3 Staff Report
Kris Shen (SEMI) gave the staff report. Highlights
- Overview the SEMI Global 2014 Calendar of Events
- Remind the upcoming SEMI standards ballots submission deadline, and remind to vote for Cycle 4
- Recently Published 2 PV Standards
  - SEMI PV53-0514 Test Method for In-Line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnace
  - SEMI PV54-0514 Specification for Silver Paste, Used to Contact with N+ Diffusion Layer of Crystalline Silicon Solar Cells
Attachment-2, SEMI Staff Report 20140613.pdf

4 Liaison Reports
4.1 North America PV Materials Committee
Kris Shen (SEMI) reported. Highlights:
- Next meeting – Intersolar North America Meetings, San Francisco Marriott, CA, July 9, 2014
Attachment-3, NA Liaison Report PV Materials 20140504.pdf

4.2 Europe PV Automation Committee
Kris Shen (SEMI) reported. Highlights:
- TC to be disbanded
Attachment-4, Europe PV Automation Liaison Report June 10, 2014.ppt

4.3 Europe PV Materials Committee
Kris Shen (SEMI) reported. Highlights:
- Next meeting – Date to be decided
- Ballot Results Summary from October meeting
  - Doc. 5565, Line Item Revision to PV42, Test Method for In-Line Measurement of Waviness on PV Silicon Wafers by a Light Sectioning Technique Using Multiple Line Segments – PASSED
  - Doc. 5433, New Standard, Test Method for In-line Characterization of PV Silicon Wafers regarding Grain Size – PASSED
  - Doc. 5432, New Standard, Test Method for In-line Characterization of PV Silicon Wafers by Using Photoluminescence – PASSED
Attachment-5, Europe PV Materials Liaison Report March 17, 2014.ppt

4.4 Japan PV Automation Committee
Kris Shen (SEMI) reported. Highlights:
- Next meeting – June 27, 2014, SEMI Japan, Tokyo, Japan
- Ballot Action in Cycle 6
  - Doc. #5223A, New Subordinate Standard: “Media Interface Specifications for a Horizontal Communication between Equipment” to be Used to Implement SEMI PV35 – Passed as balloted
  - Doc. #5631, Line Item Revisions to SEMI PV35-1012, Specification For Horizontal Communication Between Equipment For Photovoltaic Fabrication System
Attachment-6, JP_PVAuto_Liaison_for_CH_2014_0613_R0.9.ppt

4.5 Japan PV Materials Committee
Kris Shen (SEMI) reported. Highlights:
- Next meeting – July 4, 2014, SEMI Japan Office, Tokyo, Japan
- Working on
  - Doc. #5417, New Standard: Test Method for Measurement of Defects in PV Silicon Wafers in PV Modules by Electroluminescence Imaging
Attachment-7, 140612_JA_PV&PVM_China-Summer_2014_R0.1.pptx

4.6 Taiwan PV Committee
Kris Shen (SEMI) reported. Highlights:
- Next meeting – July 25, 2013, SEMI Office, Hsinchu
Attachment-8, Taiwan Liaison Report for SJ Meeting December 2013_PV.ppt

5 Ballot Review
5.1.1 Document failed technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.
Attachment-9, 5382B Failed.pdf

5.2 Cycle 3-2014: Doc. 5659, New Standard: Test Method Based on RGB for C-Si Solar Cell Color
5.2.1 Document failed technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.
Attachment-10, 5659 Failed.pdf

5.3.1 Document failed technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.
Attachment-11, 5477B Failed.pdf

6 Task Force Reports
6.1 PV Raw Materials Task Force
- Working on
Attachment-12, PV Silicon Raw Material20140609.ppt

6.2 PV Silicon Wafer Task Force
Attachment-13, PV Silicon Wafer TF Report 13.06.2014.ppt

6.3 Crystalline Silicon Cell Task Force
- Working on
  - Doc. 5426, Specification For Aluminum Paste, Used In Back Surface Field Of Crystalline Silicon Solar Cells
6.4  **PV Module Task Force**

- Working on 4 documents
  - Doc. 5660, Specification for Ultra-thin Glasses Used for Photovoltaic Modules
  - Doc. 5661, Test Method for Electrical Parameters of Bifacial Solar Module
  - Doc. 5563, Specification for Framing Tape for PV Modules
  - Doc. 5644, Terminology for Back Contact PV Cell and Module

Attachment-15, PV Module TF Report-2014-6-13.ppt

6.5  **Silicon Thin Film PV Module Task Force**

- Working on Doc. 5478, Test method for thin-film silicon PV modules light soaking

Attachment-16, Silicon Thin Film PV Module Task Force.ppt

6.6  **PV Diffusion Furnace Test Methods Task Force**

- Working on Doc. 5429, New Standards: Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces

Attachment-17, PV Diffusion Furnace Test Methods TF Report0613.ppt

6.7  **PV Power Station Equipment Integrated Performance Task Force**

- Working on Doc. 5648, New standard: Test Method for the Integrated Efficiency of Installed PV Components
- New SNARF: Specification for on Site Hotspot Failure


7  **Old Business**

None

8  **New Business**

8.1  **Request for Ballots in cycle 5-2014**

- Doc. 5563A, New Standard: Specification for Framing Tape for PV Modules

**Motion:** To approve Doc. 5563A for Balloting in cycle 5-2014

**By/2 nd:** Shuquan Tian (Yingli)/ Zhixin Li(LCT)

**Discussion:** Shuquan Tian shows the data for the 180 degree peeling test that come from the different tape suppliers and it includes different material test plates in this experiment, for example aluminum, PET, TPE, glass and stainless. The data shows that there is not significant difference between the different material test plate, so it is OK to use the stainless plate for this standard.

Question 1st: It is necessary to define the stainless type because of so many different type.
Answer: Yes, it is right, the type of stainless is 304 in this standard.

Question 2nd: The histogram is OK for the management level people, but we need to have the detail and scientific analysis method for the technology guys.
Answer: OK, I agree.

**Vote:** 30-0, Motion Passed

- Doc. 5660, Specification for Ultra-thin Glasses Used for Photovoltaic Modules
Motion: To approve Doc. 5660 for Balloting in cycle 5-2014
By/2 nd: Jianmei Xu(Trina) / Dengyuan Song(Yingli)
Discussion:

Q1: the current scope of the ultra-thin glasses is 2.0-3.0mm, if there is some thinner glasses in the future, how to define?
   A1: The standard name cannot update, we can update the standard in the future if there is some new thinner glasses.

Vote: 28-0, Motion Passed

- Doc.5644, New Standard: Terminology for Back Contact PV Cell and Module
  Motion: To approve Doc. 5644 for Balloting in cycle 5-2014
  By/2 nd: Ton Schless(SIBCO) / Dazhou Yan(SINOSICO)
  Discussion: None
  Vote: 25-0, Motion Passed

- Doc. 5426A, Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells
  Motion: To approve Doc. 5426A for Balloting in cycle 5-2014
  By/2 nd: Rulong Chen(Suntech) / Dengyuan Song(Yingli)
  Discussion: None
  Vote: 27-0, Motion Passed

Motion: To approve Doc. 5476B for Balloting in cycle 5-2014
By/2 nd: Li He(CPVT) / Dengyuan Song(Yingli)
Discussion:
The change of “1.1 The purpose of this test method is to standardize analytical protocols for the determination of total carbon content in PV silicon raw materials which may affect the properties and performances of PV solar product or its processing.” in Doc. 5476B was suggested by Mr. Xiexiang Wu

Vote: 27-0, Motion Passed

- Doc. 5546B, New Standard: Test Method for Determination of Chlorine in Silicon by Ion Chromatography
  Motion: To approve Doc. 5476B for Balloting in cycle 5-2014
  By/2 nd: Xiaoxia Liu(GCL) / Dengyuan Song(Yingli)
  Discussion: None
  Vote: 27-0, Motion Passed

8.2 New SNARFs & TFOFs

- SNARF- New Standard: Specification for Hotspot in Crystalline Silicon PV Modules in the Field
  Motion: To approve the SNARF
  By/2 nd: Zhe Liang(Suntech) / Dengyuan Song(Yingli)
  Discussion:
  Dr. Dengyuan Song: There are many uncertain factors in the field, such as wind seep, humidity and temperature, and they possibly affect the test result.
  Dr. Zhenyu Wu: Seasonal and transportation factors should be considered. The pass/fail criteria of hot-spot should be different between standard module and double glass module.
  Dr. Xinwei Niu: The scope of this standard should be only for crystalline silicon PV module.
  Mr. Guangchun Zhang: If the temperature difference affect the output power, the module should be replaced.
  Mr. Xiexiang Wu: From the point of view of the power station owner, this standard is very important and helpful, I suggest that the module should be replace if the temperature difference is 30℃ or 40℃.
  Vote: 27-1, Motion Passed

Motion: To approve the SNARF
By/2 nd: Jing Wang (Yingli)/ Zhixin Li (LCT)

Discussion: Question 1st: Now in addition to the Confocal Laser Scanning Microscope and Veeco, is there any other test method?
Answer: For high precision testing, only Confocal Laser Scanning Microscopy test method and Veeco.
Question 2nd: The disadvantages of Confocal Laser Scanning Microscopy?
Answer: The minimum resolution of Confocal Laser Scanning Microscopy is 2 µm, and Veeco is 2nm. Compared to Veeco, the accuracy of Confocal Laser Scanning Microscopy is lower. But as the tool of testing aspect ratio of solar cell metal fingers, is enough, and this method can be more direct, more informative, and no contact, nondestructive test.

Vote: 29-0, Motion Passed
Attachment-19, Test Method for Determining the Aspect Ratio.pdf

SNARF- New Standard: Test Method for the Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss

Motion: To approve the SNARF
By/2 nd: Fengxia Sun (Yingli)/ Zhixin Li (LCT)

Discussion: Question 1st: What’s advantage of the standard method compared with other methods?
Answer: Weighing method has advantages of low cost and easy to popularize compare with confocal microscopy and level meter method.
Question 2nd: Discuss the standard’s English name
Answer: Test Method for The Rate of A Crystalline Silicon Wafer by Determining The Weight Loss.
Question 3 rd: Weighing method is the oldest method, There is no data?
Answer: There are images and comparison data of weighing method and confocal, See PPT image data.

Vote: 11-4, Motion Passed
Attachment-20, Test Method for Etch Rate.pdf

SNARF- New Standard: Practice for MWT Back Contact PV Module Assembly

Motion: To approve the SNARF
By/2 nd: Ton Schless (SIBCO)/ Jingbing Zhu (Suntech)

Discussion: Question 1st: MWT should be show the whole name.
Answer: OK, added the whole name and updated the doc name to Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly.

Vote: 23-1, Motion Passed

SNARF- New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

Motion: To approve the SNARF
By/2 nd: Linyan Liu (LDK)/ Dengyuan Song (Yingli)

Discussion: None.

Vote: 26-0, Motion Passed

SNARF- New Standard: Test Method for Measuring the Multi-wire Sawing Tension

Motion: To approve the SNARF
By/2 nd: Liangyu Liu (48th Research Institute)/ Zhixin Li (LCT)

Discussion: Q1: The actual tension should be the wire tension, so the title must be modified.
A1: Accept for the expert suggest. And updated the doc name to Test Method for the Wire Tension of Multi-wire Saws
Q2: “Test method” can be modified to “guide”, or not?
A2: This standard introduce a test method, can be applied to measure kinds of wire, not aim at the
specially wire, so the standard belongs to the scope of test method.
Q3: The process of measuring by this test method is static or dynamic?
A3: It is static.
**Vote:** 22-1, Motion Passed
**Attachment-21, Test method for the wire tension of multi-wire saws.pdf**

- **New Task Force:** Multi-wire Saws Task Force

Motion: To approve the TFOF
**By/2**: Liangyu Liu (48th Research Institute)/ Dengyuan Song (Yingli)
**Discussion:** None.
**Vote:** 25-0, Motion Passed

**9 Action Item Review**

**9.1 Open Action Items**
None

**9.2 New Action Items**
See Table 6.

**10 Next Meeting and Adjournment**
The next meeting of the China PV Standards committee will be on September 12th, 2014, Friday, in Dalian, Liaoning, China.

Respectfully submitted by:
Kris Shen
SEMI China

Minutes approved by:
Jun Liu (CESI), Co-chair 2014/6/27
Guangchun Zhang (CanadianSolar), Co-chair 2014/6/27

**Table 8 Index of Available Attachments #1**

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#1 Due to file size and delivery issues, attachments must be downloaded separately. A zip file containing all attachments for these minutes is available at www.semi.org. For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.