# PV Committee China TC Chapter
# PV Materials Committee China TC Chapter
# Joint Meeting Summary and Minutes

China Fall Standards Meeting 2017

October 13th, 2017, Friday, 08:30-17:20

Huang He Grand Hotel

No.100 Middle Renmin Road, Jiangyan, Taizhou, Jiangsu, China

**TC Chapter Announcements**

Next TC Chapter Meeting

Saturday, May 26th, 2018 08:30-17:30

Shanghai, China

**Table 1 Meeting Attendees**

*Italics* indicate virtual participants

**Joint Photovoltaic Committee Co-Chairs:** Guangchun Zhang(CSI)
**Joint Photovoltaic Materials Committee Co-Chairs:** Guangchun Zhang(CSI)
**SEMI Staff:** Daniel Qi – SEMI China, Sophia Huang – SEMI China, Mina – SEMI China

| *Company* | *Last* | *First* | *Company* | *Last* | *First* |
|---|---|---|---|---|---|
| Almaden | Lin | Junliang | Jolywood | Cheng | Xingwu |
| Almaden | Shi | Xiayu | JYT | Chen | Hui |
| Borealis | Thomas | Hjertberg | JYT | Guo | Dawei |
| Borealis | Horng | Yun Tee | Lightway | Wang | Zhanyou |
| Borealis | Bert | Broeders | Linton | Li | Zhixin |
| Borealis | Zhu | Joseph | Linton | Liu | Erfei |
| Borealis | Wang | Carl | LINYANG PV | Zhao | Tongrong |
| Borouge | Wang | Yuneng | LONGi | Ren | Gaigai |
| Borouge | Zhao | Ang | LONGi | Deng | Liangping |
| Borouge | Zhou | Zhouxin | LONGi | Fu | Nannan |
| CESI | Pei | Huichuan | LONGi | Wang | Xiangdong |
| CETC 48 | Liu | Liangyu | LONGi | Lv | Jun |
| CETC 48 | Long | Hui | LONGi | Zhu | Chen |
| CETC 48 | Cai | Xianwu | LONGi | Zhu | Qiangzhong |
| CETC 48 | Yang | Zhiquan | LONGi | Qi | Ji |
| ChianSC | Li | Shijun | LONGi | Wang | Zhichao |
| ChianSC | Tan | Haoyun | LONGi | Chen | Guoqing |
| ChianSC | Li | Siyuan | LONGi | Feng | Jun |
| CPVT | He | Li | LONGi | Zhang | Pengqiang |
| CPVT | Wang | Meijuan | LONGi | Xin | Delei |
| CSI | Yang | Lianli | LONGi | Zhong | Chunhua |
| CSI | Wang | Yusheng | LONGi | Yang | Fei |
| CSI | Guo | Suqin | NAURA | Li | Buzhong |
| CSI | Zhang | Guangchun | NAURA | Sun | Pengtao |
| FJJL | Yang | Aijun | Revax | Jiang | Xiangji |
| FJJL | Li | Jiansheng | RIETECH | Zhang | Tao |
| Fraunhofer-Institut für Solare Energiesysteme ISE | Daniel | Philipp | SCCC | Liu | Bin |
| GCL | Liu | Tao | Semilab | Huang | Li |

| | | | | | |
|---|---|---|---|---|---|
| GCL | Wang | Wu | Sevenstar | Dong | Xiaokai |
| GCL | Liu | Xiaoxia | Sevenstar | Wang | Chunhong |
| GCL | Wang | Taoxia | SIMIT | Liu | Zhengxin |
| GCL | Wu | Yanrong | SINOMA | Zhou | Hua |
| GCL | Lu | Wenfeng | SINOSICO | Yan | Dazhou |
| Gsola | Zeng | Xiangchao | SINOSICO | Cao | Junying |
| GTAT | Zhou | Zhenxing | STATE GRID | Lin | Fang |
| Hanergy | Zhang | Ying | Sunman | Zhu | Jingbing |
| Hanergy | Li | Xuan | Sunport | Zhu | Haojie |
| Hanergy | Wu | Zhenyu | Suntech | Chen | Rulong |
| Hanwha QCELLS | Fan | Zhaoyang | Suntech | Zhou | Min |
| Hanwha QCELLS | Ge | Huayun | Suntech | Guo | Yiwei |
| Hohai University | Zhang | Zhen | TALESUN | Lian | Weifei |
| Honbest | Huang | Junran | TALESUN | Lu | Junyu |
| HUITIAN | Zhou | Jun | Trina | Xu | Jianmei |
| HUITIAN | Yao | Yuanyi | Trina | Yan | Ping |
| ILLIES | Miao | Zhi | Trina | Xiao | Taoyun |
| JA Solar | Huang | Xinming | TUV | Li | Ningda |
| JA Solar | Xu | Desheng | TÜV NORD | Xu | Haigang |
| JA Solar | Wang | Shizhao | XINMING | Zhang | Lin |
| Jinko | Wang | Quanzhi | XINMING | Qiu | Liming |
| Jinko | Li | Ning | XINTE ENERGY | Fan | Xiecheng |
| Jinko | Jin | Hao | XINTE ENERGY | Qiu | Yanmei |
| JNU | Mai | Yaohua | Xinyang Normal University | Li | Yanlei |
| JNU | Shen | Kai | Yingli | Ni | Jianxiong |
| Jolywood | Liu | Yong | Yingli | Xu | Zhuo |
| Jolywood | Huang | Shifang | Yingli | Liu | Yan |
| Jolywood | Huang | Haijun | | | |

**Table 2 Leadership Changes**

| *WG/TF/SC/TC Name* | *Previous Leader* | *New Leader* |
|---|---|---|
| Photovoltaic | | |
| Testing Equipment Task Force | Long Hui (CETC 48) | Long Hui (CETC 48) and Ding Zhiqiang (Trina) |
| Photovoltaic Materials | | |
| None | | |

**Table 3 Committee Structure Changes**

| *Previous WG/TF/SC Name* | *New WG/TF/SC Name or Status Change* |
|---|---|
| None | |

**Table 4 Ballot Results**

| *Document #* | *Document Title* | *Committee Action* |
|---|---|---|
| Photovoltaic | | |
| 6074 | New Standard: Test Method for Peeling Force between Electrode and Ribbon/Back Sheet | **Passed** *with editorial changes* |
| 5982 | New Standard: Specification for Crystalline Silicon Photovoltaic Module Dimensions | **Failed** *and return to TF for re-work and reballot in Cycle 8-2017* |
| 5841A | New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace | **Passed** *as balloted* |

**Table 4 Ballot Results**

| *Document #* | *Document Title* | *Committee Action* |
|---|---|---|
| 6070A | New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Electroluminescence (EL) Imaging | **Passed** *with technical changes and editorial changes, Ratification Ballot To Be Issued. Minority report submitted by Peter Wagner on Nov 11, 2017. Sophia forward MR to 6070 responsible person Taoyun Xiao (Trina Solar), who decided to transfer it to letter ballot, email confirmed on Nov 21, 2017.*<br>**Finally Failed** *and return to TF for re-work and reballot in Cycle 9-2017 or Cycle 1-2018* |
| 5925A | New Standard: Specification for Dual-glass Module with Crystalline Silicon Terrestrial Solar Cell | **Passed** *with editorial changes* |
| 5725 | New standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly | **Failed** *and return to TF for re-work and reballot in Cycle 8-2017* |
| 5968A | New Standard: Guide for Sample Preparation Method for Photovoltaic Backsheet Performance Tests | **Passed** *with editorial changes* |
| 5661A | New Standard: Test Method for Electrical Parameters of Bifacial Solar Module | **Failed** *and return to TF for re-work and reballot in Cycle 9-2017 or Cycle 1-2018* |
| Photovoltaic Materials | | |
| 5767A | New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers | **Failed** *and return to TF for re-work and reballot in Cycle 8-2017* |

#1 **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

#2 **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

**Table 5 Activities Approved by the GCS between meetings of the TC Chapter**

| *#* | *Type* | *SC/TF/WG* | *Details* |
|---|---|---|---|
| None | | | |

**Table 6 Authorized Activities**

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

| *#* | *Type* | *SC/TF/WG* | *Details* |
|---|---|---|---|
| Photovoltaic | | | |
| 6294 | SNARF | PV Module | Reapproval of SEMI PV47-0513, Specification for Anti-Reflective Coated Glass, Used |

**Table 6 Authorized Activities**

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

| # | Type | SC/TF/WG | Details |
|---|---|---|---|
| | | Task Force | in Crystalline Silicon Photovoltaic Modules |
| 6295 | SNARF | Thin Film PV Module Task Force | New Standard: Test Method for Extension of Flexible Thin Film PV Modules |

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

**Table 7 Authorized Ballots**

| # | When | TF | Details |
|---|---|---|---|
| Photovoltaic | | | |
| 5982A | Cycle 8-2017 | PV Module Task Force | New Standard: Specification for Crystalline Silicon Photovoltaic Module Dimensions |
| R6070A | Cycle 9-2017 or Cycle 1-2018 | PV Module Task Force | New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Electroluminescence (EL) Imaging |
| 5725A | Cycle 8-2017 | PV Module Task Force | New standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly |
| 6294 | Cycle 8-2017 | PV Module Task Force | Reapproval of SEMI PV47-0513, Specification for Anti-Reflective Coated Glass, Used in Crystalline Silicon Photovoltaic Modules |
| 5983 | Cycle 8-2017 | PV Diffusion Furnace Test Methods Task Force | New Standard: Test Method for In-line Sheet Resistance Inspection |
| 5842B | Cycle 8-2017 | Crystalline Silicon Solar Cell Task Force | New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance |
| 5661B | Cycle 9-2017 or Cycle 1-2018 | PV Module Task Force | New Standard: Test Method for Electrical Parameters of Bifacial Solar Module |
| Photovoltaic Materials | | | |
| 5767B | Cycle 8-2017 | PV Silicon Wafer Task Force | New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers |
| 6072 | Cycle 8-2017 | PV Silicon Wafer Task Force | Revision of SEMI PV29-0212, Specification for Front Surface Marking of PV Silicon Wafers with Two-Dimensional Matrix Symbols |
| 6194 | Cycle 8-2017 | PV Silicon Raw Materials Task Force | New Standard: Test Method for Determination of Hydrogen in PV Polysilicon by Inert Gas Fusion Infrared Absorption Method |

**Table 8 SNARF(s) Granted a One-Year Extension**

| # | TF | Title | Expiration Date |
|---|---|---|---|
| Photovoltaic | | | |
| None | | | |
| Photovoltaic Materials | | | |
| None | | | |

**Table 9 SNARF(s) Abolished**

| # | TF | Title |
|---|---|---|
| None | | |

**Table 10 Standard(s) to receive Inactive Status**

| Standard Designation | Title |
|---|---|
| None | |

**Table 11 New Action Items**

| Item # | Assigned to | Details |
|---|---|---|
| | | |
| ChinaPV-1017-01 | Multi-wire Saws Task Force | Translate Chinese version of published 1 standards -- SEMI PV68-0815 |
| ChinaPV-1017-02 | PV Silicon Wafer Task Force | Translate Chinese version of published 1 standards -- SEMI PV22-0817 |
| ChinaPV-1017-03 | Thin Film PV Module Task Force | Translate Chinese version of published 2 standards -- SEMI PV73-0216, SEMI PV78-0817 |
| ChinaPV-1017-04 | PV Module Task Force | Translate Chinese version of published 1 standards -- SEMI PV77-0817 |

**Table 12 Previous Meeting Action Items**

| Item # | Assigned to | Details |
|---|---|---|
| ChinaPV-0417-01 | Yingli | Doc 5661 will expire on October 23th, 2017. Jianxiong Ni moved to extend the Doc 5661 for one more year. TC committee members approved it. Therefore, this project will expire on Oct. 23th, 2018.<br>*32 in favor and 0 opposed. Motion passed*<br>*CLOSED* |
| ChinaPV-0417-02 | Zhen Zhang, Hohai University | Doc 5725 will expire on June 13th, 2017. Zhen Zhang moved to extend the Doc 5725 for one more year. TC committee members approved it. Therefore, this project will expire on June 13th, 2018.<br>*32 in favor and 0 opposed. Motion passed*<br>*CLOSED* |
| ChinaPV-0417-03 | Erfei Liu, Linton | Doc 5767A will expire on September 12th, 2017. Erfei Liu moved to extend the Doc 5767A for one more year. TC committee members approved it. Therefore, this project will expire on September 12th, 2018.<br>*32 in favor and 0 opposed. Motion passed*<br>*CLOSED* |
| ChinaPV-0417-04 | Trina | Trina SEMI PV44-0513,SEMI PV45-0513 documents for Five-Year review<br>*ONGOING* |
| ChinaPV-0417-05 | Suntech | Suntech SEMI PV47-0513 document for Five-Year review<br>*ONGOING* |
| ChinaPV-0316-01 | 8 task forces' leaders | Rearrange the task force members; make sure every member is active.<br>*ONGOING* |
| ChinaPV-0715-02 | PV Silicon Raw Materials Task Force | Translate Chinese version of published 2 standards -- SEMI PV50-0114, SEMI PV64-0715<br>*CLOSED* |
| ChinaPV-0715-03 | PV Diffusion Furnace Test | Translate Chinese version of published 1 standards -- SEMI PV53-0514<br>*ONGOING* |

**Table 12 Previous Meeting Action Items**

| *Item #* | *Assigned to* | *Details* |
|---|---|---|
| | Methods Task Force | |

## 1 Welcome, Reminders, and Introductions

Committee co-chair Guangchun Zhang chaired the meeting and welcomed all attendees. All the attendees introduced themselves. Daniel Qi called the meeting to order at 09:00AM. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed.

Agenda was reviewed.

**Attachment**: 1 Chinese SEMI Standard Meeting Reminders rev1

## 2 Review of Previous Meeting Minutes

The TC Chapter reviewed the minutes of the previous meeting.

| | |
|---|---|
| **Motion:** | To approve the minutes of the previous meeting as written |
| **By / 2nd:** | Xinming Huang (JA Solar)/ Zhixin Li (Linton) |
| **Discussion:** | None |
| **Vote:** | 41 in favor and 0 opposed, (Total 41 companies.) Motion Passed. |

**Attachment**: 2 China PV&PVM TC Joint Meeting Minutes 20170418

## 3 Liaison Reports

*3.1 Photovoltaic Materials North America TC Chapter*

Sophia Huang (SEMI) reported for the PV Materials NA TC Chapter. Of note:

– Next meeting - NA Summer Standards Meeting. SEMI HQ, San Jose CA, Wednesday, July 11, 2018

- One Ballot passed
  - Doc. 6100, Reapproval of SEMI PV1-0211, Test Method for Measuring Trace Elements in Silicon Feedstock for Silicon Solar Cells by High-Mass Resolution Glow Discharge Mass Spectrometry
- Three documents Authorized for ballot in cycle 7-2017
  - Reapproval of SEMI PV49-0613, Test Method for the Measurement of Elemental Impurity Concentrations in Silicon Feedstock for Silicon Solar Cells by Bulk Digestion, Inductively Coupled-Plasma Mass Spectrometry
  - Reapproval of SEMI PV43-0113, Test Method for the Measurement of Oxygen Concentration in PV Silicon Materials for Silicon Solar Cells by Inert Gas Fusion Infrared Detection Method
  - Reapproval of SEMI PV37-0912, Guide for Fluorine (F2), Used in Photovoltaic Applications

**Attachment**: 3 Photovoltaic Materials North America TC Chapter Liaison Report

3.2 *Photovoltaic Materials Europe TC Chapter*

Sophia Huang (SEMI) reported for the PV Materials Europe TC Chapter. Of note:

– Next meeting – TBD

- One standard published in 2016
  - Doc 5889: New Standard: Test method on cell level for potential-induced degradation susceptibility of solar cells and module encapsulation materials
- PV Materials Committee, European Chapter Leadership changes
  - H. Aulich will resign as co-chair as of December 31, 2016, and his contributions and leadership during the past 9 years are greatly appreciated
  - Ch. Hagendorf, FhG-CSP, is nominated as new co-chair

**Attachment**: 4 Photovoltaic Materials Europe TC Chapter Liaison Report

3.3 *Photovoltaic and Photovoltaic Materials Japan Joint TC Chapter*

Sophia Huang (SEMI) reported for the PV and PV Materials Japan TC Chapter. Of note:

– Next meeting: April 6, 2018, 1:30 p.m. – 4:00 p.m.at SEMI Japan Office, Tokyo, Japan

- Cycle 1-2017 Ballot review for Doc 6016 Test Method for Exposure Durability of PV Cells to Acetic Acid Vapor at Japan Standards Spring 2017 Meetings
- Authorized for Cycle 9-2017 for Doc 6286 Test Method for Exposure Durability of PV Cells to Acetic Acid Vapor at Japan Standards Autumn 2017 Meetings
- PV Materials Japan TC Chapter Update for Doc 6016
  - After the two weeks review by TC Members of both PV and PV Materials, the SNARF was approved at the PV Materials Japan TC Chapter meeting held on April 18, 2016.
  - Ballot draft was reviewed at the TF meeting held on November 7, 2016.
  - Ballot submission was approved at the Japan TC Chapter meeting on December 19, 2016.
  - Ballot was on Cycle 1-2017, and the ballot results were reviewed and passed as balloted at the PV Materials Japan TC Chapter meeting held on April 7, 2017.
  - Passed A&R in May, 2017.
  - Published as PV79-0817 on August 3, 2017.
- PV Materials Japan TC Chapter Update for SNARF 6286
  - SNARF 6286 for Line Items Revision to SEMI PV79-0817 Test Method for Exposure Durability of PV Cells to Acetic Acid was approved on September 15, 2017 at Photovoltaic Materials Japan TC Chapter.

**Attachment:** 5 170922_LiaisonReport_JA_PV&PVM_r1

*3.4 PV Taiwan TC Chapter*

Sophia Huang (SEMI) reported for the PV Standard Committee Taiwan TC Chapter. Of note:

– Next Meeting - 11:00-13:00, January 31, 2018 at Hsinchu, Taiwan(TBD)

- Leadership Changes
  - OPV, DSSC and PSC TF

    Jason Shin (King Design), Y. M. Yang (NCKU), H. S. Koo (MUST), C. G. Wu (NCU), S. H. Tu (TDP), C. S. Tsao (INER) stepped down from TF Leader

- PV Package Performance TF

  Ivan Chou (Eterbright Solar) stepped down from TF Leader

- BIPV TF

  Ivan Chou (Eterbright Solar), K. T. Lee (King Design), K. H. Ke (Grain System) stepped down from TF Leader

- CIGS Solar Cell TF

  Jason Shin (King Design), H. S. Koo (MUST) stepped down from TF Leader

- Ballot Result
  - Doc 5979 New Standard: Specification of indoor lighting simulator requirements for emerging PV" Passed Technical Review on August 18, 2017

  - The voting rate of Doc 6071 for Cycle 6-17 is 53.75% with no reject, but it did not reach 60%.

    TC approved Doc 6071 for Cycle 8-17 vote

- Authorized Ballot in cycle 8-2017 voting
  - Doc 6071, PV Reliability Test TF, New Standard: Test Method For Polymer Foil Dependent Discoloration of Silver Fingers on PV Modules
  - Doc 6296, PV Reliability Test TF, New Standard: Test Method for Non-Uniform Dynamic Mechanical Loads Test for PV Module
  - Doc 6299, PV Reliability Test TF, New Standard: Test Method for Mechanical Vibration of c-Si PV cells in Shipping Environment
- Task Force Updates
  - OPV, DSSC&PSC TF

    Doc. 5979 "New Standard: Specification of indoor lightning simulator requirements for emerging PV" passed Technical Review on August 18, 2017

    Drafting Doc. 6297 "SNARF for: New Standard: Test Method for Current-Voltage (I-V) Performance Measurement of Perovskite Solar Cell (PSC), Part 1: Standard Testing Condition (STC)"

  - PV Reliability Test TF

    Abolished Doc. 5740 "New Standard: Test method of electrochemical corrosion for PV module"

    Drafting Doc. 6298 "SNARF for: New Standard: Test Method for Non-Uniform Dynamic Mechanical Loads Test for PV Module"

  - PV Package Performance TF

    None

  - BIPV TF

    Abolished Doc. 5560 "New Standard: Classification of Building Integrated Photovoltaic (BIPV)"

  - CIGS Solar Cell TF

    None

**Attachment:** 6 PV Taiwan TC Chapter Liaison Report

3.5 *SEMI Staff Report*

Daniel Qi (SEMI) gave the SEMI Staff Report. Of note:

- SEMI Standards Overview
- SEMI Global 2017 Calendar of Events
- 2017 Critical Dates for SEMI Standards Ballots
- SEMI Standards Publications
- PV Standards Publications in Second Half Year
- A&R SC Membership Update - II
- Standards 5 Year Review
- China Photovoltaic TC Update
- Enhance Task Force Management
- Core Members Attendance Record
- Necessary Info. from Website

**Attachment:** 7 SEMI Staff Report 20171013

## 4 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (A&R) Subcommittee Forms for procedural review. The A&R forms are available as attachments to these minutes. The attachment number for each balloted document is provided under each ballot review section below.

*Photovoltaic Committee China TC Chapter*

4.1 Cycle 5-2017: Doc 6074, New Standard: Test Method for Peeling Force between Electrode and Ribbon/Back Sheet

| | |
|---|---|
| **Motion:** | Junyu Lu moved that this Document passed TC Chapter review with editorial changes and will be forwarded to the ISC A&R SC for procedural review. |
| **By / 2nd:** | Rulong Chen (Suntech) /Tongrong Zhao (LINYANG PV) |
| **Discussion:** | 1. Jingbing Zhu (Sunman): Newton's symbols need to be capitalized.<br>2. Xinming Huang (JA Solar): Please pay attention to details.<br>3. Zhixin Li (Linton): Please check Physics specifications (standards) internationally<br>4. He Li (CPVT): Newton's initials and units should both be capitalized.<br>5. Yaohua Mai (Jinan University): Please confirm Newton symbol, whether it should be capitalized.<br>6. Pengfei Sun (NAURA): I recommend you to refer to SEMI Compilation of Terms. |
| **Vote:** | 41 in favor and 0 opposed. (Total 41 companies.) Motion Passed. |

**Attachment:** 8 6074 Procedural Review,

4.2 Cycle 5-2017: Doc 5982, New Standard: Specification for Crystalline Silicon Photovoltaic Module Dimensions

| | |
|---|---|
| **Motion:** | Lianli Yang moved that the committee approve SEMI Document 5982 to return to Crystalline Silicon Solar Cell Task Force for re-work and re-balloting in Cycle 8 during 2017. |
| **By / 2nd:** | Zhixin Li (Linton) |
| **Discussion:** | 1. Xinming Huang (JA Solar): Have you considered stress distribution? Or directly modify mounting hole dimension based on Hanwha Q CELLS's negatives?<br>Suqin Guo (CSI) Answer: The short side direction of the mounting hole is 941mm, which is the mainstream position in 2015 and 2016. In the first edition of the standard draft, most experts suggested that with the development of module, 941mm is no longer suitable for the development of standard.<br>2. Jianmei Xu (Trina Solar): Why include solar cell value 156.75 in this standard?<br>Lianli Yang (CSI) Answer: It has been mainstream in PV Industry. This is a common material in the industry so we include this value.<br>3. Jingbing Zhu (Sunman): 1) SEMI PV22-0817 Specification for Silicon Wafers for Use in Photovoltaic Solar Cells includes value 156.75. 2) If Doc 5982 include Hanwha Q CELLS' suggestion of the mounting hole |

distance parallel to short side 940mm~942mm and long side, will it cause troubles in the future during implementation process? 3) I suggest doing the same module standards for other difference specifications (size) of solar cell. For example, I suggest making a guide (recommendation) for a 6-inch solar cell.

4. Taoyun Xiao (Trina Solar): Has Module Dimension Standards be published at Group Standards Association CPIA?
5. Suqin Guo (CSI): Group standards have been published. Peter recommends not limiting the size of the solar cell. After discussion in standards initiated company and Task Force, size of solar cell has been removed.
6. Jianmei Xu (Trina Solar): I suggest to remove size of solar cell. The object of this standard is the appearance size so it is not necessary to specify internal details of module.
7. Lianli Yang (CSI):1) Solar cell dimension as a recommended item 2) Short side mounting hole distance confirmed as 943mm~953mm
8. Huayun Ge (Hanwha Q CELLS): Agree short side mounting hole distance confirmed as 943mm~953mm. Hanwha Q CELLS module short side mounting hole distance narrowed.

**Vote:** 35 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** None,

### 4.3 Cycle 5-2017: Doc 5841A, New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace

**Motion:** Pengfei Sun (NAURA) moved that this Document passed TC Chapter review as balloted and will be forwarded to the ISC A&R SC for procedural review.

**By / 2nd:** Rulong Chen (Suntech)

**Discussion:** None

**Vote:** 35 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** 9 5841A Procedural Review

### 4.4 Cycle 5-2017: Doc 6070A, New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Electroluminescence (EL) Imaging

**Motion:** Ping Yan (Trina Solar) moved that this Document passed TC Chapter review with technical changes and with or without editorial changes and will be forwarded to the ISC A&R SC for procedural review. **A Ratification Ballot** will be issued to verify the technical changes.

**By / 2nd:** Tongrong Zhao (LINYING PV)

**Discussion:**

1. Li Huang (SEMILAB): When you add word "identifying", you must judge the quality defects. Or add word "inspection" instead of "identifying"?
2. Yong Liu (JA Solar): I think there is not any change when add word "identifying". I think the revised title is OK.

**Vote:** 33 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Back up:** **Passed** *with technical changes and editorial changes, Ratification Ballot To Be Issued. Minority report submitted by Peter Wagner on Nov 11, 2017. Sophia forward MR to 6070 responsible person Taoyun Xiao (Trina Solar), who decided to transfer it to letter ballot, email confirmed on Nov 21, 2017.*

**Finally Failed** *and return to TF for re-work and reballot in Cycle 9-2017 or Cycle 1-2018*

**Attachment:** 10 6070A Procedural Review

### 4.5 Cycle 5-2017: Doc 5925A, New Standard: Specification for Dual-glass Module with Crystalline Silicon Terrestrial Solar Cell

**Motion:** Jianmei Xu moved that this Document passed TC Chapter review with editorial changes and will be forwarded to the ISC A&R SC for procedural review.

**By / 2nd:** Jingbing Zhu (Sunman)

**Discussion:** None

**Vote:** 33 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** 11 5925A Procedural Review

4.6 Cycle 5-2017: Doc 5725, New standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly

**Motion:** Zhen Zhang (Hohai University) moved that the committee approve SEMI Document 5725 to return to PV Module Task Force for re-work and re-balloting in Cycle 8 during 2017.

**By / 2nd:** Tongrong Zhao (LINYANG PV)

**Discussion:** None

**Vote:** 32 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** None

4.7 Cycle 5-2017: Doc 5968, New Standard: Guide for Sample Preparation Method for Photovoltaic Backsheet Performance Tests

**Motion:** Jianxiong Ni moved that this Document passed TC Chapter review with editorial changes and will be forwarded to the ISC A&R SC for procedural review.

**By / 2nd:** Tongrong Zhao (LINYANG PV)

**Discussion:** IEC 62788-2 is the comparison between different samples; we are the product to do the test pull. We laminate at first and then sample. The purpose of sample preparation is different from sampling.

**Vote:** 38 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** 12 5968A Procedural Review

4.8 Cycle 5-2017: Doc 5661A, New Standard: Test Method for Electrical Parameters of Bifacial Solar Module

**Motion:** Jianxiong Ni (YINGLI) moved that the committee approve SEMI Document 5661B to return to PV Module Task Force for re-work and re-balloting in Cycle 9-2017 or Cycle 1-2018.

**By / 2nd:** Tongrong Zhao (LINYANG PV)

**Discussion:**

1. Guangchun Zhang (CSI): 1) What is the discrete type of the rear side cell? 2) What kind of IV curve do you provide for the double side module? Unsmooth curve will cause hot spot process and other issues. Is there any abnormal circumstances for your IV curve? If there is abnormal, the problem can be found.3) At the same time, the technical and equipment problems of double side module measurement have not been solved. 4) If you do not test double side module, there will be risks. Do we have to think about more for the test method? 5) Since we do research, we should see the shortcoming of problems, we should see the negative effect and solve the negatives, then the negatives no longer exists. Because the advantages of itself is already there. We should solve the shortcomings of such products then it will be perfect. 6) To Xiangchao Zeng (Gsolar): Regarding upward and downward lighting equipment, compared to equipment abroad, what is the price difference for your equipment? 7) I suggest this standards can apply for global voting when use double light system test method.8) I suggest to propose an article on the installation environment of the simulator.
2. Jianxiong Ni (YINGLI): 1) After the solar cell is pumped out randomly, the deviation of the solar cell efficiency is no more than $\pm$0.2. The efficiency of rear side solar cell will not exceed 0.2. 2) We haven't discussed the problem of the IV curve yet. 3) We did double side flash test in 2015, but at that time, the cost is too high. 4) We will change the test method to double side light test method, which is the previous draft we use in 2015.
3. Zhen Zhang (Hohai University): If rear side power is 10%, what is the gap between measuring with 10% light intensity and 1000w/square meter light intensity?
4. Yong Liu (Jolywood): In the laboratory, if both sides are measured and the IV curve is reasonable, then indicates it is normal. However, in practical applications, it can only by randomly measured in large factories. The method of laboratory measurement in large-scale production is not necessarily applicable.
5. Xiangchao Zeng (Gsola): 1) To Guangchun Zhang (CSI): 1) We have tested many domestic double side module companies with upward lighting installation downward with plane light equipment, this way can solve double module test problem. The spectra under different light intensities can be measured by spectra equipment. 2) The price of our equipment is relevant with the ones abroad and even cheaper.
6. Yaohua Mai (Jinan University): The bracket, mounting method and hot spot problem also need to be considered. The inhomogeneity of the solar cell is an influence on the module.

7. Ping Yan (Trina Solar): I do not agree with your AAA class simulator specification changed to CBA. Please think and balance before accept the suggestion from Ronald Sinton (Sinton Instruments). AAA is now in common use, and even now, it has A+ class.
8. Jiansheng Li (FJJL): We are very clear about the performance of the equipment, 95% equipments can reach to B and AAA class. Different structures of simulator will have different data differences under different circumstances. I suggest doing more validation will be better. If measured by dual light source, there may not be any problem.
9. Desheng Xu (JA Solar): Each manufacturer's module are different, which will increase the power.

**Vote:** This document will be reballoted after it was revised.

**Attachment:** None

*Photovoltaic Materials*

4.9 Cycle 5-2017: Doc 5767A , New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers

**Motion:** Erfei Liu (Linton) moved that the committee approve SEMI Document 5767A to return to PV Silicon Wafer Task Force for re-work and re-balloting in Cycle 8 during 2017.

**By / 2nd:** Tongrong Zhao (LINYANG PV)

**Discussion:** Zhixin Li (Linton): In cycle 5-2017, Doc 5767A has get one reject from Peter Wagner, there is no other reject votes. We think Peter Wagner's suggestions are reasonable so we accepted his opinions. We modified purpose and scope and revised Schematic Cross Section of an Internal Feeder Illustrating.

**Vote:** 41 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** None

## 5 Other SDO (Standards Development Organization) Update

5.1 IEC TC 82 Update

- IEC TC82 Scope
- IEC TC82 Summary
- TC 82 Working Groups
- Context and Background
- 'PVQAT Effect' on TC82
- TC82 Productivity
- System Certifications
- Standards Development
- Certifiable Standards
- Important New Efforts

**Attachment:** 13 TC82 for SEMI Sep17
**Attachment:** 14 IEC_P-PUBS_TC82_2017-11-15

**Attachment:** 15 IEC_WORKPROGRAMME_TC82_2017-11-15

5.2 China Electronics Standardization Institute (CESI)

- National Standardization Technical Committees in the field of PV
  - The national photovoltaic energy systems standardization technical committee(SAC/TC90)

- The National Semiconductor Equipment and Materials Standardization Technical Committee(SAC/TC203)
- China Photovoltaic Industry Association(CPIA) Standardization Technical Committee

- Review of PV Standardization Work in China
  - The roles of CESI in PV standardization work
  - The international standardization work of China
  - PVQAT China
  - Comprehensive standardization technology system for PV industry
  - The current status of PV standardization in China -–GB、SJ
  - The current status of PV standardization in China –CPIA
- Work Plans in the Future
  - Continue to support the Ministry of Industry and Information Technology (MIIT) to develop "Comprehensive standardization technology system for PV industry", focus and priorities to carry out standard revision and establishment. Do a good job in standard project review, standard revision process management and so on.
  - Support MIIT to develop common standards between Taiwan and mainland, promote the development of photovoltaic industry and technology between Taiwan and mainland
  - Further strengthening the work of IEC international standardization and improving the level of China's substantive participation in international standardization.
  - Further strengthening the standardization work with associations

**Attachment:** 16 Introduction of PV Standardization work in China

**Attachment:** 17 The list of PV standards in China

## 6 Subcommittee and Task Force Reports

6.1 *Photovoltaic Materials Committee*

6.1.1 *PV Silicon Raw Materials Task Force*

Xiaoxia Liu (GCL) reported for the PV Silicon Raw Materials Task Force. This report contained information on:

- Working on
  - Doc 6194, New Standard: Test Method for Determination of Hydrogen in PV Polysilicon by Inert Gas Fusion Infrared Absorption Method-SNARF Submitted by CPVT/GCL
  - Doc 6193, New Standard: Specification for Trichlorosilane Used in Polysilicon Production-SNARF Submitted by GCL/SIMT
- Published Standards
  - PV74-0216, Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography
  - PV64-0115, Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry
  - PV59-0115, Test Method for Determining of Total Carbon Content in Silicon Powder by Infrared Absorption after Combustion in an Induction Furnace
  - PV50-0114, Specification for Impurities in Polyethylene Packaging Materials for Polysilicon Feedstock
- Update:

- Three Published Standards PV 50-0114, PV64-0115, PV74-0216 were authorized for publishing Chinese version

**Attachment:** 18 PV Silicon Raw Materials Task Force Report

### 6.1.2 *PV Silicon Wafer Task Force*

Liangping Deng (LONGi) reported for the PV Silicon Wafer Task Force. This report contained information on:

- Working on
  - Doc 5767B, New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers
  - Doc 6072, Revision of SEMI PV29-0212, Specification for Front Surface Marking of PV Silicon Wafers with Two-Dimensional Matrix Symbols
- Published Standards
  - SEMI PV22-0716, Revision of SEMI PV22-1011, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells (technical revision)
  - SEMI PV22-0817, Revision on SEMI PV22-016, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells (technical revision)

**Attachment:** 19 PV Silicon Wafer Task Force Report

## 6.2 *Photovoltaic Committee*

### 6.2.1 *Crystalline Silicon Solar Cell Task Force*

Dengyuan Song (Yingli) reported for the Crystalline Silicon Solar Cell Task Force. This report contained information on:

- Working on
  - Doc 5842B, New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance
  - Doc 6074, New Standard: Test Method for Peeling Force between Electrode and Ribbon/Back Sheet
  - Doc 6112, New Standard: Specification for Voltage Sweep Time and Direction in Transient Mode I-V Measurement of Silicon Solar Cells
- Published Standards
  - SEMI PV54-0514, New Standard: Specification For Silver Paste, Used To Contact With N+ Diffusion Layer Of Crystalline Silicon Solar Cells
  - SEMI PV58-0115, New Standard: Specification For Aluminum Paste, Used In Back Surface Field Of Crystalline Silicon Solar Cells
  - SEMI PV65-0715, New Standard: Test Method Based on RGB for C-Si Solar Cell Color
  - SEMI PV66-0715, New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope
  - SEMI PV67-0815, New Standard: Test Method for the Etch Rate of a Crystalline Silicon Wafer by Determining the Weight Loss

**Attachment:** 20 Crystalline Silicon Solar Cell Task Force Report

### 6.2.2 *PV Module Task Force*

Zhen Zhang (Hohai University) reported for the PV Module Task Force. This report contained information on:

- Working on
  - Doc 5661B, New Standard: Test Method for Electrical Parameters of Bifacial Solar Module

- Doc 5725A, New Standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly
- Doc 5925A, New Standard: Specification for Dual-glass Module with Crystalline Silicon Terrestrial Solar Cell
- Doc 5968A, New Standard: Guide for Sample Preparation Method for Photovoltaic Backsheet Performance Tests
- Doc 6070A, New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Electroluminescence (EL) Imaging
- Doc 5982A, New Standard: Specification for Crystalline Silicon Photovoltaic Module Dimensions
- Doc 6069, New Standard: Specification for Structural Silicone Adhesive for the Back Rail Fixture on PV Modules
- Doc 6073, New Standard: Specification for Crystalline Silicon PV Modules with Integrated Power Optimizer
- Doc 6113, New Standard: Test Method for Abrasion Resistance of the Polymer Backsheet of Crystalline Silicon Solar Modules

- Published Standards
  - SEMI PV44-0513, Specification for package protect for PV module
  - SEMI PV45-0513, Vinyl Acetate (VA) content test method for Ethylene-Vinyl Acetate (EVA) applied in photovoltaic modules-TGA
  - SEMI PV47-0513, Specification for Anti-Reflective Coated Glass, Used in Crystalline Silicon Photovoltaic Modules
  - SEMI PV61-0115, Specification for Framing Tape for PV Modules
  - SEMI PV62-0215, Terminology for Back Contact PV Cell and Module
  - SEMI PV63-0215, Specification for Ultra-thin glasses used for photovoltaic modules
  - SEMI PV77-0817, Guide for Calibration of PV Module UV Test Chambers

**Attachment:** 21 PV Module Task Force Report

### 6.2.3 *Thin Film PV Module Task Force*

Xuan Li (Hanergy) reported for the Thin Film PV Module Task Force. This report contained information on:

- Working on
  - Doc 6295, New Standard: Test Method for Extension of Flexible Thin Film PV Modules
- Published Standard
  - SEMI PV73-0216, Test Method for Thin-Film Silicon PV Modules Light Soaking
  - SEMI PV78-0817, Test Method for Bending Property of Flexible Thin Film PV Modules

**Attachment:** 22 Thin Film PV Module Task Force Report

### 6.2.4 *PV Diffusion Furnace Test Methods Task Force*

Liangyu Liu (CETC-48) reported for the PV Diffusion Furnace Test Methods Task Force. This report contained information on:

- Working on:
  - Doc 5841A, New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace
  - Doc 5983, New Standard: Test Method for In-line Sheet Resistance Inspection
- Published Standard
  - SEMI PV53-0514, Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces

**Attachment:** 23 PV Diffusion Furnace Test Methods Task Force Report

### 6.2.5 Multi-wire Saws Task Force

Liangyu Liu (CETC-48) reported for the Multi-wire Saws Task Force. This report contained information on:

- Working on: None
- Published Standard
  - SEMI PV68-0815, Test Method for the Wire Tension of Multi-Wire Saws

**Attachment:** 24 Multi-wire Saws Task Force Report

### 6.2.6 Testing Equipment Task Force

Hui Long (CETC-48) reported for the Multi-wire Saws Task Force. This report contained information on:

- Working on
  - Doc 6191, New Standard: Guide for the Design of Testing and Sorting Equipment for Crystalline Silicon Solar Cells
- Published Standard
  - None

**Attachment:** 25 Testing Equipment Task Force Report

## 7 Old Business

None

## 8 New Business

8.1 Standards Five-Year Review

SNARF-Doc 6294, Reapproval of SEMI PV47-0513, Specification for Anti-Reflective Coated Glass, Used in Crystalline Silicon Photovoltaic Modules

**Motion:** To approve the SNARF

**By / 2nd:** Yiwei Guo (Suntech)/ Tongrong Zhao (LINYANG PV)

**Discussion:**
1. Guangchun Zhang (CSI): 1) Have you mentioned cleanness and abrasion? 2) Have you mentioned falling sand in this standard? 3) Coating technology is now more reliable than ever, please consider this.
2. Jingbing Zhu (Sunman): This standard considers optics instead of cleaning. On one hand, this is an anti-Reflective standard; on the other hand, this standard mentioned thickness resistance. I don't think it's time to think about cleaning.
3. Xinming Huang (JA Solar): In the past, is the technology for coated glass the same as it is now?

4. Jianmei Xu (Trina Solar): Has pencil hardness mentioned in this standard?

**Vote:** 35 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** 26 Standards Five-Year Review Doc 6294

## 8.2 New SNARFS

### 8.2.1 SNARF-New Standard: Test Method for Mechanical Strength of Solar Grade Silicon Wafer and Cell

Zhuo Xu (YINGLI) addressed the committee on this topic.

**Motion:** To approve the SNARF

**By / 2nd:** Zhuo Xu (YINGLI)/Jingbing Zhu (Sunman)

**Discussion:**

1. Jingbing Zhu (Sunman): Now your test equipment is certainly not enough.
2. Yong Liu (Jolywood): 1) In the test method, test thickness is very important. 2) The unit you are using now is mm, but genrally it is all microns now. 3) Does crack means break? 4) In the manufacturing process for solar cell and module, there are bump, pulling and other aspects of damage, mechanical strength cannot be reflected. 5) The mechanical strength value of the slice may be large, but its actual piece rate is high.
3. Hao Jin (Jinko): The difference between the test patterns is very large.
4. Li Huang (SEMILAB): 1) There are test methods based on other testing principles, such as infrared testing. 2) There is a lamination test method in industry, which stress test is done by layer change.
5. Xinming Huang (JA Solar): 1) There is a formula to see the mechanical strength. 2) Does the thickness test ensure accuracy?
6. Peiya Sun (Rietech): 1) This test method will be effected by silicon wafer surface line and have influence on strength of the results. 2) In the testing process, there may be some intermediate processes such as defects and cracks.
7. Guangchun Zhang (CSI): I think this SNARF hasn't expressed the purpose of the standard clearly.

**Backup (China Renewable Energy Society PV Committee Group Standards Meeting on 10/27/2017 talked same topic )**

1. Liaoxian Bo (Institute of Semiconductors, Chinese Academy of Sciences): The process of defects and annealing should be understood at first. What are the factors that affect the mechanical strength?
2. Yonghui Zhai (Institute of Electrical Engineering, Chinese Academy of Sciences): 1) What is the loading for silicon wafer and solar cell? It can be inferred by the loading of module side. Do the samples need to be pressurized after high and low temperature tests? 2) One is the pressure on the surface, and the other is the pressure on the line, this is the problem of the test point. Since the process is different, how to define pressure? 3) Additionally, comparing the relationship before and after doing EL test, use what to see crack?
3. Bixian Xiang (Institute of Semiconductors, Chinese Academy of Sciences): 1) What is the unit of mechanical strength? 2) The topic is too big. This test method will only be better for silicon wafer, however, the structure of the solar cell involves process problems.
4. Sicheng Wang (Macro Economic Research Institute of the State Development and Reform Commission): This standard should be as close as possible to the pressure of the solar cell, then the standard will be meaningful. Solar cell must conform to the packaged product. The pressure test of sucker, roller and thermal stress must be done.
5. Daoren Gong (CGC): 1) The topic refers to the mechanical strength, but the whole standard refers to only one part of the mechanical strength. 2) Does it conform to the requirements of the definition or meets the requirements of the terms in the standard? 3) For new solar cell, now a lot of them do not mark direction, how to test this kind of solar cell?
6. Attendee: How to judge when the break appears?
7. Zheng Xu (BJTU): Is there any specific requirement for the equipment now? Is there a two-point distance between the brackets?
8. Dengyuan Song (YINGLI): 1) How to take a sample in the future? I mean the sampling data processing method. 2) What are the test scenarios for mechanical strength? 3) Summary: All attendees think this standard is necessary to do; this draft standard has many problems, for example, the title of standard should be modified; The test experiments needs to be done internally.

**Vote:** 5 in favor. (Total 38 companies.) Motion Failed.

**Attachment:** 27 SNARF Test Method for Mechanical Strength of Solar Grade Silicon Wafer and Cell

### 8.2.2 New Standard: Test Method for Extension of Flexible Thin Film PV Modules

**Motion:** To approve the SNARF

**By / 2nd:** Jingbing Zhu (Sunman)/ Dazhou Yan (SINOSICO)

**Discussion:**

1. Zhenyu Wu (Hanergy): 1) Hanergy's flexible module is in mass production. Next year the capacity is about 200-300 MW. Except Hanergy, there are another two companies ready to produce flexible module. I think it is very necessary to do flexible module test. In the case of reliability testing, the detection of humidity and temperature aging changes is also one of the key points of the assessment. The fixed position of the extension will result for different test effect. In addition, the composition of glass will be necessary for the test of multilayer films. 2) The total capacity of flexible module companies can reach to GW. 3) The relevant test data needs to be a little bit more. 4) It is recommended to do the test method at first, and then to do the index.
2. Yaohua Mai (JNU): 1) IEC is not very active about flexible module, can SEMI make a series standards for flexible module instead of an extension related detailed standard. If a series or wide range of flexible module standard is done at SEMI, Hanergy can be a leading company to do it. 2) If extension speed if quick, the conditions differs. In the actual process, the extension speed is relatively quick. Flexible modules often use plastic, so temperature is very important.
3. Guangchun Zhang (CSI): Technical breakthroughs take time, but I believe there will be potential demand for flexible module in the future. This standard can refer to the standard of Crystalline Silicon module and make several part, forming a series of standards.
4. Huichuan Pei (CESI): If there is chance, Chinese enterprises can also go to IEC platform to do flexible module standards.

**Vote:** 25 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** 28 SNARF Test Method for Extension of Flexible Thin Film PV Modules

## 8.3 Request for Ballots in cycle 8-2017, cycle 9-2017, cycle 1-2018

*Photovoltaic Committee China TC Chapter*

### 8.3.1 Doc 5982A, New Standard: Specification for Crystalline Silicon Photovoltaic Module Dimensions

**Motion:** To approve Doc 5982A for ballot in cycle 8-2017

**By / 2nd:** Lianli Yang (CSI)/ Zhixin Li (Linton)

**Discussion:** Refer to 4.2

**Vote:** 35 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** None

### 8.3.2 Doc 6070B, New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Electroluminescence (EL) Imaging

**Motion:** To approve Doc 6070B for ballot in cycle 9-2017

**By / 2nd:** Ping Yan (Trina Solar)/ Tongrong Zhao (LINYANG PV)

**Discussion:** Refer to 4.4

**Vote:** 33 in favor and 0 opposed. (Total 41 companies.) Motion Passed.

**Attachment:** None

### 8.3.3 Doc 5725A, New standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly

**Motion:** To approve Doc 5725A for ballot in cycle 8-2017

**By / 2nd:** Zhen Zhang (Hohai University)/ Tongrong Zhao (LINYANG PV)

**Discussion:** Refer to 4.6

**Vote:** 32 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** None

8.3.4 Doc 6294, Reapproval of SEMI PV47-0513, Specification for Anti-Reflective Coated Glass, Used in Crystalline Silicon Photovoltaic Modules

| | |
|---|---|
| **Motion:** | To approve Doc 6294 for ballot in cycle 8-2017 |
| **By / 2nd:** | Yiwei Guo (Suntech)/ Tongrong Zhao (LINYANG PV) |
| **Discussion:** | Refer to 8.1 |
| **Vote:** | 35 in favor and 0 opposed. (Total 38 companies.) Motion Passed. |

**Attachment:** None

8.3.5 Doc 5983, New Standard: Test Method for In-line Sheet Resistance Inspection

| | |
|---|---|
| **Motion:** | To approve Doc 5983 for ballot in cycle 8-2017 |
| **By / 2nd:** | Hui Long (CETC 48)/ Tongrong Zhao (LINYANG PV)/ Li Huang (SEMILAB) |
| **Discussion:** | 1. Jingbing Zhu (Sunman): Can the temperature be carried? Are there any temperature and humidity requirements in the standard?<br>2. Liangyu Liu: We have temperature requirements in this standard. |
| **Vote:** | 32 in favor and 0 opposed. (Total 38 companies.) Motion Passed. |

**Attachment:** None

8.3.6 Doc 5842B, New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance

| | |
|---|---|
| **Motion:** | To approve Doc 5842B for ballot in cycle 8-2017 |
| **By / 2nd:** | Xusheng Wang (CSI)/ Xinming Huang (JA Solar)/ Li Huang (SEMILAB) |
| **Discussion:** | None |
| **Vote:** | 25 in favor and 0 opposed. (Total 38 companies.) Motion Passed. |

**Attachment:** None

8.3.7 Doc 5661B, New Standard: Test Method for Electrical Parameters of Bifacial Solar Module

| | |
|---|---|
| **Motion:** | To approve Doc 5661B for ballot in cycle 9-2017 or cycle 1-2018 |
| **By / 2nd:** | Jianxiong Ni (YINGLI)/ Tongrong Zhao (LINYANG PV) |
| **Discussion:** | Refer to 4.8 |
| **Vote:** | This document will be reballoted after it was revised. |

**Attachment:** None

*Photovoltaic Materials Committee China TC Chapter*

8.3.8 Doc 5767B, New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers

| | |
|---|---|
| **Motion:** | To approve Doc 5767B for ballot in cycle 8-2017 |
| **By / 2nd:** | Erfei Liu (Linton)/ Tongrong Zhao (LINYANG PV) |
| **Discussion:** | Refer to 4.9 |
| **Vote:** | 41 in favor and 0 opposed. (Total 41 companies.) Motion Passed. |

**Attachment:** None

8.3.9 Doc 6072, Revision of SEMI PV29-0212, Specification for Front Surface Marking of PV Silicon Wafers with Two-Dimensional Matrix Symbols

| | |
|---|---|
| **Motion:** | To approve Doc 6072 for ballot in cycle 8-2017 |
| **By / 2nd:** | Quanzhi Wang(Jinko)/ Tongrong Zhao (LINYANG PV) |
| **Discussion:** | Guangchun Zhang (CSI): Where is the Two-Dimensional Matrix Symbols information when the module companies uses solar cell?<br>Huayun Ge (Hanwha QCELLS): Hanwha QCELLS already had this technology, and did not need to print at each side. If you are worried about the accuracy of the reading, you can print it in the middle of the silicon wafer. This is my experience of sharing many years of technology at Hanwha QCELLS.<br>Li Huang (SEMILAB): Hanwha QCELLS's electronic technology is visible. It is visible on the grid. I don't think it's necessary to code on four edges, from silicon to solar cell. |
| **Vote:** | 28 in favor and 0 opposed. (Total 41 companies.) Motion Passed. |

**Attachment:** None

8.3.10 Doc 6194, New Standard: Test Method for Determination of Hydrogen in PV Polysilicon by Inert Gas Fusion Infrared Absorption Method

| | |
|---|---|
| **Motion:** | To approve Doc 6194 for ballot in cycle 8-2017 |
| **By / 2nd:** | Li He (CPVT)/ Xinming Huang (JA Solar)/ Tongrong Zhao (LINYANG PV) |
| **Discussion:** | Dazhou YAN (SINOSICO): Is there any theory or basis for the hydrogen layer in silicon? What impact will the sample have in the process of circulation?<br>Xiaoxia Liu (GCL): SSP (Sheets from Silicon Powder) is basically around 20, I think it is free form, but it has not been confirmed<br>Guangchun Zhang (CSI): Silicon materials have large number in China; public concerns the quality of silicon. During the 13th five-year plan, the development of the semiconductor industry will also promote the technical progress and quality improvement of the photovoltaic industry. |
| **Vote:** | 34 in favor and 0 opposed. (Total 38 companies.) Motion Passed. |

**Attachment:** None

8.4 Request for publish the Chinese version of standards

8.4.1 SEMI PV64-0715 Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry/电感耦合等离子体光谱法测量光伏多晶硅用工业硅粉中 B, P, Fe, Al, Ca 的含量

| | |
|---|---|
| **Motion:** | To approve for publish Chinese version of standard |
| **By / 2nd:** | Junying Cao (SINOSICO)/ Li Huang (SEMILAB) |
| **Discussion:** | None |
| **Vote:** | 26 in favor and 0 opposed. (Total 38 companies.) Motion Passed. |

**Attachment:** None

8.4.2 SEMI PV50-0114 Specification for Impurities in Polyethylene Packaging Materials for Poly-Silicon Feedstock/多晶硅用聚乙烯包装材料杂质规范

| | |
|---|---|
| **Motion:** | To approve for publish Chinese version of standard |
| **By / 2nd:** | Taoxia Wang (GCL)/ Dazhou Yan (SINOSICO)/ Li Huang (SEMILAB) |
| **Discussion:** | None |

**Vote:** 29 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** None

8.4.3 SEMI PV 74-0216 Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography/硅中氯离子的测定 - 离子色谱分析法

**Motion:** To approve for publish Chinese version of standard
**By / 2nd:** Taoxia Wang (GCL)/ Dazhou Yan (SINOSICO)/ Li Huang (SEMILAB)
**Discussion:** None
**Vote:** 29 in favor and 0 opposed. (Total 38 companies.) Motion Passed.

**Attachment:** None

## 9 Next Meeting and Adjournment

The next meeting is scheduled for May 26, 2018 at Shanghai, China. See http://www.semi.org/standards-events for the current list of events.

Having no further business, a motion was made to adjourn. Adjournment was at 17:20.

Respectfully submitted by:
Sophia Huang
Standards Specialist
SEMI China
Phone: 86-21-60278553
Email: shuang@semi.org

Minutes tentatively approved by:

| | |
|---|---|
| Guangchun Zhang (CSI), Photovoltaic Committee and PV Materials Committee China TC Chapter Co-chair | <2017/11/22> |
| Jun Liu (CESI), Photovoltaic Committee and PV Materials Committee China TC Chapter Co-chair | <2017/11/22> |

**Table 13 Index of Available Attachments[#1]**

| *Title* | *Title* |
|---|---|
| 1 Chinese SEMI Standard Meeting Reminders rev1 | 15 IEC_WORKPROGRAMME_TC82_2017-11-15 |
| 2 China PV&PVM TC Joint Meeting Minutes 20170418 | 16 Introduction of PV Standardization work in China |
| 3 Photovoltaic Materials North America TC Chapter Liaison Report | 17 The list of PV standards in China |
| 4 Photovoltaic Materials Europe TC Chapter Liaison Report | 18 PV Silicon Raw Materials Task Force Report |
| 5 170922_LiaisonReport_JA_PV&PVM_r1 | 19 PV Silicon Wafer Task Force Report |
| 6 PV Taiwan TC Chapter Liaison Report | 20 Crystalline Silicon Solar Cell Task Force Report |
| 7 SEMI Staff Report 20171013 | 21 PV Module Task Force Report |
| 8 6074 Procedural Review | 22 Thin Film PV Module Task Force Report |
| 9 5841A Procedural Review | 23 PV Diffusion Furnace Test Methods Task Force Report |
| 10 6070A Procedural Review | 24 Multi-wire Saws Task Force Report |
| 11 5925A Procedural Review | 25 Testing Equipment Task Force Report |

**Table 13 Index of Available Attachments[#1]**

| | |
|---|---|
| 12 5968A Procedural Review | 26 Standards Five Year Review Doc 6294 |
| 13 TC82 for SEMI Sep17 | 27 SNARF Test Method for Mechanical Strength of Solar Grade Silicon Wafer and Cell |
| 14 IEC_P-PUBS_TC82_2017-11-15 | 28 SNARF Test Method for Extension of Flexible Thin Film PV Modules |

#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.