

**China PV Standards Committee  
Meeting Summary and Minutes**  
China Fall Standards Meeting 2014  
September 12th, 2014, Friday, 09:30 -16:50  
Grand Ballroom, 3F, Shangri-La Hotel Dalian  
66 Renmin Road, Zhongshan District, Dalian, China

**Next Committee Meeting**  
Friday, December 12th, 2014

**Table 1 Meeting Attendees**

**Co-Chairs:** Jun Liu (CESI)

**SEMI Staff:** Allen Lu – SEMI China, Kris Shen – SEMI China, Jesse Zhang – SEMI China, Toby Liu – SEMI China

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Astronergy	Niu	Xinwei	HHXF	Wang	Haichao
Beihang University	Wang	Jiu	HHXF	Cai	Yule
BJUT	Wang	Ruzhi	HHXF	Chang	Faying
Canadian Solar	Tang	Yingtang	Honbest	Huang	Junran
Canadian Solar	Zhou	Chengbai	HT-SAAE	Teng	Xinnian
CNSMQ	He	Dongjiang	HUITONG	Gao	Xue
CPVT	Jiang	Wei	JA SOLAR	Liu	Yong
CPVT	He	Li	JA SOLAR	Wang	Xiaoyong
CRECEXPO	Zhu	Gang	JASO	Huang	Xinming
CS48	Cai	Xianwu	Jingrui	Liu	Bing
CS48	Luo	Liang	Jinko	Liu	Yafeng
CS48	Li	Aicheng	Jolywood	Sun	Yuhai
CS48	Li	Liangmin	JYT	Zhao	Tongrong
CS48	Liu	Liangyu	Kepeida	Li	Jizhong
CS48	Sui	Honglin	Linton	Li	Zhixin
Tanlong	Pan	Yanping	LDK	Liu	Hai
DAHAI	Chen	Wenjie	Linton	Liu	Tieyi
Daqo	Zhou	Tianqun	Lintoncrystal	Lu	Yanghua
Daqo	Liu	Cui	Lintoncrystal	Bao	Bo
Darbond	Liu	Zhongxun	Lintonmachine	Li	Chunan
DDXDF	Duan	Dan	Lnicc	Chen	Benjuan
DETA	Shen	Xiuzhen	Lohmann	Liang	Qingtao
DETA	Zhang	Chunyong	Longi	Liu	Peidong
Diamsaw	Kang	Rongjiao	Loudar	Luo	Jun
DL.GOV	Liu	Yan	Loudar	Wang	Tianxiang
DL.GOV	Jin	Guowei	Rutech	Fan	Baobin
DLUT	Liu	Aimin	Rutech	Xu	Hongmei
Dupont	Hu	Hongjie	Semilab	Chen	Yue
Dupont	Du	Peng	Sevenstar	Li	Dongqi
Edwards	Shao	Wei	Sevenstar	Zheng	Jianyu
Edwards	Hugh	Duong	Sibco	Ton	Schless
Edwards	Chen	Qing	Sibco	Liu	Erming
Edwards	Qu	Biyao	SINOSICO	Yan	Dazhou
Edwards	Zhang	Yanyan	SINOSICO	Chu	Dongxu
EPRI.SGCC	Zhang	Junjun	Sunport	Zhang	Fengming
EPRI.SGCC	Lu	Zhilei	Suntech	Liang	Zhe
FJL	Yang	Aijun	TBEA	Diao	Liangliang
FJL	Lin	Jianchun	TBEA	Wang	Yanhui

Fulwisdom Wire	Hu	zhongxiang	TBEA	Yin	Bo
GCL	Lu	Wenfeng	TBEA	Liu	Guoxia
GCL	You	Da	Techsky	Hu	Xiaohui
GCL	Liu	Xiaoxia	Trinasolar	Zhou	Wei
Gdsolar	Wu	Xiexiang	Trinasolar	Yan	Ping
Goldstone	Li	Wenhong	Trinasolar	Xiao	Taoyun
Goldstone	Hou	Zhenhua	TUV SUD CHINA	Gao	Liang
Greatop	Zhang	Yifei	Twinesolar	Liu	Lin
Gritek	Chang	Qing	Waker	Qin	Wenfang
Hanergy	Lv	Baotang	Wxmgtt	Peng	Jianqin
Hanergy	Zhang	Yingtang	Xindaxin	Shen	Junlai
Hanergy	Guo	Feng	Yingli	Tian	Shuquan
Hareon Solar	Zhang	Yujun	Yingli	Ren	Xiuqiang
Hebei University	Mai	Yaohua	Yingli	Sun	Zhonggang
Heraeus	Wang	Yihua	Zhongneng	Hu	Gongyuan
HHXF	Wang	Yuchang			

**Table 2 Leadership Changes**

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
None		

**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.

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
5426A	New Standard: Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells	Passed with editorial changes
5476B	New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace	Passed with editorial changes
5563A	New Standard: Specification for Framing Tape for PV Modules	Passed with editorial changes
5564B	New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography	Passed with editorial changes
5644	New Standard: Terminology for Back Contact PV Cell and Module	Passed as balloted
5660	New Standard: Specification for Ultra-thin Glasses Used for Photovoltaic Modules	Passed as balloted

**Table 4 Authorized Ballots**

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
5724	Cycle 7-2014	PV Silicon Wafer Task Force	New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells
5477C	Cycle 7-2014	PV Silicon Raw Materials Task Force	New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry

**Table 5 Authorized Activities**

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
5767	SNARF	PV Silicon Wafer Task Force	New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers
5768	SNARF	PV Module	New Standard: Specification for Testing Requirements of Electroluminescence

**Table 5 Authorized Activities**

#	Type	SC/TF/WG	Details
		Task Force	Defect Detection System for Crystalline Silicon PV Modules
5773	SNARF	PV Module Task Force	New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Using Electroluminescence

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**

Item #	Assigned to	Details
ChinaPV-0914-01	Kris, China PV core member companies	Clear up the inactive and invalid members from China PV core member companies

**Table 7 Previous Meeting Action Items**

Item #	Assigned to	Details	Status
None			

### 1 Welcome, Reminders, and Introductions

Committee co-chair Jun Liu chair the meeting and welcome all attendees, all the attendees introduced themselves. Kris Shen called the meeting to order at 9:40 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 / 2<sup>nd</sup>:** Xinwei Niu (Astronergy)/ Zhixin Li(Linton)

**Discussion:** None

**Vote:** 39-0. Motion passed

[Attachment-1, China PV TC Minutes 20140613.pdf](#)

### 3 Staff Report

Kris Shen (SEMI China) gave the staff report. Highlights

- Overview the SEMI Global 2014 Calendar of Events
- SEMI standards publication update
- Overview China Docs
- Remind the upcoming SEMI standards ballots submission deadline, and remind to vote for Cycle 6
- Remind SEMI standards membership application

[Attachment-2, SEMI Staff Report 20140912.pdf](#)

### 4 Liaison Reports

#### 4.1 North America PV Materials Committee

Kris Shen (SEMI China) reported. Highlights:

- Next meeting - North America Fall Standards Meetings, SEMI HQ, San Jose, CA, November 5, 2014

[Attachment-3, NA Liaison Report PV Materials 20140804.pdf](#)

#### 4.2 Europe PV Materials Committee

Kris Shen (SEMI China) reported. Highlights:

- Next meeting – Oct. 6, 2014, SEMICON Europa, Grenoble Franc
- 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-4, European PV Materials Committee Liaison Report June 26, 2014.pdf](#)

#### 4.3 Japan PV and PV Materials Committee

Kris Shen (SEMI China) reported. Highlights:

- Next meeting – September 11, 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
  - Doc. #5532, New Standard: Test Method for Measurement of Cracks in PV Silicon Wafers in PV Modules by Laser Scanning

[Attachment-5, JA PV&PVM China Fall-2014 R0.3a.pdf](#)

#### 4.4 Taiwan PV Committee

Kris Shen (SEMI China) reported. Highlights:

- Next meeting – October 3, 2014, ITRI

[Attachment-6, Taiwan PV Standard Committee Liaison Report201409.pdf](#)

### 5 Ballot Review

5.1 Cycle 5-2014: Doc. 5426A, New Standard: Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells

5.1.1 Document **passed** with editorial changes and will be submitted to A&R SC for procedural review.. See attachment below for detail adjudication.

[Attachment-7, 5426A Procedural Review.pdf](#)

5.2 Cycle 5-2014: Doc. 5476B, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace

5.2.1 Document **passed** with editorial changes and will be submitted to A&R SC for procedural review. See attachment below for detail of ballot adjudication.

[Attachment-8, 5476B Procedural Review.pdf](#)

5.3 Cycle 5-2014: Doc. 5563A, New Standard: Specification for Framing Tape for PV Modules

5.3.1 Document **passed** with editorial changes and will be submitted to A&R SC for procedural review. See attachment below for detail of ballot adjudication.

[Attachment-9, 5563A Procedural Review.pdf](#)

5.4 Cycle 5-2014: Doc. 5564B, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography

5.4.1 Document **passed** with editorial changes and will be submitted to A&R SC for procedural review. See attachment below for detail of ballot adjudication.

[Attachment-10, 5564B Procedural Review.pdf](#)

5.5 Cycle 5-2014: Doc. 5644, New Standard: Terminology for Back Contact PV Cell and Module

5.5.1 Document **passed** as balloted and will be submitted to A&R SC for procedural review. See attachment below for detail of ballot adjudication.

[Attachment-11, 5644 Procedural Review.pdf](#)

5.6 Cycle 5-2014: Doc. 5660, New Standard: Specification for Ultra-thin Glasses Used for Photovoltaic Modules

5.6.1 Document **passed** as balloted and will be submitted to A&R SC for procedural review. See attachment below for detail of ballot adjudication.

[Attachment-12, 5660 Procedural Review.pdf](#)

## 6 Task Force Reports

### 6.1 *PV Silicon Raw Materials Task Force*

- Working on
  - Doc. 5476B, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption after Combustion in an Induction Furnace.
  - Doc. 5477B, New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry.
  - Doc. 5564B, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography.

[Attachment-13, PV Silicon Raw Material TF Report20140912.pdf](#)

### 6.2 *PV Silicon Wafer Task Force*

- Working on Doc. 5724, New Standard : Guide for specifying Quasi-monocrystalline Silicon Wafers Used in Photovoltaic Solar.

[Attachment-14, PV Silicon Wafer TF Report20140912.pdf](#)

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

- Working on
  - Doc. 5426, Specification For Aluminum Paste, Used In Back Surface Field Of Crystalline Silicon Solar Cells
  - Doc. 5427, Specification For Silver Paste, Used To Contact With N+ Diffusion Layer Of Crystalline Silicon Solar Cells
  - Doc. 5659, Test Method Based on RGB for C-Si Solar Cell Color
  - Doc. 5726, Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope
  - Doc. 5727, Test Method for The Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss

[Attachment-15, Crystalline Silicon Solar Cell TF Report20140912.pdf](#)

### 6.4 *PV Module Task Force*

- Working on
  - 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
  - Doc. 5725, Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly

[Attachment-16, PV Module TF Report 20140912.pdf](#)

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

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

[Attachment-17, Silicon Thin Film PV Module TF Report20140912.pdf](#)

#### 6.6 PV Power Station Equipment Integrated Performance Task Force

- Working on
  - Doc. 5648, Test method for the integrated efficiency of installed PV systems
  - Doc. ,Specification for on Site Hotspot Failure

[Attachment-18, PV Power Station Equipment Integrated Performance TF Report 20140912.pdf](#)

#### 6.7 PV Diffusion Furnace Test Methods Task Force

- Published SEMI PV53-0514, the TF inactive now.

[Attachment-19, PV Diffusion Furnace Test Methods TF Report 20140912.pdf](#)

#### 6.8 PV Std. Multi-wire Saws Task Force

- Working on Doc. 5728, Test Method for the Wire Tension of Multi-wire Saws

[Attachment-20, Multi-wire Saws TF Report 20140912.pdf](#)

### 7 Old Business

None

### 8 New Business

#### 8.1 Request for Ballots in cycle 7-2014

- Doc. 5724, New Standard: Guide for Specifying Quasi Monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

**Motion:** To approve Doc. 5724 for Balloting in cycle 7-2014

**By/2 nd:** Hai Liu (LDK)/ Tongrong Zhao(JYT)

**Discussion:** None

**Vote:** 25-0, Motion Passed

- Doc. 5477C, Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission Spectrometry

**Motion:** To approve Doc. 5477C for Balloting in cycle 7-2014

**By/2 nd:** Dazhou Yan(SINOSICO) / Xinwei Niu(Astronergy)

**Discussion:** None

**Vote:** 29-0, Motion Passed

#### 8.2 New SNARFs & TFOFs

- SNARF- New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Using Electroluminescence

**Motion:** To approve the SNARF

**By/2<sup>nd</sup>:** Ping Yan (Trina)/ Xinwei Niu (Astronergy)

**Discussion:** 1. EL standard should including sub-3 standard, the 1st one is PV module test equipment Specification, the 2nd is test methods and 3rd is criteria of the defects. (JA Liu Yong &CSI Tony Tang );

2. This EL test method is limited to crystalline silicon PV modules internal cell defects detection;

3. Standard names need to be modified, amended to “*Test Method for Cell Defects in Crystalline Silicon PV Modules by Using Electroluminescence*”

**Vote:** 17-3, Motion Passed

Attachment-21, Test Method of Internal Micro Defect Detection for PV Modules Introduction.pdf

- SNARF- New Standard: Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers

Motion: To approve the SNARF

By/2<sup>nd</sup>: Erfei Liu (Linton)/ Xinwei Niu (Astronergy)

**Discussion:** 1. Each material has its own standard. We should reference them one by one.

2. It is difficult to detect the  $Fe < 5 \times 10^{13}$  ppm,  $C < 1 \times 10^{16}$ .
3. Material performance is important, but price is also important to consider the cost.
4. The guide should specify on metal and nonmetal respectively.
5. Chose the type of Mu.
6. If ceramic material is acceptable.
7. We should keep communicating to the monocrystal factory.
8. Although some material will influence the quality of crystal, it may be acceptable if the following product is still qualified.
9. This guide will help many factories saving cost.
10. There should be enough data to prove the materials is good choice for the internal feeder.

**Vote:** 23-2, Motion Passed

Attachment-22, Guide for Internal Feeder Materials Used in Silicon Mono-crystal Growers Introduction.pdf

- SNARF- New Standard: Specification for Testing Requirements of Electroluminescence Defect Detection System for Crystalline Silicon PV Modules

Motion: To approve the SNARF

By/2<sup>nd</sup>: Jianchu Lin (FJL)/ Xinwei Niu (Astronergy)

- Discussion:**
1. There should be standardize for EL equipment. Besides, it's suggested that not only standardize for EL equipment but also the testing method and the evaluation specification should be developed. (JA Solar)
  2. This specification is closely related with the solar manufacturers, inspection centers and EL manufacturers, so more discuss should be implemented. (Canadian Solar)
  3. "for Crystalline Silicon PV Modules" should be noted in the title of this specification. (CPVT)
  4. "Testing Requirements" should be added in the title of this specification.
  5. After discussion, the title of this SNARF corrected to "*Specification for Testing Requirements of Electroluminescence Defect Detection System for Crystalline Silicon PV Modules*"

**Vote:** 22-1, Motion Passed

Attachment-23, General Specification for EL Defect Detection System for Solar Module Introduction.pdf

## 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 Dec 12th, 2014, Friday, in Changsha, Hunan, China.

Respectfully submitted by:

Kris Shen  
SEMI China

Minutes approved by:

Jun Liu (CESI) , Co-chair	2014/10/12
Guangchun Zhang (CanadianSolar), Co-chair	2014/10/12

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

#	Title	#	Title
1	China PV TC Minutes 20140613.pdf	12	5660 Procedural Review.pdf
2	SEMI Staff Report 20140912.pdf	13	PV Silicon Raw Material TF Report20140912.pdf
3	NA Liaison Report PV Materials 20140804.pdf	14	PV Silicon Wafer TF Report20140912.pdf
4	European PV Materials Committee Liaison Report June 26, 2014..pdf	15	Crystalline Silicon Solar Cell TF Report20140912.pdf
5	JA_PV&PVM_China_Fall-2014_R0.3a.pdf	16	PV Module TF Report20140912.pdf
6	Taiwan PV Standard Committee Liaison Report201409.pdf	17	Silicon Thin Film PV Module TF Report20140912.pdf
7	5426A Procedural Review.pdf	18	PV Power Station Equipment Integrated Performance TF Report 20140912.pdf
8	5476B Procedural Review.pdf	19	PV Diffusion Furnace Test Methods TF Report 20140912.pdf
9	5563A Procedural Review.pdf	20	Multi-wire Saws TF Report 20140912.pdf
10	5564B Procedural Review.pdf	21	Test Method of Internal Micro Defect Detection for PV Modules Introduction.pdf
11	5644 Procedural Review.pdf	22	Guide for Internal Feeder Materials Used in Silicon Mono-crystal Growers Introduction.pdf
		23	General Specification for EL Defect Detection System for Solar Module Introduction.pdf

#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](http://www.semi.org). For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.