China PV Standards Committee
Meeting Summary and Minutes
China Spring Standards Meeting 2015
March 17th, 2015, Tuesday, 09:00 -17:00
Kerry Hotel, No. 1388 Huamu Road, Pudong, Shanghai

Next Committee Meeting
Friday, July 31, 2015

Table 1 Meeting Attendees

Co-Chairs: Guangchun Zhang (CSI)

SEMI Staff: Kris Shen – SEMI China, Toby Liu – SEMI China, Mina Chen – SEMI China, Andy Tuan – SEMI Taiwan

Company	*Last*	*First*	*Company*	*Last*	*First*
Astronergy	Niu	Xinwei	JYT	Guo	Dawei
AVICglass	Zhang	Chi	JYT	Zhao	Tongrong
Borouge	Tee	Horng Yun	Kayex	Liu	Erfei
BW&A	Wu	Bevan	Koncasolar	He	Jinkang
C-E-M	Lu	Jin	LDK	Wang	Yuepeng
CESI	Feng	Yabing	LDK	Liu	Hai
CHINASC	Li	Shijun	Leshan	Liang	Hong
Chunge Glass	Yang	Bin	Linde	Qiu	Roy
CPVT	Wu	Yuan	Linton	Li	Zhixin
CPVT	He	Li	Longi	Deng	Liangping
CS48	Liu	Liangyu	Longi	Deng	Hao
CS48	Cai	Xianwu	Package Test	Lu	Binling
CS48	Sui	Honglin	Rutech	Xu	Hongmei
CSI	Wang	Xusheng	SEMICON-HO	Zhang	Xuenan
CSI	Long	Weixu	SEMILAB	Huang	Li
CSI	Tang	Yingtang	Sevenstar	Yuang	Guolin
CSI	Zhang	Guangchun	Sevenstar	Li	Dongqi
Darbond	Liu	Zhongxun	Sevenstar	Sun	Pengtao
Dupont	Du	Peng	Sevenstar	Li	Buzhong
Edwards	Chen	Qing	SIBCO	Schless	Ton
Edwards	Shao	Wei	SIBCO	Liu	Erming
FJJL	Zheng	Xiaofeng	SICA	Shi	Jianbing
FJJL	Yang	Aijun	SICA	Chen	Jason
FJJL	Li	Jiansheng	SINOSICO	Chen	Guie
Fudan University	Zhang	Wei	SINOSICO	Cao	Junying
GCL	Lu	Wenfeng	SINOSICO	Yan	Dazhou
GCL	You	Da	SINOSICO	Chu	Dongxu
GCL	Liu	Xiaoxia	SKY	Zhang	Zhenghou
GCL	Huang	Qiang	Sunport	Lu	Zhonglin
GCL	Lv	Jinbiao	Suntech	Zhu	Jingbing
GGsolar	Tang	Baisheng	Suntech	Liang	Zhe
GGsolar	Wu	Xiexiang	Talesun	Wei	Qingzuo
GNE TEK	Yao	Huawen	Talesun	Ni	Zhichun
Goldstone	Zhang	Zhiyong	TBEA	Qiu	Yanmei
Goldstone	Hou	Zhenhua	TBEA	Zan	Wu
Hanergy	Ding	Jian	TBEA	Yin	Bo
Hanergy	Li	Xuan	TBEA	Xiao	Huizhuan
Hanergy	Lv	Baotang	TESA	Zheng	Hua
Hanergy	Guo	Geng	Testpv	Song	Jie
Hareon	Zhang	Yujun	Testpv	Chen	Amy

Hebei University	Mai	Yaohua	Trina	Zhou	Wei
Henna Jiancai	Gen	Xiaoju	Trina	Xiao	Taoyun
Heraeus	Wang	Yihua	TUV SUD	Wu	Yaozhon
Honbest	Rao	Hui	TWNESOLAR	Lin	Hongfeng
Honbest	Zhou	Zhibing	Wacker	Qin	Wenfang
Honbest	Huang	Junran	Wacker		Christoph
Honbest	Chen	Jianbao	Xingyi Glass	Liu	Xiaorong
Honbest	Ma	Hongran	XYTC	Han	Huili
Huanghe Shuidian	Li	Chunsong	Yeah	Wang	Haitao
Huangshi	Kong	Fanxing	YiLi Printing	Liu	Chengfeng
JAsolar	Wang	Xiaoyong	Yingli	Song	Dengyuan
Jinko	Wu	Zhenyu	Yingli	Zhang	Duchao
Jinko	Li	Ning	Yingli	Li	Jing
Jolywood	Sun	Yuhai	Yingli	Ren	Xiuqiang
Jolywood	Xia	Wenjin	Yingli	Sun	Fengxia
JYT	Liu	Hesong			

Table 2 Leadership Changes

Group	*Previous Leader*	*New Leader*
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.

Document #	*Document Title*	*Committee Action*
5648	New Standard: Test Method for the Integrated Efficiency of Installed PV Components	**Failed** and return to TF for re-work
5659A	New Standard: Test Method Based on RGB for C-SI Solar Cell Color	Passed with editorial changes
5726	New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope	Passed with editorial changes
5727	New Standard: Test Method for The Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss	Passed with editorial changes
5728	New Standard: Test Method for the Wire Tension of Multi-wire Saws	Passed with editorial changes
5477D	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	Passed as balloted

Table 4 Authorized Ballots

#	*When*	*SC/TF/WG*	*Details*
None			

Table 5 Authorized Activities

#	*Type*	*SC/TF/WG*	*Details*
5840	SNARF	PV Module Task Force	New Standard: Guide for Calibration of PV Module UV Test Chambers
5841	SNARF	PV Diffusion Furnace Test Methods Task Force	New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace
5842	SNARF	Crystalline Silicon Solar	New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance

Table 5 Authorized Activities

#	Type	SC/TF/WG	Details
		Cell Task Force	
5843	SNARF	PV Silicon Wafer Task Force	Revision of SEMI PV22-1011, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells

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
None		

Table 7 Previous Meeting Action Items

Item #	Assigned to	Details	Status
None			

1 Welcome, Reminders, and Introductions

Committee co-chair Guangchun Zhang chaired the meeting and welcomed 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: Zhixin Li (Linton)/Yuepeng Wan(LDK)
Discussion: None
Vote: 29-0. Motion passed
Attachment-1, China PV TC Minutes 20141212.pdf

3 Staff Report

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

- Overview the SEMI Global 2015 Calendar of Events
- SEMI standards publications update
- Recently Published PV Standards
- Publishied Standards in 2015 Q1 Announcement

Attachment-2, SEMI Staff Report 20150317.pdf

4 Liaison Reports

4.1 *North America PV Materials Committee*
Kris Shen (SEMI China) reported. Highlights:

- Next meeting - North America Spring Standards Meetings, SEMI HQ, San Jose, CA, Wednesday, April 1, 2015
- New SNARFs
  - Doc. 5801, New Standard: Guide for the Planning, Implementing and Analyzing data from a Round Robin used to verify a Test Method
  - Doc. 5802, New Standard: Test Method for In-line, Noncontact Measurement of Saw Marks on Silicon Wafers for PV Applications Using Laser Position Sensor
  - Doc. 5803, New Standard: Test Method for In-line, Noncontact Measurement of Thickness and Thickness Variation of Silicon Wafers for PV Applications Using Laser Position Sensor

Attachment-3, NA Liaison Report PV Materials 20150302.pdf

4.2 *Europe PV Materials Committee*
Kris Shen (SEMI China) reported. Highlights:

- Ballot Results Summary from October 2013 meeting
  - Doc 5565, Line Item Revision to PV42, Test Method for In-Line Measurementof 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
- PV Silicon Materials TF--Last meeting: June, 2014 at Intersolar in Munich, Germany

  - Activities：Discussion of plan for round robin regarding SEMI PV 40, 41, 42, 46 developed by PW

Attachment-4, 141022_Europe_PVMat_LiaisonReport.pdf

4.3 *Japan PV and PV Materials Committee*

Kris Shen (SEMI China) reported. Highlights:

- Japan TC Chapters of PV Global TC and PV Materials Global TC have been jointly discussing the reorganization.
- Last Meeting--December 10, 2014， @ SEMI Japan Office, Tokyo, Japan
- New Standard: *"Test Method for Measurement of Cracks in PV Silicon Wafers in PV Modules by Laser Scanning"*

Attachment-5, 150317_JA_PV&PVM_China-Spring-2015_R0.2.pdf

4.4 *Taiwan PV Committee*

Andy Tuan (SEMI Taiwan) reported. Highlights:

- Doc # 5431 passed publication proof and published as PV56-1214
- Doc # 5597passed publication proof and published as PV57-1214
- Doc # 55995647to be drafted by TF as letter ballot for TC to authorize

Attachment-6, Taiwan PV Liaison Report Mar 17 2015.pdf

5 Ballot Review

5.1 Cycle 1-2015: Doc. 5648, New Standard: Test Method for the Integrated Efficiency of Installed PV Components

5.1.1 Document **Failed** and return to TF for re-work.

Attachment-7, 5648 Failed.pdf

5.2 Cycle 1-2015: Doc. 5659A, New Standard: Test Method Based on RGB for C-SI Solar Cell Color

5.2.1 Document **Passed** with editorial changes.

Attachment-8, 5659A Procedural Review.pdf

5.3 Cycle 1-2015: Doc. 5726, New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope

5.3.1 Document **Passed** with editorial changes.

Attachment-9, 5726 Procedural Review.pdf

5.4 Cycle 1-2015: Doc. 5727, New Standard: Test Method for The Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss

5.4.1 Document **Passed** with editorial changes.

Attachment-10, 5727 Procedural Review.pdf

5.5 Cycle 1-2015: Doc. 5728, New Standard: Test Method for the Wire Tension of Multi-wire Saws

5.5.1 Document **Passed** with editorial changes.

Attachment-11, 5728 Procedural Review.pdf

5.6 Cycle 1-2015: Doc. 5477D, 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

5.6.1 Document **Passed** as balloted.

Attachment-12, 5477D Procedural Review.pdf

6 Task Force Reports

6.1 *PV Silicon Raw Materials Task Force*

- Working on Doc. 5564B, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography.

Attachment-13, SEMI_PV_Silicon_Raw_Meterial20150311.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.
  - Doc. 5767, New Standard : Guide for Material Requirements of Internal Feeders Used in Mono-crystal Silicon Growers
  - New SNARF: Revision of SEMI PV22-1011, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells

Attachment-14, PV Silicon Wafer TF Report 3 172015.pdf

6.3 *Crystalline Silicon Solar Cell Task Force*

- Working on
  - Doc. 5659, New Standard: Test Method Based on RGB for C-Si Solar Cell Color
  - Doc. 5726, New Standard: Test Method for Determining the Aspect Ratio of Solar Cell Metal Fingers by Confocal Laser Scanning Microscope
  - Doc. 5727, New Standard: Test Method for The Etch Rate of A Crystalline Silicon Wafer by Determining The Weight Loss
  - New SNARF: New Standard : Test Method for Metallized Vias Quality of Metal-Wrap-Through Solar Cells

Attachment-15, Crystalline Silicon Solar Cell TF Report-20141204.pdf

6.4 *PV Module Task Force*

- Working on
  - Doc. 5661, New Standard: Test Method for Electrical Parameters of Bifacial Solar Module
  - Doc. 5725, New Standard: Practice for Metal Wrap Through (MWT) Back Contact PV Module Assembly
  - Doc. 5768, New Standard: Specification for Testing Requirements of Electroluminescence Defect Detection System for Crystalline Silicon PV Modules
  - Doc. 5773, New Standard: Test Method for Cell Defects in Crystalline Silicon PV Modules by Using Electroluminescence

- Doc. 5830, New Standard: Classification for Electroluminescence Inspection Defects in Solar Modules

Attachment-16, PV Module TF Report -2015-3-17.pdf

6.5 *Silicon Thin Film PV Module Task Force*

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

Attachment-17, Silicon Thin Film PV Module TF Report 201503.pdf

6.6 *PV Power System Task Force*

- Working on
  - Doc. 5648, New Standard: Test method for the integrated efficiency of installed PV systems
  - Doc. 5729, New Standard: Specification for on Site Hotspot Failure

Attachment-18, SEMI PV Power System Task Force Report -2015 3.17.pdf

6.7 *PV Diffusion Furnace Test Methods Task Force*

- There is no new documents in work.

Attachment-19, PV Diffusion Furnace Test Methods TF Report 20150317.pdf

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

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

Attachment-20, Multi-wire Saws TF Report.pdf

7 Old Business

None

8 New Business

8.1 *New SNARFs & TFOFs*

- SNARF- New Standard: Guide for Calibration of PV Module UV Test Chambers

Motion: To approve the SNARF to send global TC for review
By/2nd: Jiansheng Li(FJJL)/ Zhixin Li (LCT)
Discussion: Question 1：Would National PV Industry Measurement and Testing Center be the only institute that being able to calibrate the UV chambers according to the new standard?

Answer: No it wouldn't. The equipments mentioned in the new standard presentation are all practical commercial products. Each calibration house would be able to calibrate the UV chambers according to the new standard if the investment applied.

Question 2: Does different UV spectral distribution make different aging results? If so, why there is not any related requirement as those for Solar Simulator?

Answer: Different UV spectral distributions cause different aging results. The new standard also has spectral distribution requirement in terms of proportion of UVA, UVB and UVC. It's just not described exactly the same as IEC 60904-9 due to the different construction between UV chambers and solar simulators.

Question 3: Distance between UV radiometer and UV light source is a major set up specification for the calibration. How does the new standard define this distance?

Answer: It's true. This distance should be the same as the distance between the PV module and UV light source.
Vote: 31-0, Motion Passed
Attachment-21, Guide for Calibration of PV Module UV Test Chambers.pdf

- SNARF- Revision of SEMI PV22-1011, Specification for Silicon Wafers for Use in Photovoltaic Solar Cells

Motion: To approve the SNARF
By/2 nd: Hao Deng (Longi)/ Zhixin Li (LCT)
Discussion: 1. Revise the representing method of wafer size in PV22-1011 standard, for instance 156.75±0.25mm, diameter Φ205±0.25mm;

2. Naming work for revised size and specification need further discussion;

3. The contribution of new size and specification for the industry should be estimated..

Vote: 29-0, Motion Passed

Attachment-22, Electroluminescence Inspection in Crystalline Silicon Photovoltaic Modules Introduction.pdf

- SNARF- New Standard: Guide for Specifying Low Pressure Horizontal Diffusion Furnace

Motion: To approve the SNARF
By/2 nd: Pengtao Sun (Sevenstar)/Tongrong Zhao (JYT)

Discussion: 1.There is a relationship between the key parameters and design methods，so we should consider it carefully.

2. The SNARF is drafted for horizontal diffusion furnace, so the header should add ”horizontal” words.

3. How to choose key parameters? The task force members should talk about them deeply.

4. The SNARF will be very valuable, also it might be difficult to finish it。

Vote: 23-0, Motion Passed

Attachment-23, Guide for Specifying Low Pressure Diffusion Furnace-V1.5.pdf

- SNARF- New Standard: Test Method for Metal-Wrap-Through Solar Cell Via Resistance

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

Discussion: Song dengyuan: It’s very important to test the via resistance of MWT cells, but it’s more significant to test the shunt resistance related with via, so the method of testing the via shunt resistance should be applied for another SNARF later.

Tony: The test method of via resistance should be deserved more attention, which is the main purpose of this SNARF, the specific value will be changed according to the manufacturing platform.

Other committee members:

1. It should been explained that the impact on the resistance under the condition of positive and negative bias voltage and the effects of voltmeter shunting. It’s necessary to draw the equivalent circuit of this test method.

2. The title should be changed for: Test method for Metal-Wrap–Through solar cell Via- Resistance.
Vote: 23-0, Motion Passed

Attachment-24, Test Method for Metal Wrap Through Solar Cell Via Resistance.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 July 31th, 2015, Friday, in Qingdao, Shandong.

Respectfully submitted by:
Kris Shen
SEMI China

Minutes approved by:

Guangchun Zhang (CanadianSolar), Co-chair	2015/4/7
Jun Liu (CESI) , Co-chair	2015/4/7

Table 8 Index of Available Attachments #1

#	*Title*	#	*Title*
1	China PV TC Minutes 20141212.pdf	13	SEMI_PV_Silicon_Raw_Meterial20150311.pdf
2	SEMI Staff Report 20150317.pdf	14	PV Silicon Wafer TF Report 3 172015.pdf
3	NA Liaison Report PV Materials 20150302.pdf	15	Crystalline Silicon Solar Cell TF Report-20141204.pdf
4	141022_Europe_PVMat_LiaisonReport.pdf	16	PV Module TF Report -2015-3-17.pdf
5	150317_JA_PV&PVM_China-Spring-2015_R0.2.pdf	17	Silicon Thin Film PV Module TF Report 201503.pdf
6	Taiwan PV Liaison Report Mar 17 2015.pdf	18	SEMI PV Power System Task Force Report -2015 3.17.pdf
7	5648 Failed.pdf	19	PV Diffusion Furnace Test__ Methods TF Report 20150317.pdf
8	5659A Procedural Review.pdf	20	Multi-wire Saws TF Report.pdf
9	5726 Procedural Review.pdf	21	Guide for Calibration of PV Module UV Test Chambers.pdf
10	5727 Procedural Review.pdf	22	Revion of SEMI PC22-1101.pdf
11	5728 Procedural Review.pdf	23	Guide_for_Specifying_Low_Pressure_Diffusion_Furnace-V1.5.pdf
12	5477D Procedural Review.pdf	24	Test Method for Metal Wrap Through Solar Cell Via Resistance.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. For additional information or to obtain individual attachments, please contact [SEMI Staff Name] at the contact information above.