

China PV Committee
Meeting Summary and Minutes
 China Winter Standards Meetings 2013
 October 23th, 2013, Wednesday, 08:30 -18:00
 Meeting Room 8, 2nd floor, Wuxi Worldhotel Grand Juna
 No.111, Hefeng Road, Binhu District, Wuxi, China

Next Committee Meeting
 Thursday, March 20th, 2014

Table 1 Meeting Attendees

Co-Chairs: Guangchun Zhang (CanadianSolar)

SEMI Staff: James Amano – SEMI HQ, Kris Shen – SEMI China, Kai Qiao – SEMI China, Annie An – SEMI China, Toby Liu – SEMI China

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
3M	Liu	Lizhi	JYT	Guo	Dawei
48th Research Institute	Cai	Xianwu	LDK	Wan	Yuepeng
48th Research Institute	Liu	Liangyu	LDK	Cao	Sheng
48th Research Institute	Long	Hui	None	Wu	Zhenyu
48th Research Institute	Xiao	Youwen	Rheinland	Zou	Chicheng
48th Research Institute	Yang	Xiaosheng	Rutech	Mao	Yiqiang
48th Research Institute	Xiong	Hongmei	Semilab China	Chen	Yue
Averydennison	Wang	Jinhu	Sevenstar	Li	Dongqi
Canadiansolar	Peng	Lixia	Sevenstar	Yang	Haiyan
CESI	Pei	Huichuan	SIBCO	Schless	Ton
CNSMQ	He	Dongjiang	SIBCO	Zhu	Jin
CPVT	He	Li	SIC Processing	Wang	Dongxu
CPVT	Jiang	Wei	SINOSICO	Yang	Dazhou
CSI	Tong	Zhi	SINOSICO	Zhang	Yuanyuan
Darbond	Liu	Zhongxun	Solarinco	Li	Zhixin
Darbond	Zhou	Xuancheng	Sunport	Zhang	Fengming
Dowcorning	Wei	Peng	Sunport	Sheng	Wenting
Dupont	Du	Peng	Suntech	Zhu	Jingbing
GCL	Lv	Jinbiao	Suntech	Liang	Zhe
GCL	You	Dawei	Suntech	Chen	Rulong
GCL	Liu	Xiaoxia	Suntech	Lu	Jinggang
GCL	Lu	Wenfeng	Suntech	Ge	Jian
GDsolar	Wu	Xiexiang	Taihu Xincheng	Ren	Xihuang
GDsolar	Wang	Jingrui	TBEA	Liu	Jia
GDsolar	Wu	Zhiwen	TBEA	Li	Jianshuai
Giansolar	Zhao	Shengxia	TBEA	Lv	Xueqian
Hanergy	Ding	Jian	TEBA	Diao	Liangliang
Hanergy	Zhang	Ying	TESA	Wang	Meng
Hanergy	Dun	Taotao	TESA	Zhang	Bo
Hanergy	Yu	Huancong	Tianwei New Energy	Lin	Hongfeng
Hareon	Zhang	Yujun	Tonsan	Yang	Xue
Hebei University	Mai	Yaohua	Tonsan	Yang	Jian
Heraeus	Chen	Chilong	Trina	Xiao	Xinmin
Honbest	Chen	Jianbao	Trina	Xiao	Taoyun
Honbest	Huang	Junran	Trina	Wang	Zhaoyun
Intertek	Guo	Ze	Trina	Xu	Jianmei
ISRA	Liang	Hui	Trina	Huang	Qiang
ISRA	Xu	Chonglong	Trony	Jiang	Ximeng

ISRA	Xu	Jun	Yingli	Yu	Bo
JASolar	Liu	Yong	Yingli	Luo	Qi
JASolar	Wang	Xiaoyong	Yingli	Tian	Shuquan
Jinko Solar	Jin	Hao	Yingli	Ni	Jianxiang
Jinko Solar	Liu	Yafeng	Yingli	Zhang	Xiaofang
Jinko Solar	Yao	Yanyan	Yingli	Hu	Chunhui
JYT	Zhao	Tongrong			

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
Crystalline Silicon Solar Cell Task Force (new TF)		Dengyuan Song (YINGLI)

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>
5382A	New Standard: Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells	Failed and return to TF for re-work
5428A	New Standard: Specification for Impurities in Polyethylene Packaging Materials for Polysilicon Feedstock	Passed as balloted
5564	New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography	Failed and return to TF for re-work
5476	New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace	Failed and return to TF for re-work
5477	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	Failed and return to TF for re-work

Table 4 Authorized Ballots

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
5429	8-2013	PV Diffusion Furnace Test Methods TF	New Standards: Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces
5563	8-2013	Crystalline Silicon PV Module TF	New Standard: Specification for Framing Tape for PV Modules
5426	8-2013	Metal Paste for Crystalline Silicon Solar Cells TF	New Standard: Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells
5427	8-2013	Metal Paste for Crystalline Silicon Solar Cells TF	New Standard: Specification for front Surface Silver Paste, Used in P-Type crystalline Silicon Solar Cells
5564A	8-2013	PV Silicon Raw Materials TF	New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography
5476A	8-2013	PV Silicon Raw	Doc. New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an

Table 4 Authorized Ballots

#	When	SC/TF/WG	Details
		Materials TF	Induction Furnace
5477A	8-2013	PV Silicon Raw Materials TF	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
5382B	8-2013	PV Silicon Wafer TF	New Standard: Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

Table 5 Authorized Activities

#	Type	SC/TF/WG	Details
	TFOF	Crystalline Silicon Solar Cell Task Force	Charter: Identify standardization needs and priorities for crystalline silicon solar cell. Develop standards for specifications, guidelines and test methods related to crystalline silicon solar cell.
5659	SNARF	Crystalline Silicon Solar Cell Task Force	New Standard: Test Method for C-Si Solar Cell Color
5660	SNARF	Crystalline Silicon PV Module Task Force	New Standard: Specification for Ultra-thin Glasses Used for Photovoltaic Modules
5661	SNARF	Crystalline Silicon PV Module Task Force	New Standard: Test Method for Electrical Parameters of Bifacial Solar Module

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-1013-01	All China PV Task Force Leader and Kris	Decrease and merge China task force to 6 TFs

Table 7 Previous Meeting Action Items

Item #	Assigned to	Details	Status
None			

1 Welcome, Reminders, and Introductions

Committee member Guangchun chair the meeting and welcome all attendees, all the attendees introduced themselves. Kris Shen called the meeting to order at 8:40 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 / 2nd: Zhixin Li(Solarinco)/ Yong Liu (JASolar)

Discussion: None

Vote: 26-0. Motion passed

[Attachment-1, China PV TC Minutes 20130812.pdf](#)

3 Staff Report

Kris Shen (SEMI) gave the staff report. Highlights

- Overview the SEMI Global 2013 and early 2014 Calendar of Events
- Remind the upcoming SEMI standards ballots submission deadline, and remind to vote for Cycle 7
- Remind there are one more ballot cycle, Cycle 8
- Recently Published 2 PV Standards
 - [SEMI PV48-0613](#) Specification for Orientation Fiducial Marks for PV Silicon Wafers
 - [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

[Attachment-2, SEMI Staff Report 20131023.pdf](#)

4 Liaison Reports

4.1 North America PV Materials Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting - North America Fall Standards Meetings, SEMI HQ, San Jose, CA, October 30, 2013
- New SNARFs
 - PV Electrical & Optical Measurement TF
 - Doc. 5608: Line-item Revision to SEMI PV13-1111, Test Method for Contactless Excess-Charge-Carrier Recombination Lifetime Measurement in Silicon Wafers, Ingots, and Bricks Using an Eddy-Current Sensor

[Attachment-3, NA Liaison Report PV Materials 20130718.ppt](#)

4.2 European PV Equipment Automation Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting - June 2014, Intersolar Europe, Munich, Germany
- Upcoming Ballot- Cycle 8
 - Doc 5153 New Subordinate Standard "Data Definition specifications for a Horizontal Communication between equipment for crystalline photovoltaic fabrication system" (Parent Document is 4804, "Specification For A Horizontal Communication Between Equipment For Photovoltaic Fabrication System")

[Attachment-4, EU PV Equipment Liaison Report 20131021.ppt](#)

4.3 Europe PV Materials Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting - June 2014, Intersolar Europe, Munich, Germany
- 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, EU PV Materials Liaison Report 20131022.ppt](#)

4.4 Japan PV Automation Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting - October 24, 2013, SEMI Japan, Ichigaya Office, 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
 - Doc. #5631, Line Item Revisions to SEMI PV35-1012, Specification For Horizontal Communication Between Equipment For Photovoltaic Fabrication System

[Attachment-6, JP PVAuto Liaison R0.1.ppt](#)

4.5 Japan PV Materials Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting - October 24, 2013, SEMI Japan, Ichigaya 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-7, JA_PV_PVM_R0.2.pptx](#)

4.6 Taiwan PV Committee

James Amano (SEMI HQ) reported. Highlights:

- Next meeting – July 25, 2013, SEMI Office, Hsinchu
- New TF- Organic and Dye Sensitized Solar Cell TF
 - Charter: The objective is to develop technical Standards related to organic photovoltaic (OPV) and dye sensitized solar cell (DSSC), including new test methods, standardization and evaluation of OPV/DSSC products and components.

[Attachment-8, Taiwan PV Committee.ppt](#)

5 Ballot Review

5.1 Cycle 5-2013: Doc. 5382A, New Standard: Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

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, 5382A Failed.pdf](#)

5.2 Cycle 5-2013: Doc. 5428A, New Standard: Specification for Impurities in Polyethylene Packaging Materials for Polysilicon Feedstock

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

[Attachment-10, 5428A Procedure Review.pdf](#)

5.3 Cycle 5-2013: Doc. 5564, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography

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, 5564 Failed.pdf](#)

5.4 Cycle 6-2013: Doc. 5476, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace

5.4.1 Document **failed** technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.

[Attachment-12, 5476 Failed.pdf](#)

5.5 Cycle 6-2013: Doc. 5477, 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

5.5.1 Document **failed** technical review due to persuasive reject and was sent back to TF for rework. See attachment below for detail adjudication.

[Attachment-13, 5477 Failed.pdf](#)

6 Subcommittee & Task Force Reports

6.1 *PV silicon wafer TF*

- According to the rejects from Cycle 5-2013, updated the document of Doc. 5382A, Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells
Attachment-14, PV Silicon Wafer TF Report.ppt

6.2 *Crystalline Silicon PV Module TF*

- Doc. 5563, Specification for Framing Tape for PV Modules request for ballot in cycle 8-2013
Attachment-15, Crystalline Silicon PV Module TF Report.pptx

6.3 *Metal Paste for Crystalline Silicon Solar Cells TF*

- 2 Docs. request for ballot in cycle 8-2013
 - Doc. 5426, Specification for Aluminum Paste, Used in Back Surface Field of Crystalline Silicon Solar Cells
 - Doc. 5427, Specification for front Surface Silver Paste, Used in P-Type crystalline Silicon Solar Cells.Attachment-16, Metal Paste TF Report.pptx

6.4 *Poly-silicon Packaging Materials Task Force*

- According to the rejects from Cycle 5-2013, updated Doc. 5564, Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography
Attachment-17, Polysilicon Packaging Materials TF Report.pptx

6.5 *PV Diffusion Furnace Test Methods Task Force*

- Doc. 5429, New Standards: Test Method for In-line Monitoring of Flat Temperature Zone in Horizontal Diffusion Furnaces request for ballot in cycle 8-2013
Attachment-18, PV Diffusion Furnace Test Methods TF Report.ppt

6.6 *PV Silicon Raw Materials Task Force*

- According to the rejects from Cycle 5/6-2013, updated 3 docs.
 - Doc. 5564, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography
 - Doc. 5476, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption after Combustion in an Induction Furnace
 - Doc. 5477, New Standard: Test Method for Determining B, P, Fe, Al, Ca Contents in Silicon Powder for PV Applications by Inductively-Coupled-Plasma Optical Emission SpectrometryAttachment-19, PV Silicon Raw Materials TF Report.ppt

6.7 *Silicon Thin Film PV Module Task Force*

- Working on Doc. 5478, Test method for thin-film silicon PV modules light soaking
Attachment-20, Silicon Thin Film PV Module TF Report.ppt

6.8 *PV Power Station Equipment Integrated Performance Task Force*

- Recruiting the TF member, there are 26 members now
- Working on Doc. 5648, New standard: Test Method for the Integrated Efficiency of Installed PV Components
Attachment-21, PV Power Station Equipment Integrated Performance TF Report.pptx

6.9 *Crystalline Silicon PV Back Contact Technology Task Force*

- Recruiting the TF member, there are 20 members now

- Working on Doc. 5644, New Standard: Terminology for Back Contact PV Cell and Module Attachment-22, Crystalline Silicon PV Back Contact Technology TF report.pptx

7 Old Business

None

8 New Business

8.1 Request for Ballots in cycle 8-2013

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

Motion: To approve Doc. 5429 for Balloting in cycle 8-2013

By/2nd: Liangyu Liu(CETC-48) / Dongqi Li (Sevenstar)

Discussion: The accuracy is 3.3% in the report, why the standard test point is 30 points?—Fengming Zhang (Sunport)

The 3.3% is obtained by experiment, while 30 is the number of test points in the standard. In order to adapt to the different furnaces, we provide for the test points 15 to 30 in the standard—Liangyu Liu (CETC-48)

Vote: 30-0, Motion Passed

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

Motion: To approve Doc. 5563 for Balloting in cycle 8-2013

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

Discussion: Q1: The framing tape has a long history in the PV industry; does it include all of suppliers in the process of making the standard?

A1: It includes the most of suppliers in the process of making the standard;

Q2: What's the scale of framing module with tape in the PV industry? What are the advantages of framing tape? What's the significant difficulty in the process of making the standard? Is there significant difference between the different suppliers' standard?

A2: There is a big scale for framing tape in Europe, and the scale is 1:1 in Yingli Company. The first advantage is that improving the efficiency because of no curing, the second advantage is that having a low loss in production process, the third advantage is that it is easy to realize the automatic production, and the last advantage is that no clean in the production process. The standard purpose is that unifying the standards those are using in different tape and module suppliers, there are no significant difference between the different standards.

Q3: Does it define the glue material in the standard?

A3: Currently the tape material is basic same and the chairman Zhang said that the standard should not limit the material development, so it does not distinguish the tape material.

Q4: Does the reliable test include UV test? What should we do except the DH and HF test?

A4: The aging tests only include DH and HF items according to the IEC retest guideline and the tape will hide in the frame, so it is not necessary to do the UV test.

Vote: 39-0, Motion Passed

- Doc.5426--Specification For Aluminum Paste, Used In Back Surface Field Of Crystalline Silicon Solar Cells

Motion: To approve Doc. 5426 for Balloting in cycle 8-2013

By/2nd: Rulong Chen(Suntech) / Zhixin Li(Solarinco)

Discussion: The tolerance of oven temperature need to be confirmed.--Li He(CPVT)

The temperature condition should be included in viscosity requirement.--Li He(CPVT)

The specification of EVA and TPT need to be defined.--Fengming Zhang(Sunport)

Vote: 27-0, Motion Passed

- Doc.5427--Specification For Silver Paste, Used To Contact With N+ Diffusion Layer Of Crystalline Silicon Solar Cells

Motion: To approve Doc. 5427 for Balloting in cycle 8-2013

By/2nd: Rulong Chen(Suntech) / Zhixin Li(Solarinco)

Discussion: The tolerance of oven temperature need to be confirmed.--Li He(CPVT)

The temperature condition should be included in viscosity requirement.--Li He(CPVT)

The published China standards should be referenced.--Dongjiang He(CNSMQ)

Vote: 29-0, Motion Passed

● Doc. 5564A, New Standard: Test Method for the Measurement of Chlorine in Silicon by Ion Chromatography

Motion: To approve Doc. 5564A for Balloting in cycle 8-2013

By/2nd: Wenfeng Lu(GCL)/ Zhixin Li(Solarinco)

Discussion: None

Vote: 23-0, Motion Passed

● Doc. 5476A, New Standard: Test Method for Determination of Total Carbon Content in Silicon Powder by Infrared Absorption After Combustion in an Induction Furnace

Motion: To approve Doc. 5476A for Balloting in cycle 8-2013

By/2nd: Li He (CPVT)/ Fengming Zhang (Sunport)

Discussion: None

Vote: 27-0, Motion Passed

● Doc. 5477A, 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

Motion: To approve Doc. 5477A for Balloting in cycle 8-2013

By/2nd: Dazhou Yan(SINOSICO)/ Zhixin Li(Solarinco)

Discussion: None

Vote: 26-0, Motion Passed

● Doc. 5382B, New Standard: New Standard: Specification for Quasi-monocrystalline Silicon Wafers used in Photovoltaic Solar Cells

Motion: To approve Doc. 5477A for Balloting in cycle 8-2013

By/2nd: Sheng Cao (LDK)/ Zhixin Li(Solarinco)

Discussion: None

Vote: 26-0, Motion Passed

8.2 New SNARFs & TFOFs

● SNARF- New Standard:: Test Method for Electrical Parameters of Bifacial Solar Module

Motion: To approve the SNARF

By/2nd: Jianxiong Ni (Yingli) / Zhixin Li(Solarinco)

Discussion: Q1: During the presentation, first testing sunny side at STC condition, and testing rear side also at 1000W/m², so what is the meaning of this standard?

A1: The aim of standard is to show the difference of real output for bifacial solar module, and it need basic results of indoor testing.

Q2: In this presentation, the SANRF is just a proposal of bifacial testing method, So it is not the right time to apply.

A2: Because the dilemma of power testing method for bifacial solar module has hindered the development of bifacial solar module. Nowadays, PV Fab just test the sunny side of bifacial solar module, and the it decrease the power grade due to the transmission of light, so PV Fab will lose the money, but bifacial solar module can generate more power than normal PV module. So it is very necessary to explore electrical parameters testing method. As to the details of testing method, we had cooperated with many laboratories to set the proposal to combine many factors together. And if our committee makes sure that the theory of the testing method is realizable, so now is the right time to do it.

Q3: How do you get the formula? Why not just testing the power of rear side?

A3: It compares the output of solar modules at outdoor and indoor testing electrical parameters, and simulates the formula. The primary formula is deduced by simulation, and we think that it should be

further corrected and collect more data. The power of rear side of bifacial module varies from the surroundings, and it will be very difficult to test.

Q4: The thesis of this standard focus on bifacial solar module, so why not compare different bifacial solar modules?

A4: Thanks for your suggestion; we will invite other manufactures to join the team to finish this work.

Vote: 23-0, Motion Passed

- New Task Force: Bifacial Power Generating PV Module Task Force

Motion: To approve the SNARF

By/2 nd: Jianxiong Ni (Yingli) / Zhixin Li(Solarinco)

Discussion: Most TC members recommend the SNARF New Standard:: Test Method for Electrical Parameters of Bifacial Solar Module should be involved in Crystalline Silicon PV Module Task Force

Vote: 0-22, Motion Failed

- SNARF-New Standard: Test Method for Circularity and Powder Content of Silicon Carbide for Solar Wafer Cutting

Motion: To approve the SNARF

By/2nd: Xiaofang Zhang (Yingli) / Zhixin Li (Solarinco)

Discussion: Q1 : Is there a roundness testing method is proposed, have proposed defined to roundness, isometric in all directions?

A1: this standard is to write roundness testing methods, the roundness is defined but also is in the standard content, roundness is area of the circumference of the circle, such as actual circumference divided by the number of particles, approximates to the spherical particles, granularity is more close to 1.

Q2: What is the method of sampling, whether to consider testing of the problems of sampling methods, random sampling?

A2: this problem involves the content of the standard, there can be a lot of sampling way, such as sampling in the same bag samples or several bag sample, of course also involves exactly how many grams of sample weight, how many particles into the measuring chamber, etc., these will have an impact on the result of the test, so must be standardized.

Q3: This method can distinguish the types of silicon carbide, silicon powder and silicon carbide?

A3: at present, this method cannot distinguish, but we can according to the particle size and intuitive to see the amount of powder, which is not involved in cutting the number of particles.

Q4: There is already a silicon carbide abrasive standard, if it can't be use, can you use it after change some parameters?

A4: It can't be use, because the current silicon carbide abrasive standard is mainly particle size distribution, no specification for roundness and powder, because didn't involve this item of the roundness, so it can't use directly after the change of parameters.

Vote: 0-15, Motion Failed

- SNARF-New Standard: Test Method For C-Si Solar Cell Color

Motion: To approve the SNARF

By/2nd: Chunhui Hu (Yingli) / Zhixin Li(Solarinco)

Discussion: Q1. Discussion: The Method is to test the color difference on the Cell, But the key problem is on the module, how to convince customers by the cell's standard?

A2: Because the module is formed by cell through the array and encapsulation, So just keep the cell color of the module to be consistent, it can ensure that the module does not appear chromatic aberration.

Q2. How to test the surface is polished or mirror by the three color method? The method has to consider different silicon wafers, different surface, mono-crystalline, multi-crystalline and so on.

A2: The method is used to test the cells which have completed PECVD process or printing and firing process, and the cells have been through the texturization process and diffusion process, so the surface of the cells are texturization, and there is no polishing or mirror. Because there is big difference between

the mono-crystalline and multi-crystalline, so it needs to adjust respectively the range of the color when test the equipment.

Q3. Discussion: Are there any pictures and data to demonstrate the accuracy of this method and the effect, how is the resolution, and any quantitative data.

A3: The method based on our experiment and production data can accurately test the color of the cell by now, and the gray, sequins, chromatic aberration, printing defects cells can be singled out through test, the remaining about 80% of the cell are divided into four or six color which can be directly into the module production, and the modules without chromatic aberration. The detecting resolution of this method is high, it can distinguish the cell with chromatic difference 1 hue value, such as setting hue 213 as shallow blue, then set the hue value 214 as mid blue.

Q4: The cell will appear different color in different point, and the equipment is vertical, how to distinguish the difference? How many colors can the method distinguish?

A4: Indeed, the cell will appear different color in different light, different point, But if the cells appear the same color in the same light and point, they will appear the same color in the same module. The kinds of color can be set according to different requirements, in addition to consider the convenience during module manufacturing, it can set four or six colors.

Q5: Dose this test method have to bind one specific device? what's the direction and the purpose of the standard?

A5: This test method does not need to bind to a specific device, as long as the equipment can meet the production demand of color test and the equipment will be a nice choice. This standard is a test method for cell color test, and the standard will format the related content of color test, not include the product specifications of cell color. The purpose of this standard is to sort the cell's color more efficiently, and accurately, and further reduces the production costs, improve product quality, and contribute to the industry product quality improvement.

Q6. Discussion: Why do you set this test method as a standard, what is the purpose?

A6: Because this method can test the cell color efficiently, accurately, and can reduce the production cost and improve the product quality for the whole industry, so we apply for the method as a standard.

Q7. Discussion: Taiwan has put forward the cell color standard and defined the terms of classification. There are lots of methods for the cell color test, why do you choose this method?

A7: The cell color standard which put forward by Taiwan is different from this test method standard. Due to lots of test equipments in the market at present, in order to ensure the effect of the cell color test, we will format the relative performance parameters of the test instrument in the standard content. This method is more suitable for the method to test the cell color at present.

Q8: Defining a standard or method have to point out the advantage, what is the advantage of the method?

A8: The main advantage of the method are: high measurement precision, high efficiency (one cell per second), low cost, low energy consumption and so on.

Vote: 18-11, Motion Passed

● TFOF- New Task Force: Silicon Solar Cell Task Force

Motion: To approve the TFOF

By/2nd: Chunhui Hu (Yingli) / Zhixin Li(Solarinco)

Discussion: It should decrease and merge China task forces, not formed to much. Kris organize all the TF leaders to merge some ones and announce the new China PV TF structure in the next TC meeting — Yong Liu(JAsolar)

Vote: 23-0, Motion Passed

● SNARF- New Standard: Specification for Ultra-thin Glasses Used for Photovoltaic Modules

Motion: To approve the SNARF

By/2nd: Jianmei Xu (Trina) / Mai Yaohua (Hebei University)

Discussion: Q: Does the element content of glass influence the glass quality?

A: The element content of glass influence the transmittance of the glass, and it doesn't influence the strength of glass obviously.

Q: BIPV modules with “5+5” glass can meet the building strength requirement. Can the ultra-thin glass meet the requirement of BIPV modules on the building?

A: Modules with ultra-thin glass are mainly used for electric station on the ground. So no concern should be paid on the flexibility change of the module.

Vote: 26-0, 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 March 20th, 2014, Thursday, in Shanghai, Combined with Solarcon China 2014.

Respectfully submitted by:

Kris Shen

SEMI China

Minutes approved by:

Guangchun Zhang (CanadianSolar), Co-chair	2013/11/4
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Table 8 Index of Available Attachments #1

#	Title	#	Title
1	China PV TC Minutes 20130812.pdf	12	5476 Failed.pdf
2	SEMI Staff Report 20131023.ppt	13	5477 Failed.pdf
3	NA Liaison Report PV Materials 20130718.ppt	14	PV Silicon Wafer TF Report.ppt
4	EU PV Equipment Liaison Report 20131021.ppt	15	Crystalline Silicon PV Module TF Report.pptx
5	EU PV Materials Liaison Report 20131022ppt	16	Metal Paste TF Report.pptx
6	JP_PVAuto_Liaison_R0.1.ppt	17	Polysilicon Packaging Materials TF Report.pptx
7	JA_PV_PVM_R0.2.pptx	18	PV Diffusion Furnace Test Methods TF Report.ppt
8	Taiwan PV Committee.ppt	19	PV Silicon Raw Materials TF Report.ppt
9	5382A Failed.pdf	20	Silicon Thin Film PV Module TF Report.ppt
10	5428A Procedure Review.pdf	21	PV Power Station Equipment Integrated Performance TF Report.pptx
11	5564 Failed.pdf	22	Crystalline Silicon PV Back Contact Technology TF report.pptx

#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.