

North America HB-LED Committee Meeting Summary and Minutes

N.A. Standards Spring 2013 Meetings
Thursday April 4, 2013 15:00 – 17:00 PST
SEMI Headquarters in San Jose, CA

Next Committee Meeting

The next N.A. HB-LED committee meeting is scheduled for July 11, 2013 in conjunction with SEMICON West 2013 at the San Francisco Marriott Marquis Hotel in San Francisco, CA.

*All times are in PST. Times and dates are subject to change without notice.
For additional meeting details, the latest schedule, registration, and travel information, please visit <http://www.semi.org/node/45276>

Table 1 Meeting Attendees

Co-Chairs: Chris Moore (Semilab), Iain Black (Philips Lumileds), Bill Quinn (Veeco), David Reid (Silian)
SEMI Staff: Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
BayTech Group	Baylies	Winthrop	SuperSight	Peroots	Len
<i>Brooks Automation</i>	<i>Babbs</i>	<i>Daniel</i>	Tokyo Electron	Mashiro	Supika
BW & Associates	Wu	Bevan	Zeromicron	Nguyen	Francis
Cimetrix, Inc.	Rubow	Brian	Zeromicron	Nguyen	Luu
GT Advanced Technologies	Joyce	David	Zeromicron	Nguyen	Ryan
<i>Entegris</i>	<i>Felipe</i>	<i>Jeff</i>			
Silian	Chao	Julie	SEMI Headquarters	Amano	James
Silian	Reid	David	SEMI Japan	Kanno	Hirofumi
Sonoscan	Martell	Steve	SEMI N.A.	Tran	Michael

Italics indicates virtual participants

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
Equipment Automation Task Force - Software Working Group	Karl-Heinz Büchel (AIXTRON SE)	Brian Rubow (Cimetrix)

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>
5420A	New Standard: Specification for 150 mm Open Plastic and Metal Wafer Cassettes Intended for Use for Manufacturing HB-LED Devices	Passed as balloted. Superclean.

Table 4 Authorized Activities

There were no authorized activities.

Table 5 Authorized Ballots

#	When	SC/TF/WG	Details
5468	Cycle 3-2013	HB-LED Equipment Automation Interfaces TF	New Standard: Mechanical Interface Specification for 150 mm HB-LED Load Port
5469	Cycle 4-2013	HB-LED Equipment Automation Interfaces TF	New Standard: Specification for High Brightness LED Manufacturing Equipment Communication Interface (HB-LED ECI)

Table 6 New Action Items

Item #	Assigned to	Details
2013Apr#01	Julie Chao	Work on adding Lasermarking to SEMI HB1.
2013Apr#02	David Joyce	Work on the defect definitions as a Related Information addition to SEMI HB1.
2013Apr#03	HB-LED Wafer TF	Review SEMI MF154 on adding <i>Glossary of Structures and Contaminants Seen on Specular Sapphire Wafer Surfaces</i> to SEMI HB1.
2013Apr#04	Julie Chao, Win Baylies, Matt Novak, David Joyce and Steve Martell	Analyze the Double Sided Polishing survey results and send out the summary for review at the next HBLED Wafer TF teleconference.
2013Apr#05	Julie Chao, Win Baylies, David Joyce and Steve Martell	Analyze the Patterned Sapphire Substrate survey results and send out the summary for review at the next HBLED Wafer TF teleconference.
2013Apr#06	Win Baylies, Julie Chao, Francis Nguyen	Review SEMI M38 and work on adding reclaimed wafer specifications to SEMI HB1.
2013Apr#07	John Stover	Review and update the Purchase Order in SEMI HB1.
2013Apr#08	David Joyce	Ask Luke Glinski for an Impurities and Defects TF co-leader.
2013Apr#09	Win Baylies	Send the TFOF for the Patterned Sapphire Substrate (PSS) TF to the committee for review.
2013Apr#010	Len Perroots	Prepare a report to the committee on the applicability of notchless wafers to HB-LED sapphire wafers.

Table 7 Previous Meeting Actions Items

Item #	Assigned to	Details	Status
2012Oct#01	Michael Tran and Paul Trio	Publish the updated Double-Sided Polishing (DSP) survey online and find volunteers to test for potential survey bugs.	CLOSED
2012Oct#02	Chris Moore	Review SNARF #5529 (HB-LED JMMM) for Aixtron only specifications.	OPEN
2012Oct#03	Chris Moore	Send an email to the European Silicon Wafer committee regarding the HB-LED committee revisions to their SNARF for Gallium Nitride on Silicon Wafer	OPEN
2012Jul#01	HB-LED Wafer TF	Revise AUX001 to separate sapphire vendors.	CANCELED
2012Jul#02	HB-LED Wafer TF	Indicate how to become a registered supplier.	CLOSED
2012Jul#03	Jiao Jianzhong	Email revised Document #5265A to the HB-LED Wafer TF.	CLOSED
2012Jul#04	Julie Chao	Contact Heehyack Jang (ILJIN Display) to discuss his reject vote about "Tighter Specifications."	CLOSED

1 Welcome, Reminders, and Introductions

1.1 David Reid (Silian) called the meeting to order at 3:09 PM PST. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

Attachment: 01, SEMI Standards Required Meeting Elements

2 Review of Previous Meeting Minutes

2.1 The committee reviewed the minutes of the previous meeting.

Motion: To approve the previous meeting minutes (Fall 2012) as written.

By / 2nd: David Joyce (Silian) / Len Peroots (SuperSight)

Discussion: None.

Vote: Unanimous in favor. Motion passed.

Attachment: 02, HB-LED Meeting Minutes (Fall 2012)

3 Liaison Reports

3.1 *N.A. SEMI Staff Report*

3.1.1 Michael Tran (SEMI N.A.) gave the N.A. Staff Report. The key items were as follows:

- Some Upcoming SEMI Major Events
 - SEMICON West 2013
 - July 9-11, 2013 in San Francisco, CA, USA
 - SEMICON Taiwan 2013
 - September 4-6, 2013 in Taipei
 - SEMICON Europa 2013
 - October 8-10, 2013 in Dresden, Germany
- Upcoming North America Standards Meetings
 - NA Compound Semiconductor Materials Committee in conjunction with CS MANTECH 2013
 - May 15, 2013 in New Orleans, Louisiana
 - NA Standards Meetings at SEMICON West 2013
 - July 8-11, 2013 in San Francisco, California
- Cycle 4 and 5-2013 Critical Dates for SEMI Standards Ballots
 - Cycle 4, 2013
 - Ballot Submission Date: May 20, 2013
 - Voting Period Starts: June 1, 2013
 - Voting Period Ends: July 1, 2013
 - Cycle 5, 2013
 - Ballot Submission Date: July 18, 2013
 - Voting Period Starts: July 29, 2013

- Voting Period Ends: August 28, 2013
- SEMI Standards Publications
 - Standards published from January 2013 to March 2013:
 - New Standards: 9
 - Revised Standards: 14
 - Reapproved Standards: 2
 - Withdrawn Standards: 2
 - There are a total of 871 SEMI Standards in portfolio and that includes 93 Inactive standards
- Major Items Included in the Revision to the SEMI *Regulations*
 - This revision to the *Regulations* added a new category called Complementary Files
 - Complimentary files are considered an official part of a standard or safety guideline
 - Complimentary files are NOT in PDF file format
 - Otherwise, they would be conjoined to the standard or safety guideline which are published in the PDF file format
 - They could be in any non-PDF format that is required for use with a standard or safety guideline
 - The TC Chapters decide which non-PDF files are complimentary
 - If they are not complimentary, then they are considered non-official and are categorized as *Various Materials*
 - If they are complimentary, then the files must be balloted if they are revised or added to a standard or safety guideline
 - Other Major Items
 - Global Technical Committee Structure
 - All regional and local TC become chapters and are independent regardless of whether an RSC exist in their region
 - Formation and Disbandment of Global Technical Committee
 - Formation and Disbandment of TC Chapter under existing Global Technical Committee
 - Elimination of Regional Standards
 - Intellectual Property (IP) section (§15 in the *Regulations*)
 - There is now an exit mechanism for Letter of Assurances in “limbo”
 - More clarification for Letter of Intents and the discovery of IP after a standard is published
- Major Items Included in the Revision to the SEMI *Procedure Guide*
 - The *Procedure Guide* was revised to align with changes in the *Regulations*
 - Added the TFOF as Appendix 2

- Addition of recommendation for author and/or the TF leader to distribute draft ballot to all TF members 7 days prior to Letter Ballot submission
- Global Activity Report
 - North America has the most TFs, SNARFs, and ballots followed by Japan and Europe
 - Please see the attached Staff Report for detailed information and other regions
- Request to Members
 - Looking for details on how standards are actually used:
 - Development/Engineering
 - Procurement
 - Manufacturing
 - Interview should take less than 30 minutes – contact James Amano (jamano@semi.org) or any Standards staff
- SEMI N.A. contact: Michael Tran, mtran@semi.org

Attachment: 03, SEMI NA Staff Report Spring 2013

4 Ballot Review

NOTE 1: Committee adjudication on ballots reviewed is detailed in the Audits & Reviews (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.

Document #	Document Title	Committee Action
5420A	New Standard: Specification for 150 mm Open Plastic and Metal Wafer Cassettes Intended for Use for Manufacturing HB-LED Devices	Passed as balloted. Superclean.

Motion: Document 5420A passed committee review as balloted and will be forwarded to the A&R for procedural review.
By / 2nd: Win Baylies (BayTech Group) / Julie Chao (Silian)
Discussion: None.
Vote: 8-0 in favor. Motion passed.

Attachment: 04, A&R Form for Procedural Review of Document #5420A

5 Subcommittee & Task Force Reports

5.1 HB-LED Wafer Task Force

5.1.1 Julie Chao (Silian) and Winthrop Baylies (BayTech Group) reported for the HB-LED Wafer Task Force. The TF reviewed previously approved changes in SEMI HB1-0113, *Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Device*. Some of the approved changes included uniqueness for wafer IDs, revision to the back surface roughness specification and updated the bow and warp definitions for front surface, back surface and median planes.

5.1.2 The TF will work on further additions to SEMI HB-1 in the future:

- Lasermarking
 - Frontside, Backside

- Reference to fiducial on Frontside, Backside
- Orientation of Mark
- Mark Font (data matrix and alphanumeric)
- Mark Message (serialization, i.e. supplier information)
- Defect definitions: Crack, Pit, Scratch, Surface Purity [updated] as Related Information
- Glossary of *Structures and Contaminants Seen on Specular Sapphire Wafer Surfaces* (SEMI MF 154)
- Patterned Sapphire Substrate ready Wafer Specifications
- Double Sided Polishing Wafer Specifications
- Updated Surface Roughness Parameters & Test Methods
- Reclaimed Wafer Specifications (SEMI M38,)

Action Item: 2013Apr#01, Julie Chao to work on adding Lasermarking to SEMI HB1.

Action Item: 2013Apr#02, David Joyce to work on the defect definitions as a Related Information addition to SEMI HB1.

Action Item: 2013Apr#03, The HB-LED Wafer TF to review SEMI MF154 on adding *Glossary of Structures and Contaminants Seen on Specular Sapphire Wafer Surfaces* to SEMI HB1.

Action Item: 2013Apr#04, Julie Chao, Win Baylies, Matt Novak, David Joyce and Steve Martell to analyze the Double Sided Polishing survey results and send out the summary for review at the next HB-LED Wafer TF teleconference.

Action Item: 2013Apr#05, Julie Chao, Win Baylies, David Joyce and Steve Martell to analyze the Patterned Sapphire Substrate survey results and send out the summary for review at the next HB-LED Wafer TF teleconference.

Action Item: 2013Apr#06, Win Baylies, Julie Chao, and Francis Nguyen to review SEMI M38 and work on adding reclaimed wafer specifications to SEMI HB1.

Action Item: 2013Apr#07, John Stover to review and update the Purchase Order in SEMI HB1.

Attachment: 05, HB-LED Wafer TF Report Spring 2013

5.2 Impurities and Defects Task Force

5.2.1 David Joyce (GT Advanced Technologies) reported for the Impurities and Defects TF. The TF reviewed the Impurities and Defects survey results since their last meeting in conjunction with the Strategies in Light conference. Currently, the TF is jointly working with the HB-LED Wafer TF on the defect definitions for Crack, Pit, Scratch, and Surface Purity as a Related Information for SEMI HB-1. The TF is also considering looking for a co-leader as Luke Glinski (GT Advanced Technologies) the TF leader have not been active in the TF.

Action Item: 2013Apr#08, David Joyce to ask Luke Glinski for an Impurities and Defects TF co-leader.

5.3 HB-LED Equipment Automation TF

5.3.1 Equipment Automation TF – Hardware WG

5.3.1.1 Jeff Felipe (Entegris) reported for the Equipment Automation TF – Hardware WG. The TF reviewed the voting results for Document #5420A, *New Standard: Specification for 150 mm Open Plastic and Metal Wafer*

Cassettes Intended for Use for Manufacturing HB-LED Devices. The document was superclean as there were no reject votes or negatives. The TF submitted the document to the committee for review and it was approved.

5.3.1.2 The TF submitted document 5468 (Specification for 150 mm HB-LED Loadport) for balloting in Cycle 3-2013 and it was approved by the committee. They plan to hold a teleconference during June to review the voting results.

5.3.2 *Equipment Automation TF – Software Working Group*

5.3.2.1 Brian Rubow (Cimetrix) reported for the Equipment Automation TF – Software WG. There was a leadership change in the Working Group as Karl-Heinz Büchel from AIXTRON SE has stepped down and Brian Rubow from Cimetrix was appointed the Working Group Chair. The WG reviewed and balloted document 5469 (Equipment Communication Interface) in Cycle 4-2013 with approval from the committee. Document 5529 (Job Management and Material Management) will be balloted sometime in 2014.

Attachment: 06, HB-LED Equipment Automation TF Report – Hardware WG

Attachment: 07, HB-LED Equipment Automation TF Report – Software WG

6 Old Business

6.1 There was no old business.

7 New Business

7.1 *Proposal of the Patterned Sapphire Substrate (PSS) TF*

7.1.1 Win Baylies (BayTech Group) submitted a TFOF to form the Patterned Sapphire Substrate (PSS) TF for the committee to review. The PSS TF will develop a new document for the definitions of PSS geometries. The committee was concerned that some of the defined PSS geometries could be protected by Intellectual Properties (IP). Win and Julie said the TF will only develop definitions of the geometries and no specifications or values of the geometries will be used. Julie Chao and Win believes the document will be safe as it should not infringe on existing IP and it will be written to avoid potential IP issues. The committee is still concern because there are still a lot of unknowns for defining the PSS geometries and steps. David Joyce said most of the companies that patterned sapphires will not want to deal with IP or sign any agreement. After the committee discussion, the TFOF was revised to remove metrics and any hints of values or Specifications. Win will distribute the TFOF to the committee for additional review.

Attachment: 08, TFOF for the Patterned Sapphire Substrate (PSS) TF

Action Item: 2013Apr#09, Win Baylies to send out the TFOF for the Patterned Sapphire Substrate (PSS) TF

7.2 *The Applicability of the Notchless Wafers Fiducial Markings to HB-LED Wafers*

7.2.1 Len Peroots (Supersight) reported to the committee on the topic of 450 mm Notchless Wafers presented by Pinyen Lin from the Global 450 Consortium. The notchless wafers use backside laser-inscribed fiducial marks for alignment instead of having to depend on a notch of a wafer. Len said it is an evolution of how wafers are marked and it looks like the technology will be available for sapphire wafers, but he is not familiar with the readability and applicability of the marks on sapphire. According to members of the Global 450 Consortium, sapphire wafers does meet some of the criteria for the technology. Len said this technology and activity will be incorporated into a standard and is being proposed to the Silicon Wafer committee at SEMICON West 2013. This is something worth looking into and Len will have a report to the committee on the applicability of the technology to the HB-LED sapphire wafers.

Action Item: 2013Apr#10, Len Peroots to prepare a report to the committee on the applicability of notchless wafers to HB-LED sapphire wafers.

7.3 New Ballot Authorizations

7.3.1 The committee approved the following documents for balloting:

#	When	SC/TF/WG	Details
5468	Cycle 3-2013	HB-LED Equipment Automation Interfaces TF	New Standard: Mechanical Interface Specification for 150 mm HB-LED Load Port
5469	Cycle 4-2013	HB-LED Equipment Automation Interfaces TF	New Standard: Specification for High Brightness LED Manufacturing Equipment Communication Interface (HB-LED ECI)

Motion: To approve the balloting of document 5468 in Cycle 3-2013.

By / 2nd: Jeff Felipe (Entegris) / David Joyce (GT Advanced Technologies)

Discussion: None.

Vote: 8-0 in favor. Motion passed.

Motion: To approve the balloting of document 5469 in Cycle 4-2013.

By / 2nd: Brian Rubow (Cimetrix) / Bevan Wu (BW & Associates)

Discussion: None.

Vote: 9-0 in favor. Motion passed.

8 Action Item Review

8.1 Open Action Items

8.1.1 Michael Tran (SEMI N.A.) reviewed the open action items. These can be found in the Open Action Items table at the beginning of these minutes.

8.2 New Action Items

8.2.1 Michael Tran (SEMI N.A.) reviewed the new action items. These can be found in the New Action Items table at the beginning of these minutes.

9 Next Meeting and Adjournment

9.1 The next N.A. HB-LED Standards Meetings is scheduled in conjunction with SEMICON West 2013 for July 10 and 11 at the San Francisco Marriott Marquis Hotel in San Francisco, CA.

Tentative Schedule

Wednesday, July 10*

- HB-LED Equipment Automation Hardware WG TF (08:30 AM - 12:00 PM Noon)

Thursday, July 11*

- HB-LED Equipment Automation Software WG TF (09:00 AM - 2:30 PM)
- HB-LED Wafer TF / Impurities & Defects TF (08:00 AM - 3:00 PM)

- HB-LED Technical Committee (3:00 PM - 5:00 PM)

*All times are in PST. Times and dates are subject to change without notice.

For additional meeting details, the latest schedule, registration, and travel information, please visit <http://www.semi.org/node/45276>

9.2 Having no further business, a motion was made to adjourn the N.A. HB-LED committee meeting on April 4, 2013 in conjunction with the N.A. Standards Spring 2013 Meetings at SEMI Headquarters in San Jose, CA.

Respectfully submitted by:

Michael Tran
 Senior Standards Engineer
 SEMI North America
 Phone: 1-408-943-7019
 Email: mtran@semi.org

Minutes approved by:

Chris Moore (Semilab), Co-chair	
Bill Quinn (William Quinn Consulting), Co-chair	
David Reid (Silian), Co-chair	
Iain Black (Philips Lumileds), Co-chair	

Table 8 Index of Available Attachments #1

#	Title	#	Title
01	SEMI Standards Required Meeting Elements	05	HB-LED Wafer TF Report Spring 2013
02	HB-LED Meeting Minutes (Fall 2012)	06	HB-LED Equipment Automation TF Report – Hardware WG
03	SEMI NA Staff Report Spring 2013	07	HB-LED Equipment Automation TF Report – Software WG
04	A&R Form for Procedural Review of Document #5420A	08	TFOF for the Patterned Sapphire Substrate (PSS) TF

#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 Michael Tran at the contact information above.