

## North America HB-LED Technical Committee Chapter Meeting Summary and Minutes (DRAFT)

N.A. Standards Fall 2014 Meetings  
Thursday, November 06, 2014 14:00 – 17:00 Pacific Time  
SEMI Headquarters in San Jose, California

### Next N.A. HB-LED TC Chapter Meeting

The next N.A. HB-LED TC Chapter Meeting will be held in conjunction with the N.A. Standards Spring 2015 Meetings at SEMI Headquarters in San Jose, California. Please see § 9 of these minutes for the tentative schedule for all HB-LED standards meetings and visit <http://www.semi.org/node/54226> for more information.

### Table 1 Meeting Attendees

**Co-Chairs:** Iain Black (Philips Lumileds)  
Mike Feng (Silian)  
Chris Moore (BayTech-Resor)

**SEMI Staff:** Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Aashi Glass	Takahashi	Mark	<i>Microsense</i>	<i>Kallus</i>	<i>David</i>
BayTech-Resor	Baylies	Winthrop	<i>Self</i>	<i>Wagner</i>	<i>Peter</i>
BayTech-Resor	Moore	Chris	Sonoscan	Martell	Steve
BW & Associates	Wu	Bevan	SuperSight	Peroots	Len
Corning	Schmidt	Ilona	Veeco	Armour	Eric
Hennecke Systems	Gruening	Chris	SEMI N.A.	Tran	Michael

*Italics indicates virtual participants*

### Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
NA HB-LED TC Chapter	Bill Quinn (WEQ Consulting), <i>stepped down as co-chair</i>	Eric Armour (Veeco), <i>new co-chair pending NARSC approval.</i>
NA HB-LED Tablet Working Group		Chris Moore (BayTech-Resor)
NARSC		Chris Moore (BayTech-Resor) <i>is now the primary co-chair representative of the NA HB-LED TC Chapter for the NARSC.</i>

### 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>TC Chapter Action</i>
5741	Line item revisions to SEMI HB1-0814, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices	
Line Item 1	Update References to Section 3.1 and Table R1-1, Row 2-3.8 and Row 2-3.10	<b>Passed</b> TC Chapter review as balloted.

**Table 4 Authorized Activities**

#	Type	SC/TF/WG	Details
---	TFOF	Korea HB-LED WG	HB-LED Source Materials TF ( <i>New Task Force under the NA HB-LED TC Chapter</i> )
5818	SNARF	HB-LED Wafer TF	Line Items Revision to SEMI HB1-XXXX, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices  <i>(There is a prior revision of SEMI HB1-0814 (Document 5741) pending further procedural review and publication. This SNARF will be effective after the outcome of Document 5741.)</i>

Note: SNARFs and TFOFs are available for review on the SEMI Website at:  
<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

**Table 5 Authorized Ballots**

Listing of documents approved by the TC Chapter for letter ballot.

#	When	SC/TF/WG	Details
5747	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Saw Marks on Crystalline Sapphire Wafers Using Optical Probes
5748	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Thickness and Shape of Crystalline Sapphire Wafers Using Optical Probes
5749	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Waviness of Crystalline Sapphire Wafers Using Optical Probes

**Table 6 New Action Items**

Item #	Assigned to	Details
2014Nov#01	Eric Armour	To share with Veeco Korea his feedback for a proposed new standard: Specification of Epitaxial Metal Organic Sources and copy Michael Tran.
2014Nov#02	Win Baylies / Chris Moore / Michael Tran	Let the Korea HB-LED Working group members know about the revisions made to their TFOFs and SNARFs at the NA HB-LED TC Chapter meeting.
2014Nov#03	Chris Moore / Michael Tran	To have a session at the next TF or TC Chapter meeting on the cleanup and chopping block of inactive Task Forces under the NA HB-LED TC Chapter.
2014Nov#04	Michael Tran	To let Paul Trio know that Chris Moore is now the primary co-chair representing the NA HB-LED TC Chapter to the NARSC.

**Table 7 Previous Meeting Actions Items**

Item #	Assigned to	Details	Status
2014Jul#01	Michael Tran	To follow up with the China HB-LED TC Chapter regarding the title of Document 5723 for clarification.	CLOSED
2014Jul#02	Michael Tran	To send David Kallus whenever the newest version SEMI HB1 is published.	CLOSED
2014Jul#03	Michael Tran	To contact Mark Takahashi of AGC Chemicals if interested to join the Sapphire Tablet Substrates Working Group.	CLOSED

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>	<i>Status</i>
2014Jul#04	Michael Tran	To contact members of the Sapphire Tablet Substrates Working Group to let them know they have joined the group.	CLOSED
2014Jul#05	Michael Tran	To send Peter Wagner the reviewed TFOF for HB-LED Test Methods TF and SNARFs #5747, #5748, and #5749.	CLOSED
2014Feb#01	Mike Feng	To work on the Double Sided Polished (DSP) Wafer table for SEMI HB1.	OPEN
2014Feb#03	Win Baylies, Oskar Amster, Lisa Maiocco, & Steve Martell	To form a working group and help with identifying and supplying sapphire wafer defect pictures.	OPEN
2014Feb#04	Iain Black	Contact Jule Flemish for work on a Patterned Sapphire Substrate (PSS) guide.	OPEN
2014Feb#05	Win Baylies	To follow up with Dr. Donggren Ko from Rubicon to resume PSS discussion.	OPEN
2013Oct#03	Impurities and Defects TF	Collect images for area contamination, particles, and voids.	OPEN
2013Oct#04	Impurities and Defects TF	Include scale for all images.	OPEN
2013Oct#05	Impurities and Defects TF	Review Page 1 (Purpose, Scope, Limitations, Referenced Standards and Documents) in SEMI HB1.	OPEN
2013Jul#02	Michael Tran	Work with Natalie Shim (SEMI Korea) to align the Korea HB-LED Working Group charter with the Global HB-LED charter.	OPEN
2013Jul#03	Michael Tran	Transfer existing SNARFs under the Equipment TF	OPEN
2013Jul#04	Bevan Wu	Re-instigate communication with ITRI on 2" PSS feedback.	Open, Bevan to provide update by September 2014
2013Jul#05	Peter Wagner	Share wafer flatness parameter presentation.	Has to be published in M1 first as RI to reference it. OPEN

## 1 Welcome, Reminders, and Introductions

1.1 Chris Moore (BayTech-Resor) called the meeting to order at 2:01 PM. 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 TC Chapter reviewed the previous meeting minutes from the N.A. HB-LED TC Chapter meeting at SEMICON West 2014.

**Motion:** To approve the previous meeting minutes at SEMICON West 2014 as written.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Len Peroots (SuperSight)

**Discussion:** None.

**Vote:** 8-0 in favor. Motion passed.

**Attachment:** 02, N.A. HB-LED TC Chapter Meeting Minutes (West 2014)

### 3 Working Group, Liaison and Staff Reports

#### 3.1 China HB-LED TC Chapter

3.1.1 Michael Tran (SEMI N.A.) reported for the China HB-LED TC Chapter. Of note:

- Meeting information
  - Last meeting
    - China Standards Second Meeting 2014
      - Harbin, Heilongjiang, China
      - Friday, September 19th, 2014
    - Next Meeting
  - Next meeting
    - China Standards First Meeting 2015
      - Nanjing, Jiangsu, China
      - Friday, April 10th, 2015
- Single Crystal Sapphire Task Force
  - Currently drafting these documents:
    - Doc. 5723, New Standard: *Specification for Single Crystal Sapphire Intended for Use for Manufacturing HB- LED Wafers*
    - Doc. 5775, New Standard: *Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers*
- GaN based LED Epitaxial Wafer Task Force
  - Currently drafting Doc. 5776, *New Standard: Test Method for Detecting Surface Defects of GaN based LED Epitaxial Wafer Used for Manufacturing HB-LED*

**Discussion:** None.

**Attachment:** 03, China HB-LED TC Chapter Report (Fall 2014)

#### 3.2 North America Standards Staff Report

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

- Remaining SEMI Global Events in 2014
  - International Technology Partners Conference (ITPC)
    - November 9-12 in Big Island, Hawaii
  - Collaborative Alliance for Semiconductor Test (CAST) Workshop: Implementing Next Generation Data Logging
    - November 12-13 in San Jose, California
  - SEMI South America Semiconductor Strategy Summit
    - November 18-20 in Buenos Aires, Argentina

- SEMICON Japan
  - December 3-5 in Tokyo
- Early SEMI Global Events in 2015
  - Industry Strategy Symposium
    - January 11-14 in Half Moon Bay, California
  - European 3D TSV Summit
    - January 19-21 in Grenoble, France
  - SEMICON Korea and LED Korea
    - February 4-6 in Seoul
  - ISS Europe
    - February 22-24 in Amsterdam, Netherlands
  - SEMICON China and FPD China
    - March 17-19 in Shanghai
  - LED Taiwan
    - March 25-28 in Taipei
- SEMI Standards Publications Stats
  - July 2014 – October 2014
    - New Standards: 8
    - Revised Standards: 29
    - Reapproved Standards: 2
    - Withdrawn Standards: 2
  - Total SEMI Standards in portfolio: 917
    - Includes 108 Inactive Standards
- Upcoming NA Standards Meetings in 2015
  - NA Standards Spring 2015 Meetings
    - (Tentative) March 30 – April 2 at SEMI HQ in San Jose, California
  - NA Compound Semiconductor Materials TC Chapter Meeting at CS MANTECH 2015
    - (Tentative) May 20 in Scottsdale, Arizona
  - NA Standards Meetings at SEMICON West 2015
    - (Tentative) July 13-16 in San Francisco, California
- SEMI NA Standards staff contact: Michael Tran, [mtran@semi.org](mailto:mtran@semi.org)

**Discussion:** None.

**Attachment:** 04, N.A. Standards Staff Report (Fall 2014)

### 3.3 Korea HB-LED Working Group

3.3.1 Michael Tran (SEMI N.A.) reported for the Korea HB-LED Working Group. Of note:

- Meeting Information
  - Last meeting
    - October 23, 2014 at Veeco Korea in Gyeonggi-do, Korea
  - Next meeting
    - To be determined in 2015
- Major Updates
  - MO (Metal Organic) Source Team
    - The team has submitted a new TFOF for the NA HB-LED TC Chapter to review (see § 5.1 and § 7.1 of these minutes for details)
  - SEMI HB1 Review Team
    - The team has submitted a new SNARF for the NA HB-LED TC Chapter to review (see § 5.1 and § 7.3 of these minutes for details)
- SEMI Korea Standards staff contact: Natalie Shim, [eshim@semi.org](mailto:eshim@semi.org)

**Discussion:** None.

**Attachment:** 05, Korea HB-LED Working Group Report (Fall 2014)

### 3.4 Tablet Substrates Working Group

3.4.1 Win Baylies (BayTech-Resor) and Chris Moore (BayTech-Resor) reported for the Tablet Substrate Working Group. The Working Group discussed an article detailing the formation of the Tablet Working Group published online by SEMI: <http://www.semi.org/en/node/51236>.

3.4.2 The Working Group reviewed the market segments for Sapphire. Of note:

- Global sapphire production will continue to focus on LED applications in 2015.
- The 4-inch LED segment will remain as the largest with a 46.2% share, while the 2-inch and 6-inch LED segments will take up 16.4% and 13.3% respectively.
- On the other hand, cover lens applications for Apple Watch will see the fastest growth to account for 13.8% of global sapphire production.

3.4.3 The Working Group will continue to reach out to other potential companies interested in tablet substrates. A survey was agreed by the Working Group for all working group members who is working in the areas of the Sapphire market segments.

**Discussion:** None.

**Attachment:** 06, Sapphire Market Segments

## 4 Ballot Review

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

Document #	Document Title	TC Chapter Action
5741	Line item revisions to SEMI HB1-0814, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices	

Line Item 1	Update References to Section 3.1 and Table R1-1, Row 2-3.8 and Row 2-3.10	Passed TC Chapter review as balloted.
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**Motion:** Line item 1 of Document 5741 passed TC Chapter review as balloted and will be forwarded to the A&R SC for procedural review.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** 7-0 in favor. Motion passed.

## 5 Task Force Reports

### 5.1 HB-LED Wafer Task Force

5.1.1 Win Baylies (BayTech-Resor) reported for the HB-LED Wafer Task Force. The TF discussed the following topics:

- *Tablet Substrates Working Group*
  - See § 3.4 of these minutes.
- *TFOF and SNARF from Korea*
  - The NA HB-LED TC Chapter reviewed the following TFOF and SNARF from Korea and approved them:
    - New TFOF: HB-LED Source Materials TF (New Task Force under the NA HB-LED TC Chapter)
      - The Task force charter and scope were revised to be more materials specific by the NA HB-LED TC Chapter
    - Doc. 5818: Line Items Revision to SEMI HB1-XXXX, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices
      - The NA HB-LED TC Chapter approved this SNARF to revise SEMI HB1, but they would like to know more where the proposed specifications in the SNARF comes from.
  - The TFOF and Doc. 5818 will be under the NA HB-LED TC Chapter and the HB-LED Wafer TF because there are no formal HB-LED chapter in Korea yet.
  - The SNARF (*New Standard: Specification of Epitaxial Metal Organic Sources*) from Korea was not approved because the NA HB-LED TC Chapter had feedback they would like to pass on to the Korean members:
    - They would like to see the MO sources in the Scope section be split individually. Start with the first source and then proceed with the rest one at a time.
    - The new standard could also talk about handling, how it's packaged, and the initial bubble preparation
    - MO sources canisters have double male connections. Also each chemical supplier have different size canisters. It would be good have a standard addressing these topics.

- The SEMI Standards Program also have a Gases committee. Your new standard could be under the HB-LED or the Gases committee. Have you looked into the Gases committee for potential support? Do you want this standard under the HB-LED or Gases committee?
- *SEMI HBI Discussion*
  - Reviewed Document # 5741, *Line Item Revisions to SEMI HBI-0113, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices*
    - The NA HB-LED TC Chapter will proceed to find the reject vote related and not persuasive because the Silicon Wafer committee have stopped supporting the outdated referenced documents and the NA HB-LED TC Chapter have no interest in supporting them too.
- *HB-LED Wafer Marking Experiment Project Discussion (No new updates were given)*
  - Background
    - Several mark fields, each containing a Data Matrix (SEMI T7) and Alpha-Numeric (SEMI M12) message, will be marked on these wafers with surface finish as specified for the back surface. Because the front- and back-surfaces of the starting wafers have identical surface conditions, after marking, the mark field locations distinguish front- from back-surfaces. This marking uses mark field characteristics that are widely deployed in silicon wafer production.
  - Participants
    - Silian - Sapphire wafer maker
    - InnoLas - Lasermark equipment maker
    - HTT - Lasermark equipment reader maker
    - Osram - HB-LED device maker
    - Silian - Sliced and lasermarked both sides of wafer
  - Completed steps
    - InnoLas has completed laser marking of the two wafers and will ship them to Silian for polishing.
  - Next steps
    - Silian has received the laser marked wafers from InnoLas and the wafers are in polishing process.
    - Silian will send the polished wafers to HTT for Mark Characterization and then HTT will ship the wafers to Osram.
    - Osram will perform the epi growth and then read the markings post-epi.
    - The final wafer marking experiment report will be generated by Silian and Osram.
- *Impurities and Defects Discussion (No new updates were given)*
  - The Impurities and Defects TF reviewed the list of visual defects for Silicon Wafer surfaces in SEMI MF154-0305. They found the following Silicon Wafer defects (in red) to be applicable to Sapphire Surface defects:

Sleek (Groove)
Annealing spot (localized light scatter)
Edge Chip
Edge Crack
Pits
Skating Rink Defect
Slip (slip lines)
Bubbles
Residual pits (area contamination)
Orange Peel

- The next step for the TF is gathering input on how to best define the defects.
  - The TF still reviewing photographs of Sapphire surface defects captured from Silian and Altatech
  - The definition of the Sapphire Surface defects and select photographs of the defects will be incorporated into Document 5629 (New Standard: Guide for Defect Identification on Bare Sapphire Wafers)
- *Double Sided Polished (DSP) Wafers Discussion (No new updates were given)*
    - The TF reviewed proposed specifications for 2”, 4” and 6” DSP wafers by Silian.
    - DSP Specifications Proposal #1:

Orientation:	C-plane (0001) 0° ± 2° (no orientation)
Diameter	100.0 ± 0.5 mm
Flat Orientation:	A-plane (11-20)
Flat Length:	32.5 ± 2.5 mm
Thickness:	650 ± 25 µm
Frontside State:	Mirror Polished
Backside State:	Mirror Polished
Frontside Roughness:	0.1 – 0.3 nm
Backside Lasermark:	Refer to custom drawing
TTV:	< 25 µm
Bow:	≤ 30 µm
Warp:	< 30 µm
Bevel Dimensions:	Standard

- DSP Specifications Proposal #2:

Orientation:	C-plane (0001) 0° ± 2° (no orientation)
Diameter	50, 75, 100.0 ± 0.5 mm
Thickness:	300, 400, 650 ± 25µm
Frontside State:	Mirror Polished
Backside State:	Mirror Polished
Frontside Roughness:	0.1 – 0.3nm
Backside Lasermark:	Refer to custom drawing:

TTV:	< 25 $\mu\text{m}$
Bow:	$\leq$ 30 $\mu\text{m}$
Warp:	< 30 $\mu\text{m}$
Bevel Dimensions:	Standard

- DSP wafers specifications will be added to SEMI HB1 (Specifications for Sapphire Wafers for Manufacturing HB-LED Devices) after further review of each proposal.
- *Patterned Sapphire Substrates (PSS) Specifications Discussion (No new updates were given)*
  - The TF reviewed tools used for each PSS property:
    - AOI for Defect Terminology
    - SEM, 3D microscope, AFM for Geometry
    - AFM, 3D microscope for Uniformity
    - SEM, AFM for Shape
    - The TF has not decided what tool to use for the Edge Exclusion
  - A SNARF for PSS Specifications will be drafted soon

**Action Item:** 2014Nov#01, Eric Armour to share with Veeco Korea his feedback for a proposed new standard: *Specification of Epitaxial Metal Organic Sources* and copy Michael Tran.

**Action Item:** 2014Nov#02, Win Baylies / Chris Moore / Michael Tran to let the Korea HB-LED Working group members know about the revisions made to their TFOFs and SNARFs at the NA HB-LED TC Chapter meeting.

**Attachment:** 07, HB-LED Wafer TF Report (Fall 2014)

## 5.2 HB-LED Test Methods Task Force

5.2.1 Peter Wagner (Self) reported for the Task Force. The TF completed the drafts of the following Documents:

- Doc. 5747, New Standard: Test Method for Measurement of Saw Marks on Crystalline Sapphire Wafers Using Optical Probes
- Doc. 5748, New Standard: Test Method for Measurement of Thickness and Shape of Crystalline Sapphire Wafers Using Optical Probes
- Doc. 5749, New Standard: Test Method for Measurement of Waviness of Crystalline Sapphire Wafers Using Optical Probes

5.2.2 The TF reviewed the documents with the NA HB-LED TC Chapter and they were approved for letter balloting (see § 7.2 for details).

## 5.3 Patterned Sapphire Substrates (PSS) Task Force

5.3.1 There were no new updates. Please see § 5.1 for the previous PSS discussion.

## 5.4 HB-LED Equipment Communication Interfaces Task Force

5.4.1 Michael Tran (SEMI N.A.) reported for the HB-LED Equipment Communication Interfaces TF. Brain Rubow (Cimetrix) the TF leader, said the Task Force will be inactive going forward because of the lack of participation from

key companies. Chris Moore (BayTech-Resor) said it's best to disband the task force and other inactive task forces if there are long periods of inactivity to keep things organized and clean for the NA HB-LED TC Chapter.

**Action Item:** 2014Nov#03, Chris Moore / Michael Tran to have a session at the next TF or TC Chapter meeting on the cleanup and chopping block of inactive Task Forces under the NA HB-LED TC Chapter.

## 6 Old Business

6.1 None.

## 7 New Business

### 7.1 *New Co-chair of the NA HB-LED TC Chapter*

7.1.1 Bill Quinn (WEQ consulting) has stepped down as co-chair of the NA HB-LED TC Chapter. He recommended Eric Armour from Veeco to replace him as the new co-chair. Eric has agreed to become the new co-chair of the NA HB-LED TC Chapter (*pending further approval from the NA Regional Standards Committee*).

**Motion:** To approve Eric Armour as the new co-chair of the NA HB-LED TC Chapter.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Illona Schmidt (Corning)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.

### 7.2 *Primary Co-chair Representative of the NA HB-LED TC Chapter for the NARSC*

7.2.1 Chris Moore (BayTech-Resor) said that he attends the most of the time NARSC compared to the other NA HB-LED TC Chapter co-chairs. He said he should be the primary and the not the backup co-chair representative of the NA HB-LED TC Chapter for the NA Regional Standards Committee (NARSC).

**Motion:** To approve Chris Moore (BayTech-Resor) as the primary co-chair representative of the NA HB-LED TC Chapter for the NA Regional Standards Committee (NARSC).

**By / 2<sup>nd</sup>:** Len Perroots (SuperSight) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** 7-0 in favor. Motion passed.

**Action Item:** 2014Nov#04, Michael Tran to let Paul Trio know that Chris Moore is now the primary co-chair representing the NA HB-LED TC Chapter to the NARSC.

### 7.3 *New TFOF and SNARF from Korea*

7.3.1 The N.A. HB-LED TC Chapter reviewed the following TFOF and SNARFs for approval (see §5.1 for discussion):

#	Type	SC/TF/WG	Details
---	TFOF	Korea HB-LED WG	HB-LED Source Materials TF ( <i>New Task Force under the NA HB-LED TC Chapter</i> )
5818	SNARF	HB-LED Wafer TF	Line Items Revision to SEMI HB1-XXXX, Specifications for Sapphire Wafers Intended for Use for Manufacturing High Brightness-Light Emitting Diode Devices  <i>(There is a prior revision of SEMI HB1-0814 (Document 5741) pending further procedural review and publication. This SNARF will be effective after the outcome of Document 5741.)</i>

Note: SNARFs and TFOFs are available for review on the SEMI Website at:  
<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

**Motion:** To approve the TFOF as revised by the NA HB-LED TC Chapter for the formation of a new Task Force: HB-LED Source Materials TF

**By / 2<sup>nd</sup>:** Eric Armour (Veeco) / Len Peroots (SuperSight)

**Discussion:** None.

**Vote:** 7-0 in favor. Motion passed.

**Motion:** To approve SNARF #5818

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** The NA HB-LED TC Chapter would like to know more where the proposed specifications in the SNARF come from.

**Vote:** 6-0 in favor. Motion passed.

## 7.4 New Ballot Authorization

7.4.1 The N.A. HB-LED TC Chapter reviewed the following documents for letter ballot approval:

#	When	SC/TF/WG	Details
5747	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Saw Marks on Crystalline Sapphire Wafers Using Optical Probes
5748	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Thickness and Shape of Crystalline Sapphire Wafers Using Optical Probes
5749	Cycle 1, 2015	HB-LED Test Methods TF	New Standard: Test Method for Measurement of Waviness of Crystalline Sapphire Wafers Using Optical Probes

**Motion:** To approve the letter balloting of Document #5747 in Cycle 1, 2015.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** 7-0 in favor. Motion passed.

**Motion:** To approve the letter balloting of Document #5748 in Cycle 1, 2015.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** 7-0 in favor. Motion passed.

**Motion:** To approve the letter balloting of Document #5749 in Cycle 1, 2015.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** 7-0 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 TC Chapter Meeting will be held in conjunction with the N.A. Standards Spring 2015 Meetings at SEMI Headquarters in San Jose, California. Please see § 9 of these minutes for the tentative schedule for all HB-LED standards meetings and visit <http://www.semi.org/node/54226> for more information.

Thursday, April 02\*

- HB-LED Test Methods TF (08:00 AM - 09:00 AM)
- HB-LED Wafer TF / Impurities & Defects TF (09:00 AM - 11:00 AM)
- HB-LED Tablet Working Group (11:00 AM – 12:00 PM)
- N.A. HB-LED TC Chapter (1:30 PM - 4:30 PM)

\*All times are Pacific and tentative. Times and dates are subject to change without notice.

9.2 Having no further business, the N.A. HB-LED TC Chapter meeting on Thursday, November 06 was adjourned at 3:33 PM at SEMI Headquarters in San Jose, California.

**Motion:** To adjourn the N.A. HB-LED TC Chapter meeting on Thursday, November 06 at SEMI Headquarters in San Jose, California.

**By / 2<sup>nd</sup>:** Win Baylies (BayTech-Resor) / Eric Armour (Veeco)

**Discussion:** None.

**Vote:** Unanimous in favor. Motion passed.

Respectfully submitted by:  
 Michael Tran  
 Senior Standards Engineer  
 SEMI North America  
 Phone: 1-408-943-7019  
 Email: [mtran@semi.org](mailto:mtran@semi.org)

Minutes approved by:

Chris Moore (BayTech-Resor), Co-chair	
Mike Feng (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	Korea HB-LED Working Group Report (Fall 2014)
02	N.A. HB-LED TC Chapter Meeting Minutes (West 2014)	06	Sapphire Market Segments
03	China HB-LED TC Chapter Report (Fall 2014)	07	HB-LED Wafer TF Report (Fall 2014)
04	N.A. Standards Staff Report (West 2014)		

#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 Michael Tran at the contact information above.