



HB-LED Committee China TC Chapter

Meeting Summary and Minutes

China Spring Standards Meeting 2019

Friday, March 29th, 2019, 13:30-17:00

Room 803, Building 2nd, No.1158 Zhangdong Road, Shanghai, SEMI China Office

TC Chapter Announcements

Next TC Chapter Meeting

Friday, September 27th, 2019

Fujian, China

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Hongbo Zuo (AURORA), Jiangbo Wang (HC-SEMITEK)

SEMI Staff: Daniel Qi (SEMI China), Isadora Jin (SEMI China), Ein Wu (SEMI China)

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
AURORA	Zuo	Hongbo	HC SEMITEK	Wang	Jiangbo
AURORA	Li	Tie	HC SEMITEK	Zhou	Biao
AURORA	Yan	Zehua	HC SEMITEK	Hu	Jiahui
SMTC	Wu	Liangwen	ETI	Mo	Qingwei
E-Xinhe	Zheng	Songsen	GAPSS	Wei	Mingde
AMEC	Li	Tianxiao	JINGAN	Zhang	Heng
AMEC	Tian	Ye	JINGAN	Si	Fanghu
AMEC	Liu	Yingbin	DDXDF	Zhao	Songbin
AMEC	Cao	Han	SINOPATT	Zhang	Neng
AMEC	Zhu	Qiulong	GHTOT	Qi	Liuyun
HIT	Gan	Yang	BST	Liu	Jianzhe
China Fortune Land Development	Xu	Yan	Schneider	Chen	Yongyang
China Fortune Land Development	Jiang	Zeyu	Micro-Power Scientific	Jin	Xiaoliang
CIMETRIX	Liu	Bo	IAWBS	Lu	Min
CIMETRIX	Huang	Yufeng	GCL	Liu	Yifeng
TOPEC	Shu	Weiwei	UCAS	Xia	Changtai
CFLD	Li	Xiaohuan	HQU	Lai	Zhiyuan

Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leader</i>
None		

Table 3 Committee Structure Changes

<i>Previous WG/TF/SC Name</i>	<i>New WG/TF/SC Name or Status Change</i>
None	

Table 4 Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
6192A	New Standard: Specification for Dry Etching Patterned Sapphire Substrate (DPSS)	Passed with technical changes and editorial changes. Ratification ballot to be issued.
6370	New Standard: Specification of Susceptors for HB-LED MOCVD Equipment Communication Interface	Passed with technical changes and editorial changes. Ratification ballot to be issued.
6371	New Standard: Test Method for Determining Geometrical Parameters of Patterns on Patterned Sapphire Substrate	Failed and return to TF for re-work and rebalot

#1 **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

#2 **Failed** ballots and line items were returned to the originating task forces for re-work and re-balloting or abandoning.

Table 5 Activities Approved by the GCS between meetings of the TC Chapter

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
TBD	SNARF	Equipment Communication Interface Task Force	Modified the document title From <u>New Standard: Specification of Recipe Management for HB-LED Equipment</u> to <u>New Standard: Specification of Recipe Management for LED Equipment</u> .

Table 6 Authorized Activities

Listing of all revised or new SNARF(s) approved by the Originating TC Chapter.

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
TBD	SNARF	Equipment Communication Interface Task Force	New Standard: Specification of Recipe Management for LED Equipment
TBD	SNARF	Sapphire Single Crystal Ingot Task Force	Line Item Revision to SEMI HB XX, Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers.

#1 SNARFs and TFOFs are available for review on the SEMI Web site at:

<http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF>

Table 7 Authorized Ballots

<i>#</i>	<i>When</i>	<i>TF</i>	<i>Details</i>
6371	Cycle 5-2019	Patterned Sapphire Substrate Task Force	New Standard: Test Method for Determining Geometrical Parameters of Patterns on Patterned Sapphire Substrate
R6192A	TBD	Patterned Sapphire Substrate Task Force	New Standard: Specification for Dry Etching Patterned Sapphire Substrate (DPSS)
R6370	TBD	Equipment Communication	New Standard: Specification of Susceptors for HB-LED MOCVD Equipment Communication Interface

Table 7 Authorized Ballots

#	When	TF	Details
		Interface Task Force	

Table 8 SNARF(s) Granted a One-Year Extension

#	TF	Title	Expiration Date
5629	Single Crystal Sapphire Task Force	New Standard, Guide for Identification Defects on Bare Surfaces of Sapphire Wafers	2020/7/11

Table 9 SNARF(s) Abolished

#	TF	Title
None		

Table 10 Standard(s) to receive Inactive Status

Standard Designation	Title
None	

Table 11 New Action Items

Item #	Assigned to	Details
China HB-LED-0329-01	Steven Lee (AMEC)	Appeal NAURA’s experts to join in HB-LED Equipment Communication Interface Task Force

Table 12 Previous Meeting Action Items

Item #	Assigned to	Details
None		

1 Welcome, Reminders, and Introductions

Daniel Qi (SEMI) called the meeting to order at 13:30. Committee co-chair Jiangbo Wang chaired the meeting and welcomed all attendees. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

Agenda was reviewed.

- Attachment:**
- 1 Chinese SEMI Standard Meeting Reminders
 - 2 HB-LED TC Spring Meeting 2019 Agenda

2 Review of Previous Meeting Minutes

The TC Chapter reviewed the minutes of the previous meeting.



Motion: To approve the minutes of the previous meeting as written
By / 2nd: Jiangbo Wang (HC SEMITEK) / Steven Lee (AMEC)
Discussion: None
Vote: 19 in favor and 0 opposed (Total 19 companies.) **Motion Passed.**
Attachment: 3 China HB-LED Fall Meeting Minutes 20181024

3 Liaison Reports

3.1 HB-LED North America TC Chapter

Isadora Jin (SEMI) reported for the HB-LED North America TC Chapter. Of note:

Action Item: Next meeting - NA Spring Standards Meeting. SEMI HQ in Milpitas CA, April 1st, 2019

- The Co-chairs of North America HB-LED TC are Andrew Kim (InnovationforX), Chris Moore (Frontier Semiconductor) and Mike Feng (Silian)
- Ballot results
 - Doc. 6430, Reapproval to SEMI HB4-0913, *Specification of Communication Interfaces for High Brightness LED Manufacturing Equipment (HB-LED ECI)* **Passed** Cycle 7-2018 as balloted.
- Granted SNARF(s) one-year extension
 - Doc. 5984, New Standard: Guide for Biscyclopentadienylmagnesium
 - Doc. 5985, New Standard: Guide for Triethylgallium for HB-LED Manufacturing
 - Doc. 5986, New Standard: Guide for Trimethylaluminum for HB-LED Manufacturing
 - Doc. 5988, New Standard: Guide for Trimethylindium for HB-LED Manufacturing
- Plan to combine PSS TF with HB-LED Wafer TF. Both TFs are looking for new members.

Attachment: 4 NA HB-LED Liaison Report Nov 2018

3.2 SEMI Staff Report

Isadora Jin (SEMI) gave the SEMI Staff Report. Of note:

- SEMI Standards Overview
- SEMI Global 2019 Calendar of Events
- 2019 Critical Dates for SEMI Standards Ballots
- SEMI Standards Publications
- China HB-LED TC Update
- Enhance Task Force Management
- Core Members Attendance Record
- Necessary Info. from Website

Attachment: 5 SEMI Staff Report 20190329

4 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (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.



4.1 Document 6192A, New Standard: New Standard: Specification for Dry Etching Patterned Sapphire Substrate (DPSS)

- Motion:** Fanghu Si (JINGAN) moved that this Document passed TC Chapter review with technical changes and with or without editorial changes and will be forwarded to the ISC A&R SC for procedural review. A Ratification Ballot will be issued to verify the technical changes.
- By / 2nd:** Fanghu Si (JINGAN)/Yang Gan (HIT)
- Discussion:** Fanghu Si (JINGAN): The purpose is added.
Jianzhe Liu (BST): 4.2.2 description is more detailed than 4.1.1. It's better to remove 4.1.1 and keep 4.2.2 remained. 4.2.1 description is more detailed than 4.1.2. It's better to remove 4.1.2 and keep 4.2.1 remained.
Jiangbo Wang (HC-SEMITEK): 4.1 can be removed.
Yang Gan (HIT): The description of how to measure the Angle is added following Figure 6 is appropriate.
Jiangbo Wang (HC SEMITEK): Check boxes are improper.
Jianzhe Liu (BST): Check boxes are improper.
Yang Gan (HIT): Did you use optical method to test defect size?
Steven Lee (AMEC): I think the original table 1 is good.
Liu Yun Qi (GHTOT): Agreed.
Jiangbo Wang (HC SEMITEK): Just keep the eigenvalue is appropriate.
Steven Lee (AMEC): The range and check boxes are improper.
Jianzhe Liu (BST): The explanation of A and B can be added in 4.1.10.
Jiangbo Wang (HC-SEMITEK): Approve the modification.
- Vote:** 19 in favor and 0 opposed. (Total 19 companies.) Motion Passed.
- Attachment:** 6 SEMI Standards 6192A 20190325

4.2 Document 6370, New Standard: Specification of Susceptors for HB-LED MOCVD Equipment Communication Interface

- Motion:** Han Cao (AMEC) moved that this Document passed TC Chapter review with technical changes and with or without editorial changes and will be forwarded to the ISC A&R SC for procedural review. A Ratification Ballot will be issued to verify the technical changes.
- By / 2nd:** Han Cao (AMEC)/Liangwen Wu (SMTC)
- Discussion:** Han Cao (AMEC): Figures are added to describe wafer numbering method for polygon and satellite susceptors. In this case descriptions of figure 2 and figure 3 are added in 6.1.2, 6.3.5 and 6.3.6 correspondingly.
Jiangbo Wang (HC-SEMITEK): Figures are clear.
Han Cao (AMEC): Accept the suggestion, change unknown to dummy.
Han Cao (AMEC): The Item "Reserved" is for both customer or equipment supplier to use. It is a standard SEMI description. Change it to 7-63 = Reserved according to SEMI E5.
Han Cao (AMEC): SusceptorID has 80 characters. Concentric ring has 4 characters. Circular order has 4 characters. Two connectors has 1 character each. Thus 'WaferLocationID' is calculated as 80+1+4+1+4=90.
Jiangbo Wang (HC-SEMITEK): Is SML noticed in 6370?
Han Cao (AMEC): Because this issue was resolved back in 2016, <https://www.peergroup.com/Resources/SECSMessageLanguage.aspx>. It's probably not needed to add TM or Registered R.
Jiangbo Wang (HC-SEMITEK): Maybe it is better to add the standard that use SML in 4.1 as reference.
Han Cao (AMEC): Maybe we can add process tray in Susceptor definition in 5.3.3.
- Vote:** 19 in favor and 0 opposed. (Total 19 companies.) Motion Passed.
- Attachment:** 7 6370 Ballot Review

4.3 Document 6371, New Standard: Test Method for Determining Geometrical Parameters of Patterns on Patterned Sapphire Substrate

- Motion:** Jianzhe Liu (BST) moved that the committee approve SEMI Document 6371 to return to Patterned Sapphire Substrate Task Force for rework and rebalotting in Cycle 5-2019.
- By / 2nd:** Jianzhe Liu (BST) / Yang Gan (HIT)
- Discussion:** Yang Gan (HIT): What is your test scope?
Jianzhe Liu (BST): The test scope of AFM is 15 μ m \times 15 μ m. The test scope of SEM is 5mm \times 5mm.



Vote: 18 in favor and 1 opposed. (Total 19 companies.) Motion Passed.

Attachment: 8 6371Ballot review

4.4 Document R5775D, New Standard: Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers.

Motion: Zhehua Yan (AURORA) moved that the committee approve the line item review once the standard is published.

By / 2nd: Zhehua Yan (AURORA) / Steven Lee (AMEC)

Discussion: Yang Gan (HIT): Did you illustrate end face E1 and E2 in section 6?

Zhehua Yan (AURORA): Yes, I mentioned end face E1 and E2 in 6.1.3.

Jiangbo Wang (HC-SEMITEK): Then you can follow Peter's suggestion and delete the second sentence in 4.1.1.

Vote: 18 in favor and 0 opposed. (Total 18 companies.) Motion Passed.

Attachment: 9 SNARF Line Item Revision to R5775D

5 Subcommittee and Task Force Reports

5.1 Single Crystal Sapphire Task Force

Liuyun Qi (GHTOT) reported for the Single Crystal Sapphire Task Force. This report contained information on:

- Introduced the task force's leaders and members
- Working on
 - Doc 5946, New Standard: Test Method for Grain Boundary of Single Crystal Sapphire by Optical Homogeneity Technique (OHT)

Attachment: 10 Single Crystal Sapphire Task Force Report-2019-03-29

5.2 Sapphire Single Crystal Ingot Task Force

Zhehua Yan (AURORA) reported for the Sapphire Single Crystal Ingot Task Force. This report contained information on:

- Introduced the task force's leaders and members
- Working on
 - Doc R5775D, New Standard: Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers
 - Doc 5629, New Standard: Guide for Identification Defects on Bare Surfaces of Sapphire Wafers
- Grant one -year extension
 - Doc 5629, New Standard: Guide for Identification Defects on Bare Surfaces of Sapphire Wafers

Attachment: 11 Sapphire Single Crystal Ingot TF Report

5.3 GaN based LED Epitaxial Wafer Task Force

Jiangbo Wang (HC SEMITEK) reported for GaN based LED Epitaxial Wafer Task Force. This report contained information on:

- Introduced the task force's leaders and members



- Introduced the task force's leaders and members
- TF Work Plan for the Next Step

Attachment: 12 GaN based LED Epitaxial Wafer Task Force-20190329

5.4 Sapphire Single Crystal Orientation Task Force

Inactive

5.5 Pattern Sapphire Substrate Task Force

Jianzhe Liu (BST) reported for *Pattern Sapphire Substrate Task Force*. This report contained information on:

- Introduced the task force's leaders and members
- Working on:
 - Doc 6192A, New Standard: Specification for Dry Etching Patterned Sapphire Substrate (DPSS)
 - Doc 6371, New Standard: Test Method for Determining Geometrical Parameters of Patterns on Patterned Sapphire Substrate

Attachment: 13 SEMI HB-LED PSS Task Force Report 20190329

5.6 HB-LED Equipment Communication Interface Task Force

Steven Lee (AMEC) reported for *HB-LED Equipment Communication Interface Task Force*. This report contained information on:

- Introduced the task force's leaders and members
- Working on:
 - Doc 6370, New Standard: Specification of Susceptors for HB-LED MOCVD Equipment Communication Interface
 - SNARF, Specification of Recipe Management for LED Equipment

Attachment: 14 Equipment Communication Interface Task Force Report

6 Old Business

6.1 Refer to Table 12 Previous Meeting Action Items

7 New Business

7.1 Requests for ballots in Cycle 5-2019

7.1.1 Doc.6371, New Standard: Test Method for Determining Geometrical Parameters of Patterns on Patterned Sapphire

Motion: Jianzhe Liu (BST) moved the Committee to approve the Doc 6371 for ballot in cycle 5-2019.

By / 2nd: Jianzhe Liu (BST) / Yang Gan (HIT)

Discussion: Yang Gan (HIT): What is your test scope?

Jianzhe Liu (BST): The test scope of AFM is 15 μ m \times 15 μ m. The test scope of SEM is 5mm \times 5mm.

Vote: 18Y-1N



7.2 New SNARFs

7.2.1 SNARF: Line Item Revision to SEMI HB XX, Specification for Sapphire Single Crystal Ingot Intended for Use for Manufacturing HB-LED Wafers.

Motion: Zhehua Yan (AURORA) moved that the committee approve the line item review once the standard is published.

By / 2nd: Zhehua Yan (AURORA) / Steven Lee (AMEC)

Discussion: Yang Gan (HIT): Did you illustrate end face E1 and E2 in section 6?

Zhehua Yan (AURORA): Yes, I mentioned end face E1 and E2 in 6.1.3.

Jiangbo Wang (HC-SEMITEK): Then you can follow Peter's suggestion and delete the second sentence in 4.1.1.

Vote: 18Y-0N

Attachment: 9 SNARF Line Item Revision to R5775D

15 SNARF_R5775D Feb 2019 v1

7.2.2 SNARF: Specification of Recipe Management for LED Equipment

Motion: Clare Liu (Cimetrix) moved that the committee approve the SNARF for New Standard: Specification of Recipe Management for LED Equipment.

By / 2nd: Clare Liu (Cimetrix) / Liangwen Wu (SMTC)

Discussion: Yang Gan (HIT): Can you explain the scope of recipe?

Clare Liu (Cimetrix): The SNARF will focus on recipe management which specify the communication equipments interface. This do benefits to fabs and equipment suppliers.

Liangwen Wu (SMTC): Is the SNARF's scope refer to HB-LED or MOCVD?

Clare Liu (Cimetrix): This SNARF is refer to MOCVD.

Yang Gan (HIT): Does E30 already include this SNARF's content?

Clare Liu (Cimetrix): E30 is available for semiconductor, but not appropriate for HB-LED.

Jiangbo Wang (HC-SEMITEK): It will be better to involve NAURA into this SNARF and Task Force. If more companies involved in this work, it will be better.

Songbin Zhao (DDXDF): I approve this SNARF and I am glad to involve in.

Vote: 18Y-0N

Attachment: 16 Snarf Report_RecipeManagement -2 CL 032519

17 SNARF RECIPE MANAGEMENT-v2

8 Next Meeting and Adjournment

The next meeting is scheduled for September 27th, 2019 in Fujian, China. See <http://www.semi.org/standards-events> for the current list of events.

Adjournment: 17:00

Respectfully submitted by:

Isadora Jin

Standards, Senior Specialist

SEMI China

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Minutes tentatively approved by:

Hongbo Zuo (AURORA), Co-chair	<2019/04>
Jiangbo Wang (HC-SEMITEK), Co-chair	<2019/04>

Table 13 Index of Available Attachments#1

<i>Title</i>	<i>Title</i>
1 Chinese SEMI Standard Meeting Reminders	2 HB-LED TC Spring Meeting 2019 Agenda
3 China HB-LED Fall Meeting Minutes 20181024	4 NA HB-LED Liaison Report Nov 2018
5 SEMI Staff Report 20190329	6 SEMI Standards 6192A 20190325
7 6370 Ballot Review of HB-LED Susceptor Automation Interface	8 6371Ballot review
9 SNARF Line Item Revision to R5775D	10 Single Crystal Sapphire Task Force Report-2019-03-29
11 Sapphire Single Crystal Ingot TF Report	12 GaN based LED Epitaxial Wafer Task Force-20190329
13 SEMI HB-LED PSS Task Force Report 20190329	14 Equipment Communication Interface Task Force Report
15 SNARF_R5775D Feb 2019 v1	16 Snarf Report_RecipeManagement -2 CL 032519
17 SNARF RECIPE MANAGEMENT-v2	

#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.