Microlithography NA TC Chapter
Meeting Summary and Minutes

SEMICON West
Wednesday, July 11, 2018
9:00 AM – 11:00 AM
San Francisco Marriott Marquis, San Francisco, California

TC Chapter Announcements

Next TC Chapter Meeting
July 10, 2019 - 10:00 AM – Noon (tentative)
San Francisco, California

Table 1 Meeting Attendees
Italics indicate virtual participants
Co-Chairs: Bryan Barnes
SEMI Staff: Kevin Nguyen

<table>
<thead>
<tr>
<th>Company</th>
<th>Last</th>
<th>First</th>
<th></th>
<th>Company</th>
<th>Last</th>
<th>First</th>
</tr>
</thead>
<tbody>
<tr>
<td>NIST</td>
<td>Barnes</td>
<td>Bryan</td>
<td>Samoo</td>
<td>Jinho</td>
<td>Jinho</td>
<td>Kim</td>
</tr>
<tr>
<td>Pall Corporation</td>
<td>Bavarian</td>
<td>Mona</td>
<td>DNP</td>
<td>Naoya</td>
<td>Naoya</td>
<td>Hayashi</td>
</tr>
<tr>
<td>Wes Erck &amp; Associates</td>
<td>Erck</td>
<td>Wes</td>
<td>I&amp;I Consulting</td>
<td>Starikov</td>
<td>Starikov</td>
<td>Alex</td>
</tr>
<tr>
<td>Pall Corporation</td>
<td>Hung</td>
<td>Kelvin</td>
<td>IMSM</td>
<td>Tang</td>
<td>Tang</td>
<td>Pat</td>
</tr>
<tr>
<td>Xyalis</td>
<td>Hurat</td>
<td>Sylvie</td>
<td></td>
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</tr>
</tbody>
</table>

Table 2 Leadership Changes

WG/TF/SC/TC Name | Previous Leader | New Leader
-- | --------------- | ------------

Table 3 Committee Structure Changes

Previous WG/TF/SC Name | New WG/TF/SC Name or Status Change
-- | ------------------

Table 4 Ballot Results

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6327</td>
<td>Revision to SEMI P45-0211, Specification For Job Deck Data Format For Mask Tools</td>
<td>Passed with technical changes. Ratification Ballot will be issued.</td>
</tr>
</tbody>
</table>

#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

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>6327</td>
<td>SNARF</td>
<td>Mask Order TF</td>
<td>Revision to SEMI P45-0211, Specification For Job Deck Data Format For Mask Tools</td>
</tr>
</tbody>
</table>

Table 6: Authorized Activities

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

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Mask Order TF</td>
<td>Revision to SEMI P45-0211, Specification For Job Deck Data Format For Mask Tools (expand scope)</td>
</tr>
</tbody>
</table>

#1 SNARFs and TFOFs are available for review on the SEMI Web site at:
[http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF](http://downloads.semi.org/web/wstdsbal.nsf/TFOFSNARF)

Table 7: Authorized Ballots

<table>
<thead>
<tr>
<th>#</th>
<th>When</th>
<th>TF</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>#</th>
<th>TF</th>
<th>Title</th>
<th>Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9: SNARF(s) Abolished

<table>
<thead>
<tr>
<th>#</th>
<th>TF</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10: Standard(s) to receive Inactive Status

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEMI P29-1111</td>
<td>Specification for Characteristics Specific to Attenuated Phase Shift Masks and Masks Blanks</td>
</tr>
<tr>
<td>SEMI P31-0304</td>
<td>Practice for Catalog Publication for Chemical Amplified (CA) Photoresist Parameter</td>
</tr>
<tr>
<td>SEMI P37-0613</td>
<td>Specification for Extreme Ultraviolet Lithography Substrates and Blanks</td>
</tr>
<tr>
<td>SEMI P47-0307</td>
<td>Test Method for Evaluation of Line-Edge Roughness and Linewidth Roughness (Reapproved 0513)</td>
</tr>
</tbody>
</table>

Table 11: New Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>July2018-#1</td>
<td>Kevin Nguyen (SEMI) &amp; Alex Starikov</td>
<td>To coordinate and distribute Revision of SEMI P19-92 (Reapproved 0707) Specification for Metrology Pattern Cells for Integrated Circuit Manufacture, for information ballot</td>
</tr>
</tbody>
</table>
Table 12 Previous Meeting Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>July2017-#1</td>
<td>Kevin Nguyen (SEMI)</td>
<td>To distribute SNARF for Revision to SEMI P18-92 (Reapproved 1104) SPECIFICATION FOR OVERLAY CAPABILITIES OF WAFER STEPPERS, to members for two weeks review</td>
<td>Completed</td>
</tr>
<tr>
<td>July2017-#2</td>
<td>Bryan Barnes (NIST)</td>
<td>To review SEMI P47-0307 (Reapproved 0513) Test Method for Evaluation of Line-Edge Roughness and Linewidth Roughness</td>
<td>Completed</td>
</tr>
<tr>
<td>July2017-#3</td>
<td>Kevin Nguyen (SEMI)</td>
<td>To contact the author of SEMI P37-0613 Specification for Extreme Ultraviolet Lithography Substrates and Blanks, for 5 year review</td>
<td>Completed</td>
</tr>
<tr>
<td>July2017-#4</td>
<td>Kevin Nguyen (SEMI)</td>
<td>To seek feedback from members if there is an interest to maintain the following standards. Otherwise, they will go inactive.  - SEMI P29-1111 Specification for Characteristics Specific to Attenuated Phase Shift Masks and Masks Blanks  - SEMI P46-1111 Specification for Critical Dimension (CD) Measurement Information Data on Photomask by XML  - SEMI P31-0304 (Reapproved 0611) Practice for Catalog Publication for Chemical Amplified (CA) Photoresist Parameter  - SEMI P45-0211 Specification for Job Deck Data Format for Mask Tools</td>
<td>Completed</td>
</tr>
<tr>
<td>July2017-#5</td>
<td>Kevin Nguyen (SEMI)</td>
<td>To contact author from Japan for SEMI P22-0307, Guideline for Photomask Defect Classification and Size Definition, for 5 year review.</td>
<td>Completed</td>
</tr>
</tbody>
</table>

1 Welcome, Reminders, and Introductions

1.1 Bryan Barnes called the meeting to order at 9:00 AM. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting. There was a minor correction. Wes Erck has stepped down from the TC Chapter leadership, but he still remains active in the task forces.

Motion: Accept the minutes as amended.
By / 2nd: Alex Starikov/Wes Erck
Discussion: None
Vote: Unanimous.

3 Liaison Reports

3.1 SEMI Staff Report

Kevin Nguyen (SEMI) gave the SEMI Staff Report. Of note:

- Next meetings
  - November 5-8, 2018  
  - SEMI HQ in Milpitas, California
- 2018 Critical Dates for SEMI Standards Ballots
  - Cycle 6, 2018
    - Ballot Submission Date: July 20
    - Voting Period Starts: August 1
    - Voting Period Ends: August 31
  - Cycle 7, 2018
    - Ballot Submission Date: August 22
    - Voting Period Starts: September 5
Voting Period Ends: October 5

- SEMI Standards Publications
  - Total SEMI Standards in portfolio: 987
    - Includes 236 Inactive Standards

- New Forms, Regulations & Procedure Manual
  - New version of Regulations (June 8, 2018)
    - Improvements on Rules for Handling of Patented Technology (Regulations § 16.1-16.3)
      - Patented Technology that might be material to the Standard is disclosed at the end stage of document development
        - Disclosed after the ballot is issued
        - Assessment for potential materiality and technical justifiability for inclusion shall be postponed to the next scheduled meeting.
    - A TF sometimes decides to use patented technology after it has started the document development project.
      - To require subsequent update of SNARF regarding use of Patented Technology and subsequent LOI process to ensure that TC Chapter agrees to the course of action recommended by the TF.
    - Additional Official Virtual TC Chapter Meeting Related Rules (Regulations ¶ 7.4.2 and § 9.5)
      - Loss of necessary infrastructure at the meeting location described in the Background Statement of the Letter Ballot
        - The necessary infrastructure (e.g., electrical power, internet connection, required software applications)
      - New version of Procedure Manual (June 8, 2018)
      - New TFOF & SNARF
      - New Ballot Review Templates
      - www.semi.org/standards

Attachment: 01, Staff Report July 2018_SA rev1

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.

4.1.1 Doc. 6327, Revision to SEMI P45-0211, Specification for Job Deck Data Format For Mask Tools
  - Ballot passed with technical changes. Ratification Ballot will be issued. See attachment for details.
  Attachment: 02, 6327 Procedural Review

5 Subcommittee and Task Force Reports
5.1 Data Path Task Force
No report.

5.2 Patterning Metrology Task Force
5.2.1 There are two issues with P18 and P19 that were raised by Alex.
• SEMI P18-92 (Reapproved 1104) Specification for Overlay Capabilities of Wafer Steppers
• SEMI P19-92 (Reapproved 0707) Specification for Metrology Pattern Cells for Integrated Circuit Manufacture

Bryan reported that there is an error (raised by Alex at SEMICON West 2017 meeting) on the equation under section 3.1.1 of P18, which appears to be a SEMI publication error. It is currently being fixed by SEMI. P19, on the other hand, needs a new definition of centerline, which needs balloting.

Alex explained the issues with P19 and P18 as he wants others to join with him in the revision process. Bryan recommended Alex to start putting together the informational ballot for distribution to global microlithography committee for feedback. And SEMI Staff will help facilitating the process. By distributing the ballot this way, it probably a good way to strawpoll the interest level. Once the feedback is received, Alex certainly can ask Bryan to proceed for technical ballot.

5.3 Mask Order Task Force

Wes reported that he is working with tool and mask companies to expand P45. A SNARF was presented. And he would like the committee to authorize this activity.

Motion: To approve SNARF
By / 2nd: Wes Erck/Alex Starikov
Discussion: None
Vote: 3-0
Attachment: 03, PV45 Revision SNARF

6 Leadership and Task Force Changes

6.1 Bryan reported NIST is supportive of Standards. However, there is budget constrain. In addition, he has a new manager, so he is unsure of his commitment in the future. However, he is also interest in SEMI Virtual Meeting, and would love to participate when SEMI is ready.

7 Old Business

7.1 Standards due for Five-Year Review.

7.1.1 The following standards are due for 5 year review. As there is no volunteer coming forward to keep these standards up to date, it was recommended in letting these standards to go inactive.

• SEMI P9-1111
  o Guide for Functional Testing of Microelectronic Resists
• SEMI P29-1111
  o Specification for Characteristics Specific to Attenuated Phase Shift Masks and Masks Blanks
• SEMI P31-0304 (Reapproved 0611)
  o Practice for Catalog Publication for Chemical Amplified (CA) Photoresist Parameter
• SEMI P35-1106 (Reapproved 0913)
  o Terminology for Microlithography Metrology
• SEMI P36-1108 (Reapproved 0913)
• SEMI P37-0613
  o Specification for Extreme Ultraviolet Lithography Substrates and Blanks
• SEMI P46-1111
• SEMI P47-0307 (Reapproved 0513)
  o Test Method for Evaluation of Line-Edge Roughness and Linewidth Roughness

**Motion:** To let standards above go inactive  
**By / 2nd:** Wes Erck/ Hayashi Naoya  
**Discussion:** None  
**Vote:** 5-0

### 8 New Business

8.1 *New TFOF and SNARF*

There is a need to create a new task force to maintain and revise lithography standards.

### 9 Next Meeting and Adjournment

The next meeting is tentatively scheduled for July 10, 2019 - 10:00 AM – Noon.  
San Francisco, California. See [http://www.semi.org/standards-events](http://www.semi.org/standards-events) for the current list of events.  
Having no further business, a motion was made to adjourn. Adjournment was at 11:00 AM.

Respectfully submitted by:

Kevin Nguyen,  
SEMI Standards Operations Manager  
Phone: 408-943-7997  
Email: knguyen@semi.org

Minutes tentatively approved by:

| Bryan Barnes (NIST) Co-chair | August 10, 2018 |

### Table 13 Index of Available Attachments#1

<table>
<thead>
<tr>
<th>Title</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Report July 2018_SA rev1</td>
<td>PV45 Revision SNARF</td>
</tr>
<tr>
<td>6327 Procedural Review</td>
<td></td>
</tr>
</tbody>
</table>

#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.