

North America Microlithography Committee Meeting Summary and Minutes

SPIE Advanced Lithography 2013
Thursday, February 28, 2013
4:30 PM – 6:00 PM (PST)
San Jose Convention Center in San Jose, CA

Next Committee Meeting

The next NA Microlithography Committee meeting will be held at the San Francisco Marriott Marquis Hotel in conjunction with SEMICON West 2013 on July 8-11, 2013 in San Francisco, California. The meeting date, time, and room are to be determined and subject to change.

The latest schedule and meeting details will be updated at: <http://www.semi.org/en/node/45276>

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Wes Erck (Wes Erck & Associates), Rick Silver (NIST)

SEMI Staff: Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
ASML	<i>Zimmerman</i>	<i>John</i>	Wes Erck & Associates	Erck	Wes
GLOBALFOUNDRIES	Mangat	Pawitter			
NIST	Silver	Rick	SEMI NA	Trio	Paul
Synopsys	Gookassian	John	SEMI NA	Tran	Michael

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
Overlay Metrology Specifications TF	Rick Silver (NIST)	(Disbanded)

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>
5048	Line-Item Revisions to SEMI P37-1109, Specification for Extreme Ultraviolet Lithography Mask Substrates	Line Items 1 and 2, passed with editorial changes

Table 4 Authorized Activities

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
5561	SNARF	Mask Orders (P10) TF	Revision to SEMI P10-1112, Specification of Data Structures for Photomask Orders

Table 5 Authorized Ballots

<i>#</i>	<i>When</i>	<i>SC/TF/WG</i>	<i>Details</i>
5561	Cycle 1-2015	Mask Orders (P10) TF	Revision to SEMI P10-1112, Specification of Data Structures for Photomask Orders

Table 6 New Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
2013Feb#01	Wes Erck	Work with David Bouldin on some of the inputs received from Justin Benore for documents 5120, 5121, 5122, 5123, 5124, and 5125.
2013Feb#02	Michael Tran	Send Wes Erck and John Gookassian documents 5121, 5124, 5125, 5126, and 5127 for their review.
2013Feb#03	Michael Tran	Contact Thomas Germer whether to keep the TF open or disband it at SEMICON West 2013.
2013Feb#04	Pawitter Mangat	See if someone from GLOBALFOUNDRIES has any suggestions for new syntax to be implemented in the P10 XML schema files.
2013Feb#05	Pawitter Mangat	Will review SEMI P34 (Square Photomask Substrates) with others to see if it should be revised or reapproved.
2013Feb#06	Michael Tran	Send Wes Erck and Rick Silver the committee reviewed document list for 5 year review.

Table 7 Previous Meeting Actions Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>	<i>Status</i>
2012Jul#01	Wes Erck	Send a letter to the ISC SC requesting permission to publish document #5047 without a Letter of Assurance	CLOSED. LoA received from Toppan.
2012Jul#02	Michael Tran	Work with Wes Erck on documents needing five years reviews.	OPEN
2011Jul #01	Wes Erck	Work with Justin Benore (MGC Pure Chemicals America) on inputs submitted for ballots (5120, 5121, 5122, 5123, 5124, and 5125).	OPEN, see Action Item: 2013Feb#01
2011Jul #02	Wes Erck	Work with John Gookassian (Synopsis) on inputs submitted for ballots (5121, 5124, 5125, 5126, and 5127).	OPEN, see Action Item: 2013Feb#02
2011Jul #04	Rick Silver	Ask Thomas Germer (NIST) about the current status of the Standards for Scatterometry TF.	OPEN, see Action Item: 2013Feb#03

1 Welcome, Reminders, and Introductions

1.1 Wes Erck (Wes Erck & Associates), committee co-chair, called the meeting to order at 4:45 PM PST. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

Attachment: 01, 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 from SEMICON West 2012 as written.

By / 2nd: Rick Silver (NIST) / John Gookassian (Synopsis)

Discussion: None.

Vote: 4-0 in favor. Motion passed.

Attachment: 02, Previous Meeting Minutes (West 2012)

3 Liaison Reports

3.1 Japan Micropatterning Committee

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

- The chair is currently Iwao Higashikawa (Toshiba)
 - The leader of the Mask Data Format for Mask Tools TF is Toshio Suzuki (DNP)
 - The leader of the 5 Year Review TF is Iwao Higashikawa (Toshiba)
- Meeting Information
 - The last meeting was December 11, 2012 during Japan Winter Meetings 2012 at SEMI Japan, Tokyo, Japan
 - The next meeting will be April 9, 2013 during Japan Spring Meetings 2013 at SEMI Japan, Tokyo, Japan
- Ballot Results
 - Doc.#5483, Reapproval of SEMI P47-0307, *Test Method for Evaluation of Line-edge roughness and Line-width Roughness*
 - Passed committee review
- New SNARFs
 - Doc. #5535, Reapproval of SEMI P35-1106, *Terminology for Microlithography M*
 - Doc. #5536, Reapproval of SEMI P36-1108, *Guide for Magnification Reference for Critical Dimension Measurement for Scanning Electron Microscopes (CD-SEMs)*
 - Doc. #5537, Line Item Revision to SEMI P23-0200 (Reapproved 1107), *Guidelines for Programmed Defect Masks and Benchmark Procedures for Sensitivity Analysis of Mask Defect Inspection Systems*
- Mask Data Format for Mask Tools TF
 - The TF is drafting document #5229, Revision to SEMI P44, *Specification for Open Artwork System Interchange Standard (OASIS) Specific to Mask Tools*
- 5 Years Review TF
 - The TF is drafting:
 - Doc. #5484, Revision to SEMI P22-0307, *Guideline for Photomask Defect Classification and Size Definition*
 - Doc. #5537, Line Item Revision to SEMI P23-0200 (Reapproved 1107), *Guidelines for Programmed Defect Masks and Benchmark Procedures for Sensitivity Analysis of Mask Defect Inspection Systems*
- SEMI Japan Micropatterning contact, Naoko Tejima, SEMI Japan (ntejima@semi.org)

Attachment: 03, Japan Micropatterning Report

3.2 SEMI Staff Report

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

- Upcoming SEMI Major Events in 2013:
 - SEMICON/ FPD/ SOLARCON China, March 19-21, 2013 in Shanghai, China

- SEMICON Singapore, May 7-9, 2013 in Marina Bay Sands
- SEMICON Russia, June 5-6, 2013 in Moscow
- SEMICON West, July 9-11, 2013 in San Francisco, California
- SEMICON Taiwan, September 4-6, 2013 in Taipei
- SEMICON Europa, October 8-10, 2013 in Dresden, Germany
- Upcoming NA Standards Meetings
 - NA Compound Semiconductor Materials Committee
 - May 15, 2013 (tentative), in conjunction with CS MANTECH, New Orleans, Louisiana
 - NA Standards Meetings at SEMICON West 2013
 - July 8-11, 2013, in San Francisco, California
- SEMI Standards Publications
 - Standards published from January 2013 :
 - New Standards: 9
 - Revised Standards: 3
 - Reapproved Standards: 0
 - Withdrawn Standards: 0
 - There are a total of 871 SEMI Standards in portfolio and that includes 93 Inactive standards
- Revised SEMI Regulations and PG
 - Global TC Structure (RTC/LTC to TC Chapters under a Global Technical Committee)
 - Formation and Disbandment of Global Technical Committee
 - Formation and Disbandment of TC Chapter under existing Global Technical Committee
 - Elimination of Regional Standards
 - IP Section (§ 15)
 - Exit mechanism from LOA in limbo
 - Clarification and additional guidance on Letter of Intent (LOI)
 - Restructuring the section in chronological order
 - From approval of activity to discovery after publication
 - Redefine Supplementary Materials
 - Remove Appendices from “Supplementary Materials”
 - Redefine “Other Supplementary Materials” as “Various Materials”
 - Not official content of the Standard or Safety Guideline
 - Part of a standard but is published separately
 - Future Tasks – Regulations
 - Virtual Meetings
 - Identify key concerns/issues
 - infrastructure, language, approval process
 - Benchmark other SDOs

- Addition of a new official material similar to an Appendix published separately with a different file format
- Official Liaisons with other SDOs
- Redefine Interest Categories of TC Members -- currently based on IC, include PV/FPD/MEMS
- Inclusion of regulatory requirement in SEMI Standards / Safety Guidelines

Attachment: 04, SEMI North America Standards Staff Report

4 Ballot Review

NOTE 1: Committee adjudication on the ballot is detailed in the Audits & Reviews (A&R) Subcommittee Form for procedural review. The A&R form is available as an attachment to these minutes. The attachment number for the ballot document is provided under the ballot review section below.

4.1 Line-Items Revisions to SEMI P37-1109, *Specification for Extreme Ultraviolet Lithography Substrates and Blanks*

Motion: Line items 1 and 2 **passed** committee review with editorial changes and will be forwarded to the A&R for procedural review.

By / 2nd: John Zimmerman (ASML) / John Gookassian (Synopsys)

Discussion: None.

Vote: 3-0 in favor. Motion passed.

Attachment: 05, 5048ProceduralReview

5 Subcommittee & Task Force Reports

5.1 *Terminology of Metrology TF*

5.1.1 Wes Erck (Wes Erck & Associates) reported for the Terminology of Metrology TF. The TF's document SEMI P35-1106, *Terminology for Microlithography Metrology* was balloted for reapproval by the Japan 5-year review TF.

5.2 *Overlay Metrology Specifications TF*

5.2.1 Rick Silver (NIST) reported for the Overlay Metrology Specifications TF. There were no activities due to proprietary materials. One company owns the proprietary tool and the TF don't see anything changing so the committee approved to disband the TF.

Motion: To disband the Overlay Metrology Specifications TF

By / 2nd: Rick Silver (NIST) / John Gookassian (Synopsys)

Discussion: None.

Vote: 3-0 in favor. Motion passed.

5.3 *Standards for Scatterometry TF*

5.3.1 Wes Erck (Wes Erck & Associates) and Rick Silver (NIST) reported for the Standards for Scatterometry TF. There has been no new activity and SEMI staff will contact Thomas Germer (NIST) to keep the TF open or disband by SEMICON West 2013.

Action Item: 2013Feb#03, Michael Tran to contact Thomas Germer whether to keep the TF open or disband it at SEMICON West 2013.

5.4 Extreme Ultraviolet (EUV) Mask TF

5.4.1 John Zimmerman (ASML) reported for the Extreme Ultraviolet (EUV) Mask TF. The TF discuss the ballot results and comments for Document #5048, *Line-Item Revisions to SEMI P37-1109, Specification for Extreme Ultraviolet Lithography Mask Substrates* which the Line Items passed committee review with editorial changes.

Attachment: 06, P-37 Revision Voting Results

5.5 Mask Orders (P10) TF

5.5.1 Wes Erck (Wes Erck & Associates) reported for the Mask Orders (P10) TF. The latest revision to SEMI P10, *Specification of Data Structures for Photomask Orders* was published in November 2012 and its XML schema files were included in February 2013 at <http://dom.semi.org/web/wstandards.nsf/schema>. The TF submitted a SNARF to revise SEMI P10 again and was approved by the committee to be balloted for Cycle 1-2015. Wes mentioned that semiconductor foundries such as Globalfoundries, UMC, and TSMC have been participating in Mask Orders. The TF would like to have someone from one of these companies preferably involved with P10 in the past to work on the syntax for the P10 XML schema files.

Action Item: 2013Feb#04, Paiwitter Mangat to see if someone from GLOBALFOUNDRIES has any suggestions for new syntax to be implemented in the P10 XML schema files

5.6 Data Path TF

5.6.1 Wes Erck (Wes Erck & Associates) reported for the Data Path TF. Wes said most of the work had been on the Japanese side.

5.7 Extreme Ultraviolet (EUV) Fiducial Mark TF

5.7.1 Pawitter Mangat (GLOBALFOUNDRIES) reported for the Extreme Ultraviolet (EUV) Fiducial Mark TF. The TF reviewed SEMI P48, *Specification of Fiducial Marks for EUV Mask Blank*. A lot of progress has been made and there are lots of data available. The Fiducial tool will be validated by the end of March 2013. Long He (Intel/SEMATECH) has the technicalities down to a specification table that was circulated last October. The TF will submit a revised SNARF for P48 and ballot it at SEMICON West 2013.

6 Old Business

6.1 Five-Year Review

6.1.1 Michael Tran (SEMI NA) presented to the committee a list of documents that were due for 5 year review. The committee reviewed the list and provided that status of each document:

<i>Document</i>	<i>Title</i>	<i>Status</i>
SEMI P2-0308	Specification for Chrome Thin Films for Hard Surface Photomasks	Jim Potzick and Wes Erck reviewing.
SEMI P3-0308	Specification for Photoresist/E-Beam Resist for Hard Surface Photoplates	Maybe inactive status. Undecided.
SEMI P5-0704	Specification for Pellicles	John Zimmerman, Long He and Wes Erck reviewing

<i>Document</i>	<i>Title</i>	<i>Status</i>
SEMI P6-88 (Reapproved 0707)	Specification for Registration Marks for Photomasks	Maybe inactive status. Undecided.
SEMI P11-0308	Test Method for Determination of Total Normality for Alkaline Developer Solutions	No support. To be inactive at SEMICON West 2013.
SEMI P12-0997	Determination of Iron, Zinc, Calcium, Magnesium, Copper, Boron, Aluminum, Chromium, Manganese, and Nickel in Positive Photoresists by Inductively Coupled Plasma Emission Spectroscopy (ICP)	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P13-91 (Reapproved 1104)	Determination of Sodium And Potassium in Positive Photoresists by Atomic Absorption Spectroscopy	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P14-0997	Determination of Tin in Positive Photoresists by Graphite Furnace Atomic Absorption Spectroscopy	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P15-92 (Reapproved 1104)	Determination of Sodium and Potassium in Positive Photoresist Metal Ion Free (MIF) Developers by Atomic Absorption Spectroscopy	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P16-92 (Reapproved 1104)	Determination of Tin in Positive Photoresist Metal Ion Free (MIF) Developers by Graphite Furnace Atomic Absorption Spectroscopy	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P17-92 (Reapproved 0299)	Determination of Iron, Zinc, Calcium, Magnesium, Copper, Boron, Aluminum, Chromium, Manganese, and Nickel in Positive Photoresist Metal Ion Free (MIF) Developers by Inductively Coupled Plasma Emission Spectroscopy (ICP)	Ballot failed in 2011. To be inactive at SEMICON West 2013.
SEMI P18-92 (Reapproved 1104)	Specification for Overlay Capabilities of Wafer Steppers	Ballot Failed in 2011. John Zimmerman is reviewing.
SEMI P19-92 (Reapproved 0707)	Specification for Metrology Pattern Cells for Integrated Circuit Manufacture	Rich Allen and Rick silver reviewing.
SEMI P28-96 (Reapproved 0707)	Specification for Overlay-Metrology Test Patterns for Integrated-Circuit Manufacture	Rick Silver reviewing and will decide to make it inactive or not.
SEMI P34-0200 (Reapproved 0707)	Specification for 230 mm Square Photomask Substrates	Pawitter Mangat will send and forward to others to see if it should be revised or reapproved.
SEMI P39-0308	Specification for Open Artwork System Interchange Standard (OASIS)	Sending to Tom Grebinski. Let him know it has to be balloted for reapproval.

Action Item: 2013Feb#05, Pawitter Mangat to review SEMI P34 (Square Photomask Substrates) with others to see if it should be revised or reapproved.

Action Item: 2013Feb#06, Michael Tran to send Wes Erck and Rick Silver the committee reviewed document list for 5 year review.

Attachment: 07, NA Microlithography 5 year Review Document List

7 New Business

7.1 *New SNARF*

7.1.1 Wes Erck submitted SNARF #5561: Revision to SEMI P10, *Specification of Data Structures for Photomask Orders* for the committee approval.

Motion: To approve SNARF #5561.

By / 2nd: Rick Silver (NIST) / Pawitter Mangat (GLOBALFOUNDRIES)

Discussion: None.

Vote: 3-0 in favor. Motion passed.

7.2 *Ballot Authorization*

7.2.1 Wes Erck submitted SNARF #5561: Revision to SEMI P10, *Specification of Data Structures for Photomask Orders* for ballot authorization from the committee.

Motion: To approve letter ballot of Document #5561 for Cycle 1, 2015.

By / 2nd: Rick Silver (NIST) / Pawitter Mangat (GLOBALFOUNDRIES)

Discussion: None.

Vote: 3-0 in favor. Motion passed.

8 Action Item Review

8.1 *Open Action Items*

8.1.1 Michael Tran (SEMI) 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) 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 NA Microlithography Committee meeting will be held at the San Francisco Marriott Marquis Hotel in conjunction with SEMICON West 2013 on July 8-11, 2013 in San Francisco, California. The meeting date, time, and room are to be determined and subject to change.

The latest schedule and meeting details will be updated at: <http://www.semi.org/en/node/45276>

9.2 Having no further business, a motion was made to adjourn the NA Microlithography committee meeting on February 28, 2013 in conjunction with SPIE Advanced Lithography 2013 at the San Jose Convention Center in San Jose, CA. Adjournment was at 6:08 PM PST.

Respectfully submitted by:

Michael Tran
Senior Standards Engineer
SEMI North America
Phone: 1-408-943-7019
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Minutes approved by:

Wes Erck (Wes Erck & Associates), Co-chair	
Rick Silver (NIST), Co-chair	

Table 8 Index of Available Attachments #1

#	<i>Title</i>	#	<i>Title</i>
01	Required Meeting Elements	05	5048ProceduralReview
02	Previous Meeting Minutes (West 2012)	06	P-37 Revision Voting Results
03	Japan Micropatterning Report	07	NA Microlithography 5 year Review Document List
04	North America Standards Staff Report		

#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.