



North America MEMS / NEMS Standards Committee Meeting Summary and Minutes



SEMI®
International
Standards

NA Standards Spring 2015 Meetings
30 March, 14:30 – 16:30 Pacific Time
SEMI Headquarters in San Jose, California

Committee Announcements

Next Committee Meeting

SEMICON West 2015 Meetings

July 13, 2015

San Francisco Marriott Marquis Hotel in San Francisco, California

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Win Baylies (BayTech-Resor), Steve Martell (Sonoscan)

SEMI Staff: Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
BayTech-Resor	Baylies	Win	Sonoscan	Martell	Steve
NIST	Allen	Rich	SEMI	Tran	Michael

Table 2 Leadership Changes

<i>Group</i>	<i>Previous Leader</i>	<i>New Leader</i>
None		

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>
5808	Reapproval of SEMI MS8-0309, Guide to Evaluating Hermeticity of MEMS Packages	Passed as balloted. Superclean
4719C	Revision to SEMI MS3-0307, Terminology for MEMS Technology	Passed as balloted. Superclean

Table 4 Authorized Activities

<i>#</i>	<i>Type</i>	<i>SC/TF/WG</i>	<i>Details</i>
5870	SNARF	NA MEMS / NEMS TC Chapter	Line Item revision to SEMI MS4-1113, <i>Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i> with title change to: <i>Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i>

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

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

**Table 5 Authorized Ballots**

#	When	SC/TF/WG	Details
5870	Cycle 4 or 5, 2015	NA MEMS / NEMS TC Chapter	Line Item revision to SEMI MS4-1113, <i>Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i> with title change to: <i>Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i>

Table 6 Previous Meeting Actions Items

Item #	Assigned to	Details
2014Nov#01	Michael Tran	Contact Yann Guillou of SEMI Europe regarding the attendance for the previous SEMI European MEMS Summit 2014.
2014Nov#02	Michael Tran	Contact Yann Guillou of SEMI Europe to promote MEMS standards activities at the next European MEMS Summit 2015.
2013Apr #01	Jason Gorman	Draft a dynamic characterization interest survey and send it to the committee chairs for review and launch it before SEMICON West 2013.
2012Oct #03	Mark Crockett now Mark Tondra	Submit a SNARF to prepare for the 5 year review of SEMI MS6-0308, Guide for Design and Materials for Interfacing Microfluidic Systems

1 Welcome, Reminders, and Introductions

Steve Martell, committee co-chair, called the meeting to order at 2:35 PM. After welcoming all attendees, the SEMI meeting reminders on membership requirements, antitrust, patentable technology, and meeting guidelines were presented and explained. Finally, the agenda was reviewed.

Attachment: 01, SEMI Standards Required Meeting Elements

2 Review of Previous Meeting Minutes

The committee reviewed the minutes of the previous meeting held November 3 in conjunction with the NA Standards Fall 2014 meetings.

Motion: Accept the minutes of the previous meeting as written.

By / 2nd: Win Baylies (BayTech-Resor) / Rich Allen (NIST)

Discussion: None

Vote: Unanimous in favor. Motion passed.

Attachment: 02, NA MEMS/NEMS Fall 2014 meeting (November 3) minutes

3 SEMI Staff Report

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

- 2015 Global Calendar of Events
 - SEMICON Southeast Asia (April 22-24, Penang, Malaysia)
 - Advanced Semiconductor Manufacturing Conference [ASMC] (May 3-6, Saratoga Springs, New York)
 - Intersolar Europe (June 10-12, Munich Germany)



- SEMICON Russia (June 17-18, Moscow)
- SEMICON West (July 14-16, San Francisco, California)
- SEMICON Taiwan (September 2-4, Taipei)
- European MEMS Summit (September 17-18, Milan, Italy)
- Strategic Materials Conference [SMC] (September 22-23, Mountain View, California)
- SEMICON Europa (October 6-8, Dresden, Germany)
- SEMICON Japan (December 16-18, Tokyo)
- NA Standards Spring 2015 Meetings (March 29 to April 2)
 - Committees meeting at SEMI Headquarters (San Jose)
 - 3DS-IC | EHS | Facilities & Gases | HB-LED | Information & Control | Liquid Chemicals | MEMS/NEMS | Metrics | PV Materials
 - SEMI thanks Intel (Santa Clara) for hosting the Physical Interfaces & Carriers (PIC) committee and task force meetings.
 - SEMI thanks KLA-Tencor (Milpitas) for hosting the Silicon Wafer committee and task force meetings.
- Upcoming North America Meetings (2015)
 - 2015:
 - NA Compound Semiconductor Materials TC Chapter Meeting (May 20 in conjunction with CS MANTECH, Scottsdale, Arizona)
 - NA Standards Meetings at SEMICON West 2015 (July 13-16, San Francisco, California)
 - NA Standards Fall 2015 Meetings (November 2-5, San Jose, California)
 - 2016:
 - NA Standards Spring 2016 Meetings (April 4-7, San Jose, California)
- Technical Ballot Critical Dates for NA Standards meetings at SEMICON West 2015
 - Cycle 4: due April 10 / Voting Period: April 21 – May 21
 - Cycle 5: due May 8 / Voting Period: May 22 – June 22
- Standards Publications Report

Cycle	New	Revised	Reapproved	Withdrawn
November 2014	1	4	1	0
December 2014	3	4	3	0
January 2015	5	2	0	1
February 2015	3	7	3	0


 - Total in portfolio – 928 (includes 110 Inactive Standards)
- New Requirements/Process Reminders for TC Chapter Meetings
 - Standards Document Development Project Period
 - Project period shall not exceed 3 years (Regs 8.3.2)
 - SNARF approval to TC Chapter approval



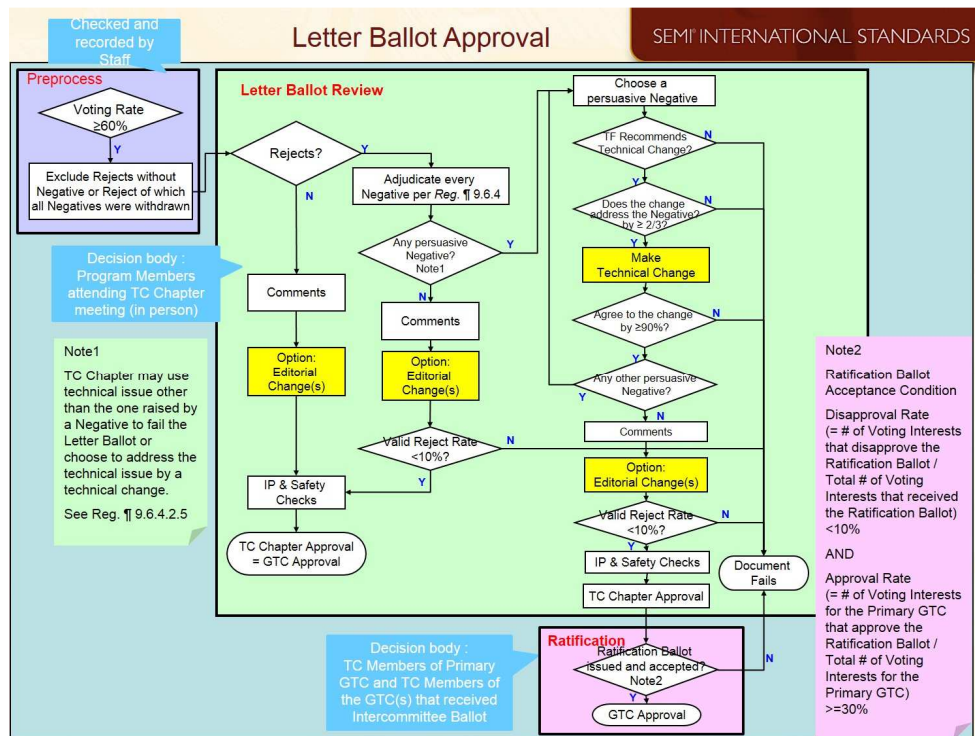
- If document development activity is found to be continuing, but cannot be completed within the project period, TC Chapter may grant one-year extension at a time, as many times as necessary.
- SNARF Review Period
 - A submitted SNARF for a new, or for a major revision to an existing, Standard or Safety Guideline is made available to all members of a TC Chapter's parent global technical committee for two weeks for their review and comment. (Regs 8.2.1)
 - If the SNARF is submitted at a TC Chapter meeting, the committee can review and approve, but the SNARF will need to be distributed for two weeks and then approved via GCS.
- New SNARF & TFOF forms *{embedded in Staff Report, see Attachment 03 of these minutes}*
- Procedures for Correcting Nonconforming Titles of Published Standards Document (PM Appendix 4)
 - Some Standards qualify for a special procedure where a line item change can be used to correct the titles. Otherwise, the corrective action will likely require a major revision.
- Table of Content (TOC)
 - No section of a Standard or Safety Guideline may contain a list of section numbers and titles (e.g., similar to a Table of Contents).
 - Table of content can be approved editorially during Reapproval
- Assignment of Draft Document Numbers
 - Upon successful publication of a Document, or termination of work on it by the TF, Standards staff retires the Document number and its associated SNARF, and they are not to be used for further Document development activity.
 - For a Document with Line Item(s) that passed while others failed, the same SNARF may be used to rebalot only those failed Line Item(s).
 - A new SNARF is required to introduce new Line Item(s).
- SNARF
 - SNARFs may be submitted and approved for new, revised, reapproved, or reinstated Documents that have been approved by the TC Chapter, but not yet published (i.e., no new Publication Date Code exists yet). (PM NOTE 8)
- Minority Report (MR)
 - The motion passes if a simple majority of the total GCS voting membership (i.e., not just those who return votes) approve the motion (Regs 9.9)
- Latest Approvals/Next Revisions
 - Follow-up revisions of Regulations and Procedure Manual were published on 27 March, 2015 for use in NA Spring Standard meetings.
- Regulations/PM Ballot Revisions



<i>Group #</i>	<i>Title</i>	<i>Regs</i>	<i>PM</i>
1	Clarification on Standards Document Development Project Period	Y	Y
2	GCS Voting Period for Minority Reports	Y	Y
3	Improvement on Minority Report Handling for Shorter Time to Publication	Y	Y
4	TC Membership Requirement	Y	N
5	Ballot Adjudication Process Improvement	Y	Y
6	Revision to Procedural Review	Y	Y
7	Clarification of TC Chapter Review and Adjudication Term	Y	Y
8	Clarification of Procedure Guide to Procedure Manual	Y	Y
9	Miscellaneous Changes of Regulations	Y	N
10	Add New Requirements Related to Notices	N	Y
11	Add New Guidance Related to Note	N	Y
12	Clarification on SNARF and TFOF submitter	N	Y
13	Clarification on SNARF approval procedures for New Standards/Safety Guidelines and major revision of existing Standards/Safety Guidelines	N	Y
14	Update Appendix 4 Related to Correction of Nonconforming Titles	N	Y
15	Clarifications of Procedures Related to Table of Contents	N	Y
16	Clarifications on Use of Shall, Must, and Should	N	Y
17	Miscellaneous Changes to Procedure Manual	N	Y

 Indicates follow-up from Oct-Nov 2014 Regs ballot

- Ballot Adjudication Process Improvement (Group 5)
 - Problem
 - Publications of Documents can be delayed by the need to go through another cycle of Letter Ballot issuance and adjudication at a TC Chapter meeting to make any technical change.
 - Proposed Solution
 - Allow TC Chapter to make technical changes on balloted Standard Document during its adjudication under certain conditions. Conduct a Ratification Ballot in order to ensure global consensus on supporting the technical changes made by the TC Chapter.
 - NOTE: This Group was originally proposed as Group 10 in the previous Regulations Ballot to ISC and failed.
 - Taking suggestion of ISC at its SEMICON Japan 2014 meeting in December, the scope of the Ratification Ballot is now limited to technical changes made by TC Chapter during adjudication of a Letter Ballot.



- GCS Voting Period for Minority Report (Group 2)
 - Problem
 - Voting period for Minority Report is too short to solicit sufficient votes from GCS voting members.
 - Proposed Solution
 - To let GCS member have 2 weeks voting period, which is same length as the Minority Report submission window.
 - NOTE: This problem was raised by the NARSC at its Fall 2014 meeting at which the ISC Ballot on Regulations change was discussed. Following-up on this problem by additional changes in the Regulations was suggested by the Regulations SC Chair at the time.
- Improvement on Minority Report Handling for Shorter Time to Publication (Group 3)
 - Problem
 - Despite the rare occurrence of MR submission, every Document approved by the TC Chapter has to wait at least a month before it qualifies for A&R procedural review, which in turn results in a longer time to publish.
 - Proposed Solution
 - Expedite the process by allowing A&R procedural review to be commenced as soon as record of ballot review made available.
 - If an MR is submitted on a Document, Publication will be on hold until responsible parties reach conclusion on the MR. If the Document is returned to the TF for rework based on consideration of the MR, A&R approval is nullified.
 - NOTE: This problem was raised by JARSC at its SEMICON Japan 2014 meeting. ISC members expressed their support on improvement toward faster publication.

Attachment: 03, SEMI Standards Staff Report



4 Ballot Review

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.

NOTE 1: Committee adjudication on Cycle 2, 2015 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 document is provided below the summary tables.

4.1 Cycle 2, 2015 Ballots

Document #	Document Title	Committee Action
5808	Reapproval of SEMI MS8-0309, Guide to Evaluating Hermeticity of MEMS Packages	Passed as balloted. Superclean
4719C	Revision to SEMI MS3-0307, Terminology for MEMS Technology	Passed as balloted. Superclean

Attachment: 04, Ballot Review for Doc. 5808

05, Ballot Review for Doc. 4719C

5 Task Force Reports

The following task forces under the NA MEMS/NEMS TC Chapter are currently inactive: Materials Characterization TF, Reliability TF, and Wafer Bond TF.

5.1 International Terminology Task Force

The committee agreed to change the status of the International Terminology TF to inactive.

5.2 Microfluidics Task Force

CEN/TC 332 is a group working on standardization of laboratory equipment for biotechnological and medical applications. The TF is looking to work with this group on microfluidics-related activities. However, it was pointed out that any resulting standard from this effort would be published under ISO which could be an issue for SEMI losing copyright.

5.3 Packaging Task Force

The committee agreed to change the status of the Packaging TF to inactive.

6 Old Business

6.1 Status Update on Previous Action Items

Item #	Assigned to	Details	Status
2014Nov#01	Michael Tran	Contact Yann Guillou of SEMI Europe regarding the attendance for the previous SEMI European MEMS Summit 2014.	Open
2014Nov#02	Michael Tran	Contact Yann Guillou of SEMI Europe to promote MEMS standards activities at the next European MEMS Summit 2015.	Open



2013Apr #01	Jason Gorman	Draft a dynamic characterization interest survey and send it to the committee chairs for review and launch it before SEMICON West 2013.	Rich Allen to follow up with Jason Gorman.
2012Oct #03	Mark Crockett now Mark Tondra	Submit a SNARF to prepare for the 5 year review of SEMI MS6-0308, Guide for Design and Materials for Interfacing Microfluidic Systems	Open

6.2 SNARFs Past Three Year Document Development Period

Per *Regulations* section 8.3.2, the Standard Document Development Project Period shall not exceed three years. The EXCEPTION for *Regulations* section 8.3.2 enables the TC Chapter to grant a one-year extension at a time if Document development activity is found to be continuing.

The following activities under the Microfluidics TF are past the three-year document development period:

- SNARF # 4819, Standard Test Method for Electroosmotic Mobility in Microfluidic Systems
- SNARF # 5267, New Standard: Specification for Microfluidic Port and Pitch Dimensions
- SNARF # 5268, New Standard: Test Method for Autofluorescence of Materials

Motion: Find development of Documents 4819, 5267, and 5268 as continuing.

By / 2nd: Win Baylies (BayTech-Resor) / Rich Allen (NIST)

Discussion: None

Vote: Unanimous in favor. Motion passed.

6.3 Published Standards with Nonconforming Titles

Many of the published SEMI Standards have titles that do not conform to the requirements specified in the SEMI Standards *Regulations* and *Procedure Manual*. Appendix 4 of the SEMI Standards Procedure Manual establishes a procedure for correcting nonconforming titles of published Standards Documents. SEMI MS4 (*Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance*) was identified as one of the published SEMI Standards with a nonconforming title that must be corrected.

The title of SEMI MS4 would be corrected from, "Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance" to "Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance." {See section 7.2 and 7.3 of these minutes for the new SNARF approval and authorization for ballot submission to correct the nonconforming title of SEMI MS4}

This line item is permitted in accordance with the Special Procedure listed in section A4-1 and Table A4-1 of the SEMI Procedure Manual.

7 New Business

7.1 Future of the MEMS / NEMS Committee

Rich Allen pointed out that the committee should find ways to collaborate with MIG (MEMS Industry Group) on standardization activities. For example, MIG worked with IEEE in developing a standard for MEMS sensors. While the standards development work was carried out under IEEE, MIG was there to help write the standard. Karen Lightman is the head of MIG and does a remarkable job working with various MEMS companies and organizations. MIG is very effective in getting many companies to attend its various events (e.g., MEMS Executive Congress). It was also reported that MIG will have its MEMS Technical Congress from May 6-7 in Boston, MA.



7.2 New TFOFs & SNARFs

New SNARF for: Line item revision to SEMI MS4-1113, Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance with title change to: Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance

Rationale: Appendix 4 of the SEMI Standards Procedure Manual establishes a procedure for correcting nonconforming titles of published Standards Documents. SEMI MS4 (*Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance*) was identified as one of the published SEMI Standards with a nonconforming title that must be corrected.

Scope: The title of SEMI MS4 would be corrected from, "Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance" to "Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance."

Motion: Approve SNARF for MS4 line item revision to correct nonconforming title.

By / 2nd: Rich Allen (NIST) / Win Baylies (BayTech-Resor)

Discussion: None

Vote: Unanimous in favor. Motion passed.

7.3 Upcoming Ballot Authorization

#	When	SC/TF/WG	Details
5870	Cycle 4 or 5, 2015	NA MEMS / NEMS TC Chapter	Line Item revision to SEMI MS4-1113, <i>Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i> with title change to: <i>Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance</i>

Motion: Authorize ballot submission for MS4 line item revision to correct nonconforming title.

By / 2nd: Rich Allen (NIST) / Win Baylies (BayTech-Resor)

Discussion: None

Vote: Unanimous in favor. Motion passed.

8 Next Meeting and Adjournment

The next meeting of the North America MEMS/NEMS committee is scheduled for Tuesday, July 14 in conjunction with SEMICON West 2015 in San Francisco, California. The tentative schedule is provided below:

SEMICON West 2015 Meetings

July 13-16, 2015

San Francisco Marriott Marquis Hotel

780 Mission Street

San Francisco, California 94103

U.S.A.

Monday, July 13

- Microfluidics TF (10:00 AM to 11:00 AM)
- NA MEMS / NEMS Committee (2:30 PM to 4:30 PM)

Having no further business, a motion was made to adjourn the NA MEMS/NEMS Committee meeting in conjunction with the NA Standards Spring 2015 meetings. Adjournment was at 4:00 PM.



Respectfully submitted by:

Michael Tran
Senior Standards Engineer
SEMI North America
Phone: +1.408.943.7019
Email: mtran@semi.org

Minutes approved by:

Win Baylies (BayTech-Resor)	June 10, 2015
Steve Martell (Sonoscan)	

Table 7 Index of Available Attachments #1

#	<i>Title</i>
1	SEMI Standards Required Meeting Elements
2	NA MEMS / NEMS Fall 2014 Meeting (November 2) Minutes
3	SEMI 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.