

## North America MEMS / NEMS Committee Meeting Summary and Minutes

N.A. Standards SEMICON West 2013 Meetings  
Monday, July 08, 2013, 2:30 – 4:30 PST  
San Francisco Marriott Marquis Hotel in San Francisco, California

### Next Committee Meeting

The next N.A. MEMS / NEMS standards meetings are tentatively scheduled for October 28, 2013 at SEMI Headquarters in San Jose, CA in conjunction with the NA Standards Fall 2013 Meetings.

For meeting details, registration, the latest schedule, and travel information, please visit <http://www.semi.org/en/node/46221>

### Table 1 Meeting Attendees

**Co-Chairs:** Mark Crockett (MEMSMART) / Win Baylies (BayTech Group) / Janet Cassard (NIST)

**SEMI Staff:** Michael Tran

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Bevan Wu & Associates	Wu	Bevan	Sonoscan	Martell	Steve
MEMSMART	Crockett	Mark			
<i>NIST</i>	<i>Cassard</i>	<i>Janet</i>	SEMI Taiwan	Wu	Cher
NIST	Allen	Richard	SEMI N.A.	Tran	Michael

*\*Italics indicate virtual participants*

### Table 2 Leadership Changes

There were no leadership changes.

### 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>
5586	Line Item Revision to SEMI MS2-0212, Test Method for Step-Height Measurements of Thin Films	
Line Item 1	Update a Reference Supplied in Footnote #5	<b>Passed</b> as balloted. Superclean.
5587	Line Items Revision to SEMI MS4-0212, Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance	
Line Item 1	Update a Reference Supplied in Footnote #7	<b>Passed</b> as balloted. Superclean.
Line Item 2	Update a Reference Supplied in Footnote #10	<b>Passed</b> as balloted. Superclean.

#### Table 4 Authorized Activities

There were no new activities.

#### Table 5 Authorized Ballots

There were no authorized ballots.

#### Table 6 New Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
2013Jul#01	Steve Martell	Send Michael Tran the contact information of potential outgassing members. OPEN
2013Jul#02	Marium Sodaka	Send a table from an SOI document to the Wafer Bond TF to create a survey for an SOI related MEMS standard. CLOSED.

#### Table 7 Old Action Items

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>	<i>Status</i>
2013Apr#01	Jason Gorman	To draft a dynamic characterization interest survey and send it to the committee chairs for review and launch it before SEMICON West 2013.	Open; on hold until 2014  Most likely to participate. Talked about various activities that may tie in with NIST activities.
2012Oct#01	Steve Martell	Reach out to the Assembly & Packaging committee for possible TF leader candidates and related MEMS packaging activities	Open
2012Oct#02	Mark Crockett	Create a LinkedIn discussion topic for reliability and search for a leader for the Reliability TF	CLOSED
2012Oct#03	Mark Crockett	Submit a SNARF to prepare for the 5 year review of SEMI MS6-0308, Guide for Design and Materials for Interfacing Microfluidic Systems	Open; Mark has been too busy.

## 1 Welcome, Reminders, and Introductions

1.1 Mark Crockett (MEMSMART) called the meeting to order at 2:33 PM PST. 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 committee reviewed the minutes of the previous meeting from Spring 2013.

**Motion:** To approve the previous meeting minutes as written.

**By / 2<sup>nd</sup>:** Steve Martell (Sonoscan) / Richard Allen (NIST)

**Discussion:** None.

**Vote:** 3-0 in favor. Motion passed.

**Attachment:** 02, MEMS / NEMS Meeting Minutes (Spring 2013)

### 3 Liaison Reports

#### 3.1 SEMI Staff Report

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

- Some Upcoming SEMI Major Events
  - SEMICON Taiwan 2013 / LED Taiwan 2013
    - September 4-6, 2013 in Taipei
  - SEMICON Europa 2013 / Plastic Electronics Exhibition and Conference
    - October 8-10, 2013 Dresden, Germany
  - SEMICON Japan 2013
    - December 4-6, 2013 in Chiba
- Upcoming North America Standards Meeting
  - NA Standards Fall 2013 Meetings
    - October 28-31, 2013 in San Jose and Santa Clara, California
    - Inviting local companies willing and able to host some of the meetings to maintain one-week format
- Cycle 6-2013 Critical Dates for SEMI Standards Ballots
  - Cycle 6, 2013
    - Ballot Submission Date: August 15, 2013
    - Voting Period Starts: August 29, 2013
    - Voting Period Ends: September 30, 2013
- SEMI Standards Publications
  - Standards published from April 2013 to June 2013:
    - New Standards: 16
    - Revised Standards: 11
    - Reapproved Standards: 15
    - Withdrawn Standards: 0
  - There are a total of 887 SEMI Standards in portfolio and that includes 94 Inactive standards
- SEMI N.A. Standards staff contact: Michael Tran, [mtran@semi.org](mailto:mtran@semi.org)

**Attachment:** 03, SEMI N.A. Standards Staff Report (West 2013)

### 4 Ballot Review

NOTE 1: Committee adjudication on the ballots is 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 section below.

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
5586	Line Item Revision to SEMI MS2-0212, Test Method for Step-Height Measurements of Thin Films	
Line Item 1	Update a Reference Supplied in Footnote #5	<b>Passed</b> as balloted.

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
		Superclean.
5587	Line Items Revision to SEMI MS4-0212, Standard Test Method for Young's Modulus Measurements of Thin, Reflecting Films Based on the Frequency of Beams in Resonance	
Line Item 1	Update a Reference Supplied in Footnote #7	<b>Passed</b> as balloted. Superclean.
Line Item 2	Update a Reference Supplied in Footnote #10	<b>Passed</b> as balloted. Superclean.

**Motion:** Document #5586, Line item 1 passed committee review and will be forwarded to the A&R SC for procedural review.

**By / 2<sup>nd</sup>:** Steve Martell (Sonoscan) / Richard Allen (SEMATECH)

**Discussion:** None.

**Vote:** 3-0 in favor. Motion passed.

**Attachment:** 04, 5586 Procedural Review

**Motion:** Document #5587, Line item 1 and 2 passed committee review and forwarded to the A&R SC for procedural review.

**By / 2<sup>nd</sup>:** Steve Martell (Sonoscan) / Richard Allen (SEMATECH)

**Discussion:** None.

**Vote:** 3-0 in favor. Motion passed.

**Attachment:** 05, 5587 Procedural Review

## 5 Subcommittee & Task Force Reports

### 5.1 International Terminology TF

5.1.1 Steve Martell (Sonoscan) reported for the International Terminology Task Force. The TF is waiting for Document #5514, *Revision to SEMI MS5-1211, Test Method for Wafer Bond Strength Measurements Using Micro-Chevron Test Structures* to be published so the TF could revise SEMI MS3, *Terminology for MEMS Technology*.

### 5.2 Materials Characterization TF

5.2.1 Janet Cassard reported for the Materials Characterization TF. There was not much to report as the TF reviewed the ballot results for Documents 5586 and 5587 (see §4 of these minutes). The stability test results for Reference Materials (RMs) 8096, 8097 lot 95 and 8097 lot 98 looked fine. The stability tests will be performed monthly once the results fail for an improperly stored RM. The quality documentation for the RMs is currently being consolidated within the division.

**Attachment:** 06, Materials Characterization TF Minutes (West 2013)

### 5.3 Microfluidics TF

5.3.1 Mark Crockett (MEMSMART) reported for the Microfluidics TF. The TF has been mostly working on updating Document 5267, *New Standard: Specification for Microfluidic Port and Pitch Dimensions*. The TF didn't

have enough time to work on Document 5515, *Revision to SEMI MS7-0708, Specification for Microfluidic Interfaces to Electronic Device Packages* as it needs updates to the drawings and addressing feedback from reject voters.

5.3.2 The TF believes the microfluidics area is picking up more steam by other companies for Silicon on Insulator (SOI) materials and technology. If anyone knows an SOI company that might be interested in MEMS, please point them to this committee.

#### 5.4 Packaging TF

5.4.1 Steve Martell (Sonoscan) reported for the Packaging TF. The TF is still looking for an expert in the area of outgassing. Steve has been making pitches to several people in outgassing and he's got a couple of leads.

**Action Item:** 2013Jul#01, Steve Martell to send Michael Tran the list of potential outgassing contacts.

#### 5.5 Reliability TF

5.5.1 Mark Crockett (MEMSMART) reported for the Reliability TF. The TF is still looking for a leader and the position is still open.

5.5.2 Bevan Wu asked how much of a factor reliability is in MEMS. Mark said MEMS have a reliability constraint that is driven mostly by the mechanical side. The limitations on the mechanical side of MEMS have been more of a problem for MEMS than the electrical side. Projects in MEMS have been canceled because of reliability. It is an issue and it needs to be addressed. This TF needs to make reliability strong for MEMs in the future.

#### 5.6 Wafer Bond TF

5.6.1 Richard Allen (NIST) reported for the Wafer Bond TF. The TF is working with Mariam Sodaka from SOITEC at incorporating Silicon on Insulator wafers for MEMS applications. The TF and Mariam will draft a survey for the industry to create an SOI standard with emphasis on MEMS.

5.6.2 Mark Crockett wondered if any company makes SOI wafers specifically for microfluidics. Steve Martell said SOI is almost a perfect insulator with no leakage unlike the dopant ones.

**Action Item:** 2013Jul#02, Mariam Sodaka to send a table from an SOI document to the Wafer Bond TF to create an industry survey for an SOI related MEMS standard.

## 6 Old Business

### 6.1 5-Year Review Documents Update

#	Details	Status
SEMI MS3-0307	Terminology for MEMS Technology	Steve Martell is waiting for MS5 to be published to revise MS3.
SEMI MS6-0308	Guide for Design and Materials for Interfacing Microfluidic Systems	On hold as Mark Crockett is working MS7 and Document #5267.
SEMI MS7-0708	Specification for Microfluidic Interfaces to Electronic Device Packages	Mark Crockett is still working on it.

## 7 New Business

### 7.1 MEMS Industry Group (MIG) Standardized Document

7.1.1 Mark Crockett presented to the committee a document from the MEMS Industry Group: *Standardized Sensor Performance Parameter Definitions*. The document is written by authors from Intel and Qualcomm with

contributions from other MEMS and semiconductor companies. Mark said the document contains a lot of useful MEMS specifications that could be used for potential MEMS testing standards. Mark said the document contains a lot of useful MEMS parameters for which test methods can be developed.

## 8 Action Item Review

### 8.1 Old Action Items

8.1.1 Michael Tran (SEMI N.A.) reviewed the old action items. These can be found in the Old 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. MEMS/NEMS standards meetings are tentatively scheduled for October 28, 2013 at SEMI Headquarters in San Jose, CA in conjunction with the NA Standards Fall 2013 Meetings.

### \*Tentative Schedule\*

Monday, October 28

- Wafer Bond TF (9:00 AM - 10:00 AM)
- Microfluidics TF (10:00 AM - 11:00 AM)
- Packaging TF (11:00 AM - 11:30 AM)
- Terminology TF (11:30AM - 12:30 PM)
- Materials Characterization TF (1:30 PM - 2:30 PM)
- N.A. MEMS / NEMS Committee (2:30 PM - 4:30 PM)

\*All times are in PST. Times and dates are subject to change without notice. For meeting details, registration, the latest schedule, and travel information, please visit <http://www.semi.org/en/node/46221>

Having no further business, a motion was made to adjourn the N.A. MEMS / NEMS committee meeting on July 08, 2013 in conjunction with the N.A. Standards SEMICON 2013 Meetings at the San Francisco Marriott Marquis Hotel in San Francisco, California.

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:

Mark Crockett (MEMSMART), Co-chair	August 7, 2013
Win Baylies (BayTech Group), Co-chair	August 8, 2013
Janet Cassard (NIST), Co-chair	August 7, 2013

**Table 8 Index of Available Attachments #1**

<i>#</i>	<i>Title</i>	<i>#</i>	<i>Title</i>
01	SEMI Standards Required Meeting Elements	04	5586 Procedural Review
02	MEMS / NEMS Meeting Minutes (Spring 2013)	05	5587 Procedural Review
03	SEMI N.A. Standards Staff Report (West 2013)	06	Materials Characterization TF Minutes (West 2013)

#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.