



# Silicon Wafer Europe TC Chapter

## Meeting Summary and Minutes

SEMICON Europa 2022

November 16, 2022, 2:00 PM to 3:30 PM

International Congress Center Messe Munchen in Munich, Germany

### TC Chapter Announcements

*Next TC Chapter Meeting*

Spring 2023 (end of March or early April) via virtual meeting. Meeting date to be announced once finalized.

### Table 1 Meeting Attendees

*Italics indicate virtual participants*

**Co-Chairs:** Fritz Passek (Siltronic), Peter Wagner (consultant)

**SEMI Staff:** Paul Trio

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
ASML	Planting	Bert	<i>Semiconductor Metrology &amp; Standards</i>	<i>Poduje</i>	<i>Noel</i>
Global Wafers	Sanna	Cristina	Semilab	Basa	Peter
<i>Global Wafers Japan</i>	<i>Takeda</i>	<i>Ryuji</i>	SiCrystal	Weber	Arnd
Hine Automation	Gomez	Luis	Siltronic AG	Riedel	Frank
KLA	Haller	Kurt	<i>SUMCO</i>	<i>Nakai</i>	<i>Tetsuya</i>
<i>Self</i>	<i>Yoshise</i>	<i>Masanori</i>	Wooptix	Gaudestad	Jan

### 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>
None		

#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**

#	Type	SC/TF/WG	Details
None			

**Table 6 Authorized Activities**

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

#	Type	SC/TF/WG	Details
6985	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI MF1390, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
6986	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI M43, Guide for Reporting Wafer Nanotopography
6987	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI M84, Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
6982	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Revision to SEMI M78, Guide for Determining Nanotopography of Unpatterned Silicon Wafers for the 130 nm to 22 nm Generations in High Volume Manufacturing with title change to: Guide for Determining Nanotopography of Unpatterned Silicon Wafers in High Volume Manufacturing
6983	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Revision for SEMI M49, Guide for Specifying Geometry Measurement Systems for Silicon Wafers for the 130 nm to 16 nm Technology Generations
6988	SNARF	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI MF1048, Test Method for Measuring the Reflective Total Integrated Scatter
6989	SNARF	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI M40, Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
6990	SNARF	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI ME1392, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
6984	SNARF	Int'l Automated Advanced Surface Inspection (AASI) TF	Line Item Revision of SEMI M50, Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method

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

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

**Table 7 Authorized Ballots**

#	When	TF	Details
6985	SNARF	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI MF1390, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning

**Table 7 Authorized Ballots**

#	When	TF	Details
6986	Cycle 1 or 2, 2023	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI M43, Guide for Reporting Wafer Nanotopography
6987	Cycle 1 or 2, 2023	Int'l Advanced Wafer Geometry (AWG) TF	Reapproval of SEMI M84, Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
6982	Cycle 1 or 2, 2023	Int'l Advanced Wafer Geometry (AWG) TF	Revision to SEMI M78, Guide for Determining Nanotopography of Unpatterned Silicon Wafers for the 130 nm to 22 nm Generations in High Volume Manufacturing with title change to: Guide for Determining Nanotopography of Unpatterned Silicon Wafers in High Volume Manufacturing
6957	Cycle 1 or 2, 2023	Int'l Automated Advanced Surface Inspection (AASI) TF	Line Item Revision of SEMI M52, Guide for Specifying Scanning Surface Inspection Systems for Silicon Wafers for the 130 nm to 5 nm Technology Generations
6988	Cycle 1 or 2, 2023	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI MF1048, Test Method for Measuring the Reflective Total Integrated Scatter
6989	Cycle 1 or 2, 2023	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI M40, Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
6990	Cycle 1 or 2, 2023	Int'l Automated Advanced Surface Inspection (AASI) TF	Reapproval of SEMI ME1392, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
6984	Cycle 1 or 2, 2023	Int'l Automated Advanced Surface Inspection (AASI) TF	Line Item Revision of SEMI M50, Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method

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

#	TF	Title	Expiration Date
None			

**Table 9 SNARF(s) Abolished**

#	TF	Title
None		

**Table 10 Standard(s) to receive Inactive Status**

<i>Standard Designation</i>	<i>Title</i>
SEMI M70	Test Method for Determining Wafer-Near-Edge Geometry Using Partial Wafer Site Flatness

**Table 11 New Action Items**

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
2022Nov-01	Paul Trio	Work with SEMI Staff to assist in coordination of activities between Silicon Wafer and Compound Semiconductor Materials Technical Committees

**Table 12 Previous Meeting Action Items**

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
None		

## 1 Welcome, Reminders, and Introductions

Fritz Passek called the meeting to order at 2:18 PM. 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

The TC Chapter reviewed the minutes of the previous meeting.

**Motion:** Approve the minutes as written.

**By / 2<sup>nd</sup>:** Kurt Haller / Bert Planting

**Discussion:** None

**Vote:** 12-0

**Attachment:** 02, Silicon Wafer Europe TC Chapter November 14, 2018 Meeting Minutes

## 3 Liaison Reports

### 3.1 Silicon Wafer Japan TC Chapter

Tetsuya Nakai reported for the Silicon Wafer Japan TC Chapter. Of note:

- Last meeting: Wednesday, May 25, 2022 at the SEMI Standards Japan Spring Meetings
  - Official Virtual TC Chapter Meeting
- Next meeting: Thursday, August 25, 2022 at the SEMI Standards Japan Summer Meetings
  - Official Virtual TC Chapter Meeting
- Ballot Results
  - (6570) New Standard: Guide for Measuring Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers by a Laser-Scatter Tomography Technique → Failed and returned to TF for rework
- International Advanced Wafer Geometry Task Force
  - Presentation by Dr.H Ishiuchi on “Scaling Trend of Logic LSI according to the IRDS Roadmap”

- M49 extension beyond 16nm TN
  - Yoshise provided an idea for future technical road map for M49 including 10,7,5 and 3nm process. The wafers of 45nm/32nm SFQR wafer can be used to 10nm process with DUV litho tool. The process node for 7,5,3nm need to use EUV and added new SFQR guide with EUV process, which more relax value due to shorter wavelength. TF agree to have continuous discussion by e-mail base
- 5 years review
  - MF1390-0219, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
  - M70, “Practice for Determining Wafer Near Edge Geometry Using Partial Wafer Site Flatness” → There is no any comment to revise or changes. To propose a SNARF for Reapproval to SEMI M70 at Europe
- New Business: Wafer edge area
  - Akiyama asked about if anyone has information on the new metric on the wafer edge.
    - Edge profile. Add 2nd fitting circle for Bevel-Surface
    - Surface to the shoulder metrics (something like extended ZDD/ESFQR)
- International/Japan Test Method Task Force
  - Ballot Development
    - 5772, Revision of MF391 Test Methods for Minority Carrier Diffusion Length in Extrinsic Semiconductors by Measurement of Steady-state Surface photovoltage
    - 6570, New Standard: Guide for Measuring Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers by a Laser-Scatter Tomography Technique
    - 6702, Revision of M60 Test Method for Time Dependent Dielectric Breakdown Characteristics of SiO<sub>2</sub> Films for Si Wafer Evaluation
    - 6687, Revision of M51 Test Method for Characterizing Silicon Wafer by Gate Oxide Integrity
  - 6570 was submitted for the ballot cycle 3 -2022, failed TC Chapter review and will be returned to the TF rework.
- SNARF Granted a One-Year Extension
  - (6687) Revision of M51: Test Method for Characterizing Silicon Wafer by Gate Oxide Integrity
    - International Test Methods Task Force
- 5-Year Review
  - SEMI M51-1012: Test Method for Characterizing Silicon Wafer by Gate Oxide Integrity
    - Past due, Japan Test Method TF
  - SEMI M60-1014: Test Method for Time Dependent Dielectric Breakdown Characteristics of SiO<sub>2</sub> Films for Si Wafer Evaluation
    - Past due, Japan Test Method TF

**Attachment:** 03, Silicon Wafer Japan Liaison Report

### 3.2 Silicon Wafer North America TC Chapter

Noel Poduje reported for the Silicon Wafer North America TC Chapter. Of note:

- Last meeting: SEMICON West, San Francisco, CA / Tuesday, July 12, 2022
- Next meeting: SEMI HQ, Milpitas, CA / Tentative April 4, 2023
- SNARF Extension
  - (6853) New Standard: Specification for SOI Wafers for RF Device Applications
    - Int'l SOI TF
- Authorized Activities
  - (6955) Line Item Revision of SEMI M40 - Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
  - (6956) Line Item Revision of SEMI ME1392 - Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
  - (6957) Line Item Revision of SEMI M52 - Guide for Specifying Scanning Surface Inspection Systems for Silicon Wafers for the 130 nm to 5 nm Technology Generations
  - (6958) Reapproval of SEMI M21 - Guide for Assigning Addresses to Rectangular Elements in a Cartesian Array
  - (6959) Reapproval of SEMI MF1763 - Test Method for Measuring Contrast of a Linear Polarizer
  - (6824) Line Item Revision of SEMI MF1048-0217 Test Method For Measuring Reflective Total Integrated Scatter
  - (6955) Line Item Revision of SEMI M40 - Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
  - (6956) Line Item Revision of SEMI ME1392 - Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
  - (6957) Line Item Revision of SEMI M52 - Guide for Specifying Scanning Surface Inspection Systems for Silicon Wafers for the 130 nm to 5 nm Technology Generations
  - (6958) Reapproval of SEMI M21 - Guide for Assigning Addresses to Rectangular Elements in a Cartesian Array
- Int'l Advanced Wafer Geometry TF
  - Ballot Review – Doc. 6767, Test Method for Flatness of Silicon Carbide Wafers =by Optical Interference, from China Compound Semiconductor TC
    - This ballot, among others, failed for various reasons having received many negatives and comments. It is back in Task Force.
    - It was raised that SEMI Standards should deal with non-Si geometry. The manufacturers of geometry tool should inform users of the suitability of their tools for non-Si relative to current Standards and bring these issues to AWG as necessary.
  - Old Business
    - M49 extension beyond 16nm TN was presented by Yoshise
      - Discussion on next steps SEMI M49 (e.g., updates, use in industry)
    - Advanced 200mm wafer requirements & Wafer requirements for EUV → No update
    - 5-year review

- SEMI MF1390-0218, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
- SEMI M78-0618, Guide for Determining Nanotopography of Unpatterned Silicon Wafers for the 130 nm to 22 nm Generations in High Volume Manufacturing
- SEMI M43-0418, Guide for Reporting Wafer Nanotopography
- Update of Legacy Test Methods → Deferred to a later meeting.
- Geometry Standards for non-Si substrates
  - The TF will ask SEMI to organize some sort of joint discussion among the Regions and among SI and Compound Committees and TF's. The goal is to promote cooperation and facilitate discussion about a topic that crosses geographic and material technology boundaries. Fritz encouraged a return to the precompetitive approach liked with I300I.
- Int'l Automated Advanced Surface Inspection TF
  - Ballot Development
    - Ballots Approved for coming cycles
      - 6824, 6955, 6956, 6957 *[see above for details]*
    - M50-1116 5-yr review: Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method
      - Fritz affirmed Dr. Frank Laube and the European IAASI will lead the review
  - Presentation
    - Fritz outlined a presentation regarding haze reference standard wafers that had to be postponed until the European TF meeting planned for November. IC makers working on the most advanced technology nodes are indeed requiring increasingly tighter surface roughness requirements on prime device wafer surfaces.
- Int'l SOI Wafer TF
  - Ballot Development
    - Drafting Doc. 6860, Revision of SEMI M41-0615, Specification of Silicon-on-Insulator (SOI) for Power Device/Ics
      - Ballot is ready for submission, but Japan would like to review the draft before issuing for ballot.
    - Drafting Doc. 6583, New Standard: Specification for SOI Wafers for RF Device Applications
- Int'l Test Methods TF
  - 5 Year Review due
    - SEMI MF533-0310 (Reapproved 0416), Test Method for Thickness and Thickness Variation of Silicon Wafers
    - SEMI MF26-0714E, Test Method for Determining the Orientation of a Semiconductive Single Crystal
    - SEMI MF1982-0317, Test Method for Analyzing Organic Contaminants on Silicon Wafer Surfaces by Thermal Desorption Gas Chromatography
    - SEMI MF1391-1107 (Reapproved 0912), Test Method for Substitutional Atomic Carbon Content of Silicon by Infrared Absorption



- SEMI MF1763-0318, Test Method for Measuring Contrast of a Linear Polarizer
  - To be issued for reapproval
- SEMI M21-0318, Guide for Assigning Addresses to Rectangular Elements in a Cartesian Array
  - To be issued for reapproval
- Int'l Polished Wafer TF
  - No meeting, no update

**Attachment:** 04, Silicon Wafer North America Liaison Report

#### 4 Staff Report

Paul Trio gave the SEMI Staff Report. Of note:

- Upcoming Events
  - SEMICON Japan (December 14-16, 2022) in Tokyo
  - SEMICON Korea (February 1-3, 2023) in Seoul
  - SEMICON China (now June 29-July 1, 2023) in Shanghai
- North America Standards Fall 2022 Meetings took place on November 7-10 at SEMI HQ in Milpitas, California
- North America Standards Spring 2023 Meetings scheduled for April 3-6 at SEMI HQ
- Critical Dates for SEMI Standards Ballots

2022	Ballot Submission Deadline	Voting Opens	Voting Closes
Cycle 8	October 4	October 18	November 17
Cycle 9	November 15	November 29	December 29
2023			
Cycle 1	January 4	January 18	February 17
Cycle 2	February 1	February 15	March 17
Cycle 3	March 8	March 22	April 21
Cycle 4	April 19	May 3	June 2

- SEMI Standards Publications
  - Total Standards in Portfolio: 1,069 (includes 320 Inactive standards)

Cycle	New	Revised	Reapproved	Withdrawn
July 2022	0	3	0	0
August 2022	0	5	0	2
September 2022	2	3	6	1



October 2022	3	8	0	0
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○ New Standards

<i>Cycle</i>	<i>Designation</i>	<i>Title</i>	<i>Committee</i>	<i>Region</i>
September 2022	SEMI F120	Test Method for the Electrochemical Critical Pitting Voltage Testing of Stainless Steel Used in Corrosive Gas Systems	Gases	NA
September 2022	SEMI E120.2	Specification for Protocol Buffers for Common Equipment Model (CEM)	Information & Control	NA
October 2022	SEMI E125.2	Specification for Protocol Buffers for Equipment Self Description (EqSD)	Information & Control	NA
October 2022	SEMI E134.2	Specification for Protocol Buffers of Data Collection Management	Information & Control	NA
October 2022	SEMI E142.4	Specification for SECS II Protocol for Substrate Mapping Using Item Transfer	Information & Control	NA

- New SEMI Corporate PPT Template
  - New SEMI corporate PPT template now available. TFs are encouraged to begin transitioning to the new template. Please reach out to SEMI staff if needing assistance

**Attachment:** 05, SEMI Staff Report

## 5 Ballot Review

None.

## 6 Task Force Reports

### 6.1 *Int'l Advanced Wafer Geometry TF*

Frank Riedel presented. Of note:

- Old Business
  - 5- Year Reviews
    - SEMI MF1390-0218, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
      - TF recommends submitting MF1390 for reapproval w/o changes and wait for feedback from industry on any required change
    - SEMI M43-0418, Guide for Reporting Wafer Nanotopography
      - TF recommends submitting M43 for reapproval w/o changes

- SEMI M70-1015 Test Method for Determining Wafer-Near-Edge Geometry Using Partial Wafer Site Flatness
  - No action required. Move on to inactive state.
- SEMI M78-0618 Guide for Determining Nanotopography of Unpatterned Silicon Wafers for the 130 nm to 22 nm Generations in High Volume Manufacturing
  - SNARF shall be submitted on title change deleting reference to technology generation
- SEMI M84-0414E Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
  - TF recommends submitting M84 for reapproval w/o changes

**Motion:** Approve to issue reapproval ballots for MF1390, M43, M84 + Allow M70 to go into Inactive status.

**By / 2<sup>nd</sup>:** Kurt Haller / Bert Planting

**Discussion:** None

**Vote:** 11-0

**Motion:** Authorize Letter Ballot submission for MF1390, M43, M84 for Cycle 1 or 2, 2023.

**By / 2<sup>nd</sup>:** Frank Riedel / Kurt Haller

**Discussion:** None

**Vote:** 11-0

- Update of Legacy Standards
  - No general need to update legacy standards
  - In a case-by-case process something might come up. Then hopefully someone volunteers on revising or submitting for reapproval. Or a legacy standard moves on to inactive state.
- Geometry Standards for non-Si substrates
  - Silicon Wafer TC meeting members will discuss responsibilities with the European chair of the Compound Materials TC, Arndt Weber [*see section 8.1 of these minutes for the discussion*]
- New Business
  - Yoshise-san provided SNARF on revision of M49
    - TF discussed few items of the Scope section which required little modification
  - TF recommends approval of SNARF by Silicon Wafer Europe TC chapter
  - Moreover, Yoshise-san provided a presentation detailing rationales behind this activity
  - Wafer surface roughness becomes increasingly important in the industry
    - AFM appears to be future reference method besides haze data acquisition by SSISs
- Action Items
  - Submit MF1390 for reapproval w/o changes and wait for feedback from industry if any change is required
  - Submit M40 for reapproval w/o changes
  - Submit SNARF to Silicon Wafer TC tomorrow on title change of M78

- Later M40 and M78 may be combined in one document as New Business
- Submit M84 for reapproval w/o changes and discuss with Compound Materials TC
- Continue scrutinizing the need and proper kind of an AFM roughness standard document

**Motion:** Approve the SNARF for M78 major revision + Authorize for ballot submission for C1 or C2-2023 to be adjudicated at SEMICON West 2023.

**By / 2<sup>nd</sup>:** Kurt Haller / Bert Planting

**Discussion:** None

**Vote:** 11-0

**Motion:** Approve M49 revision SNARF

**By / 2<sup>nd</sup>:** Masanori Yoshise / Kurt Haller

**Discussion:** None

**Vote:** 10-0

**Attachment:** 06, Int'l Advanced Wafer Geometry TF Report

## 6.2 Int'l Automated Advanced Surface Inspection Task Force

Frank Riedel reported. Of note:

- Ballot Review
  - SEMICON West ballots do-over: MF1048, M40, ME1392, and M52
  - Kurt reported the current status and pointed out reference to M59 is not an issue, because this document although inactive is still “in print” and available to the industry
- Ballot Development
  - Kurt provided a draft of a 1-line-item revision of M52 (cf. Doc 6956)
- Old Business
  - SEMI M50-1116: Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method
    - Frank Laube provided a SNARF on a 1-line-item revision of M50
    - No other revisions needed
    - Task Force unanimously recommends approval of SNARF and Doc draft by TC
- New Business
  - Haze standardization
    - Frank Laube gave a nice presentation on this topic triggering lively discussion among meeting participants [*see attachment for presentation details*]
    - TF recommends precompetitive cooperation among wafer and AFM tool manufacturers for developing a standard on AFM roughness
- Action Items
  - Continue discussion on standardization of AFM roughness in AWG TF meeting



- Kurt to invite wafer manufacturers and IDMs for an international phone call for defining SSIS tool requirements with respect to haze measurement

**Motion:** Authorize submission of M52 revision ballot for C1 or C2-2023 to be adjudicated at SEMICON West 2023  
**By / 2<sup>nd</sup>:** Kurt Haller / Frank Riedel  
**Discussion:** None  
**Vote:** 11-0

**Motion:** Authorize reapproval ballots for MF1048, M40, ME1392 for C1 or C2-2023 to be adjudicated at SEMICON West 2023  
**By / 2<sup>nd</sup>:** Kurt Haller / Frank Riedel  
**Discussion:** None  
**Vote:** 9-0

**Motion:** Approve the SNARF for M50 Line Item Revision  
**By / 2<sup>nd</sup>:** Kurt Haller / Frank Riedel  
**Discussion:** None  
**Vote:** 10-0

**Motion:** Authorize submission of M50 Line Item ballot for C1 or C2-2023 for adjudication at SEMICON West 2023  
**By / 2<sup>nd</sup>:** Kurt Haller / Frank Riedel  
**Discussion:** None  
**Vote:** 9-0

**Attachment:** 07, Int'l Automated Advanced Surface Inspection TF Report

### 6.3 Int'l Test Methods Task Force

Peter Wagner presented. Of note:

- Review of Recent SEMI Japan Activities
  - Japan Test Methods TF
    - Revision of M51 Test Method for Time Zero Dielectric Breakdown Characteristics of Amorphous SiO<sub>2</sub> Films for Silicon Wafer Evaluation
      - TF will make correction and discuss them. Schedule will be revised.
    - Revision of M60 Test Method for Time Dependent Dielectric Breakdown Characteristics of Amorphous SiO<sub>2</sub> Films for Silicon Wafer Evaluation
      - Revision planned by Japan TM TF
    - Revision of M85 Guide for the Measurement of Trace Metal Contamination on Silicon Wafer Surface by Inductively Coupled Plasma Mass Spectrometry
      - survey regarding changes started , result will be distributed to TF members

- Revision of MF391 Test Method for Minority Carrier Diffusion Length in Extrinsic Semiconductors by Measurement of Steady State Surface Photovoltage
  - Drafting started , doc . 5772
- Draft document 6570A Guide for Measuring Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers by a Laser Scattering Tomography Technique
  - on ballot in cycle 7, 2022, to be adjudicated in December 2022
- Japan Society of Newer Metals Activity
  - Measurement of carbon concentration in Si
  - Measurement of epi resistivity by metal contact C-V method
- Review preliminary results of ballot 6570A
  - Preliminary tally was presented by Paul Trio
    - 60.0 % return | 41 accepts | 2 rejects | 2 comments
    - The rejects were shortly displayed and summarized
  - Adjudication of ballot results by Si Wafer TC in December 2022 in Japan
  - F. Passek stressed importance that a Test Method standard does not specify a specific equipment
- Discussion on Replacement of Mercury in SEMI Standards (Friedrich Passek) [*detailed presentation included in attachment*]
  - Background
    - International agreement prohibiting import , export and use of Hg from 2013 in force since August 16, 2017
    - Currently ratified by > 90 countries
    - Named after an accident in 1953 Minamata , Japan, where the city experienced heavy mercury poisoning
  - A preliminary list of SEMI standards potentially impacted was presented
  - One SEMI standard particularly impacted
    - MF1392, Test Method for Determining Net Carrier Density Profiles in Silicon Wafers by Capacitive Voltage Measurements with a Mercury Probe
    - A new method was suggested based on non-contact C V
- Action Items
  - Paul Trio:
    - identify all SEMI standards impacted by Hg ban
  - Friedrich Passek /Paul
    - set up phone conference
    - subject : how to proceed with replacement of Hg in SEMI standards
    - goal : establish working group , identify members
- Next Meeting
  - TBD, Spring 2023

**Attachment:** 08, Int'l Test Methods TF Report



## 7 Old Business

None

## 8 New Business

### 8.1 Alignment with Activities in the Compound Semiconductor Materials (CSM) TC

The committee discussed the need for better alignment with activities taking place in the CSM TC. While some test methods do not transfer between Silicon Wafer and the CSM TCs, there are opportunities to share best practices. Another area for alignment are key terms that are common between committees. Currently, there is no systematic approach for cross-committee coordination. Paul Trio noted that liaison reports provide some insight on current committee activities, including new activities or upcoming ballots. However, he noted that staff can also do better in coordinating, so the appropriate committees are informed. There were some concerns with activities in the China CSM TC chapter but meetings were held in local language making it challenging for non-native speakers to participate. Some meetings were scheduled with very little to no advanced notification. Paul Trio again noted that staff can better assist with coordination.

**Action Item:** Paul Trio to work with SEMI Staff to assist in coordination of activities between Silicon Wafer and Compound Semiconductor Materials Technical Committees

## 9 Next Meeting and Adjournment

The next meeting will be announced once finalized.

Adjournment: 4:19 PM.

Respectfully submitted by:

Paul Trio

Director, Standards

SEMI

Phone: +1.408.943.7041

Email: ptrio@semi.org

Minutes tentatively approved by:

Fritz Passek (Siltronic AG), Co-chair	<Date approved>

**Table 13 Index of Available Attachments#1**

<i>Attachment #</i>	<i>Title</i>
01	SEMI Standards Required Meeting Elements
02	Silicon Wafer Europe TC Chapter November 14, 2018 Meeting Minutes
03	Silicon Wafer Japan TC Chapter Liaison Report
04	Silicon Wafer North America TC Chapter Liaison Report
05	SEMI Staff Report



**Table 13 Index of Available Attachments#1**

06	Int'l Advanced Wafer Geometry TF Report
07	Int'l Automated Advanced Surface Inspection TF Report
08	Int'l Test Methods TF 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](http://www.semi.org). For additional information or to obtain individual attachments, please contact Paul Trio at the contact information above.