Silicon Wafer NA TC Chapter
Meeting Summary and Minutes

SEMICON West Meetings
Tuesday, July 11, 2023
9:00 AM – 12:00 PM
Moscone Center, San Francisco, CA

TC Chapter Announcements

Next TC Chapter Meeting
Tuesday, April 2, 2024, Milpitas, CA in conjunction with NA Spring Meetings. Check www.semi.org/en/standards for the latest update.

Table 1 Meeting Attendees

Co-Chairs: Noel Poduje (SMS), Dinesh Gupta (STA)
SEMI Staff: Kevin Nguyen (SEMI HQ)

Company	*Last*	*First*	*Company*	*Last*	*First*
Wooptix	**Gaudestad**	**Jan**	**Siltronic**	**Passek**	**Fritz**
STA	**Gupta**	**Dinesh**	**SOITEC**	**Pfeiffer**	**Gerd**
KLA	**Haller**	**Kurt**	*SMS*	*Poduje*	*Noel*
Chongquing	*Hu*	*Hao*	*GlobalWafers*	*Ruprecht*	*David*
Consultant	**James**	**Lary**	**Okmetic**	**Santala**	**Petri**
Nordson SONOSCAN	*Martell*	*Steve*	*GlobalWafers*	*Takeda*	*Ryuji*
SUMCO	*Nakai*	*Tetsuya*	**Consultant**	**Tan**	**Karen**
Othman & Partners	*Othman*	*Maslina*	*Self*	*Wagner*	*Peter*

Italic indicates remote participant. Bold indicates in person participant.

Table 2 Leadership Changes

WG/TF/SC/TC Name	*Previous Leader*	*New Leader*
None		

Table 3 Ballot Results

Document #	*Document Title*	*TC Chapter Action*
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	Passed as balloted
6982,	Revision to SEMI M78-0618 Guide For Determining Nanotopography Of Unpatterned Silicon Wafers For The 130 nm to 22 nm Generations In High Volume Manufacturing	Passed as balloted
6984,	Line item revision of SEMI M050-1116, Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method	Passed as balloted
6985,	Reapproval of SEMI MF1390, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning	Passed as balloted
6986,	Reapproval of SEMI M43, Guide for Reporting Wafer Nanotopography	Passed as balloted
6987,	Reapproval of SEMI M84, Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications	Passed as balloted
6988,	Reapproval of SEMI MF1048-0217 Test Method For Measuring Reflective Total Integrated Scatter	Passed as balloted
6989,	Reapproval of SEMI M40, Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers	Passed as balloted

Document #	*Document Title*	*TC Chapter Action*
6990,	Reapproval of SEMI ME1392, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces	Passed as balloted
7025,	Line Item Revision of SEMI MF1529-1110: Test Method for "Sheet Resistance Uniformity Evaluation by In-Line Four-Point Probe with the Dual-Configuration Procedure"	Passed as balloted
7029,	Reapproval of SEMI M61-0612 (Reapproved 0319)Specification for Silicon Epitaxial Wafers with Buried Layers	Passed as balloted
7030,	Reapproval of SEMI MF95-1107 (Reapproved 0718) Test Method for Thickness of Lightly Doped Silicon Epitaxial Layers on Heavily Doped Silicon Substrates Using an Infrared Dispersive Spectrophotometer	Passed as balloted
7031,	Reapproval of SEMI MF950-1107 (Reapproved 0718) Test Method for Measuring the Depth of Crystal Damage of a Mechanically Worked Silicon Wafer Surface by Angle Polished and Defect Etching	Passed as balloted
7032,	Reapproval of SEMI MF84-0312 (Reapproved 0718) Test Method for Measuring Resistivity of Silicon Wafers With an In-Line Four-Point Probe	Passed as balloted
7033,	Reapproval of SEMI MF672-0412 (Reapproved 1018) Guide for Measuring Resistivity Profiles Perpendicular to the Surface of a Silicon Wafer Using a Spreading Resistance Probe	Passed as balloted
7034,	Reapproval of SEMI MF671-0312 (Reapproved 0718) Test Method for Measuring Flat Length on Wafers of Silicon and Other Electronic Materials	Passed as balloted
7035,	Reapproval of SEMI MF576-0812 (Reapproved 0718) Test Method for Measurement of Insulator Thickness and Refractive Index on Silicon Substrates by Ellipsometry	Passed as balloted
7036,	Reapproval of SEMI MF533-0310 (Reapproved 0416) Test Method for Thickness and Thickness Variation of Silicon Wafers	Passed as balloted
7037,	Reapproval of SEMI MF525-0312 (Reapproved 0718) Test Method for Measuring Resistivity of Silicon Wafers Using a Spreading Resistance Probe	Passed as balloted
7038,	Reapproval of SEMI MF523-1107 (Reapproved 0718) Practice for Unaided Visual Inspection of Polished Silicon Wafer Surfaces	Passed as balloted
7039,	Reapproval of SEMI MF397-0812 (Reapproved 0718) Test Method for Resistivity of Silicon Bars Using a Two-Point Probe	Passed as balloted
7040,	Reapproval of SEMI MF374-0312 (Reapproved 0718) Test Method for Sheet Resistance of Silicon Epitaxial, Diffused, Polysilicon, and Ion-implanted Layers Using an In-Line Four-Point Probe with the Single-Configuration Procedure	Passed as balloted
7041,	Reapproval of SEMI MF26-0714E Test Method for Determining the Orientation of a Semiconductive Single Crystal	Passed as balloted
7042,	Reapproval of SEMI MF2074-0912 (Reapproved 0718) Guide for Measuring Diameter of Silicon and Other Semiconductor Wafers	Passed as balloted
7043,	Reapproval of SEMI MF1982-0317 Test Method for Analyzing Organic Contaminants on Silicon Wafer Surfaces by Thermal Desorption Gas Chromatography	Passed as balloted
7044,	Reapproval of SEMI MF1763-0318 Test Method for Measuring Contrast of a Linear Polarizer	Passed as balloted
7045,	Reapproval of SEMI MF1630-1107 (Reapproved 0718) Test Method for Low Temperature FT-IR Analysis of Single Crystal Silicon for III-V Impurities	Passed as balloted
7046,	Reapproval of SEMI MF1619-1107 (Reapproved 0718) Test Method for Measurement of Interstitial Oxygen Content of Silicon Wafers by Infrared Absorption Spectroscopy with p-Polarized Radiation Incident at the Brewster Angle	Passed as balloted
6958,	Reapproval of SEMI M21-0318 Guide for Assigning Addresses to Rectangular Elements in a Cartesian Array	Passed as balloted
6983,	Revision for SEMI M49-0918 With Title Change To: Guide for Specifying Geometry Measurement Systems for Silicon Wafers for the 130 nm To 3 nm technology generations	Failed and returned to TF for rework and reballot
7072,	Reapproval of SEMI MF1569-0307 (Reapproved 0718) Guide for Generation of Consensus Reference Materials for Semiconductor Technology	Passed as balloted
7073,	Reapproval of SEMI MF1527-0412 (Reapproved 1018) Guide for Application of Certified Reference Materials and Reference Wafers for Calibration and Control of Instruments for Measuring Resistivity of Silicon	Passed as balloted
7074,	Reapproval of SEMI MF1392-0307 (Reapproved 0718) Test Method for Determining Net Carrier Density Profiles in Silicon Wafers by Capacitance-Voltage Measurements with a Mercury Probe	Passed as balloted
7075,	Reapproval of SEMI MF1391-1107 (Reapproved 0912) Test Method for Substitutional Atomic Carbon Content of Silicon by Infrared Absorption	Passed as balloted

Document #	Document Title	TC Chapter Action
7076,	Reapproval of SEMI MF1388-0707 (Reapproved 0718) Test Method for Generation Lifetime and Generation Velocity of Silicon Material by Capacitance-Time Measurements of Metal-Oxide-Silicon (MOS) Capacitors	Passed as balloted
7077,	Reapproval of SEMI MF1366-0308 (Reapproved 1018) Test Method for Measuring Oxygen Concentration in Heavily Doped Silicon Substrates by Secondary Ion Mass Spectrometry	Passed as balloted
7078,	Reapproval of SEMI MF1188-1107 (Reapproved 0718) Test Method for Interstitial Oxygen Content of Silicon by Infrared Absorption With Short Baseline	Passed as balloted
7079,	Reapproval of SEMI MF110-1107 (Reapproved 0718) Test Method for Thickness of Epitaxial or Diffused Layers in Silicon by the Angle Lapping and Staining Technique	Passed as balloted
7080,	Reapproval of SEMI MF1049-0308 (Reapproved 1018) Practice for Shallow Etch Pit Detection on Silicon Wafers	Passed as balloted
7081,	Reapproval of SEMI M8-0312 (Reapproved 0718) Specification for Polished Monocrystalline Silicon Test Wafers	Passed as balloted
7082,	Reapproval of SEMI M56-1018 Practice for Determining Cost Components for Metrology Equipment Due to Measurement Variability and Bias	Passed as balloted
7083	Reapproval of SEMI M38-0312 (Reapproved 0718) Specification for Polished Reclaimed Silicon Wafers	Passed as balloted

#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 4 Ratification Ballot Results

Document #	Document Title	ISC A&R Action
None		

Table 5 Activities Approved by the GCS between meetings of the TC Chapter

#	Type	SC/TF/WG	Details
None			

Table 6 Authorized Activities

#	Type	SC/TF/WG	Details
None			

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

Table 7 Authorized Ballots

#	When	SC/TF/WG	Details
None			

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

#	TF	Title	Expiration Date
6853	Int'l SOI TF	New Standard: Specification for SOI Wafers for RF Device Applications	9/6/2024

Table 9 SNARF(s) Abolished

#	TF	Title
None		

Table 10 Standard(s) to receive Inactive Status

Standard Designation	Title
None	

Table 11 New Action Items

Item #	Assigned to	Details
July2023-#1	Ajinkya Daware (ASML), Dinesh Gupta (STA), and Kevin Nguyen (SEMI)	To work on the survey for Revision of SEMI M1 (Subject: 300 mm wafer diameter changing tolerance ±200 um to ±100 um)

Table 12 Previous Meeting Action Items

Item #	Assigned to	Details	Status
April2023-#1	Kevin Nguyen (SEMI Staff)	To provide the AWG TF the updated 5-year review list at the next meeting.	Completed
April2023-#2	Kevin Nguyen (SEMI Staff)	To contact ASML and ask them to come to the next meeting and present the markup version of M1 and justification for changing the tolerance of 300 mm wafer diameter.	Completed

1 Welcome, Reminders, and Introductions

1.1 Dinesh Gupta 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.

Motion: Accept the minutes as written.

By / 2nd: By: Friedrich Passek / Siltronic AG
Second: Kurt Haller / KLA-Tencor

Discussion: None

Vote: 9-0

3 Review of Schedule for the next meeting (Spring, April 2024)

3.1 Draft schedule is attached.

Attachment: Sch SiWfr 0424 Tentative

4 Liaison Reports

4.1 *Europe TC Chapter*

4.1.1 Fritz reported. All activities were reported from the previous meeting in Spring 2023. A recap is available on these slides attached.

Attachment: EU Si Wafer TC Chapter Liaison Report Dec 2022 v1

4.2 *Japan TC Chapter*

4.2.1 Nakai-san reported for the Japan TC Chapter.

- Last meeting
    - April 13, 2023
- Next meeting
    - August 25, 2023
- Ballot Result
    - None
- 5-Year Review
    - SEMI M51-1012 Test Method for Characterizing Silicon Wafer by Gate Oxide Integrity
    - SEMI M60-1014 Test Method for Time Dependent Dielectric Breakdown Characteristics of SiO2 Films for Si Wafer Evaluation

Attachment: 202306_Silicon Wafer_JA_Liaison R0

4.3 *GCS*

4.3.1 Dinesh Gupta gave an update on GCS report. Of note:

- PW TF NA Leader is needed.
- Discussed the structure for WG of Test Methods TF.
    - Create a new standard for epi-resistivity determination without the use of Mercury.

5 SEMI Staff Report

5.1 Kevin Nguyen (SEMI) reported.

- SEMI upcoming event
    - Upcoming NA Meetings
        - NA Standards Fall Meetings
            - Nov 6-9, 2023
            - SEMI HQ in Milpitas, California
        - SEMICON Europa
            - Nov 14-17
            - Munich, Germany

        - SEMICON Japan
            - Dec 13-15
            - Tokyo, Japan
- Celebrating SEMI Standards 50th Year Anniversary
- 2023 Critical Dates for SEMI Standards Ballots
    - https://www.semi.org/en/collaborate/standards/ballots
- SEMI Standards Publications
    - Total SEMI Standards in portfolio: 1,079
        - Includes 327 Inactive Standards
    - New Publications Staff
        - Vivian Hoang – Sr. Specialist, Standards Publications
        - Joined SEMI May 17, 2023.
        - Will focus on processing ballots to reduce backlog and improve publishing time.

Attachment: Staff Report July 2023 v3

6 Regulations Change Report (if applicable)

6.1 No new report.

7 Ballot Review

7.1 Doc. 6983, Revision for SEMI M49-0918 With Title Change To: Guide for Specifying Geometry Measurement Systems for Silicon Wafers for the 130 nm to 3 nm Technology Generations

7.1.1 Reject: Kobelco
Reject Name: Tsunaki, Hidetoshi
Negative Text:

The description at item 1.3 ,Thickness (450mm wafers) in Table 5, Metrology Specific Equipment Characteristics for Edge Profile Measurement, described 450mm wafer as a part of reference wafer. However item 1.2 Wafer Characteristics in the table 2, Materials to be measured deleted all 450mm wafer from related characteristics. This is inconsistency between the item 1.3 of Table 5 and item 1.3 in Table 2.

Motion: Negative is related and persuasive. (Needs > 1/3 votes to pass.)
By: Noel Poduje / Semiconductor Metrology & Standards
Second: Kurt Haller / KLA-Tencor
Discussions:

- Peter Wagner: What happened to all other negatives?
- Noel Poduje: Most of the negatives were discussed in the TF meeting. The easy (editorial) ones will be incorporated. All other rejects will be considered. The TF will try to address and come to a reasonable consensus document before issuing the next ballot.
- Fritz Passek: The document should also be revised to consider its limitation
- Result: 9-Y 0-N Voting Result: Pass - 100.00%

Complete negatives are found in the attachment below.

Attachment: SiWafer cycle 5-23 rev2

7.1.2 Final Action

Motion: This Document failed TC Chapter review and will be returned to the TF for rework.
By: Kurt Haller / KLA-Tencor
Second: Friedrich Passek / Siltronic AG
Result: 9-Y 0-N Voting Result: Pass - 100.00%

7.2 The following ballots passed TC Chapter review as balloted below. Refer to attachments for full details.

- 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
- 6982, Revision to SEMI M78-0618, Guide For Determining Nanotopography Of Unpatterned Silicon Wafers For The 130 nm to 22 nm Generations In High Volume Manufacturing
- 6984, Line item revision of SEMI M050, Test Method for Determining Capture Rate and False Count Rate for Surface Scanning Inspection Systems by the Overlay Method
- 6985, Reapproval of SEMI MF1390, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
- 6986, Reapproval of SEMI M43, Guide for Reporting Wafer Nanotopography
- 6987, Reapproval of SEMI M84, Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
- 6988, Reapproval of SEMI MF1048-0217 Test Method For Measuring Reflective Total Integrated Scatter
- 6989, Reapproval of SEMI M40, Guide for Measurement of Roughness of Planar Surfaces on Polished Wafers
- 6990, Reapproval of SEMI ME1392, Guide for Angle Resolved Optical Scatter Measurements on Specular or Diffuse Surfaces
- 7025, Line Item Revision of SEMI MF1529-1110: Test Method for "Sheet Resistance Uniformity Evaluation by In-Line Four-Point Probe with the Dual-Configuration Procedure"
- 7029, Reapproval of SEMI M61-0612 (Reapproved 0319)Specification for Silicon Epitaxial Wafers with Buried Layers
- 7030, Reapproval of SEMI MF95-1107 (Reapproved 0718) Test Method for Thickness of Lightly Doped Silicon Epitaxial Layers on Heavily Doped Silicon Substrates Using an Infrared Dispersive Spectrophotometer
- 7031, Reapproval of SEMI MF950-1107 (Reapproved 0718) Test Method for Measuring the Depth of Crystal Damage of a Mechanically Worked Silicon Wafer Surface by Angle Polished and Defect Etching
- 7032, Reapproval of SEMI MF84-0312 (Reapproved 0718) Test Method for Measuring Resistivity of Silicon Wafers With an In-Line Four-Point Probe
- 7033, Reapproval of SEMI MF672-0412 (Reapproved 1018) Guide for Measuring Resistivity Profiles Perpendicular to the Surface of a Silicon Wafer Using a Spreading Resistance Probe
- 7034, Reapproval of SEMI MF671-0312 (Reapproved 0718) Test Method for Measuring Flat Length on Wafers of Silicon and Other Electronic Materials
- 7035, Reapproval of SEMI MF576-0812 (Reapproved 0718) Test Method for Measurement of Insulator Thickness and Refractive Index on Silicon Substrates by Ellipsometry
- 7036, Reapproval of SEMI MF533-0310 (Reapproved 0416) Test Method for Thickness and Thickness Variation of Silicon Wafers
- 7037, Reapproval of SEMI MF525-0312 (Reapproved 0718) Test Method for Measuring Resistivity of Silicon Wafers Using a Spreading Resistance Probe
- 7038, Reapproval of SEMI MF523-1107 (Reapproved 0718) Practice for Unaided Visual Inspection of Polished Silicon Wafer Surfaces
- 7039, Reapproval of SEMI MF397-0812 (Reapproved 0718) Test Method for Resistivity of Silicon Bars Using a Two-Point Probe
- 7040, Reapproval of SEMI MF374-0312 (Reapproved 0718) Test Method for Sheet Resistance of Silicon Epitaxial, Diffused, Polysilicon, and Ion-implanted Layers Using an In-Line Four-Point Probe with the Single-Configuration Procedure

- 7041, Reapproval of SEMI MF26-0714E Test Method for Determining the Orientation of a Semiconductive Single Crystal
- 7042, Reapproval of SEMI MF2074-0912 (Reapproved 0718) Guide for Measuring Diameter of Silicon and Other Semiconductor Wafers
- 7043, Reapproval of SEMI MF1982-0317 Test Method for Analyzing Organic Contaminants on Silicon Wafer Surfaces by Thermal Desorption Gas Chromatography
- 7044, Reapproval of SEMI MF1763-0318 Test Method for Measuring Contrast of a Linear Polarizer
- 7045, Reapproval of SEMI MF1630-1107 (Reapproved 0718) Test Method for Low Temperature FT-IR Analysis of Single Crystal Silicon for III-V Impurities
- 7046, Reapproval of SEMI MF1619-1107 (Reapproved 0718) Test Method for Measurement of Interstitial Oxygen Content of Silicon Wafers by Infrared Absorption Spectroscopy with p-Polarized Radiation Incident at the Brewster Angle
- 6958, Reapproval of SEMI M21-0318 Guide for Assigning Addresses to Rectangular Elements in a Cartesian Array
- 7072, Reapproval of SEMI MF1569-0307 (Reapproved 0718) Guide for Generation of Consensus Reference Materials for Semiconductor Technology
- 7073, Reapproval of SEMI MF1527-0412 (Reapproved 1018) Guide for Application of Certified Reference Materials and Reference Wafers for Calibration and Control of Instruments for Measuring Resistivity of Silicon
- 7074, Reapproval of SEMI MF1392-0307 (Reapproved 0718) Test Method for Determining Net Carrier Density Profiles in Silicon Wafers by Capacitance-Voltage Measurements with a Mercury Probe
- 7075, Reapproval of SEMI MF1391-1107 (Reapproved 0912) Test Method for Substitutional Atomic Carbon Content of Silicon by Infrared Absorption
- 7076, Reapproval of SEMI MF1388-0707 (Reapproved 0718) Test Method for Generation Lifetime and Generation Velocity of Silicon Material by Capacitance-Time Measurements of Metal-Oxide-Silicon (MOS) Capacitors
- 7077, Reapproval of SEMI MF1366-0308 (Reapproved 1018) Test Method for Measuring Oxygen Concentration in Heavily Doped Silicon Substrates by Secondary Ion Mass Spectrometry
- 7078, Reapproval of SEMI MF1188-1107 (Reapproved 0718) Test Method for Interstitial Oxygen Content of Silicon by Infrared Absorption with Short Baseline
- 7079, Reapproval of SEMI MF110-1107 (Reapproved 0718) Test Method for Thickness of Epitaxial or Diffused Layers in Silicon by the Angle Lapping and Staining Technique
- 7080, Reapproval of SEMI MF1049-0308 (Reapproved 1018) Practice for Shallow Etch Pit Detection on Silicon Wafers
- 7081, Reapproval of SEMI M8-0312 (Reapproved 0718) Specification for Polished Monocrystalline Silicon Test Wafers
- 7082, Reapproval of SEMI M56-1018 Practice for Determining Cost Components for Metrology Equipment Due to Measurement Variability and Bias
- 7083, Reapproval of SEMI M38-0312 (Reapproved 0718) Specification for Polished Reclaimed Silicon Wafers

Attachment: **A&R files**

8 Task Force Reports

8.1 *Int'l Advanced Wafer Geometry Task Force /Noel Poduje (SMS)*

8.1.1 Noel reported. Of note:

- Presentation
    - None
- Ballot review
    - Doc. 6983 - Revision of SEMI M49-0918 With Title Change To: Guide for Specifying Geometry Measurement Systems for Silicon Wafers for the 130 nm to 3 nm Technology Generations
        - There were multiple rejects and comments from five voters. All were reviewed and addressed as time allowed. Ballot failed.
    - The following four documents were superclean; no rejects or comments. There was no discussion. They will be recommended for publication at the TC meeting tomorrow.
        - 6982 - Revision to SEMI M78-0618, with Title Change To: Guide for Determining Nanotopography of Unpatterned Silicon Wafers for Generations In High Volume Manufacturing
        - 6985 - Reapproval of SEMI MF1390-0218, Test Method for Measuring Bow and Warp on Silicon Wafers by Automated Noncontact Scanning
        - 6986 - Reapproval of SEMI M43-0418, Guide for Reporting Wafer Nanotopography
        - 6987 - Reapproval of SEMI M84-0414E, Specification for Polished Single Crystal Silicon Wafers for Gallium Nitride-On-Silicon Applications
- Old Business
    - Advanced 200mm wafer requirements
        - No new discussion
    - Wafer requirements for EUV
        - No new discussion
- Update of Legacy Test Methods
    - Deferred to a later meeting.
- Geometry Standards for non-Si substrates
    - EU is considering this. No discussion here.

Attachment: AWG minutes

8.2 Int'l Automated Advanced Surface Inspection Task Force/ Kurt Haller (KLA)

8.2.1 Kurt reported. Of note:

- Prior meetings and working groups
    - A teleconferenced Workshop on prime wafer microroughness and its measurement by AFM and SSIS haze was discussed at Europa, then organized and held March 15, 2023. Workshop content was summarized for the TF Spring Mtg. The TF recommended proceeding with two Working Groups, one to explore standardizing AFM calibration and measurement conditions, the other to recommend the best optical configurations for measuring SSIS haze that will—it is hoped—correlate with AFM measurements. Updates on the Working Groups activities were reviewed later at this TF meeting.

- Ballot Review
  -
  - Four of the five ballots passed superclean; the M52 line item—defining the acronym LSE as "light scattering equivalent"—also passed with comments.
- Reports
  - Fritz delivered an update on Judith Wittman and Victor Bergmann's plans for an AFM WG meeting to be held 2 August 2023, to discuss AFM xy- and z-scan calibration, tip conditions, and other AFM measurement protocols necessary for achieving the very low background noise levels required to measure prime Si wafer rms roughness accurately and repeatably. Their preliminary agenda includes initial discussions of cross-site AFM and haze measurements on a substantial set of sample wafers to validate protocols to be incorporated into a new SEMI standard.
  - With respect to optimal SSIS configurations for haze, Kurt reported that KLA has identified several candidate configurations for the SP7 that have wider spatial frequency coverage and higher signal intensity than the current "incumbent" configuration used to measure mean haze levels. He expects to be able to share an initial "gross reality check" of the correlation of internally generated AFM data from a limited number of wafers and their measured SP7 haze, taken with the incumbent and candidate optical configurations. Kurt will work with Frank Laube to schedule a haze WG meeting a week or two after the AFM WG meeting on 2 August to review the initial data and discuss the potential for adding general language to SEMI M52 regarding the characteristics of "haze oriented" optical configurations.

Attachment: IAASI_Minutes_SEMI_West_2023

8.3 *Int'l SOI Wafers TF/Gerd Pfeiffer (SOITEC)*

8.3.1 Dinesh Gupta reported. Of note:

- The TF completed revision for doc. 6860, Revision of SEMI M41- 0615, Specification of Silicon-on-Insulator (SOI) for Power Device/IC, which was approved at SEMICON Japan 2022. The document is publishing.
- On a separate topic, Kevin Nguyen noted that Doc. 6583, New Standard: Specification for SOI Wafers for RF Device Applications, has reached 3 year project limitation. The TF needs TC Chapter's permission for 1 year project extension.
  - Motion: Approve a 1 year extension of the project period for the SNARF for Doc. 6583
By: Kurt Haller / KLA-Tencor
Second: Friedrich Passek / Siltronic AG
Discussion:
Result: 9-Y 0-N Voting Result: Pass - 100.00%

8.4 *Int'l Test Methods TF/Dinesh Gupta (STA)*

8.4.1 Dinesh reported. Of note:

- The ballots included several documents in 2023 Cycle 4 and 2023 Cycle 5. The lists of these documents are attached. All documents passed "Super Clean" except one document, "MF576-0812 (Reapproved 0718) Test Method for Measurement of Insulator Thickness and Refractive Index on Silicon Substrates by Ellipsometry" that had a comment. Comment on Doc. MF576 was "Extremely out dated by Dr. Germer".
  - It is proposed that the Doc. MF576 be discussed in the Task Force. This document should be made up to date.
- Dr. Passek presented the status of the activity on the elimination of Mercury from SEMI Standards.
  - Phase out of Mercury Working Group
    - Presentation of project proposal in two telecons in March 2023

- Main task: Create a new standard for epi-resistivity determination without the use of Mercury.
- Main methods suggested: Non-contact CV (ACV), AC-SPV (SCP).
- Working group formation in March/ April 2023. Participants: Global Wafers, JSNM, SEH, Semi, Semilab, Siltronic, Sumco.
- Working Group kick-off meeting in May 2023
- WG meetings will be held every 1-2 months (next telecon on July 11th, 2023)
  - Inviting all to join today's teleconference at 10 PM Pacific.
- Main subjects of next meeting:
- Reach agreement on first method to be standardized
- Initialize SNARF

Attachment: **Min Test Methods Mtg 071023**

Attachment: **Mercury_less_standardization_2023_07_10**

8.5 *Int'l Polished Wafer TF/Dinesh Gupta (STA)*

8.5.1 Dinesh reported. Of note:

- ASML presented 300 mm wafer diameter tolerance from ±200um to ±100 um base on rationales:
  - 300mm wafer industry has progressed towards tighter control on wafer diameter tolerance
  - State of the art 300mm wafer manufacturing capabilities offer significantly smaller wafer diameter tolerance than SEMI specification of ±200µm (verified with multiple manufacturers)
  - SEMI wafer diameter tolerance guideline has been unchanged since last 10+ years
  - More precise and representative wafer geometry specification would enable solutions for advanced technology nodes
- A Survey to both wafer suppliers and users is needed. Dinesh will work with ASML and Kevin to move forward.

Attachment: **SEMIcon_west 2023_wafer_specifications**

9 Old Business

9.1 None

10 New Business

10.1 None

11 Next Meeting and Adjournment

11.1 The next meeting is scheduled for April 2, 2024 at SEMI HQ in Milpitas, CA. Refer http://www.semi.org/standards for the current list of meeting schedules.

11.2 Having no further business, a motion was made to adjourn. Adjournment was at 11:30 AM.

Respectfully submitted by:

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

Minutes approved by:

Dinesh Gupta (STA)	<Date approved>
Noel Poduje (SMS)	<Date approved>

Table 13 Index of Available Attachments[#1]

Title	*Title*
Sch SiWfr 0424 Tentative	AWG minutes
EU Si Wafer TC Chapter Liaison Report Dec 2022 v1	IAASI_Minutes_SEMI_West_2023
202306_Silicon Wafer_JA_Liaison R0	Min Test Methods Mtg 071023
Staff Report July 2023 v3	Mercury_less_standardization_2023_07_10
SiWafer cycle 5-23 rev2	SEMICON_west 2023_wafer_specifications
A&R files	

#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.