

Compound Semiconductor Materials Europe TC Chapter Meeting Summary and Minutes

Spring Meeting Wednesday, May 3, 2023 4:30 PM – 6:30 PM CEST Official Virtual TC Chapter Meeting

TC Chapter Announcements

Next TC Chapter Meeting July 25, 2023 (4:30 PM-6:30 PM CEST) online. Check <u>www.semi.org/en/standards</u> for the latest update.

Table 1 Meeting Attendees

Co-Chair: Arnd Weber (SiCrystal) **SEMI Staff:** Kevin Nguyen (SEMI)

Company	Last	First
Axelis	Alliegro	Rick
Munich University of Applied Sciences	Alt	Hans-Christian
Wolfspeed	Barbieri	Tom
Infineon	Buchweitz-Moenke	Michael
LPE-Epi	Crippa	Danilo
SOITEC	Guiot	Eric
Fraunhofer IISB	Kranert	Christian
Bruker	Lafford	Tamzin
NREL	Mahadik	Nadeem
Nordson Sonoscan	Martell	Steve
Wolfspeed	Rao	Shailaja
Si Crystal	Weber	Arnd

Italic indicates online participant

Table 2 Leadership Changes

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

Table 3 Committee Structure Changes

Previous WG/TF/SC Name	New WG/TF/SC Name or Status Change
None	



Table 4 Ballot Results

Document #	Document Title	Committee Action
None		

Table 5 Ratification Ballot Results

Document #	Document Title	ISC A&R Action	A&R Forms
None			

Note 1: Passed Ratification ballots will be submitted to SEMI publication for final processing.

Note 2: Failed Ratification ballots were returned to the originating task forces for re-work and re-balloting or abandoning.

Table 6 Authorized Activity

#	Туре	SC/TF/WG	Details
7053	SNARF	5 Year Review TF	Line Item Revision of SEMI M63-0915, Test Method For Measuring The Al Fraction In AlGaAs ON GaAs Substrates By High Resolution X-Ray Diffraction

#1 SNARFs and TFOFs are available for review on the SEMI web site at: <u>http://downloads.semi.org/web/</u><u>wstdsbal.nsf/tfofsnarf</u>

Table 7 Authorized Ballots

#	When	TF	Details
6870	Cycle 5-23	Test Methods TF	New Standard: Test Method for Quantifying Basal Plane Disclocation Density in 4h-Sic by X-Ray Diffraction Topography/Imaging
7053	Cycle 5-23	5 Year Review TF	Line Item Revisions of SEMI M63-0915, Test Method for Measuring the Al Fraction in AlGaAs on GaAs Substrates by High Resolution X-Ray Diffraction

Table 8 New Action Items

Item #	Assigned to	Details
May01-2023-1	Tom Barbieri	To conduct a feasibility study on Epi Defects and perhaps form a Task Force to create a SEMI Document.

Table 9 Previous Meeting Action Items

Item #	Assigned to	Details	Status
None			



1 Welcome, Reminders, and Introductions

1.1 Arnd Weber called the meeting to order at 4:30 PM. Attendees introduced themselves. Kevin Nguyen presented meeting reminders on antitrust, intellectual property issues and effective meeting guidelines.

2 Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed the minutes of the previous meeting.

Motion:	To approve the meeting minutes	
By / 2 nd :	By: Christian Kranert / Fraunhofer IISB	
	Second: Richard Alliegro / Axcelis Technologies	
Discussion:	None	
Vote:	4-0. Motion passed.	

Attachment: EU CSM Minutes Europa 2022

3 Task Force Report

3.1 SiC-Task Force

3.1.1 Arnd Weber reported the work for M55 to include 200 mm is completed. There is no other business. When M55 is due for 5 year review or if any other new business is brought up, TF will deal with it.

3.2 Test Methods Task Force

3.2.1 Christian Kranert presented draft ballot 6870, New Standard: Test Method for Quantifying Basal Plane Dislocations in 4H-SiC by X-ray Topography. The ballot was reviewed Christian reported the document is ready for ballot submission.

Motion:	To authorize doc. 6870 for letter ballot.
By / 2 nd :	By: Christian Kranert / Fraunhofer IISB
	Second: Nadeem Mahadik / NREL
Discussion:	Nadeem Mahadik: Parameters impact the results of counting BPD?
	Christian Kranert: Yes, several variations were already considered. Speed and intensity must be set
	to get a good correlation.
	Nadeem Mahidik: What is the interval for calibration?
	Christian Kranert: It mentions in the document as regularly.
Vote:	5-0. Motion passed.

3.3 5-year Review (M46, M63, M75) Task Force

3.3.1 Hans Christian Alt reported.

- SEMI M46 Test Method for Measuring Carrier Concentrations in Epitaxial Layer Structures by ECV Profiling
 - Was set to inactive in the previous meeting.
- SEMI M75 Specification for Polished Monocrystalline Gallium Antimonide Wafers

 Was set to inactive in the previous meeting.
- SEMI M63 Test Method for Measuring the Al Fraction in AlGaAs on GaAs Substrates by High Resolution X-Ray Diffraction
 - Hans Christian went over the revision of the draft ballot. Minor revisions are proposed. Arnd Weber agreed with the proposed changes. Ballot should be issued.



- Motion: To approve SNARF and line item revision of SEMI M63 for letter ballot.
- By / 2nd: By: Hans Christian Alt / Munich University
 - Second: Tamzin Lafford / Bruker Corporation
- Discussion: None
- **Vote:** 7-0. Motion passed.

4 Ballot Review

4.1.1 None.

5 Liaison Reports

- 5.1 China CSM TC Chapter
- 5.1.1 Kevin Nguyen reported. Of note:
- Last meeting
 - April 26, 2023
 - o Dongguan, Guangdong
- Next meeting
 - Fall meeting, 2023
 - Exact date and time will be determined.
- Ballot Review
 - Doc. 6768, New Standard: Test Method for Micropipe Density of Silicon Carbide Wafer by Laser Reflection
 - Failed
 - Arnd Weber commented that the micropipe density test method has been missing for the past 25 years. It would be nice to come up with this test method supporting by several companies, not just one.
 - Doc. 6769, New Standard: Test Method Qualitative for Residual Stress of Silicon Carbide Wafers by Photoelastic
 - Failed
- Tom Barbieri asked for the status of Doc. 6767, New Standard: Test Method for Flatness of Silicon Carbide Wafers by Optical Interference, which was issued in the past. Kevin Nguyen said it appears it was not issued for review. The status for balloting is unknown.

Attachment: CSM China TC Chapter Apr 2023

- 5.2 Japan CSM TC Chapter
- 5.2.1 Kevin Nguyen reported. Of note:
- Last meeting
 - May 26, 2021 at Japan Spring 2021 Meetings
 - o Web Conference
- Next meeting



- Jan. 19, 2022 at Japan Winter 2022 Meetings
- Web Conference
- New TFOF
 - o Silicon Carbide Substrate liaison TF

Attachment: Japan CSM Liaison Report Feb2022 v1

- 5.3 North America CSM TC Chapter
- 5.3.1 Kevin Nguyen reported. Of note:
 - Last Meeting: November 22, 2022 via online
 - Next Meeting: TBD
 - Ballot Review
 - Doc. 6952, Reapproval of SEMI M10-0218 Terminology for Identification of Structures and Features Seen on Gallium Arsenide Wafers Passed as balloted
 - Doc. 6953, Line Item Revision of SEMI M79-0218 Specification for Round 100 mm Polished Monocrystalline Germanium Wafers for Solar Cell Applications – Passed as balloted
 - Doc. 6954, Line Item Revision of SEMI M23-0811 (Reapproved 0218) Specification for Polished Monocrystalline Indium Phosphide Wafers – Passed as balloted
 - M86 (GaN) Revision TF
 - Doc. 6806, Revision of M86, Specification for Polished Monocrystalline c-Plane Gallium Nitride Wafers (Subject: To revise 1-4 inches diameter) – Passed in June 2022 and published as M86-0922

Attachment: NA CSM TC Chapter Liaison report Nov 2022 v1

6 New Business

6.1 New Activity

- 5y review: SEMI M81-0418: Guide to Defects Found in Monocrystalline Silicon Carbide Substrates
 - Arnd Weber reported M81 is due for 5 year review, but the SNARF was not created. Since this is not urgent, Arnd will prepare the SNARF before the next meeting. If anyone is interested in this effort, please contact or send Arnd an email.
 - Tamzin Lafford, Tom Barbieri, and Nadeem Mahadik would like to be a part of this effort. Arnd requested them to confirm with him by sending an email.

6.2 Review of document-status and upcoming-reviews

- Arnd Weber presented the status of all European Compound Materials SEMI standards and their status.
- 6.3 Review/discussion of recently submitted ballots on SiC test methods
- Tom Barbieri said M81 is a good base for silicon carbide defect, but he was wondering if there is any thought on creating a guide for epi defect?
- Arnd Weber said it is good to have common definitions for epi defects, customer and supplier should come up with the same definition. He is asking for volunteer.
- Christian Kranert said he will also check with his colleagues at Fraunhofer for expertise.
- Arnd Weber said he would be available if needed.



- Nadeem Mahadik also chimed in and reported it is important to have a consensus for nomenclature for epi defects. He would help to get started and be involved if the TF is formed.
- Action Item 1 Tom Barbieri will check Victor at Power America to see if there is anything going on. As part of the effort, Tom will conduct a feasibility study and perhaps form a Task Force to create a SEMI Document.

7 Next Meeting and Adjournment

7.1 The next meeting is scheduled for July 25, 2023 (4:30 - 6: 30 PM CEST) online meeting to review ballots for M61 and BPD Test Method. Refer to <u>http://www.semi.org/standards</u> for the list of meeting schedules.

Having no further business, adjournment was at 6:00 PM CEST.

Respectfully submitted by:

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

Minutes tentatively approved by:

Arnd Weber (SiCrystal)

Table 10 Index of Available Attachments#1

	Title	
EU CSM Minutes Europa 2022		
CSM China TC Chapter Apr 2023		
Japan CSM Liaison Report Feb2022 v1		
NA CSM TC Chapter Liaison report Nov 2022 v1		

#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.