



# 3D Packaging & Integration North America TC Chapter

## Meeting Summary and Minutes

SEMICON West Standards Meetings 2021

Wednesday, December 8, 10:00 – 12:00 Noon (Pacific) Hybrid

Moscone Center, San Francisco, California, and via Official Virtual TC Chapter Meeting (OVTCCM)

### TC Chapter Announcements

*Next TC Chapter Meeting*

TBD

### Table 1 Meeting Attendees

**Co-Chairs:** Bill Kerr (Evergreen Enhancement), Chris Moore (Covalent Metrology)

**SEMI Staff:** Laura Nguyen

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Air Products	Arslanian	Gregory	NIST	Allen	Richard
Applied Materials	Sadighi	Iraj	Nordson SONOSCAN	Martell	Steve
Carpenter Technology	Abraham	Akash	Thermo Fisher Scientific	Biedrzycki	Mark
Evergreen Enhancement	Kerr	Bill	SEMI	Nguyen	Laura

### Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader(s)</i>	<i>New Leader(s)</i>
3DP&I Bonded Wafer Stacks TF	Steve Martell/Nordson SONOSCAN Richard Allen/NIST [ <i>Stepped down</i> ]	Steve Martell/Nordson SONOSCAN
PLP Panel TF	Cristina Chu/SEMI Pathfinders Richard Allen/NIST Timothy Kryman/Onto Innovation [ <i>stepped down</i> ]	Cristina Chu/SEMI Pathfinders Richard Allen/NIST

### Table 3 Committee Structure Changes

None

### Table 4 Ballot Results

<i>Document #</i>	<i>Document Title</i>	<i>Committee Action</i>
6829	Line Item Revision to SEMI 3D16-1116, Specification for Glass Base Material for Semiconductor Packaging	
L1	Update “Referenced Standards and Documents” Section.	<b>Passed</b> , 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 5 Activities Approved by the GCS between meetings of the TC Chapter**

None

**Table 6 Authorized Activities**

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

#	Type	SC/TF/WG	Details
--	TFOF	PLP Panel TF	Revised TFOF to include formal linkages with TFs in other Regions/Locales.

Note 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**

None

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

None

**Table 9 SNARF(s) Abolished**

None

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

None

**Table 11 New Action Items**

None

**Table 12 Previous Meeting Action Items**

None

**1 Welcome, Reminders, and Introductions**

Bill Kerr (Evergreen Enhancement), called the meeting to order at 10:04 Pacific. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

**Attachment:** SEMI Standards Required Elements



## 2 Review of Previous Meeting Minutes

The TC Chapter reviewed the minutes of the previous meeting.

**Motion:** To accept the previous meeting minutes (from Summer 2021) as written.

**By / 2<sup>nd</sup>:** By: Steve Martell / Nordson SONOSCAN  
Second: Akash Abraham / Carpenter Technology

**Discussion:** None.

**Vote:** 4-0 in favor. Motion passed.

**Attachment:** [2021Summer] 3DP&I NA TC Chapter Meeting Minutes FINAL

## 3 Liaison Reports

### 3.1 3D Packaging & Integration Japan TC Chapter

Laura Nguyen (SEMI HQ) reported for the Japan TC Chapter. Of note:

#### Meeting Information

- Last meeting: Friday, October 22, 2021, online via OVTCCM
- Next meeting: Tuesday, January 18, 2022, online via OVTCCM

#### Committee Structure Change

<i>Previous WG/TF/SC Name</i>	<i>New WG/TF/SC Name or Status Change</i>
450 mm Assembly & Test Die Preparation (ATDP) Task Force	Disband

#### Leadership {See attachment for Org Chart}

- Committee Co-Chairs
  - Kazunori Kato – AiT
    - 1st GCS voting member; 1st 3D Packaging & Integration representative to the JRSC
  - Masahiro Tsuruya – iNEMI
    - 2nd GCS voting member; 3rd 3D Packaging & Integration representative to the JRSC
  - Haruo Shimamoto – AIST
    - 2nd 3D Packaging & Integration representative to the JRSC

#### Activities Approved via GCS between Meetings

<b>Doc #</b>	<b>Type</b>	<b>SC/TF/CFG</b>	<b>Title/Details</b>
6858	SNARF	3D Packaging & Integration 5 Year Review TF	Revision to SEMI G13-88 (Reapproved 0811) with Title Change from "Standard Test Method for Expansion Characteristics of Molding Compounds" to: "Test Method For Thermal Expansion Characteristics Of Molding Compounds"

#### Authorized Activities

<b>Doc #</b>	<b>Type</b>	<b>SC/TF/CFG</b>	<b>Document Title/Details</b>
6867	SNARF	3D Packaging & Integration 5 Year Review TF	Reapproval of SEMI G86-0217 Test Method for Measurement of Chip (Die) Strength by Mean of 3-Point Bending

## Authorized Ballots

Doc #	When	TF	Document Title/Details
6858	01/02-2022	3D Packaging & Integration 5 Year Review Task Force	Reapproval of SEMI G86-0217 Test Method for Measurement of Chip (Die) Strength by Mean of 3-Point Bending

## Task Force Highlights

- Encapsulation Characteristics for Wafer Level Package and Panel Level Packaging TF
  - Developed final ballot drafts for 8 encapsulate materials characteristics and 3 items for performances by the end of Q3.
  - Ballots for 8 material characteristics submitted to Cycle 08-2021
    - #6706 - New Standard: Specification for CTE and Tg Measurement Methodology for PLP/WLP Encapsulation Materials
    - #6707 - New Standard: Specification for Flowability Measurement Methodology for PLP/WLP Encapsulation materials
    - #6708 - New Standard: Specification for Gel Time Measurement Methodology for PLP/WLP Encapsulation materials
    - #6709 - New Standard: Specification for Modulus Measurement Methodology for PLP/WLP Encapsulation materials
    - #6710 - New Standard: Specification for Shear Strength Measurement Methodology for PLP/WLP Encapsulation Materials
    - #6711 - New Standard: Specification for Viscosity Measurement Methodology for PLP/WLP Encapsulation materials
    - #6712 - New Standard: Specification for Wettability Measurement Methodology for PLP/WLP Encapsulation materials
- Five Years Review TF
  - Listed up the documents which require 5-years-review in 2021.
  - All documents are identified as re-approval or inactive.
  - Two documents submitted to Cycle08-2021.
    - #6858 - Revision to SEMI G13-88 (Reapproved 0811) with Title Change from “Standard Test Method for Expansion Characteristics of Molding Compounds” to: “Test Method For Thermal Expansion Characteristics Of Molding Compounds”
    - #6703A - Revision to SEMI G63-95 (Reapproved 0811) “Test Method for Measurement of Die Shear Strength”
- 3DS IC Bonded Layer Inspection Metrology TF
  - In process of tested inspection ability study for bonded layer inspection.
  - Samples were sent to two measurement sites for feasibility study. Also under study whether current ID marking at each layer can be detectable at the measurement.
  - Plan to developing Guidelines for layer inspection technique.
- 3D Packaging & Integration Steering Group WG
  - Continue to brainstorm the potential areas of SEMI Standard.
    - Example: RDL Adhesion Strength Measurement/Metrology Proposal
  - Share the taskforce activities progress
  - Work on the joint discussion with TWN TC (held meeting on August 2020)
  - Displayed 3 posters at SEMICON Japan 2021
- Panel Level Packaging (PLP) Glass Carrier TF



- Ballot 6590, New Standard: Specification for Glass Carrier Characteristics for Panel Level Packaging (PLP) Applications
- Published as 3D023-0721 in July, 2021
- Panel Level Packaging (PLP) Glass Carrier ID Marking TF established under Traceability TC

**Staff Contact:** Mami Nakajo, mnakajo@semi.org

**Attachment:** 20211110\_3DPI-Japan\_LiaisonR\_v1.1

### 3.2 3D Packaging & Integration Taiwan TC Chapter

Laura Nguyen (SEMI HQ) reported for the Taiwan TC Chapter. Of note:

#### Meeting Information

- Last meeting: Aug. 13, 2021 at the SEMI Standards Taiwan Spring 2021 Meetings  
SEMI Taiwan Office, Zhubei City, Hsinchu County, Taiwan
- Next meeting: March 4, 2022 at the SEMI Standards Taiwan Spring 2022 Meetings  
SEMI Taiwan Office, Zhubei City, Hsinchu County, Taiwan

#### Leadership

- Committee Co-Chairs:
  - Wei-Chung Lo (ITRI)
  - Wendy Chen (King Yuan Electronics)
  - Roger Hwang (ASE)

Organization Chart {See attachment for Org Chart}

#### Authorized Activities

#	Type	SC/TF/WG	Details
6866	SNARF	Testing Task Force	Line Item Revision to SEMI 3D14-0615 Guide for Incoming/Outgoing Quality control and Testing Flow for 3DSIC Products
6865	SNARF	Middle End Process Task Force	Reapproval of SEMI 3D15-0316 Guide for Overlay Performance Assessment for 3DS-IC Process.

#### Authorized Ballots

#	When	TF	Details
6866	Cycle 7 or 8, 2021	Testing Task Force	Line Item Revision to SEMI 3D14-0615 Guide for Incoming/Outgoing Quality control and Testing Flow for 3DSIC Products
6865	Cycle 7 or 8, 2021	Middle End Process Task Force	Reapproval of SEMI 3D15-0316 Guide for Overlay Performance Assessment for 3DS-IC Process.

#### Task Force Highlights

##### Testing Task Force

- Leadership Change
  - L: Wendy Chen - KYEC
  - L: Roger Hwang - ASE
  - L: Shang-Chun Chen – ITRI changed to Chang-Sheng Chen/ITRI
- New Business
  - Over 5 years review by TF, Scheduled to get new doc. # for Line Item Change 3D14-0615 Guide for Incoming/Outgoing Quality control and Testing Flow



- New topic direction discussion : Chip testing before stacking: standard CCC might not be sufficient, consider to introduce MAC to protect both the chip and probe, and its testing temperature condition  
Action Item : TF Co-leaders work with SEMI Staff to invite Probe card players to kick off meeting at the end of September.

#### Testing Task Force

- Leadership Change
  - L: Arthur Chen – NTUST
  - L: Mike Chang – ITRI
- New Business
  - Over 5 years review , scheduled to get new doc. # for reapproval SEMI 3D15-0316 Guide for Overlay Performance Assessment for 3DS-IC Process
  - Study the feasibility of submitting a new SNARF for CMP standards in the next TC meeting.

Staff Contact: Cher Wu; cherwu@semi.org

**Attachment:** 3D P&I TW Liaison Report\_20210813\_V1

### 3.3 SEMI Staff Report

Laura Nguyen (SEMI) gave the SEMI Staff Report. Of note:

#### SEMI Global Calendar of Events

- SEMICON West (December 7-9; San Francisco, CA/USA)
- SEMICON Japan (December 15-17; Tokyo, Japan)
- SEMICON Taiwan (December 28-30; Taipei, Taiwan)

#### Critical Dates for SEMI Standards Ballots

- Cycle 9-2021: Ballot Submission Due: Nov 16/Voting Period: Nov 30 – Dec 30
- Cycle 1-2022: Ballot Submission Due: Jan 5/Voting Period: Jan 19 – Feb 18
- Cycle 2-2022: Ballot Submission Due: Feb 1/Voting Period: Feb 15 – Mar 17
- Cycle 3-2022: Ballot Submission Due: Mar 9/Voting Period: Mar 23 – Apr 22

Critical Dates: <http://www.semi.org/en/Standards/Ballots>

#### Regulations and Procedure Manual Update

- *Regulations* (November 1, 2021)
  - Bias-free terminology - provide alternative, bias-free terms or option to rewrite and eliminate sensitive terms
  - Clarification of Inactive Status
  - Procedures for revising global Technical Committee charter and scope
  - [https://www.semi.org/sites/semi.org/files/2021-11/Standards\\_Regulations\\_November\\_1\\_2021.pdf](https://www.semi.org/sites/semi.org/files/2021-11/Standards_Regulations_November_1_2021.pdf)
- *Procedure Manual* (November 1, 2021)
  - Ballot procedures for Primary and Subordinate Standards
  - Ratification ballot improvement - clarification of the scope of Audit and Review process review to cover in authorizing, preparing, and conducting both Letter and Ratification ballots.
  - Clarifies that only Type 1 editorial changes are allowed in a reapproval ballot.
  - [https://www.semi.org/sites/semi.org/files/2021-11/Procedure\\_Manual\\_November\\_1\\_2021.pdf](https://www.semi.org/sites/semi.org/files/2021-11/Procedure_Manual_November_1_2021.pdf)

#### Style Manual update

- Style Manual (November 1, 2021)
  - New Appendix 5
  - Table A5-1 Restricted Biased Terms with Approved, Alternative, Bias-Free Terms



<i>Restricted Biased Terms</i>	<i>Approved, Alternative, Bias-free Terms</i>
blacklist	blocklist, denylist, droplist
master	primary, main, leader, active
slave	secondary, replica, follower, standby
webmaster	web product owner
whitelist	allowlist, accesslist, permitlist

- Table A5-2 Biased Terms to Avoid with Approved, Alternative, Bias-Free Terms

[https://www.semi.org/sites/semi.org/files/2021-11/Style%20Manual%20Version%208\\_November%201%2C%202021\\_final.pdf](https://www.semi.org/sites/semi.org/files/2021-11/Style%20Manual%20Version%208_November%201%2C%202021_final.pdf)

### Standards Publications Report

<i>Cycle</i>	<i>New</i>	<i>Revised</i>	<i>Reapproved</i>	<i>Withdrawn</i>
August 2021	4	3	0	0
September 2021	0	5	6	0
October 2021	1	2	3	1
November 2021	3	7	7	1

Total in portfolio – 1,056 (includes 297 Inactive Standards)

### New Standards

<i>Cycle</i>	<i>Designation</i>	<i>Title</i>	<i>Committee</i>	<i>Region</i>
August 2021	SEMI A4.1	Specification for the Automated Test Equipment Tester Event Messaging for Semiconductors (TEMS)	Automated Test Equipment	NA
August 2021	SEMI D82	Test Method for Viewing Angle of Flat Panel Displays	FPD – Metrology	KO
August 2021	SEMI F116	Guide for Drain Segregation for Semiconductor Manufacturing Tools to Support Site Water Reuse	Liquid Chemicals	NA
August 2021	SEMI M90	Test Method for Bulk Micro Defect Density and Denuded Zone Width in Annealed Silicon Wafers by Optical Microscopy After Preferential Etching	Silicon Wafer	JA
October 2021	SEMI C103	Guide for Reporting Performance Parameters of the Chemical Mechanical Planarization (CMP) Conditioning Disks Used in Semiconductor Manufacturing	Liquid Chemicals	NA
November 2021	SEMI E183	Specification for Rich Interactive Test Database (RITdb)	Automated Test Equipment	NA
November 2021	SEMI E186	Specification for Location and Dimensions for Power Connectors and EtherCAT ports in Mass Flow Controllers and Mass Flow Meters	Gases	NA
November 2021	SEMI D74	Guide for Measuring Dimensions of Plastic Films/Substrates	FPD - Materials & Components	JA

### Inactive Standards (as of November 30, 2021) Cont.

<i>Committee</i>	<i>Number of Inactive Standards</i>
Assembly & Packaging	68
Automated Test Equipment	2
Compound Semiconductor Materials	4
Environmental Health & Safety	8
Facilities	14
FPD – Equipment	5
FPD – Factory Automation	14

FPD – Materials & Components	13
Gases	18
Information & Control	37
Liquid Chemicals	26
MEMS	4
Metrics	12
Micropatterning	30
Photovoltaic	3
Physical Interfaces & Carriers	25
Silicon Wafer	12
Traceability	8

**Attachment:** Staff Report Dec 2021 v3\_3DP&I

#### 4 Ballot Review

NOTE 1: TC Chapter adjudication on ballots reviewed is detailed in the Audits & Review (A&R) Subcommittee Forms for procedural review. The A&R forms are available as attachments to these minutes. The attachment number for each balloted document is provided under each ballot review section below.

4.1.1 Document 6829 — Line Item Revision to SEMI 3D16-1116, Specification for Glass Base Material for Semiconductor Packaging

4.1.1.1 Line Item #1: Update “Referenced Standards and Documents” Section.

- The ballot passed TC Chapter review as balloted. See attachment for ballot adjudication.

**Attachment:** 6829\_ProceduralReview

#### 5 Subcommittee and Task Force Reports

5.1 *Panel Level Packaging (PLP) Panel Task Force – did not meet*

Task Force Leader Rich Allen (NIST) reported for both this Task Force. Of note:

**Motion:** Remove Tim Kryman from Leadership of the PLP Panel TF.

**By / 2<sup>nd</sup>:** By: Steve Martell / Nordson SONOSCAN  
Second: Gregory Arslanian / Air Products

**Discussion:** None.

**Vote:** 5-0 in favor. Motion passed.

5.2 *3DP&I Inspection & Metrology and Bonded Wafer Stacks Task Force – did not meet*

Task Force Leader Steve Martell (Nordson SONOSCAN) reported for both the 3DP&I Inspection & Metrology and 3DP&I Bonded Wafer Stacks Task Forces.

Of note, the task force reviewed the ballot results that can be found in Section 4 of these minutes and Rich Allen stepped down from TF leader.

**Motion:** Remove Rich Allen from leadership of the 3DP&I Bonded Wafer Stacks TF.

**By / 2<sup>nd</sup>:** By: Richard Allen / NIST - National Institute of Standards & Technology  
Second: Gregory Arslanian / Air Products

**Discussion:** None.

**Vote:** 5-0 in favor. Motion passed.

**Attachment:** NA 3DP&I Ballot Results Cycle 8-21





## 6 Old Business

None

## 7 New Business

### 7.1 TFOF Revision

The committee reviewed the TFOF for the Panel Level Packaging (PLP) Panel Task Force and revised the charter.

**Motion:** Approve the PLP Panel TFOF with revisions as amended in the meeting.

**By / 2<sup>nd</sup>:** By: Gregory Arslanian / Air Products  
Second: Mark Biedrzycki / ThermoFisher Scientific

**Discussion:** None.

**Vote:** 5-0 in favor. Motion passed.

## 8 Next Meeting and Adjournment

8.1 The next meeting is tentatively scheduled for the week of March 28-31, in conjunction with NA Spring Meetings 2022. Schedule details TBD. Please check [www.semiconwest.org](http://www.semiconwest.org) for updates.

Adjournment: 10:47.

Respectfully submitted by:

Laura Nguyen

Sr. Coordinator, International Standards

SEMI Global Headquarters

Phone: +1.408.943.7019

Email: [lnguyen@semi.org](mailto:lnguyen@semi.org)

Minutes tentatively approved by:

Bill Kerr (Evergreen Enhancement), Co-chair	<Date approved>
Chris Moore (Covalent Metrology), Co-chair	<Date approved>

**Minutes approved by: 3DP&I NA OVTCCM on November 8, 2022 (Fall Meetings).**

**Table 13 Index of Available Attachments<sup>#1</sup>**

<i>Title</i>	<i>Title</i>
SEMI Standards Required Elements	Staff Report Dec 2021 v3_3DP&I
[2021Summer] 3DP&I NA TC Chapter Meeting Minutes FINAL	6829_ProceduralReview
20211110_3DPI-Japan_LiaisonR_v1.1	NA 3DP&I Ballot Results Cycle 8-21
3D P&I TW Liaison Report_20210813_V1	TFOF for Panel TF_revision v2

#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 Laura Nguyen at the contact information above.