Liquid Chemicals North America TC Chapter

Meeting Summary and Minutes

Fall 2018 Standards Meetings

November 6, 2018 14:00–17:00

SEMI HQ, Milpitas, California

TC Chapter Announcements

Next TC Chapter Meeting

April 2, 2019 14:00 – 17:00

SEMI HQ, Milpitas, CA

General Announcement

None

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Don Hadder (Intel); Steve Rogers (KMG Chemicals); Laura Ledenbach (PeroxyChem)
SEMI Staff: Inna Skvortsova

Company	*Last*	*First*	*Company*	*Last*	*First*
Intel	Hadder	Don	SEMI	Skvortsova	Inna
PeroxyChem	Ledenbach	Laura			
KMG Chemicals	Rogers	Steve			
Swagelok	Shutler	Rob			
Mega Fluid Systems	Kandiyeli	David			
SACHEM	Schleisman	Tony			
GF Piping Systems	McIntosh	Bob			
Mega Fluid Systems	Murai	Koh			

Table 2 Leadership Changes

WG/TF/SC/TC Name	*Previous Leader*	*New Leader*
NA Chapter of Liquid Chemicals TC		Koh Murai (MegaFluid Systems)

Motion: To appoint Koh Murai (Mega Fluids) for a new coChair of NA Chapter of Liquid Chemicals Technical Committee:

By / 2nd: Don Hadder (Intel) / Bob McIntosh (GF Piping)
Discussion: None
Vote: 5/0. Motion passed.

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*
6399	Line-item Revision to SEMI E49-0617, Guide for High Purity and Ultrahigh Purity Piping Performance, Subassemblies, and Final Assemblies	**Passed**

#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*
6451	SNARF	CAM TF	Revision to SEMI C1-0310 (Reapproved 0618), *Guide for the Analysis of Liquid Chemicals* **Approved by GCS 8/15/2018**

Table 6 Authorized Activities

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

#	*Type*	*SC/TF/WG*	*Details*
TBD	SNARF	UPW TF	Revision to SEMI C93- 0217: *Guide for Determining the Quality of Ion Exchange Resin Used in Polish Applications of Ultrapure Water System* **New SNARF to be distributed for 2-week member review followed by GCS approval**
TBD	SNARF	CAM TF	New Standard: *Guide for Chemical Mechanical Planarization (CMP) Particle Size Distribution (PSD) Measurement and Reporting used in Semiconductor Manufacturing* **New SNARF to be distributed for 2-week member review followed by GCS approval**
TBD	SNARF	HPPM&C TF	New Standard: *Guide for Reporting Chemical Mechanical Planarization (CMP) Polishing Pad Hardness used in Semiconductor Manufacturing* **New SNARF to be distributed for 2-week member review followed by GCS approval**
n/a	Record of Editorial Change	HPLA&T TF	Record of Editorial Change by TC Chapter for Procedural Review for SEMI E49.5-MMYY*: *Guide for the Design of Ultrahigh Purity Solvent Distribution Systems with non-Metallic Fluid Paths in Semiconductor Manufacturing Equipment* ***Publishing of document #5978 on hold for PIP authorization**
TBD	SNARF	CAM TF	Line-item Revision for SEMI C36-1213, *Specifications for Phosphoric Acid*, to correct nonconforming title to: *Specification for Phosphoric Acid* **New SNARF approved at TC meeting**

#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*	*TF*	*Details*
6085	Cycle 2-2019	HPPM&C TF	Revision to SEMI F57- 0314, *Specification for High Purity Polymer Materials and Components Used in Ultrapure Water and Liquid Chemical Distribution Systems.*
6195	Cycle 2-2019	HPPM&C TF	Revision to SEMI F104-0312, *Particle Test Method for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution Systems, with title change to correct nonconforming title.*

TBD	Cycle 2-2019	CAM TF	Line-item Revision for SEMI C36-1213, *Specifications for Phosphoric Acid*, to correct nonconforming title to: *Specification for Phosphoric Acid.*

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

#	*TF*	*Title*	*Expiration Date*
NONE			

Table 9 SNARF(s) Abolished

#	*TF*	*Title*
6431	HPPM&C TF	Line-item Revision to SEMI F18-95 (Reapproved 0413), *Guide for Determining the Hydrostatic Strength of, and Design Basis for, Thermoplastic Pipe and Tubing.*

Table 10 Standard(s) to receive Inactive Status

Standard Designation	*Title*
SEMI F8-0998 (Reapproved 0613)	*Test Method for Evaluating the Sealing Capabilities of Tube Fitting Connections Made of Fluorocarbon Materials, When Subjected to Tensile Forces*
SEMI F18-95 (Reapproved 0413)	*Guide for Determining the Hydrostatic Strength of, and Design Basis for, Thermoplastic Pipe and Tubing*

Table 11 New Action Items

Item #	*Assigned to*	*Details*
#01Nov2018	**(Inna Skvortsova)**	Distribute SNARF for revision to SEMI C93, and New Standards proposals for 2-week member review and GCS approval and ballot authorization
#02Nov2018	**(Inna Skvortsova)**	Organize follow up training for new co-Chairs focused on ballots preparation (templates, structure/type of documents, Letter vs Ratification). Conduct training in conjunction with Spring TC Meetings during LChem Leadership Meeting.
#03Nov2018	(**Laura Ledenbach, Don Hadder**	Prepare NA LChem TC/TFs project tracking document by Spring 2019 TC/Leadership Training Session
#04Nov2018	**(Steve Rogers)**	To review and recommend action plan for the following documents: SEMI C51, SEMIC84, SEMI C85, SEMI C19 by Spring 2019 TC Meeting.
#05Nov2018	**(Inna Skvortsova)**	SEMI C80-0214 ownership transfer from EU LCh&Gases TC to NA Gases TC (notify relevant Standards staff). DONE

Table 12 Previous Meeting Action Items

Item #	*Assigned to*	*Details*
None		

1) Welcome, Reminders, and Introductions

Don Hadder (Intel) called the meeting to order at 14:03 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.ppt**

2) Review of Previous Meeting Minutes

2.1 The TC Chapter reviewed and approved the minutes of the previous Spring 2018 Standards meeting.

Motion:	To approve minutes as written
By / 2nd:	Koh Murai (Mega Fluids) / Bob McIntosh (GF Piping)
Discussion:	None
Vote:	6Y/0. Motion passed.

Attachment 02: **NA Liquid Chemicals TC Meeting Minutes (July 2018).pdf**

3) SEMI Staff Report

Inna Skvortsova (SEMI) gave the SEMI Staff Report. Of note:

SEMI Global 2018 Calendar of Events

- SEMICON Europa (November 13-16, 2018, Munich, Germany)
- SEMICON Japan (December 12-14, 2018, Tokyo, Japan)

SEMI Global 2019 Calendar of Events

- SEMICON Korea (January 23-25, 2019), Seoul, Korea
- MEMS and Sensor Industry Group (February 19-20, Monterey, California)
- SEMICON China (March 20-22, Shanghai, China)
- SEMICON Southeast Asia (May 7-9, Kuala Lumpur, Malaysia)
- SEMICON West (July 9-11, San Francisco, California)

Upcoming North America Meetings

- NA Standards Spring 2019 Meetings (April 1-4, 2019, SEMI HQ, Milpitas, California)
- SEMICON West 2019 Meetings (July 8-11, 2019, San Francisco, California)
- NA Standards Fall 2019 Meetings (November 4-7, 2019, SEMI HQ, Milpitas, California)

Letter Ballot Critical Dates for NA Standards meetings

- Cycle 8-18: due Oct 12 / Voting Period: Oct 26 – Nov 26
- Cycle 9-18: due Nov 14/ Voting Period: Nov 28 – Dec 28
- Cycle 1-19: due Jan 3 / Voting Period: Jan 16 – Feb 16
- Cycle 2-19: due Feb 1 / Voting Period: Feb 15 – March 18
- Cycle 3-19: due March 12 / Voting Period: March 26-April 25

http://www.semi.org/en/Standards/Ballots

- SEMI Standards Publications

Cycle	New	Revised	Reapproved	Withdrawn

July 2018	0	3	21	0
August 2018	2	11	4	0
September 2018	0	8	1	0
October 2018	7	8	12	0

Total SEMI Standards in portfolio: 996. Includes 252 Inactive Standards

Cycle	Designation	Title	Committee	Region
October 2018	SEMI PV85	Practice for Metal Wrap Through (MWT) Back Contact Photovoltaic (PV) Module Assembly	Photovoltaic	CH
October 2018	SEMI PV86	Specification for Crystalline Silicon Photovoltaic Module Dimensions	Photovoltaic	CH
October 2018	SEMI PV87	Test Method for Peeling Force Between Electrode and Ribbon/Back Sheet	Photovoltaic	CH
October 2018	SEMI PV88	Test Method for Determination of Hydrogen in Photovoltaic (PV) Polysilicon by Inert Gas Fusion Infrared Absorption Method	Photovoltaic	CH

- New Forms, Regulations & Procedure Manual
    - New version of *Regulations* (June 8, 2018)
    - New version of *Procedure Manual* (June 8, 2018)
    - New TFOF & SNARF
    - New Ballot Review Templates
    - www.semi.org/standards
        - Bottom left, under **Resources**!
- Rules for Handling of Trademark (Regulations § 16.4)
    - Sections 16.4.1 and 16.4.4 of the recently revised of the Regulations contain requirements for the use of trademarks in published Documents.
    - Existing Documents have been found that contain trademarks for items such as materials, software protocols, and equipment.
    - All TC Chapters should review their Documents **at the time a revision or reapproval ballot** is planned to determine if a trademark is used and, if so, whether its use is justified, properly represented, and that a footnote references the trademark owner.
    - Failure to do so could jeopardize ballot approval.

- *SNARF(s) and TFOF **approved** by GCS in between TC Chapter Meetings*
    - Revision to SEMI C1-0310 (Reapproved 0618), *Guide for the Analysis of Liquid Chemicals*
        - Approved by GCS 8/15/2018
- *SNARF 3 year status TC Chapter may grant a one-year extension:*
    - **None**
- *SNARFs to abolish at TC meeting:*
    - **SNARF # 6431,** Line-Item Revision to SEMI F18-0195(Reapproved 0413): *Guide for Determining the Hydrostatic Strength of, and Design Basis for, Thermoplastic Pipe and Tubing*

Motion: To abolish SNARF #6431. The standard will receive inactive status.

By / 2nd: Koh Murai (Mega Fluids) / Bob McIntosh (GF Piping)

Discussion: None.

Vote: 6/0. Motion passed.

- *Nonconforming Titles*
    - **SEMI C33-0213** - Specifications for n-Methyl 2-Pyrrolidone
    - **SEMI C36-1213** - Specifications for Phosphoric Acid
    - **SEMI C64-0308** (Reapproved 1214) - SEMI Statistical Guidelines for Ship To Control
    - **SEMI F104-0312** - Particle Test Method Guide for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution Systems

NOTE: Refer to Procedure Manual (PM) Appendix Table A4-1 and A4-2

- *Documents due for 5 Year Review*

Name	Due for Review	Title
****SEMI F104-0312**	3/1/2017	Particle Test Method Guide for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution Systems
SEMI C79-0113	1/31/2018	Guide to Evaluate the Efficacy of Sub-15 nm Filters Used in Ultrapure Water (UPW) Distribution Systems
SEMI F18-95 (Reapproved 0413)	4/26/2018	Guide for Determining the Hydrostatic Strength of, and Design Basis for, Thermoplastic Pipe and Tubing
SEMI C36-1213	12/30/2018	Specifications for Phosphoric Acid
SEMI C51-0114	1/10/2019	Specification for Xylenes
SEMI C80-0214	2/14/2019	Guide for Tetrakis(Dimethylamino) Silane (TDMAS)
SEMI C84-0214	2/28/2019	Guide for Cyclopentanone

SEMI C85-0214	2/28/2019	Guide for Methyl Isobutyl Carbinol (MIBC)
SEMI C18-0714	7/31/2019	Specification for Acetic Acid
SEMI C19-0514	5/16/2019	Specification for Acetone
SEMI C23-0714	7/31/2019	Specifications for Buffered Oxide Etchants

Attachment 03: SEMI Staff Report Liquid Chemicals TC (Nov 2018).ppt

4) Liaison Reports

4.1 Liquid Chemicals Europe TC Chapter – no update, next meeting November 2018

- Staff Contact: James Amano (jamano@semi.org)

4.2 Liquid Chemicals Japan TC Chapter

Inna Skvortosva (SEMI) reported for the Liquid Chemicals Japan TC Chapter. Of note:

- Committee Co-chairs
  - Hiroshi Tomita (Toshiba)
  - Hiroyuki Araki (SCREEN Semiconductor Solutions)
- Last Meeting: April 23, 2018 during Japan Spring Meetings at SEMI Japan, Tokyo, Japan
- Next Meeting: December 12, 2018 at SEMICON Japan 2018, Tokyo, Japan
- Ballot Results

Doc #	Document Title	TC Chapter Action
6320	Line Item Revision to SEMI C77-0912: Test Method for Determining the Counting Efficiency of Liquid-Borne Particle Counters for Which the Minimum Detectable Particle Size is Between 30 nm and 100 nm	-
Line Item 1	Correct the expressional accuracy in 6.4.1.	**Passed as balloted, Super Clean**
Line Item 2	Correct the grammatical mistakes in Figure 1.	**Passed as balloted, Super Clean**
Line Item 3	Correct the expression which may be misunderstood in 7.2.4 and Table 1.	**Passed as balloted, Super Clean**
Line Item 4	Correct the mistake of the superscript notation and the numerical row in 7.2.4.	**Passed as balloted, Super Clean**
Line Item 5	Specify the meaning of CV value in 7.5.3.1	**Passed as balloted, Super Clean**
Line Item 6	Adjust the expression of temperature to the notation of SI unit in 6.2.2 and 6.5.2.	**Passed as balloted, Super Clean**

Note 1: **Passed** ballots and line items will be submitted to the ISC Audit & Review Subcommittee for procedural review.

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

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- Five-Year Review

Designation	Standard Title	Action By	Assigned to
SEMI C82-0713	Test Method for Particle Removal Performance of Liquid Filter Rated 20 to 50 nm With Liquid-Borne Particle Counter	2018	Liquid Filter Task Force
SEMI C83-0713	Test Method for Tensile Strength Applied to Welded Connections Made by PFA Weld Fitting	2018	Welding Fitting Task Force
SEMI C89-0116	Test Method for Particle Removal Performance of Liquid Filter Rated Below 30 nm with Inductively Coupled Plasma – Mass Spectroscopy (ICP-MS)	2021	-

- Task Force / Study Group Reports:
  - Diaphragm Valve Task Force
    - No activities
  - Welding Fitting Task Force
    - No activities
  - Liquid Filter Task Force
    - #6197 - Reapproval to SEMI F110-0712
    - SNARF was approved at Liquid Chemical Japan TC Chapter meeting on April 21, 2017
    - Ballot submitted for Cycle 5-2017, passed at Liquid Chemical Japan TC Chapter on December 13, 2017 during SEMICON Japan 2017.
      - Editorial Change was proposed as report (separately from #6197) and passed at LC Japan TC Chapter meeting on December 13, 2017
      - Passed A&R in January 2018
      - Editorial change also passed A&R in January
      - **Published as F110-0712(Reapproved 0618)**

  - Liquid-Borne Particle Counter (LPC) Task Force
    - 6196 - Reapproval to SEMI C77-0912
    - SNARF was approved at Liquid Chemical Japan TC Chapter meeting on April 21, 2017
      - Ballot submitted for Cycle 7-2017and passed at Liquid Chemical Japan TC Chapter on December 13, 2017 during SEMICON Japan 2017
      - Passed A&R in January 2018
      - **Published as C77-0912(Reapproved 0618)**

  - Ultrapure Liquid Evaluation Study Group
    - Considering to standardize the particle measurement at POP in future.
    - Asking a cooperation by Interfacial Nano Electrochemistry for seeking the solution to the issues concerned to analyzing metals of organic solvent including IPA.
      - The results of the experiment and analysis at INE were reported by Mr. Yoshida from KANTO KAGAKU on LC Japan TC Chapter on April 23, 2018.
        - INE found out the cause of difference between the amount of the Fe contamination in the DI water and the amount of the Fe contamination which pours the DI water over the Si wafer surface.
    - Ultrapure Liquid Chemical Evaluation Study Group will be discharged at next committee meeting since the report was provided.
    - To consider the future standardization

For more information, please contact: Mizue Iwamura, SEMI Japan, miwamura@semi.org

Attachment 04: Japan Liquid Chem Liaison Report (Nov 2018).pdf

Attachment 05: Japan Interfacial Nano Electrochemistry Study Group Report.pdf

5) 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.

Ballot #6399

The TC Chapter reviewed the Document #6399, *Line-item Revision to SEMI E49-0617, Guide for High Purity and Ultrahigh Purity Piping Performance, Subassemblies, and Final Assemblies*

The ballot **passed** TC review and will be submitted to the ISC A&R for procedural review. Details can be found in the attached Procedural Review file.

Motion:	Document # 6399 is not a Safety Document, when all safety-related information is removed, Document is still technically sound and complete.
By / 2nd:	Koh Murai (Mega Fluid Systems) /Bob McIntosh (GF Piping)
Discussion:	None.
Vote:	6-0. Motion passed.

Motion:	Forward Document # 6399 to the ISC A&R for procedural review as written.
By / 2nd:	Bob McIntosh (GF Piping) / Koh Murai (Mega Fluid Systems)
Discussion:	None.
Vote:	6-0. Motion passed.

Attachment 06: 6399_Procedural Review

6) Subcommittee and Task Force Reports

6.1 Chemical Analytical Methods Task Force Report

Don Hadder reported for the CAM Task Force. Of note:

- Leadership Change
  - None
- Ballot Adjudication
  - None
- New SNARFS
  - Line-item Revision for SEMI C36-1213, *Specifications for Phosphoric Acid, to correct nonconforming title to: Specification for Phosphoric Acid*
  - New Standard: *Guide for Chemical Mechanical Planarization (CMP) Particle Size Distribution (PSD) Measurement and Reporting used in Semiconductor Manufacturing*
    - New SNARF to be distributed for 2-week member review followed by GCS approval
- Upcoming Ballots
  - 6433, New Standard, Test Method for CMP Conductivity (Slurry and pCMP Cleaning Chemicals)
  - 6388, C44-0618 Specification and Guide for Sulfuric Acid
  - 6465, Line-item Revision for SEMI C36-1213, Specifications for Phosphoric Acid, to correct nonconforming title to: Specification for Phosphoric Acid

- **New Standards Proposal - CMP slurry metrology**
  - (Presented by Tregub, Alexander alexander.tregub@intel.com)
  - **Backgroud**: PSD (Particle Size Distribution) for CMP slurries plays a significant role in CMP performance
  - **Issue 1:** In most cases, IDMs supplier's CoA data list just one parameter, Mean Particle Size (MPS). However, MPS alone does not describe comprehensively or accurately distribution of the particle sizes.
  - **Suggestion**: introduce a standard requiring slurry manufacturers list parameters complimentary to MPS:
    - Width of distribution; Modality (monomodal, bi-modal, etc)
  - **Expected advantage**: more complete and accurate parameters of PSD on CoA will reduce quality issues at IDMs and improve stability of product manufacturing at suppliers
  - **Issue 2.**: IDMs supplier's CoA data do not specify metrology tool types, dilution of analytical samples, and other important SOP parameters that can significantly change the reported values
  - **Suggestion**: Implement a universal and more complete matrix for reporting out the PSD parameters for CMP slurries
  - **Expected advantage:** improving predictability of slurry performance at IDMs; optimizing slurries selection via enabling better comparison of the PSDs of different slurries
- **Action plan**: generate SNARFs and review at the appropriate SEMI standard committee/s

Attachment 07: CAM TF Report (Nov 2018).pdf

6.2 Ultrapure Water Task Force Report

Bob McIntosh reported for the UPW Task Forces. Of note:

- Leadership change:
  - None
- Ballot Adjudication:
  - None
- New SANRFs
  - Revision to SEMI C93-0217: Guide for Determining the Quality of Ion Exchange Resin Used in Polish Applications of Ultrapure Water System
    - The industry is becoming increasingly susceptible to particulate and organic contamination. UPW Polish resin has a significant potential to contribute contamination and requires testing for its cleanliness.
    - This revision of the document is going to focus on smaller size of the particles driven by UPW IRDS definition, analyzing particles down to 6nm.
      - New SNARF to be distributed for 2-week member review followed by GCS approval
- Upcoming Ballots in Cycle 9-18
  - 6316, Revision of SEMI C79-0113, Guide to Evaluate the Efficacy of Sub-15 nm Filters Used in Ultrapure Water (UPW) Distribution Systems
- Plans for 2019 SNARFs (for review at SEMI Spring meeting)

- 2018 IRDS is expected to be published in Q1 2019. As planned: 3 documents should be reviewed and updated to support advanced industry needs:
  - SEMI F63 – UPW Quality
  - SEMI F61 – UPW System Design and Operation
  - SEMI F75 – UPW metrology

Attachment 08: UPW Task Force Report Nov 2018.pdf

6.3 High Purity Polymer Materials & Components (HPPM&C) Task Force Report

Bob McIntosh reported for HPPM&C Task Force. Of note:

- Leadership change:
  - None
- Ballot Adjudication:
  - None
- New SANRFs
  - New Standard: Guide for Reporting Chemical Mechanical Planarization (CMP) Polishing Pad Hardness used in Semiconductor Manufacturing
    - New SNARF to be distributed for 2-week member review followed by GCS approval
- Upcoming Ballots in Cycle 2-19
  - SEMI F104-0312, *Particle Test Method Guide for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution systems*
  - SEMI F57-0314, *Specification For Polymer Materials And Components Used in Ultrapure Water and Liquid Chemical Distribution Systems*
- **New Standards Proposal - Standard/Guide for CMP pads hardness metrologies**
  - (Presented by Tregub, Alexander alexander.tregub@intel.com)
  - **Background**: Hardness is one of the most important properties for CMP pads, because it directly affects CMP process performance, such as Material Removal rate (MRR) and defectivity.
  - **Issue 1:** In most cases, IDMs supplier's report on CoA hardness using a historic incapable legacy parameter, Hardness Shore (HS). HS is incapable of accurate differentiating pad hardness variations within the same pad batches, thus producing pad performance variations in CMP process. Such variations are known to cause significant quality issues resulting in reduced yield in the fabs
  - Suggestions:
    - introduce complimentary accurate pad hardness parameter/s, based on a capable metrology, such as storage modulus (SM) measured using Dynamic Mechanical Analysis (DMA).
    - Start reporting SM, or any other advanced capable parameter, on CoA
    - Continue reporting on CoA legacy parameter HS to provide comparison with historic database.
  - **Expected advantage**: more accurate parameters of pad hardness on CoA will reduce quality issues at IDMs and improve stability of product manufacturing at suppliers
  - **Issue 2:** Often, pad hardness reported on CoA at one temperature, such as RT. Reporting hardness at one fixed temperature is not sufficient, because (1) hardness of polymer-made CMP pads depends on temperature and (2) CMP pads operate at the elevated temperatures, above RT.

- **Suggestion:** Report hardness data at elevated temperatures relevant to the typical temperature operating range of CMP processes**.**

– **Issue 3:** In the cases, when suppliers utilize DMA metrology, information related to the test SOPs, such as deformation mode, deformation frequency and load amplitude, are not reported.

- **Suggestion:** Implement a universal and complete matrix for reporting pad conditions to measure pad hardness.

– **Expected advantage**: improving consistency of pad properties for CMP process; optimizing pad selection via enabling better comparison of hardness of different pads.

- **Action plan**: generate SNARFs and review at the appropriate SEMI standard committee/s

Attachment 09: HPPM&C Task Force Report (Nov 2018).pdf

6.4 High Purity Liquid Assemblies and Systems (HPLA&S) Task Force Report

Koh Murai reported for the HPLA&S Task Forces. Of note:

- **PIP proposal submission to correct references in SEMI E49.5 (pending publication)**
  - E49.6 specifically details testing and assembly procedures for stainless steel piping materials. E49.5 is all polymeric piping materials and so must reference the existing polymeric testing and assembly procedures. Since both standards were released for review and ballot at the same time this change was not updated in E49.5 by oversight**.**

Motion: TC reviewed and approved Type2 editorial changes proposed in PIP form for SEMI E49.5

By / 2nd: Koh Murai (Mega Fluid Systems) / Don Hadder (Intel)

Discussion: None.

Vote: 6-0. Motion passed

Attachment 10: PIP Form for SEMI E49.5

7) Old Business

7.1 Standards due for Five-Year Review.

Inna Skvortsova addressed the TC Chapter on this topic. Of note:

Name	***Due**	**Title**	**Status / Action required**
****SEMI F104-0312**	3/1/2017	*Particle Test Method Guide for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution Systems*	Revision ballot planned for Q1-2019
SEMI C79-0113	1/31/2018	*Guide to Evaluate the Efficacy of Sub-15 nm Filters Used in Ultrapure Water (UPW) Distribution Systems*	Ballot planned by EOY2018
SEMI F18-95 (Reapproved 0413)	4/26/2018	*Guide for Determining the Hydrostatic Strength of, and Design Basis for, Thermoplastic Pipe and Tubing*	To receive inactive status.

SEMI C36-1213	12/30/2018	*Specifications for Phosphoric Acid*	SEMI staff to prepare LI to correct title for Cycle 2-2019
SEMI C51-0114	1/10/2019	*Specification for Xylenes*	CAM TF to review for revision/reapproval scope. New SNARF by Spring 2019
SEMI C80-0214	2/14/2019	*Guide for Tetrakis(Dimethylamino) Silane (TDMAS)*	EU – Gases TC – request to transfer ownership to Gases TC
SEMI C84-0214	2/28/2019	*Guide for Cyclopentanone*	CAM TF to review for revision/reapproval scope. New SNARF by Spring 2019
SEMI C85-0214	2/28/2019	*Guide for Methyl Isobutyl Carbinol (MIBC)*	CAM TF to review for revision/reapproval scope. New SNARF by Spring 2019
SEMI C19-0514	5/16/2019	*Specification for Acetone*	CAM TF to review for revision/reapproval scope. New SNARF by Spring 2019
SEMI C18-0714	7/31/2019	Specification for Acetic Acid	TBD
SEMI C23-0714	7/31/2019	Specifications for Buffered Oxide Etchants	TBD

Motion: TC reviewed and authorized SEMI F18 and SEMI F8 to receive inactive status when due per SEMI Regulations

By / 2nd: Koh Murai (Mega Fluid Systems) / Bob McIntosh (GF Piping)

Discussion: None.

Vote: 6-0. Motion passed

7.2 *SNARFs Approaching 3-Year Review*

- No SNARFs need extension.

8) New Business

8.1 New TFOFs and SNARFs Authorization:

- No new TFOFs authorization
- New SNARF for Line-item Revision for SEMI C36-1213, *Specifications for Phosphoric Acid*, to correct nonconforming title to: *Specification for Phosphoric Acid*

Motion: To approved SNARF for Line-item Revision for SEMI C36-1213, to correct nonconforming title to: Specification for Phosphoric Acid

By / 2nd: Bob McIntosh (GF Piping) / Koh Murai (Mega Fluid Systems)

Discussion: None.

Vote: 6-0. Motion passed

- Technical Committee authorized to distribute new SNARF for the following document to for 2-week Global TC membership review followed by GCS approval:

    - Revision to SEMI C93- 0217: *Guide for Determining the Quality of Ion Exchange Resin Used in Polish Applications of Ultrapure Water System*
    - New Standard: *Guide for Chemical Mechanical Planarization (CMP) Particle Size Distribution (PSD) Measurement and Reporting used in Semiconductor Manufacturing*
    - New Standard: Guide for Reporting Chemical Mechanical Planarization (CMP) Polishing Pad Hardness used in Semiconductor Manufacturing

8.2 New Ballots Authorization:

Motion: To authorize ballot #6085 submission for Cycle 2-2019 for Revision to SEMI F57- 0314, *Specification for High Purity Polymer Materials and Components Used in Ultrapure Water and Liquid Chemical Distribution Systems*

By / 2nd: Bob McIntosh (GF Piping) / Koh Murai (Mega Fluid Systems)

Discussion: None.

Vote: 6-0. Motion passed

Motion: To authorize ballot #6195 submission for Cycle 2-2019 for Revision to SEMI F104-0312, *Particle Test Method for Evaluation of Components Used in Ultrapure Water and Liquid Chemical Distribution Systems, with title change to correct nonconforming title.*

By / 2nd: Bob McIntosh (GF Piping) / Koh Murai (Mega Fluid Systems)

Discussion: None.

Vote: 6-0. Motion passed

Motion: To authorize ballot #TBD submission for Cycle 2-2019 for Line-item Revision for SEMI C36-1213, *Specifications for Phosphoric Acid*, to correct nonconforming title to*: Specification for Phosphoric Acid.*

By / 2nd: Bob McIntosh (GF Piping) / Koh Murai (Mega Fluid Systems)

Discussion: None.

Vote: 6-0. Motion passed

Action Items:

(Inna Skvortsova) Distribute SNARF for revision to SEMI C93, and New Standards proposals for 2-week member review and GCS approval and ballot authorization

(Inna Skvortsova) Organize follow up training for new co-Chairs. Conduct training in conjunction with Spring TC Meetings during LChem Leadership Meeting.

(**Laura Ledenbach, Don Hadder**) Prepare NA LChem TC/TFs project tracking document by Spring 2019 TC/Leadership Training Session

(Steve Rogers) To review and recommend action plan for the following documents: SEMI C51, SEMIC84, SEMI C85, SEMI C19 by Spring 2019 TC Meeting.

9) IRDS Council Update Report

Due to the IRDS meeting schedule overlap with SEMI Standards Fall meetings, IRDS Council update report will be presented at next NA LChem TC Meeting in Spring 2019.

10) Action Items Review

9.1 Previous Meeting(s) Action Items

Inna Skvortsova (SEMI) reviewed open action items. These can be found in the Previous Meeting(s) Action Items table at the beginning of these minutes.

9.2 New Action Items

Inna Skvortsova (SEMI) reviewed the new action items. These can be found in the New Action Items table at the beginning of these minutes.

11) Next Meeting and Adjournment

The next meeting is scheduled for April 2, 2019 at SEMI HQ, CA in conjunction with NA Standards Spring Meetings. See http://www.semi.org/standards-events for the current list of events. Having no further business, a motion was made to adjourn. Adjournment was at 4:52 PM.

Respectfully submitted by:

Inna Skvortsova

Sr. Standards Coordinator

SEMI North America

Phone: 408-9436996

Email: iskvortsova@semi.org

Minutes tentatively approved by:

Don Hadder (Intel), Co-chair	1/24/2019
Laura Ledenbach (Peroxy Chem) Co-chair	1/22/2019
Steve Rogers (KMG Chemicals) Co-chair	1/24/2019
Koh Murai (MegaFluids Systems) Co-chair	1/25/2019

Table 13 Index of Available Attachments#1

Title	*Title*
Attachment 01: SEMI Standards Required Elements.ppt	Attachment 07: CAM Task Force Report (Nov 2018)
Attachment 02: NA Liquid Chemicals TC Meeting Minutes (July 2018).pdf	Attachment 08: UPW Task Force Report (Nov 2018)
Attachment 03: SEMI Standards Staff Report (Nov 2018).ppt	Attachment 09: HPPM&C Task Force Report (Nov 2018)
Attachment 04: Japan Liquid Chem Liaison Report (Nov 2018).pdf	Attachment 10: PIP Form E49.5
Attachment 05: JA Interfacial Nano Electrochemistry Study Group Report	
Attachment 06: 6399_Procedural Review	

#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.