



Gases and Liquid Chemicals EU TC Chapter Meeting Summary and Minutes

SEMICON Europa 2016

October 26, 2016

Alpexpo, Grenoble, France

Table 1 Meeting Attendees

Italics indicate virtual participants

Co-Chairs: Gordon Ferrier (Gordon F Consulting)

SEMI Staff: James Amano

| <i>Company</i> | <i>Last</i> | <i>First</i> | <i>Company</i> | <i>Last</i> | <i>First</i> |
|----------------|-------------|--------------|----------------|-------------|--------------|
| Sitex 45 | Ulieru | Dumitru | | | |
| Pall Gmbh | Ruth | Jochen | | | |
| Self | Wagner | Peter | | | |
| Tokyo Electron | Mashiro | Supika | | | |

Table 2 Leadership Changes

| <i>WG/TF/SC/TC Name</i> | <i>Previous Leader</i> | <i>New Leader</i> |
|-------------------------|------------------------|--------------------|
| Cleaning Gases TF (New) | | Jean-Marie Collard |

Table 3 Committee Structure Changes

| <i>Previous WG/TF/SC Name</i> | <i>New WG/TF/SC Name or Status Change</i> |
|-------------------------------|---|
| | Cleaning Gases TF (New) |

Table 4 Ballot Results

| <i>Document #</i> | <i>Document Title</i> | <i>Committee Action</i> |
|-------------------|--|-------------------------|
| 5656B | Revision to SEMI C65-0308 : Guide for Trimethylsilane (3MS) | Passed |
| 5657B | Revision to SEMI C66-0308: Guide for Trimethylaluminium (TMAI) | Passed |
| 6077 | Reapproval for SEMI C67-0811 : Guide for Hafnium Amides | Passed |
| 6078 | Reapproval for SEMI C68-0811 : Guide for Zirconium Amides | Passed |
| 6079 | Reapproval for SEMI C73-0811 : Guide for Hafnium Chloride | Passed |
| 6080 | Reapproval for SEMI C74-0811: Guide for Hafnium Tert-Butoxide | Passed |
| 6081 | Reapproval for SEMI C75-0811: Guide for Tetrakis (Dimethylamino) Titanium | Passed |
| 6082 | Reapproval for SEMI C76-0811 : Guide for Zirconium Tert-Butoxide | Passed |
| 6083 | Reapproval for SEMI C72-0811: Guide for Propylene-Glycol-Mono-Methyl-Ether (PGME), Propylene-Glycol-Mono-Methyl-Ether-Acetate (PGMEA) and the Mixture 70wt% PGME / 30wt% | 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

None

Table 6 Authorized Activities

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

| # | Type | SC/TF/WG | Details |
|------|-------|----------------------|---|
| 6148 | SNARF | Cleaning Gases TF | Guide for F2/N2/Ar chamber cleaning gas mixtures use in semiconductor manufacturing |
| | | | |
| | | | |

#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 |
|------|------|----|---------|
| None | | | |

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

| Standard Designation | Title |
|----------------------|-------|
| None | |

Table 11 New Action Items

| Item # | Assigned to | Details |
|--------|-------------|---|
| 1 | James Amano | James Amano to enter new Cleaning Gases SNARF and TFOF into SEMI database |

Table 12 Previous Meeting Action Items

| Item # | Assigned to | Details |
|--------|---------------------------------------|---|
| 1 | James Amano | Update status of abolished SNARFs 5325, 5327, 5491, 5493, and 5494. CLOSED |
| 2 | James Amano | Issue Ratification Ballots for 5495, 5658A, 5765 CLOSED |
| 3 | Gordon Ferrier and Jean-Marie Collard | Draft revision ballots for 5656B and 5657B CLOSED |

1 Welcome, Reminders, and Introductions

Gordon Ferrier called the meeting to order at 10:10. 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

The TC Chapter reviewed the minutes of the previous meeting.

Motion: To approve the minutes as written

By / 2nd: Jochen Ruth/Supika Mashiro

Discussion: None

Vote: 3-0

Attachment: Meeting Minutes EU Gases and Liquid Chemicals Europa 2015 v1.pdf

3 Liaison Reports

3.1 Gases North America TC Chapter

James Amano reported. Of note:

- Heater Jacket TF
 - Currently working on a Materials and Recommendations document.
- Mass Flow Controller (MFC) TF
 - Two ballots adjudicated at West Meeting:
 - Doc. 5964A: Line Item Revision to SEMI E56-0314, Test Method for Determining Accuracy, Linearity, Repeatability, Short-Term Reproducibility, Hysteresis, and Dead Band of Thermal Mass Flow Controllers
 - Failed, re-balloted in Cycle 7-16
 - Doc. 5963A: Line Item Revision to SEMI F62-0701 (Reapproved 1111) Test Method for Determining Mass Flow Controller Performance Characteristics From Ambient and Gas Temperature Effects
 - Passed A & R in August, pending publications
- Pressure Measurement TF
 - One ballot adjudicated:
 - Doc. 3440C: New Standard, Test Method for Pressure Transducers in Gas Delivery Systems
 - Passed, Ratification Ballot issued in Cycle 6-16
- Pressure Measurement TF
 - One ballot adjudicated:
 - Doc. 3440C: New Standard, Test Method for Pressure Transducers in Gas Delivery Systems
 - Passed, Ratification Ballot issued in Cycle 6-16
- Pressure Measurement TF
 - One ballot adjudicated:
 - Doc. 3440C: New Standard, Test Method for Pressure Transducers in Gas Delivery Systems

- Passed, Ratification Ballot issued in Cycle 6-16

Attachment: NA F&G Liaison Report July2016_red.ppt

3.2 Gases Japan TC Chapter

James Amano reported. Of note:

- Live Gas Flow Rate Task Force (1/2)
 - TF formation on Sept.18,2015.
 - Charter: To develop standard of test method(s) for live gas flow rate of mass flow controllers(MFC).
 - Scope:
 - 1) TF will configure methods to measure live gas flow rate of mass flow controllers
 - 2) To standardize test methods.
 - 3) To make new standard or refine existing standards such as F77-1104.
- Live Gas Flow Rate Task Force (2/2)
- Activity
 - 1) Questionnaire survey for MFC users, MFC makers and MFC related users.
 - 2) Planning round robin test between MFC makers with critical nozzle.
 - 3) National measurement institute of Japan(NMIJ) is preparing critical nozzle
- Plan
 - 1) Start round robin test. Aug.2016.
 - 2) Finish the test. Oct.2016.
 - 3) Report at T/F by Dec.2016.

Attachment: Japan Gases Liaison Report_Oct2016.ppt

3.3 Liquid Chemicals Japan TC Chapter

James Amano reported. Of note:

- Liquid Filter Task Force
 - Doc. 5421A, New Standard: Test Method for Particle Removal Performance of Liquid Filter Rated below 30 nm with ICP-MS was published as SEMI C89-0116.
- Ultrapure Liquid Evaluation Study Group
 - Considering to standardize the particle measurement at POP in future.
 - Asking for cooperation from Interfacial Nano Electrochemistry for seeking the solution to the issues concerned to analyzing metals of organic solvent including IPA.

Attachment: Japan LChem Liaison Report_Oct2016.ppt

3.4 Liquid Chemicals NA TC Chapter

James Amano reported. Of note:

- Task Force Updates
 - Analytical Methods TF
 - TF title and scope change to “Chemical Analytical Methods”
 - Working on revision to SEMI C41-0705 (SNARF #4957)
 - High Purity Liquid Assemblies & Systems TF
 - TF scope change to include all activities related to SEMI E49.X
 - High Polymer Material & Components TF



- TF title change to “High Purity Polymer Materials and Components
 - Working on revision to SEMI F57-0314 (SNARF #TBD)
- UPW Filter Performance TF
 - TF title and scope change to Ultra Pure Water TF
 - TF scope to include work on SEMI F61, F63, F75, F79, and C93
- SEMI IX Resin TF
 - TF disbanded. Activities moved to Ultrapure Water TF
- SEMI F40 Rewrite TF
 - TF disbanded. Activities moved to High Purity Polymer Materials and Components TF
- SEMI F63 Rewrite TF
 - TF disbanded. Activities moved to Ultrapure Water TF
- Roughness of Polymer Surfaces TF
 - TF disbanded. No open activities.
- Standards to receive “Inactive” status
 - SEMI F46-0999
 - SEMI P11-0308
 - SEMI C49-1110
 - SEMI C50-1110
 - SEMI C39-1110
 - SEMI C42-1110
 - SEMI C43-1110
 - SEMI C32-0306 (Reapproved 0611)
 - SEMI C37-0706 (Reapproved 0611)
- Ultra Pure Water Task Force – Revised Charter and Scope
 - Charter:
 - The goal of the task force is to develop test methods and guides used for design and operation of facility and other systems that affect high purity water quality. The Task Force will support documents used in electronic industry.
 - Scope:
 - The scope of the task force is to develop new and update the existing specifications for high purity water systems and components to the level of the water quality requirements that would support the needs of the electronic industry. Although the focus is on advanced Semiconductor manufacturing processes (size of the node of 65nm and smaller), the task force will support other segments of the electronic industry. The examples of the documents supported by this task force are F63, C79, F61, F75, etc.

Attachment: NA Liquid Chemicals Report Aug 2016.ppt

3.5 SEMI Staff Report

James Amano gave the SEMI Staff Report. Of note:

- New Requirements/Process Reminders for TC Chapter Meetings

- Standards Document Development Project Period
 - Project period shall not exceed 3 years (Regs 8.3.2)
 - SNARF approval to TC Chapter approval
 - If document development activity is found to be continuing, but cannot be completed within the project period, TC Chapter may grant one-year extension at a time, as many times as necessary.
 - The TC Chapter should review the expiration dates for all applicable SNARFs at each TC Chapter meeting. (PM Note 10)
- SNARF Review Period
 - A submitted SNARF for a new, or for a major revision to an existing, Standard or Safety Guideline is made available to all members of a TC Chapter's parent global technical committee for two weeks for their review and comment. (Regs 8.2.1)
 - If the SNARF is submitted at a TC Chapter meeting, the committee can review and approve, but the SNARF will need to be distributed for two weeks and then approved via GCS.
- Procedures for Correcting Nonconforming Titles of Published Standards Document (PM Appendix 4)
 - Some Standards qualify for a special procedure where a line item change can be used to correct the titles. Otherwise, the corrective action will likely require a major revision.

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.

The below ballots were all approved during TC Chapter adjudication.

- 5656B, Revision to SEMI C65-0308 : Guide for Trimethylsilane (3MS)
- 5657B, Revision to SEMI C66-0308: Guide for Trimethylaluminum (TMAI)
- 6077, Reapproval for SEMI C67-0811 : Guide for Hafnium Amides
- 6078, Reapproval for SEMI C68-0811 : Guide for Zirconium Amides
- 6079, Reapproval for SEMI C73-0811 : Guide for Hafnium Chloride
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- 6081, Reapproval for SEMI C75-0811: Guide for Tetrakis (Dimethylamino) Titanium
- 6082, Reapproval for SEMI C76-0811 : Guide for Zirconium Tert-Butoxide
- 6083, Reapproval for SEMI C72-0811: Guide for Propylene-Glycol-Mono-Methyl-Ether (PGME), Propylene-Glycol-Mono-Methyl-Ether-Acetate (PGMEA) and the Mixture 70wt% PGME / 30wt%

5 Old Business

5.1 Review of Action Items from previous meeting

James Amano reviewed the action items from the previous TC Chapter meeting (summarized in Table 12). All are now closed.

6 New Business

6.1 New Cleaning Gases TFOF

Gordon Ferrier presented the TFOF drafted by Jean-Marie Collard.

- Charter:
 - F2/N2/Ar chamber cleaning gas mixtures are now used in semiconductor manufacturing. These mixtures are cleaning thin film tools faster than PFC's (C2F6, CF4..) and NF3. In addition these mixtures do not have any GWP. Today there is no SEMI standard defining the minimum purity requirements for those mixtures. Purpose of this SNARF is to established such a standard document
- Scope:
 - Develop standard documents to cover suggested minimum purity values for those new gas mixtures, starting with F2/N2/Ar mixtures

Motion: To approve the TFOF

By / 2nd: Jochen Ruth/Supika Mashiro

Discussion: None

Vote: 2-0

6.2 Cleaning Gases SNARF

- Rationale:
 - F2/N2/Ar chamber cleaning gas mixtures are now used in semiconductor manufacturing. These mixtures are cleaning thin film tools faster than PFC's (C2F6, CF4..) and NF3. In addition these mixtures do not have any GWP. Today there is no SEMI standard defining the minimum purity requirements for those mixtures. Purpose of this SNARF is to established such a standard document
- Scope:
 - Established a SEMI standard defining minimum purity requirements for F2/N2/Ar chamber cleaning gas mixtures

Motion: To approve the SNARF

By / 2nd: Jochen Ruth/Supika Mashiro

Discussion: None

Vote: 2-0

6.3 IRDS Update

Jochen Ruth presented an update on efforts in the International Roadmap for Devices and Sensors (IRDS)

Attachment: IDRS-WECC status update, SEMICON Europe 2016.ppt

7 Next Meeting and Adjournment

The next meeting is scheduled for SEMICON Europa 2017 in Munich, Germany. See <http://www.semi.org/standards-events> for the current list of events.

Table 13 Index of Available Attachments#1

| <i>Title</i> | <i>Title</i> |
|--|--|
| Meeting Minutes EU Gases and Liquid Chemicals Europa 2015 v1.pdf | Japan LChem Liaison Report_Oct2016.ppt |
| NA F&G Liaison Report July2016_red.ppt | NA Liquid Chemicals Report Aug 2016.ppt |
| Japan Gases Liaison Report_Oct2016.ppt | IDRS-WECC status update, SEMICON Europe 2016 |

#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.