Facilities & Gases North America Joint TC Chapter

Meeting Summary and Minutes

NA Standards Spring 2017 Meetings
Tuesday, April 4, 2017, 09:00 – 12:00
SEMI Headquarters, Milpitas, California

TC Chapter Announcements

Next TC Chapter Meeting

SEMICON West 2017 Standards Meetings
Tuesday, July 11, 2017, 09:00 – 12:00
Marriott Marquis Hotel, San Francisco, California

Table 1 Meeting Attendees

*Italics* indicate virtual participants

**Facilities Co-Chairs:** Steve Lewis (LPCiminelli)
**Gases Co-Chairs:** Mohamed Saleem (Brooks Instrument)
**SEMI Staff:** Laura Nguyen

<table>
<thead>
<tr>
<th>Company</th>
<th>Last</th>
<th>First</th>
<th>Company</th>
<th>Last</th>
<th>First</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Materials</td>
<td>Bruce</td>
<td>Ben</td>
<td>Ultra Clean Technology (UCT)</td>
<td>Chen</td>
<td>Yanli “Joyce”</td>
</tr>
<tr>
<td>Applied Materials</td>
<td>Mohammed</td>
<td>Bala</td>
<td>WIKA Instrument</td>
<td>Fritz</td>
<td>Thomas</td>
</tr>
<tr>
<td>Applied Seals North America, Inc.</td>
<td>Vernikovsky</td>
<td>Dalia</td>
<td>WIKA Instrument</td>
<td>Christian</td>
<td>Jeff</td>
</tr>
<tr>
<td>Brooks Instrument</td>
<td>Saleem</td>
<td>Mohamed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fujikin of America</td>
<td>Kitano</td>
<td>Erica</td>
<td>SEMI</td>
<td>Nguyen</td>
<td>Laura</td>
</tr>
<tr>
<td>Tokyo Electron Limited</td>
<td>Mashiro</td>
<td>Supika</td>
<td>SEMI</td>
<td>Trio</td>
<td>Paul</td>
</tr>
</tbody>
</table>

Table 2 Leadership Changes

<table>
<thead>
<tr>
<th>WG/TF/SC/TC Name</th>
<th>Previous Leader</th>
<th>New Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass Flow Controller Task Force</td>
<td>Erica Kitano</td>
<td></td>
</tr>
<tr>
<td>Filters &amp; Purifiers Task Force</td>
<td>Joyce Chen</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 Committee Structure Changes

None

Table 4 Ballot Results

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6110</td>
<td>Reapproval of SEMI F4-0211, Specification for Pneumatically Actuated Cylinder Valves</td>
<td>Failed</td>
</tr>
<tr>
<td>6109</td>
<td>Reapproval of SEMI F32-0211, Test Method for Determining of Flow Coefficient for High Purity Shutoff Valves</td>
<td>Failed</td>
</tr>
<tr>
<td>Document #</td>
<td>Document Title</td>
<td>Committee Action</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>6120</td>
<td>Reapproval of SEMI E137-0705 (Reapproved 1111), Guide for Final Assembly, Packaging, Transportation, Unpacking, and Relocation of Semiconductor Manufacturing Equipment</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>6105</td>
<td>Revision to SEMI F51-1115, Guide for Elastometric Sealing Technology</td>
<td>Passed, Ratification ballot to be issued</td>
</tr>
<tr>
<td>Gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6054A</td>
<td>Line Item Revisions to SEMI E18-0211, Guide for Temperature Specifications of the Mass Flow Controller</td>
<td></td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Modify Terminology Section 4.1.9</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>Line Item 2</td>
<td>Modify Terminology Section 4.1.10.1</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>Line Item 3</td>
<td>Modify Terminology Section 4.1.10.2</td>
<td>Passed, with editorial changes</td>
</tr>
<tr>
<td>Line Item 4</td>
<td>Modify Terminology Section 4.1.10.3</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Change “shall” to “should” throughout per Style Manual</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6056A</td>
<td>Revision to SEMI E28-1110, Guide for Pressure Specifications of the Mass Flow Controller with title change to Guide for Pressure Parameters of the Mass Flow Controller</td>
<td>Failed</td>
</tr>
<tr>
<td>6111</td>
<td>Reapproval of SEMI F6-92, Guide for Secondary Containment of Hazardous Gas Piping Systems</td>
<td>Failed</td>
</tr>
<tr>
<td>6106</td>
<td>Reapproval of SEMI F13-1101, Guide for Gas Source Control Equipment</td>
<td>Failed</td>
</tr>
<tr>
<td>6107</td>
<td>Reapproval of SEMI F14-93 (Reapproved 0699), Guide for the Design of Gas Source Equipment Enclosures</td>
<td>Failed</td>
</tr>
<tr>
<td>6108</td>
<td>Reapproval of SEMI F20-0706E (Reapproved 0611), Specification for 316L Stainless Steel Bar, Forgings, Extruded Shapes, Plate, and Tubing for Components Used in General Purpose, High Purity and Ultra-High Purity Semiconductor Manufacturing Applications</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6122</td>
<td>Reapproval of SEMI F78-0611, Practice for Gas Tungsten Arc (GTA) Welding of Fluid Distribution Systems in Semiconductor Manufacturing Applications</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6125</td>
<td>Line Item Revision to Correct the Nonconforming Title of SEMI F23-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Flammable Specialty Gases</td>
<td>Failed</td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Correct nonconforming title per SEMI Standards Procedure Manual</td>
<td>Failed</td>
</tr>
<tr>
<td>6126</td>
<td>Line Item Revision to Correct the Nonconforming Title of SEMI F24-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Inert Specialty Gases</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Correct nonconforming title per SEMI Standards Procedure Manual</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>6127</td>
<td>Line Item Revision to Correct the Nonconforming Title of SEMI F25-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Oxidant Specialty Gases</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Correct nonconforming title per SEMI Standards Procedure Manual</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>6128</td>
<td>Line Item Revision to Correct the Nonconforming Title of SEMI F26-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Toxic Specialty Gases</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>Line Item 1</td>
<td>Correct nonconforming title per SEMI Standards Procedure Manual</td>
<td>Passed, as balloted</td>
</tr>
<tr>
<td>6119</td>
<td>Revision to SEMI E17-1011, Guide for Mass Flow Controller Transient Characteristics Tests with title change to Test Method for Measurement of Mass Flow Controller Transient Characteristics</td>
<td>Passed, Ratification ballot to be issued</td>
</tr>
<tr>
<td>6140</td>
<td>Reapproval of SEMI C3.2-0611, Specification for Arsenic (AsH3) in Cylinders, 99.94% Quality</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6138</td>
<td>Reapproval of SEMI C3.27-1102 (Reapproved 1011), Specification for Boron Trifluoride (BF3) in Cylinders, 99.0% Quality</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6139</td>
<td>Reapproval of SEMI C3.39-1011, Specification for Nitrogen Trifluoride (NF3), 99.98% Quality</td>
<td>Passed, Superclean</td>
</tr>
</tbody>
</table>
Table 4 Ballot Results

<table>
<thead>
<tr>
<th>Document #</th>
<th>Document Title</th>
<th>Committee Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6141</td>
<td>Reapproval of SEMI C3.47-1011, Specification for Hydrogen Bromide (HBr), 99.98% Quality</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6142</td>
<td>Reapproval of SEMI C3.55-1011, Specification for Silane (SiH4), Bulk, 99.994% Quality</td>
<td>Passed, Superclean</td>
</tr>
<tr>
<td>6137</td>
<td>Reapproval of SEMI C55-1104 (Reapproved 0211), Specification for Liquid Carbon Dioxide (CO2) Used in Near Critical, Critical and Supercritical Applications, &gt;/ 99.99% Quality</td>
<td>Passed, Superclean</td>
</tr>
</tbody>
</table>

#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.

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>SC/TF/WG</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Facilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gases</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6125</td>
<td>SNARF</td>
<td>Gases</td>
<td>Line Item Revision to SEMI F23-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Flammable Specialty Gases – Revise SNARF to address the negative</td>
</tr>
<tr>
<td>6178</td>
<td>SNARF</td>
<td>Materials of Construction of Gas Delivery Systems TF</td>
<td>Line Item Revision to Correct the Title of SEMI F37-0299 (Reapproved 0611), Method for Determination of Surface Roughness Parameters for Gas Distribution System Components</td>
</tr>
<tr>
<td>6188</td>
<td>SNARF</td>
<td>Filters &amp; Purifiers TF</td>
<td>Reapproval of SEMI F54-1000 (Reapproved 1110), Test Method for Measuring the Counting Efficiency of Condensation Nucleus Counters</td>
</tr>
<tr>
<td>6181</td>
<td>SNARF</td>
<td>Filters &amp; Purifiers TF</td>
<td>Reapproval of SEMI F76-0303 (Reapproved 1110), Test Method for Evaluation of Particle Contribution from Gas System Components Exposed to Corrosive Gas</td>
</tr>
<tr>
<td>6186</td>
<td>SNARF</td>
<td>Gases</td>
<td>Reapproval of SEMI C3.58-1011, Specification for Octafluorocyclobutane, C4F8, Electronic Grade in Cylinders, 99.999% Quality</td>
</tr>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Gases</td>
<td>Revision with title change to SEMI C6.2-93 (Reapproved 1111), Particle Specification for Grade 20/0.02 Oxygen Delivered as Pipeline Gas – Send out for two-week TC member review, followed by GCS</td>
</tr>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Gases</td>
<td>Revision with title change to SEMI C6.3-89 (Reapproved 1111), Particle Specification for Grade 20/0.2 Hydrogen (H2) Delivered as Pipeline Gas – Send out for two-week TC member review, followed by GCS</td>
</tr>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Gases</td>
<td>Revision with title change to SEMI C6.4-90 (Reapproved 1111), Particle Specification for Grade 20/0.02 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas – Send out for two-week TC member review, followed by GCS</td>
</tr>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Gases</td>
<td>Revision with title change to SEMI C6.5-90 (Reapproved 1111), Particle Specification for Grade 10/0.2 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas – Send out for two-week TC member review, followed by GCS</td>
</tr>
<tr>
<td>TBD</td>
<td>SNARF</td>
<td>Gases</td>
<td>Revision with title change to SEMI C6.6-90 (Reapproved 1111), Particle Specification for Grade 10/0.1 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas – Send out for two-week TC member review, followed by GCS</td>
</tr>
</tbody>
</table>

#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

<table>
<thead>
<tr>
<th>#</th>
<th>When</th>
<th>TF</th>
<th>Details</th>
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<tbody>
<tr>
<td>Facilities</td>
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<tr>
<td>R6105</td>
<td>Cycle 4, 2017</td>
<td>F51 Revision TF</td>
<td>Revision to SEMI F51-1115, Guide for Elastometric Sealing Technology</td>
</tr>
<tr>
<td>Gases</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6125A</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Line Item Revisions to SEMI F23-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Flammable Specialty Gases</td>
</tr>
<tr>
<td>6178</td>
<td>Cycle 4, 2017</td>
<td>Materials of Construction of Gas Delivery Systems TF</td>
<td>Line Item Revision to Correct the Title of SEMI F37-0299 (Reapproved 0611), Method for Determination of Surface Roughness Parameters for Gas Distribution System Components</td>
</tr>
<tr>
<td>6188</td>
<td>Cycle 4, 2017</td>
<td>Filters &amp; Purifiers TF</td>
<td>Reapproval of SEMI F54-1000 (Reapproved 1110), Test Method for Measuring the Counting Efficiency of Condensation Nucleus Counters</td>
</tr>
<tr>
<td>6181</td>
<td>Cycle 4, 2017</td>
<td>Filters &amp; Purifiers TF</td>
<td>Reapproval of SEMI F76-0303 (Reapproved 1110), Test Method for Evaluation of Particle Contribution from Gas System Components Exposed to Corrosive Gas</td>
</tr>
<tr>
<td>6186</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Reapproval of SEMI C3.58-1011, Specification for Octafluorocyclobutane, C4F8, Electronic Grade in Cylinders, 99.999% Quality</td>
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<tr>
<td>TBD</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Revision with title change to SEMI C6.2-93 (Reapproved 1111), Particle Specification for Grade 20/0.02 Oxygen Delivered as Pipeline Gas</td>
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<td>Revision with title change to SEMI C6.3-89 (Reapproved 1111), Particle Specification for Grade 20/0.2 Hydrogen (H2) Delivered as Pipeline Gas</td>
</tr>
<tr>
<td>TBD</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Revision with title change to SEMI C6.4-90 (Reapproved 1111), Particle Specification for Grade 20/0.2 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas</td>
</tr>
<tr>
<td>TBD</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Revision with title change to SEMI C6.5-90 (Reapproved 1111), Particle Specification for Grade 10/0.2 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas</td>
</tr>
<tr>
<td>TBD</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Revision with title change to SEMI C6.6-90 (Reapproved 1111), Particle Specification for Grade 10/0.1 Nitrogen (N2) and Argon (Ar) Delivered as Pipeline Gas</td>
</tr>
<tr>
<td>TBD</td>
<td>Cycle 5, 2017</td>
<td>Gases Specification TF</td>
<td>Revision with title change to SEMI C6.7-93 (Reapproved 1111), Particle Specification for Grade 10/0.2 Nitrogen in High Pressure Gas Cylinders</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017April#01</td>
<td>Laura Nguyen</td>
<td>To send out Staff Report to members who attended the TC Chapter meeting.</td>
</tr>
<tr>
<td>2017April#02</td>
<td>Laura Nguyen</td>
<td>Ben to add Supika to BIM distribution list.</td>
</tr>
<tr>
<td>2017April#03</td>
<td>Laura Nguyen</td>
<td>Send Thomas and Mohamed SEMIViews access for SEMI C6.XX docs for review/revision.</td>
</tr>
<tr>
<td>2017April#04</td>
<td>Laura Nguyen</td>
<td>Send Joyce F32 SEMIViews access for review/revision.</td>
</tr>
</tbody>
</table>

Table 12 Previous Meeting Action Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Assigned to</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016Nov#01</td>
<td>Laura Nguyen</td>
<td>To send Motions PowerPoint to leaders and co-chairs. CLOSED.</td>
</tr>
<tr>
<td>2016Nov#02</td>
<td>Laura Nguyen</td>
<td>To send Joyce permission to access file F64, copy Mohamed. CLOSED.</td>
</tr>
<tr>
<td>2016Nov#03</td>
<td>Mohamed Saleem</td>
<td>To brainstorm new task force for reapproval ballots and create TFOF. On-going.</td>
</tr>
</tbody>
</table>

1 Welcome, Reminders, and Introductions

Mohamed Saleem (Brooks Instrument) called the meeting to order at 09:07. 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 as written.

By / 2nd: Bala Mohammed (Applied Materials) / Jeff Christine (WIKA Instruments)

Discussion: None.

Vote: 5-0 in favor. Motion passed.

Attachment: [2016Fall] F&G Minutes FINAL

3 Liaison Reports

3.1 Gases and Liquid Chemicals Europe TC Chapter

Laura Nguyen (SEMI) reported for the Gases and Liquid Chemicals Europe TC Chapter. Of note:

- Committee Co-Chairs: Jean-Marie Collard (Solvay Chemicals), Gordon Ferrier (Gordon F Consulting)
- Committee Org Chart [See attachment for Org Chart]
- Meeting Information:
  - Last Meeting: October 26, 2016 at SEMICON Europa, Grenoble, France
  - Next Meeting (tentative): November 2017 at SEMICON Europa, Munich, Germany
- Gases
  - No ballots adjudicated at Europa meeting
  - New Cleaning Gases Task Force approved
  - SNARF: Guide for F2/N2/Ar cleaning gas mixtures used in Semiconductor manufacturing
  - to replace PFC's and NF3 as chamber cleaning gases
Documents due for five-year review
- SEMI C52-0301 (Reapproved 0312), Specification for the Shelf Life of a Specialty Gas
- SEMI C3.56-0312, Specification for Diborane Mixtures
- SEMI C3.57-0312, Specification for Carbon Dioxide, CO2, Electronic Grade in Cylinders

Liquid Chemicals
- The below ballots passed adjudication at SEMICON Europa:
  - 5656B, Revision to SEMI C65-0308 : Guide for Trimethylsilane (3MS)
  - 5657B, Revision to SEMI C66-0308: Guide for Trimethylaluminimum (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
  - 6080, Reapproval for SEMI C74-0811: Guide for Hafnium Tert-Butoxide
  - 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%

Presentation at Europa 2016 Meeting
- IRDS versus ITRS and the Latest about Surface Contamination Issues.
  - Jochen Ruth (Pall) and Andreas Neuber (AMAT)

Contact: Gases: Laura Nguyen (lnguyen@semi.org); Liquid Chemicals: Inna Skvortsova (iskvortsova@semi.org)

Attachment: [Liaison] EU Gas & Liq Chem Nov 2016 v1

3.2 Gases & Facilities Japan TC Chapter
Laura Nguyen (SEMI) reported for the Gases & Facilities Japan TC Chapter. Of note:
- Committee Co-chairs: Hiromichi Enami (Hitachi High Technologies), Isao Suzuki (MKS Japan)
- Current Committee Structure [See attachment for Org Chart]
- Last Meeting: March 24, 2017 during Japan Spring Meetings 2017 at SEMI Japan, Tokyo, Japan
- Next Meeting: June 23, 2017 during Japan Summer Meetings 2017 at SEMI Japan, Tokyo, Japan
- Task Force Reports
  - Gas Panel Test Method Task Force: No activity
  - 5-year-review Task Force: No activity
    - 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.
    - 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 (NMII) is preparing critical nozzle

  - Plan update.
    4. Review at T/F on 1st. Test result and planning for next step June 2017.

- Facilities Current Structure {See attachment for Org Chart}

Contact: Naoko Tejima, SEMI Japan, ntejima@semi.org

Attachment: [Liaison] Japan F&G

3.3 SEMI Staff Report

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

- SEMI Global 2017 Calendar of Events
  - LED Taiwan (April 12-15, 2017; Taipei, Taiwan)
  - SEMICON Southeast Asia (April 25-27, 2017; Penang, Malaysia)
  - Intersolar Europe (May 31-June 2, 2017; Munich, Germany)
  - SEMICON West (July 11-13, 2017, San Francisco, California)
  - SEMICON Taiwan (September 13-15, 2017; Taipei, Taiwan)
  - PV Taiwan (October 12-14, 2017; Taipei, Taiwan)
  - SEMICON Europa (November 14-17, 2017; Munich, Germany)
  - SEMICON Japan (December 13-15, 2017; Tokyo, Japan)

- Upcoming North America Standards Meetings
  - SEMICON West 2017 (July 10-13, 2017, San Francisco, California)
  - NA Standards Fall 2017 Meetings (November 6-9 [tentative], SEMI HQ in Milpitas, California)

- Letter Ballot Critical Dates for 2017
  - West 2017 adjudication
    - Cycle 4: ballot submission due: Apr 14/Voting Period: Apr 25 – May 25
    - Cycle 5: ballot submission due: May 12/Voting Period: May 26 – June 26


- Standards Publications Report

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Total in portfolio – 972 (includes 170 Inactive Standards – see attachment to see breakdown)

- SEMI Standards Publications – New Standards
- SEMI PV76, Test Method for Durability of Low Light Intensity Organic Photovoltaic (OPV) and Dye-Sensitized Solar Cell (DSSC)
- SEMI HB8, Test Method for Determining Orientation of a Sapphire Single Crystal

- Nonconforming Titles (See attachment for full list)
- Facilities & Gases Standards needing Five-Year Review (See attachment for full list)
- SNARF 3 Year Status, TC Chapter may grant a one-year extension (See attachment for full list)

Action Item: 2017April#01, Laura to send out Staff Report to members who attended the TC Chapter meeting.
Attachment: [2017Spring] Staff Report F&G updated May2017

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 Facilities

4.1.1 Document # 6110, Reapproval of SEMI F4-0211, Specification for Pneumatically Actuated Cylinder Valves

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Materials of Construction of Gas Delivery Systems Task Force Report for comments.

Motion: Motion to find the Negative 1 related and technically persuasive and to fail Doc 6110.
By / 2nd: Thomas Fritz (WIKA Instruments) / Jeff Christian (WIKA Instruments)
Discussion: None.
Vote: 6-0 in favor. Motion passed.

4.1.2 Document #6109, Reapproval of SEMI F32-0211, Test Method for Determining of Flow Coefficient for High Purity Shutoff Valves

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready.

Motion: Motion to find the Negative SG02 related and technically persuasive and to fail Doc 6109.
By / 2nd: Thomas Fritz (WIKA Instruments) / Joyce Chen (UCT)
Discussion: None.
Vote: 6-0 in favor. Motion passed.

4.1.3 Document # 6120, Reapproval of SEMI E137-0705 (Reapproved 1111), Guide for Final Assembly, Packaging, Transportation, Unpacking, and Relocation of Semiconductor Manufacturing Equipment

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

Discussion: Comment made by Supika will not be addressed at this time. According to PM 3.3.2.3.1. AI to address after publication as editorial change at the next TC Chapter meeting.

Attachment: 6120ProceduralReview

4.1.4 Document # 6105, Revision to SEMI F51-1115, Guide for Elastometric Sealing Technology

- The ballot passed TC Chapter review with technical changes. Ratification Ballot to be issued. See attachment for ballot adjudication.

Attachment: 6105ProceduralReview
4.2 Gases

4.2.1 Document # 6054A, Line Item Revisions to SEMI E18-0211, Guide for Temperature Specifications of the Mass Flow Controller

4.2.1.1 Line Item #1: Modify Terminology Section 4.1.9

4.2.1.2 Line Item #2: Modify Terminology Section 4.1.10.1

4.2.1.3 Line Item #2: Modify Terminology Section 4.1.10.2

4.2.1.4 Line Item #2: Modify Terminology Section 4.1.10.3

- Line Item #3 passed TC Chapter review with editorial changes. Line Items #1, 2, 4 passed TC Chapter Review as balloted (superclean). See attachment for ballot adjudication.

Attachment: 6054AProceduralReview


4.2.3 Line Item #: Change “shall” to “should” throughout per Style Manual

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

Attachment: 6055AProceduralReview

4.2.4 Document # 6056A, Revision to SEMI E28-1110, Guide for Pressure Specifications of the Mass Flow Controller with title change to Guide for Pressure Parameters of the Mass Flow Controller

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Mass Flow Controller Task Force report for comments.

Motion: Motion to find the Negative 7 related and technically persuasive and to fail Doc 6056A.

By / 2nd: Erica Kitano (Fujikin) / Joyce Chen (UCT)

Discussion: None.

Vote: 5-0 in favor. Motion passed.

4.2.5 Document # 6111, Reapproval of SEMI F6-92, Guide for Secondary Containment of Hazardous Gas Piping Systems

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Materials of Construction of Gas Delivery Systems Task Force report for comments.

Motion: Motion to find the Negative related and technically persuasive and to fail Doc 6111.

By / 2nd: Thomas Fritz (WIKA Instruments) / Jeff Christian (WIKA Instruments)

Discussion: None.

Vote: 4-0 in favor. Motion passed.

4.2.6 Document # 6106, Reapproval of SEMI F13-1101, Guide for Gas Source Control Equipment

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Materials of Construction of Gas Delivery Systems Task Force report for comments.

Motion: Motion to find the Negative related and technically persuasive and to fail Doc 6106.

By / 2nd: Thomas Fritz (WIKA Instruments) / Jeff Christian (WIKA Instruments)

Discussion: None.

Vote: 4-0 in favor. Motion passed.
4.2.7 Document # 6107, Reapproval of SEMI F14-93 (Reapproved 0699), Guide for the Design of Gas Source Equipment Enclosures

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Materials of Construction of Gas Delivery Systems Task Force report for comments.

Motion: Motion to find the Negative related and technically persuasive and to fail Doc 6107.
By / 2nd: Thomas Fritz (WIKA Instruments) / Jeff Christian (WIKA Instruments)
Discussion: None.
Vote: 4-0 in favor. Motion passed.

4.2.8 Document # 6108, Reapproval of SEMI F20-0706E (Reapproved 0611), Specification for 316L Stainless Steel Bar, Forgings, Extruded Shapes, Plate, and Tubing for Components Used in General Purpose, High Purity and Ultra-High Purity Semiconductor Manufacturing Applications

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

Attachment: 6108ProceduralReview

4.2.9 Document # 6123, approval of SEMI F81-0611, Specification for Visual Inspection and Acceptance of Gas Tungsten Arc (GTA) Welds in Fluid Distribution Systems in Semiconductor Manufacturing Applications

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

Attachment: 6123ProceduralReview

4.2.10 Document # 6122 Reapproval of SEMI F78-0611, Practice for Gas Tungsten Arc (GTA) Welding of Fluid Distribution Systems in Semiconductor Manufacturing Applications

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

Attachment: 6122ProceduralReview

4.2.11 Document # 6125, Line Item Revision to Correct the Nonconforming Title of SEMI F23-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Flammable Specialty Gases

4.2.11.1 Line Item #: Correct nonconforming title per SEMI Standards Procedure Manual

- The committee found the negatives related and persuasive. The ballot failed and returned to the task force for re-work and re-ballot in the next cycle if ready. See Gases Specification Task Force report for comments.

Joyce Chen withdrew her comment during the TF meeting. Withdrawal document received by Standards staff on 04/03/2017.

Motion: Motion to find the Negative related and technically persuasive and to fail Doc 6125.
By / 2nd: Joyce Chen (UCT) / Erica Kitano (Fujikin)
Discussion: None.
Vote: 6-0 in favor. Motion passed.

The committee discussed revising the document and task force will rework the document and ask the committee to reballot in the later cycle before the next TC Chapter. The following action has been taken:

Motion: Motion to approve revision SNARF Doc 6125, and send Doc 6125A for ballot in Cycle 5, 2017 after making changes to Doc 6125.
By / 2nd: Joyce Chen (UCT) / Bala Mohammed (AMAT)
Discussion: None.
Vote: 6-0 in favor. Motion passed.
4.2.12 Document # 6126 Line Item Revision to Correct the Nonconforming Title of SEMI F24-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Inert Specialty Gases

4.2.12.1 Line Item #: Correct nonconforming title per SEMI Standards Procedure Manual

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

  Joyce Chen withdrew her comment during the TF meeting. Withdrawal document received by Standards staff on 04/03/2017.

  Attachment: 6126ProceduralReview

4.2.13 Document # 6127, Line Item Revision to Correct the Nonconforming Title of SEMI F25-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Oxidant Specialty Gases

4.2.13.1 Line Item #: Correct nonconforming title per SEMI Standards Procedure Manual

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

  Joyce Chen withdrew her comment during the TF meeting. Withdrawal document received by Standards staff on 04/03/2017.

  Attachment: 6127ProceduralReview

4.2.14 Document # 6128, Line Item Revision to Correct the Nonconforming Title of SEMI F26-0697 (Reapproved 0712), Particle Specification for Grade 10/0.2 Toxic Specialty Gases

4.2.14.1 Line Item #: Correct nonconforming title per SEMI Standards Procedure Manual

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

  Joyce Chen withdrew her comment during the TF meeting. Withdrawal document received by Standards staff on 04/03/2017.

  Attachment: 6128ProceduralReview

4.2.15 Document # 6121, Reapproval of SEMI E67-1011, Test Method for Determining Reliability of Mass Flow Controller

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

  Attachment: 6121ProceduralReview


- The ballot passed TC Chapter review with technical changes. Ratification Ballot to be issued. See attachment for ballot adjudication.

  Attachment: 6119ProceduralReview

4.2.17 Document # 6140, Reapproval of SEMI C3.2-0611, Specification for Arsine (AsH3) in Cylinders, 99.94% Quality

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

  Attachment: 6140ProceduralReview

4.2.18 Document # 6138, Reapproval of SEMI C3.27-1102 (Reapproved 1011), Specification for Boron Trifluoride (BF3) in Cylinders, 99.0% Quality

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

  Attachment: 6138ProceduralReview

4.2.19 Document # 6139, Reapproval of SEMI C3.39-1011, Specification for Nitrogen Trifluoride (NF3), 99.98%

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

  Attachment: 6139ProceduralReview
4.2.20 Document # 6143, Reapproval of SEMI C3.40-1011, Specification for Carbon Tetrafluoride (CF4), 99.997% Quality
- The ballot passed TC Chapter review as balloted (superclean). See attachment for ballot adjudication.
Attachment: 6143ProceduralReview

4.2.21 Document # 6141, Reapproval of SEMI C3.47-1011, Specification for Hydrogen Bromide (HBr), 99.98% Quality
- The ballot passed TC Chapter review as balloted (superclean). See attachment for ballot adjudication.
Attachment: 6141ProceduralReview

4.2.22 Document # 6142, Reapproval of SEMI C3.55-1011, Specification for Silane (SiH4), Bulk, 99.994% Quality
- The ballot passed TC Chapter review as balloted (superclean). See attachment for ballot adjudication.
Attachment: 6142ProceduralReview

4.2.23 Document # 6137, Reapproval of SEMI C55-1104 (Reapproved 0211), Specification for Liquid Carbon Dioxide (CO2) Used in Near Critical, Critical and Supercritical Applications, >/ 99.99% Quality
- The ballot passed TC Chapter review as balloted (superclean). See attachment for ballot adjudication.
Attachment: 6137ProceduralReview

5 Subcommittee and Task Force Reports

5.1 Facilities

5.1.1 Power Grid Harmonics Task Force
The Power Grid Harmonics Task Force did not meet. They continue to meet via teleconference. Please contact the leader of the task force, Alex McEachern, for more information. (alex@powerstandards.com)

5.1.2 F51 Revision Task Force
Paul Trio (SEMI) reported for the F51 Revision Task Force. This report contained information on the ballot review. Please see attachment for detailed information regarding the Task Force.
Attachment: F51 Revision TF Report NASpring2017

5.1.3 BIM for Semiconductor Capital Equipment Task Force
Ben Bruce (AMAT) reported for the BIM Task Force. This task force meets weekly with LAM, KLA-Tencor, AMAT, and customers to rework the Draft Doc 5155. The Draft Doc 5155 was reviewed during their task force meeting, and determined that Draft Document is ready to ballot. The task force would like to ask the committee to ballot in the next cycle. The following action was taken:

Motion: Motion to send Doc 5155A to ballot in Cycle 5, 2017.
By / 2nd: Ben Bruce (AMAT) / Bala Mohammed (AMAT)
Discussion: None.
Vote: 4-0 in favor. Motion passed.
5.2 Gases

5.2.1 Materials of Construction of Gas Delivery Systems Task Force

Laura Nguyen (SEMI) reported for the Materials of Construction of Gas Delivery Systems Task Force. This report contained information on the following below. Additional activities are authorized under New Business.

- Review of Prior Meeting and Activities
- Update on Semi F6, F13, F14, F37, F41, F69 and F101
- Ballot Review
  - SEMI F6 Rejected
  - SEMI F13 Rejected
  - SEMI F14 Rejected
  - SEMI F20 Accepted
  - SEMI F78 Accepted
  - SEMI F81 Accepted
- SEMI F6, F13, F14
  - Task force voted to accept Todd Bell’s (AES) rejection as technical and reject the documents. Vote was unanimous.
- SEMI F20, F78, 81
  - Task force voted to send ballots to ANR for final review. Vote was unanimous.
- Old Business
  - SEMI F37: Bill and Laura to discuss the title requirements. Sending out SEMI F37 for ballot.
  - SEMI F101: Bill to send out request for review to Joe Lis, Parker and Scott Balson Swagelok for input into the document.
  - SEMI F6, F13 and F14: Bill to discuss with Todd Bell about ways to rewrite the documents. Bill to also reach out to Supika Mashiro (TEL) and Scott Swanson (Intel) for potential input/assistance. Bala to reach out to Safety at AMAT for potential input/and or direction.
- New Business
  - SEMI F6, F13, F14 noted an industry requirement for other materials besides SS316L. He requested for TF to consider implementing a new section in SEMI F20 for new material (such as C-22 and other materials).
  - Bala will put together a proposed road map on how to implement new materials (either revising SEMI F20 or new specification).
  - Paul Trio of Semiconductor Components, Instruments, and Subsystems Special Interest Group (SCIS) is working on implementing some studies/specifications into SEMI documents. He will be asking this Task Force for assistance.
- Five Year Review
- Action Item Review / Recommendations
  - SEMI F22 and F74 to TF for review.
  - SEMI F37: Bill: communicate with Laura on SEMI F37. Sending out SEMI F37 for ballot.
  - SEMI F101: Bill and Joe briefly reviewed F101 and did not see any major issues. Both will review SEMI F101 and request input from Scott Balson of Swagelok for final recommendation at SEMICON West 2017’s meeting.
SEMI F6, F13 and F14: Bill to discuss with Todd Bell about ways to rewrite the documents. Bill to also reach out to Supika Mashiro (TEL) and Scott Swanson (Intel) for potential input/assistance. Bala to reach out to Safety at AMAT for potential input/and or direction.

Attachment: [Minutes] MaterialsofConstructionTF minutes_SEMIspring2017

5.2.2 Filters & Purifiers Task Force

Joyce Chen (UCT) reported for the Filters & Purifiers Task Force. This report contained information on the following below. Additional activities are authorized under New Business.

1. Review previous meeting minutes and update the status of Document 5816B, Document 6059 and Document 6060 for TF members
   - Bala has some comments for SEMI F30 and SEMI F70, but he agrees with the current status of pending publication.
   - Bala’s Comments and Suggestion on SEMI F30
   - TF leader to make section 3 clear in that the test methods are not limited to APIMS, CRDS but other Ultra Trace Analytical techniques as well.
   - Bala thinks that it should define the other Ultra Trace Analytical techniques and add “customer approval methods” into the document.
   - Bala’s Comments on SEMI F70
   - Bala thinks that the current SEMI F70 needs some major revision because it is not following the current industrial trend.

2. TF members have an extensive discussion regarding the average lifespan of filter at the end of the meeting. Mark Camenzind from Air Liquide provided a lot of valuable information on that topic. There is no clear answer to that question. It all depends on the nature of the feeding gas. The two important monitoring parameters for filter life are pressure drop and particle count in the stream.

New Business
Some action Items for Bala
- Will present the project information and some test results collaborated with Bala’s lab for particle contribution

Attachment: [Minutes] FP TF_4_3_2017

5.2.3 Mass Flow Controller Task Force

Erica Kitano (Fujikin) reported for the Mass Flow Controller Task Force. This report contained information on the ballot review that can be found in Section 4 of these minutes. Additional activities are authorized under New Business. Please see attachment for detailed information.

Attachment: [Minutes] Apr 03, 2017 MFC TF Meeting Summary

5.2.4 Gases Specification Task Force

Thomas Fritz (WIKA) reported for the Gases Specification Task Force. This report contained information on the ballot review that can be found in Section 4 of these minutes. Additional activities are authorized under New Business. Please see attachment for detailed information.

Attachment: [Minutes] Gases Spec TF - Spring2017
6 Old Business

6.1 Gases

6.1.1 Authorized Activities

6.1.1.1 Upcoming Ballots

The committee reviewed the below documents and the respecting task forces will rework the document and ask the committee to ballot cycle 4 or 5, 2017. The following action has been taken.

**Motion:** Motion to approve F37 SNARF and send for Line Item ballot in Cycle 4, or 5, 2017 after making changes to Doc 6125.

**By / 2nd:** Thomas Fritz (WIKA) / Jeff Christian (WIKA)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.

**Motion:** Motion to approve SNARFs C6.2 - C6.7, contingent of two-week TC member review, and send out for Major Revision ballot in Cycle 4, or 5, 2017 after making necessary changes to Doc 6125.

**By / 2nd:** Jeff Christian (WIKA) / Bala Mohammed (AMAT)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.

6.1.1.1 Standards due for Five-Year Review

The committee reviewed the Standards due for Five-Year Review. The committee discussed these documents and decided to ballot for reapproval. The following actions were taken below.

**Motion:** Motion to authorize SEMI F54, F76, F64, C9.1, and C3.58 for reapproval ballot in Cycle 4 or 5, 2017.

**By / 2nd:** Thomas Fritz (WIKA) / Bala Mohammed (AMAT)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.

7 New Business

7.1 Gases

7.1.1 Leadership Changes

Mohamed Saleem (Brooks Instrument) addressed the committee on this topic. The following actions were taken:

**Motion:** Nominate Erica Kitano to Mass Flow Controller Task Force co-leader.

**By / 2nd:** Thomas Fritz (WIKA) / Bala Mohammed (AMAT)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.

**Motion:** Nominate Joyce Chen to Filter and Purifiers Task Force co-leader.

**By / 2nd:** Thomas Fritz (WIKA) / Bala Mohammed (AMAT)

**Discussion:** None.

**Vote:** 6-0 in favor. Motion passed.
7.1.2  PIP Form

Laura Nguyen (SEMI) addressed the committee on this topic.

Per Appendix 4 Updates in the latest PM, use of PIP form is allowed to correct title if all of the following conditions are met: Standards having only one Subtype, Changes either Specifications to Specification or Test Methods to Test Method, No concomitant text change is required, Approved by at least one cochair of the TC Chapter. A PIP Form has been filled out in advanced and presented to the committee for review and approval. The following action was taken:

Motion:  Motion to approve PIP form for SEMI F69 and SEMI F101 to fix the non-conforming title per the latest updates in the PM.
By / 2nd:  Thomas Fritz (WIKA) / Joyce Chen (UCT)
Discussion:  None.
Vote:  6-0 in favor. Motion passed.

Attachment:  PIP Form - SEMI F69, F101

8  Next Meeting and Adjournment

The next meeting is scheduled for Tuesday, July 11, 2017 at the SEMICON West 2017 Standards meetings in San Francisco, California. See http://www.semi.org/standards-events for the current list of events.

Adjournment: 11:55.

Respectfully submitted by:
Laura Nguyen
International Standards Coordinator
SEMI Headquarters
Phone: 1.408.943.7019
Email: lnguyen@semi.org

Minutes tentatively approved by:
Steve Lewis (LPCiminelli), Facilities Co-chair  July 11, 2017
Mohamed Saleem (Brooks Instrument), Gases Co-chair  July 11, 2017

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#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 Laura Nguyen at the contact information above.