



## Facilities & Gases Joint North America TC Chapter Meeting Summary and Minutes

NA Standards Fall Meetings 2023

Tuesday, November 8, 09:00–12:00 Noon (Pacific) Hybrid

SEMI Global Headquarters, Milpitas, California, and via Official Virtual TC Chapter Meeting (OVTCCM)

### TC Chapter Announcements

*Next TC Chapter Meeting*

NA Standards Spring Meetings 2023

Tuesday, April 4, 09:00 – 12:00 Pacific

SEMI Global Headquarters, Milpitas, California/USA

### Table 1 Meeting Attendees

*Italics indicate virtual participants*

**Facilities Co-Chairs:** Steve Lewis (Gilbane Building Company)

**Gases Co-Chairs:** Mohamed Saleem (Brooks Instrument)

**SEMI Staff:** Laura Nguyen

<i>Company</i>	<i>Last</i>	<i>First</i>	<i>Company</i>	<i>Last</i>	<i>First</i>
Applied Materials	Chen	Yanli	<i>Nikon</i>	<i>Sutton</i>	<i>Carolyn</i>
<i>Axcelis Technologies</i>	<i>Alliegro</i>	<i>Richard</i>	<i>Parker Hannifin</i>	<i>Lis</i>	<i>Joseph</i>
<i>BriskHeat</i>	<i>Colquhoun</i>	<i>David</i>	<i>Shermco</i>	<i>Skadberg</i>	<i>Nick</i>
Brooks Instrument	Saleem	Mohamed	Swagelok	Zawada	John
<i>Daido Steel</i>	<i>Yoshida</i>	<i>Yutaka</i>	TEL	Mashiro	Supika
<i>DPS Group</i>	<i>Potts</i>	<i>Michael</i>	UCT	Milburn	Matt
Festo SE & Co. KG	van den Berg	Max	Valex	Kim	Josh
<i>Gilbane Building Company</i>	<i>Lewis</i>	<i>Steve</i>	<i>WIKA Instruments</i>	<i>Fritz</i>	<i>Thomas</i>
Ichor Systems	Findleton	Kevin			
<i>Mott Corporation</i>	<i>Beaune</i>	<i>Allen</i>	SEMI	Nguyen	Laura

### Table 2 Leadership Changes

<i>WG/TF/SC/TC Name</i>	<i>Previous Leader</i>	<i>New Leader</i>
<i>Facilities</i>		
None		
<i>Gases</i>		
Materials of Construction of Gas Delivery Systems Task Force	Bill Kiikvee (AP Tech)	Bill Kiikvee (AP Tech) Matt Milburn (UCT) – <i>Newly appointed</i>

### Table 3 Committee Structure Changes

None

**Table 4 Ballot Results**

None

**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 TC Chapter.

None

**Table 7 Authorized Ballots**

Listing of documents authorized by the TC Chapter for Letter Ballot.

#	When	TF	Details
<i>Facilities</i>			
6628	Cycle 1-2023	BIM TF	New Standard: Guide for Facilities Data Package for Semiconductor Manufacturing Equipment Installation and Building Information Modeling
<i>Gases</i>			
6394	Cycle 9-2022, 1 or 2-2023	Materials of Construction of Gas Delivery Systems TF	Line Item Revision to SEMI F74-1103 (Reapproved 0710), Test Method for the Performance and Evaluation of Metal Seal Designs for Use in Gas Delivery Systems
6510	Cycle 9-2022, 1 or 2-2023	Materials of Construction of Gas Delivery Systems TF	Line Item Revision to SEMI F32-0211, Test Method for Determining of Flow Coefficient for High Purity Shutoff Valves
6916	Cycle 1-2023	Heater Jacket TF	Replacement of SEMI F109-0212, Guide for Heater Systems Requirements, as a New Standard: Guide for Material Selection for Heater Systems

**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**

Item #	Assigned to	Details
2022Nov#01	Laura Nguyen	Laura to check with management if announcing Standards to go Inactive to help get through Five-Year list. <a href="#">Will review case by case basis. Completed.</a>
2022Nov#02	Max van den Berg, Thomas F.	Prepare SNARF for SEMI E49.6 and E49.8. <a href="#">Ongoing.</a>

**Table 12 Previous Meeting Action Items**

<i>Item #</i>	<i>Assigned to</i>	<i>Details</i>
2019Nov#01	Laura Nguyen	Create invite-only TF in connect@SEMI for SEMI E49.6-E49.8 revision. <b>Ongoing.</b>
2021Feb#01	Bill Kiikvee	Reach out to Swagelok contact on Doc 6612. <b>Ongoing.</b>
2021Feb#03	Bill, Mohamed, Max, Matthew Milburn	Review SEMI F19. <b>Ongoing.</b>
2021July#01	Laura Nguyen	Mohamed to reach out to Steve about creating a new Task Force for the Reapproval Ballots that failed (SEMI E6, E76). <b>Ongoing.</b>
2021July#02	Laura Nguyen	Work with Mohamed to abolish Reapproval SNARFs and reissue new SNARFs. <b>Abolished RA SNARFs, need to reissue new SNARFs, ongoing.</b>
2022Mar#02	Laura Nguyen	Work with Committee to propose new TF for SEMI E49.6, E49.8 revision. <b>Completed. Will stay in Materials TF.</b>

## 1 Welcome, Reminders, and Introductions

Steve Lewis (Gilbane) called the meeting to order at 09:04. The meeting reminders on antitrust issues, intellectual property issues and holding meetings with international attendance were reviewed. Attendees introduced themselves.

**Attachment:** SEMI Standards Required Meetings 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 / 2<sup>nd</sup>:** By: Yanli Chen / Applied Materials, Inc.  
Second: Kevin Findleton / Ichor Systems

**Discussion:** None.

**Vote:** 10-0 in favor. Motion passed.

**Attachment:** [2022West] F&G NA TC Chapter Meeting Minutes FINAL

### 2.1 Liaison Reports

### 2.2 Gases & Liquid Chemicals Europe TC Chapter

No update.

### 2.3 Gases & Facilities Japan TC Chapter

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

#### Meeting Information

- Last meeting: Thursday, September 15, 2022, via Official Virtual TC Chapter Meeting (OVTCCM)
- Next meeting: Friday, December 2, 2022, via SEMI Japan office + Official Virtual TC Chapter Meeting (OVTCCM) (Hybrid)

#### F&G Leadership

- Committee Co-chairs
  - Hiromichi Enami (Consultant), Isao Suzuki (Consultant), Masafumi Kitano (Fujikin)

F&G Current Organization Chart of Japan TC Chapter *(See attachment for Org Chart)*



### Task Force Highlights

- The 5-Year Review TF discussed future actions on Doc. 6890 Reapproval of F80 and decided to make it inactive status without rework.

Staff Contact: Nobuko Okayasu, nokayasu@semi.org

Attachment: 20220915\_JA\_G+F\_LiaisonR\_v1.0

### 2.4 Facilities Korea TC Chapter

No update.

### 2.5 SEMI Staff Report

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

#### SEMI Global 2022 & 2023 Calendar of Events

- [2022] SEMICON Europa (Nov 15-17; Munich, Germany), SEMICON Japan (December 15-17; Tokyo)
- [2023] SEMICON Korea (Feb 1-3; Seoul, Korea), SEMICON China (Mar 22-24; Shanghai, China)

#### Upcoming NA Meetings

- NA Standards Spring Meetings
  - April 3-6, 2023, at SEMI HQ, Milpitas, California/USA

#### Critical Dates for SEMI Standards Ballots

- Cycle 8-2022: Ballot Submission Due: Oct 4/Voting Period: Oct 18 – Nov 17
- Cycle 9-2022: Ballot Submission Due: Nov 15/Voting Period: Nov 29 – Dec 29

2023 Cycle dates can be found here: <http://www.semi.org/en/Standards/Ballots>

#### Standards Publications Report

<i>Cycle</i>	<i>New</i>	<i>Revised</i>	<i>Reapproved</i>	<i>Withdrawn</i>
July 2022	0	3	0	0
August 2022	0	5	0	2
September 2022	2	3	6	1
October 2022	3	8	0	0

Total in portfolio – 1,069 (includes 320 Inactive Standards)

#### New Standards

<i>Cycle</i>	<i>Designation</i>	<i>Title</i>	<i>Committee</i>	<i>Region</i>
September 2022	SEMI F120	Test Method for the Electrochemical Critical Pitting Voltage Testing of Stainless Steel Used in Corrosive Gas Systems	Gases	NA
September 2022	SEMI E120.2	Specification for Protocol Buffers for Common Equipment Model (CEM)	Information & Control	NA
October 2022	SEMI E125.2	Specification for Protocol Buffers for Equipment Self Description (EqSD)	Information & Control	NA
October 2022	SEMI E134.2	Specification for Protocol Buffers of Data Collection Management	Information & Control	NA
October 2022	SEMI E142.4	Specification for SECS II Protocol for Substrate Mapping Using Item Transfer	Information & Control	NA



## Publications Backlog

Processing Queue: 37

YTD Published: 93

- 5/5/2022 A&R cycle: 8
- 6/30/2022 A&R cycle: 11
- 8/18/2022 A&R cycle: 9
- 10/12/2022 A&R cycle: 9
- New Standards: 11
- Revisions: 43
- Reapprovals: 36
- Withdrawals: 3

### Contributing Factors

- Increased A&R cycles have resulted in a constant rate of documents for processing.
- Ballots are becoming more complex and require more time to process.
- As the Regulations, Procedure Manual, and Style Manual are updated, there is the potential for delays in processing documents (e.g., ensuring documents comply).

## NEW! SEMI Corporate PPT Template

- SEMI launched a new corporate PPT template earlier this year
  - Standards is among the first to use the new template ★
- We encourage TFs to begin transitioning over to the new template
  - Please reach out to your Staff contact for assistance
  - Templates will be sent out by Staff and can be found on the SEMI Web site [www.semi.org/standards](http://www.semi.org/standards) (under Tools for Developing Standards)

## Facilities: On-going

- SEMI E51, Guide for Typical Facilities Services and Termination Matrix
  - RA ballot failed TCC review; SNARF abolished Fall 2017; Action needed to either send to Inactive Status or issue new SNARF to reflect change in scope
  - Searching for volunteers to lead this activity
- SEMI F47, Specification for Semiconductor Processing Equipment Voltage Sag Immunity
  - Reapproval ballot failed TCC review; Spring 2018 – SNARF expired; SNARF abolished Fall 2019
  - Voltage Sag Immunity TF to issue minor revision SNARF to keep from moving to Inactive Status
- SEMI E76, Guide for 300 mm Process Equipment Points of Connection to Facility Services
  - RA ballot failed TCC review; Summer 2021 – Action needed to either send to Inactive Status or Abolish RA SNARF 6773 and reissue new SNARF
  - Searching for volunteers to lead this activity
- SEMI E6, Guide for Semiconductor Equipment Installation Documentation
  - RA ballot failed TCC review; Summer 2021 – Action needed to either send to Inactive Status or Abolish RA SNARF 6771 and reissue new SNARF
  - Searching for volunteers to lead this activity

## Facilities Five-Year Review

Designation #	Standard Title	Action By	Assigned to
SEMI F51-0917	Guide for Elastometric Sealing Technology	Sept 2022	F51 Revision TF

## SNARF 3-Year Status

- Facilities
  - 6628: New Standard, Guide for Facilities Data Package for Semiconductor Manufacturing Equipment Installation and Building Information Modeling
    - SNARF expires January 2023

- Gases
  - 6394: Line-Item Revision to SEMI F74-1103 (Reapproved 0710), Test Method for the Performance and Evaluation of Metal Seal Designs for Use in Gas Delivery Systems
    - SNARF expires Spring 2023
  - 6510: Line-Item Revision to SEMI F32-0211, Test Method for Determining of Flow Coefficient for High Purity Shutoff Valves
    - SNARF expires Spring 2023
  - 6612: New Subordinate Standard: Test Method for the Determination of Conductance of Fluid Handling Components at Subatmospheric and Vacuum Pressure, to SEMI F32-0211, Test Method for Determination of Flow Coefficient for High Purity Shutoff Valves

#### Gases: On-going

- Reapproval Ballots below failed TC Chapter Review; Summer 2021; Abolished West 2022
- Action Item to reissue new SNARFs
  - Former 6813: SEMI F28-1103 (Reapproved 0815), Test Method for Measuring Particle Generation from Process Panels
  - Former 6814: SEMI F43-0308 (Reapproved 0613), Test Method for Determination of Particle Contribution by Point-of-Use Gas Purifiers and Gas Filters
  - Former 6815: SEMI F59-0302 (Reapproved 0613), Test Method for Determination of Filter or Gas System Flow Pressure Drop Curves
  - Former 6816: SEMI F67-1101 (Reapproved 0713), Test Method for Determining Inert Gas Purifier Capacity
  - Former 6817: SEMI F68-1101 (Reapproved 0713), Test Method for Determining Purifier Efficiency
  - Former 6876: SEMI F60-1214, Test Method for ESCA Evaluation of Surface Composition of Wetted Surfaces of Passivated 316L Stainless Steel Components
  - Former 6877: SEMI F73-1214, Test Method for Scanning Electron Microscopy (SEM) Evaluation of Wetted Surface Condition of Stainless Steel Components
  - Former 6879: SEMI F77-0915, Test Method for Electrochemical Critical Pitting Temperature Testing of Stainless Steel Surfaces Used in Corrosive Gas Systems

#### Five-Year Review

Designation #	Standard Title	Action By	Assigned to
SEMI E49.6-1103 (Reapproved 1211)	Guide for Subsystem Assembly and Testing Procedures – Stainless Steel Systems	Past due	(Create new)
SEMI E49.8-1103 (Reapproved 1211)	Guide for High Purity and Ultrahigh Purity Gas Distribution Systems in Semiconductor Manufacturing Equipment	Past due	(Create new)
SEMI C14-95 (Reapproved 0913)	Test Method for Particle Shedding Performance of 25 cm Gas Filter Cartridges	Past due	Filters & Purification TF
SEMI F36-0299 (Reapproved 0913)	Guide for Dimensions and Connections of Gas Distribution Components	Past due	Filters & Purification TF

Designation #	Standard Title	Action By	Assigned to
SEMI F19-0815	Specification for the Surface Condition of the Wetted Surfaces of Stainless Steel Components	Past due	Materials TF
SEMI F21-1016	Classification of Airborne Molecular Contaminant Levels in Clean Environments	Past due	Filters & Purification TF
SEMI F62-1016	Test Method for Determining Mass Flow Controller Performance Characteristics for Ambient and Gas Temperature Effects	Past due	Mass Flow Controller TF
SEMI C54-1116	Specification for Oxygen	Past due	Gases Specification TF
SEMI C70-1116	Specification for Tungsten Hexafluoride	Past due	Gases Specification TF

Designation #	Standard Title	Action By	Assigned to
SEMI C58-1116	Specification for Hydrogen	Past due	Gases Specification TF
SEMI C56-1116	Specification for Dichlorosilane	Past due	Gases Specification TF
SEMI F113-1116	Test Method for Pressure Transducers Used in Gas Delivery Systems	Past due	Pressure Measurements TF
SEMI C60-0317	Specification for Nitrous Oxide	Past due	Gases Specification TF
SEMI C59-0317	Specification for Nitrogen	Past due	Gases Specification TF
SEMI C57-0317	Specification for Argon	Past due	Gases Specification TF

Designation #	Standard Title	Action By	Assigned to
SEMI C3-0317	Specification for Gases	Past due	Gases Specification TF
SEMI E56-0317	Test Method for Determining Accuracy, Linearity, Repeatability, Short-Term Reproducibility, Hysteresis, and Deadband of Thermal Mass Flow Controllers	Past due	Mass Flow Controller TF
SEMI E29-1110 (Reapproved 0417)	Terminology for the Calibration of Mass Flow Controllers and Mass Flow Meters	Past due	Mass Flow Controller TF
SEMI F30-0517	Test Method for Verification of Purifier Performance Testing for Trace Gas Impurities and Particles at an Installation Site	Past due	Filters & Purification TF

Designation #	Standard Title	Action By	Assigned to
SEMI F29-0997 (Reapproved 0517)	Test Method for Purge Efficacy of Gas Source System Panels	Past due	Filters & Purifiers TF
SEMI E66-0611 (Reapproved 0517)	Test Method for Determining Particle Contribution by Mass Flow Controllers	Past due	Mass Flow Controller TF
SEMI E16-0517	Guide for Determining and Describing Mass Flow Controller Leak Rates	Past due	Mass Flow Controller TF
SEMI F20-0706E (Reapproved 0917)	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	September 2022	Materials TF
SEMI F81-0611 (Reapproved 0917)	Specification for Visual Inspection and Acceptance of Gas Tungsten Arc (GTA) Welds in Fluid Distribution Systems in Semiconductor Manufacturing Applications	September 2022	Materials TF

Designation #	Standard Title	Action By	Assigned to
SEMI F78-0611 (Reapproved 0917)	Practice for Gas Tungsten Arc (GTA) Welding of Fluid Distribution Systems in Semiconductor Manufacturing Applications	September 2022	Materials TF
SEMI F69-1213E ('E' approved 10/2017)	Test Method for Transport and Shock Testing of Gas Delivery Systems	October 2022	Materials TF
SEMI E27-1017	Guide for Mass Flow Controller and Mass Flow Meter Linearity	October 2022	Mass Flow Controller TF
SEMI E18-1017	Guide for Temperature Specifications of the Mass Flow Controller	October 2022	Mass Flow Controller TF
SEMI F24-1217	Specification for Particle Concentration of Grade 10/0.2 Inert Specialty Gases	December 2022	Gases Specification TF

## Gases 5-Year Review [6/7]

SEMI F26-0118	Specification for Particle Concentration of Grade 10/0.2 Toxic Specialty Gases	1/5/2018
SEMI F26-0118	Specification for Particle Concentration of Grade 10/0.2 Oxidant Specialty Gases	1/5/2018
SEMI E137-0705 (Reapproved 0119)E	Guide for Final Assembly, Packaging, Transportation, Unpacking, and Relocation of Semiconductor Manufacturing Equipment	1/5/2018
SEMI C55-1004 (Reapproved 0119)	Specification for Liquid Carbon Dioxide (CO2) Used in Near Critical, Critical and Supercritical Applications, >1 99.99% Qagil	1/5/2018
SEMI C3.36-1011 (Reapproved 0118)	Specification for Nitrogen Trifluoride (NF3), 99.98%	1/5/2018
SEMI C3.27-1102 (Reapproved 0118)	Specification for Boron Trifluoride (BF3) in Cylinders, 99.0% Quality	1/5/2018
SEMI E67-1011 (Reapproved 0218)	Test Method for Determining Reliability of Mass Flow Controller	2/9/2018
SEMI C3.55-1011 (Reapproved 0218)	Specification for Silane (SiH4), Bulk, 99.994% Quality	2/9/2018
SEMI C3.47-1011 (Reapproved 0218)	Specification for Hydrogen Bromide (HBr), 99.98% Quality	2/9/2018
SEMI C3.40-1011 (Reapproved 0218)	Specification for Carbon Tetrafluoride (CF4), 99.997% Quality	2/9/2018
SEMI C3.36-0111 (Reapproved 0218)	Specification for Arsine (AsH3) in Cylinders, 99.94% Quality	2/9/2018
SEMI E28-0218	Guide for Pressure Specifications of the Mass Flow Controller	2/23/2018
SEMI F37-0318	Test Method for Determination of Surface Roughness Parameters for Gas Distribution System Components	3/9/2018
SEMI F64-0701 (Reapproved 0318)	Test Method for Determining Pressure Effects on Indicated and Actual Flow for Mass Flow Controllers	3/9/2018
SEMI F76-0303 (Reapproved 0318)	Test Method for Evaluation of Particle Contribution from Gas System Components Exposed to Corrosive Gas	3/9/2018
SEMI E17-0318	Guide for Mass Flow Controller Transient Characteristics Tests	3/9/2018
SEMI C9.140212 (Reapproved 0318)	Guide for Analysis of Uncertainties in Gravimetrically Prepared Gas Mixtures	3/9/2018
SEMI F54-1000 (Reapproved 0418)	Test Method for Measuring the Counting Efficiency of Condensation Nucleus Counters	4/13/2018
SEMI C3.58-1011 (Reapproved 0418)	Specification for Octafluorocyclobutane, C4F8, Electronic Grade in Cylinders, 99.999% Quality	4/13/2018
SEMI F24-0518	Specification for Particle Concentration of Grade 10/0.2 Hydrogen	5/25/2018
SEMI C3.57-0312 (Reapproved 0618)	Specification for Carbon Dioxide, CO2, Electronic Grade in Cylinders	8/15/2018
SEMI C3.56-0312 (Reapproved 0618)	Specification for Diborane Mixtures	8/15/2018
SEMI C52-0301 (Reapproved 0618)	Specification for the Shelf Life of a Specialty Gas	6/21/2018

**Attachment:** Staff Report Nov 2022 v6\_F&G

### 3 Ballot Review

None

### 4 Subcommittee and Task Force Reports

#### 4.1 Facilities

##### 4.1.1 Power Grid Harmonics Task Force – Did not meet

##### 4.1.2 SEMI F51 Revision Task Force – Did not meet

##### 4.1.3 Voltage Sag Immunity Task Force

Laura Nguyen (SEMI) gave the Task Force report on behalf of Mark Stephens (EPRI). Of note:

- To review the TF's Member list, co-leader structure, schedule of tasks, and plans and brainstorming, please refer to the PPT attachment.
- Amplifier Type Sag Generator
  - Amplifier type and includes a controller, a waveform generator, a data-acquisition system, and a power-amplification section.
  - This waveform generator can simulate any point-on-wave and provide varying magnitude, duration, frequency, and harmonics, thereby allowing a user more precise control of the voltage-sag characteristics.
  - The amplifier sag generator typically employs multiple power conversions—requiring transformer isolation—and is generally limited to lower-power applications.
- Transformer-Switch Type / Sag Generators

- The transformer type uses some form of switching to switch from nominal to reduced voltage for the testing.
- Contactors can be used, but typically cannot provide precise switching nor can they allow phase-angle control of sags.
- Most such voltage-sag generators use electronic switches employing either an insulated gate bipolar transistor (IGBT), or a silicon-controlled rectifier (SCR).
- Units up to 1000A are available. Portable Units up to 200A are available.
- Impedance Divider Type
  - A third form of sag generator is commonly referred to as the impedance divider type, which uses a thyristor-controlled reactor to switch impedances for creating voltage sags.
  - Generally, the impedance-divider sag generator may weigh less the other types of sag generators.
  - May have limited available sag depth adjustments.
- Mind Map Content Excerpts *{see attachment}*
- Component Testing
  - Task Force Component Level Testing: ASDs
  - Applications: Clean Room Air Supply and Exhaust Fans, Chilled Water Pumps, tool level applications, etc.
  - Two Semiconductor Fabs have sent EPRI Several ASDs to help improve voltage sag performance.
  - At least one model was tested and certified to SEMI F47 in 2020.
  - Plan to determine how test was done, loading, drive parameter setups, etc.
  - Testing will include Single-Phase (Type I), Two-Phase (Type II, II.A1, II.A2) and Three-Phase Type III.
- Upcoming Tool Voltage Sag Tests
  - Fab 1 Tool Testing (Upcoming 1Q 2023)
    - Conducted first round of PQ Assessment and testing in 2015.
      - Many corrections Made
    - Worked through additional issues remaining.
    - Ongoing Actions Taken:
      - Replace Sensative Relays, Replace UPS Batteries, Sag Corrector Repair
    - Identified five Specific Tools for Voltage Sag Testing
      - Three CVDs, One Etcher, One Stepper and Scanner Pair
    - Fab 1 Finding: PQ Monitoring Vendor SEMI F47 (recommended) Curve Wrong in PQM Vendor S/W *{see attachment for graphs/images}*
  - Fab 2 Tool Testing (Upcoming 1Q 2023)
    - Many Tool Downtimes Due to PQ Issues
    - Meeting at Fab December 2022 to Plan Testing
    - Review PQ data details (Correlation to Type I, II, III)
    - Refine actual tools to include
    - Meet with production and facilities
      - Discuss Tools to be included, Discuss Shutdown Mechanisms per tool
    - Walkdown tools
      - Plan Voltage Sag Testing for 1Q 2023, Potentially two rounds of testing.
- Additional Workshop Planning
  - The TF held the first workshop in April 2021 (Virtual).
  - Future Workshop Topics (Ideas)
    - SEMI Voltage Sag Immunity Task Force Work
    - Presentations on Solutions at Component, Sub-assembly, Tool, Plant Power Distribution, and Grid-Level



- 3-Phase Sag Generators – what level of power and current would be useful and be portable, additional test modes, safety, etc.
- Standard recipe to use for tool types – worst case. Should be practical and make sense for any testing.
- Superposition game – part testing vs. testing as whole
  - How to find constraints on the “no”
  - Test components – Test on range of voltages and frequencies @ full load
- Workshop Timing (Winter/Spring/Summer 2023?)
- Next TF Meeting plan
  - Tuesday, January 31<sup>st</sup>: Sag Generator Requirements Breakout Meeting
    - Subset of Interested TF members
    - Work on requirements and present to TF for input
  - March 31, 2023: Review of Technical Progress
    - Should have tool testing data and component test data to enhance understanding.
- Action Item Review *{see attachment}*

**Attachment:** SEMI VS Task Force Meeting No 16 11072022 Post Mtg summary

#### 4.1.4 *Building Information Modeling (BIM) for Semiconductor Capital Equipment Task Force*

Michael Potts (Exyte) reported for this task force. Of note:

##### Summary

- Supplier vs Customer Provided Data table inconsistency corrections on 6 tables remaining.
- Ready for re-ballot in Cycle 1, 2023.
- For back-up slides, see attachment.

Mike Potts addressed the Committee on the below:

**Motion:** Authorize SNARF 6628 Letter Ballot in Cycle 1-23.  
**By / 2<sup>nd</sup>:** By: Michael Potts / DPS Advanced Technology Group  
 Second: Carolyn Sutton / Nikon Precision Inc.  
**Discussion:** None.  
**Vote:** 11-0 in favor. Motion passed.

**Attachment:** SEMI BIM Task Force Meeting\_20221107

#### 4.2 *Gases*

##### 4.2.1 *Materials of Construction of Gas Delivery Systems Task Force*

Mohamed Saleem (Brooks Instrument) reported for this task force on the behalf of Bill Kiikvee (AP Tech). Of note:

##### Meeting Summary:

- Discussed: 6394: Line Item Revision to SEMI F74-1103 (Reapproved 0710), Test Method for the Performance and Evaluation of Metal Seal Designs for Use in Gas Delivery Systems
- 6510: Line Item Revision to SEMI F32-0211, Test Method for Determining of Flow Coefficient for High Purity Shutoff Valves

- 6612: New Subordinate Standard: Test Method for the Determination of Conductance of Fluid Handling Components at Subatmospheric and Vacuum Pressure, to SEMI F32-0211, Test Method for Determination of Flow Coefficient for High Purity Shutoff Valves
  - John Zawada from Swagelok will follow from Rob Shutler and also work with Matt
  - John taking lead on SEMI F78, F81, F69
- Five year review documents: F19, F20, F81, F78, F69. Need SNARFs, Need documents updated
  - Josh Kim/Valex would like to be added to F19 activity
- Yoshida Yutaka from Daido Steel will provide input on F20
- Akash Abraham from Carpenter Steel provided input on changes for F20
- Max van den Berg to put together SNARF for SEMI E49 proposal

#### *Action Items*

- ☐ ☒ Appoint Matt Milburn as co-leader
- ☐ ☒ Ask TC Chapter to authorize ballot submission
  - 6394: Line Item to SEMI F74, 6510: Line Item to SEMI F32
- ☐ Prepare Line Item SNARFs for:
  - SEMI F60, SEMI F73, SEMI F77

Mohamed Saleem addressed the Committee on the below:

**Motion:** Authorize SNARF 6394 and 6510 for Letter Ballot in Cycle 9-22, 1-23, 2-23.  
**By / 2<sup>nd</sup>:** By: Yanli Chen / Applied Materials, Inc.  
 Second: Kevin Findleton / Ichor Systems  
**Discussion:** None.  
**Vote:** 7-0 in favor. Motion passed.

**Attachment:** Materials of Constr Meeting Summary 11\_07\_2022\_LNN

#### *4.2.1 Filters & Purifiers Task Force*

Mohamed Saleem (Brooks Instrument) reported for this task force. Of note:

#### Meeting Summary

- Reviewed old business-
  - Cycle 5 2021 Results; Joyce and Saleem will edit the documents. Will create new SNARFS
  - 6582 - Std-Gases New Standard: Test Method for Measuring Pitting Resistance of Stainless Steel Component  
Document close to publication
  - 6816- SEMI F67 Reapproval, Test Method for Determining Inert Gas Purifier Efficiency
  - 6813- SEMI F28 Reapproval-Test Method for Measuring Particle Generation from Process Panels;
    - TF agreed to make the changes rather than making the document inactive. Laura will provide information on the document usage.
  - 6814- SEMI F43 Reapproval -Test Method for Particle Contribution for Point of Use Gas Purifiers and Gas Filters.
    - TF agreed to make the changes
  - 6815- SEMI F59 Reapproval, Test Method for Determination of Filter or Gas System Pressure Drop Curves
    - TF agreed to make the changes

New SNARFs will be required for all the documents to make changes and ballot

Five year review documents:

C14, F36, F21- The TF will review for Procedural Conformance before issuing SNARFs and balloting

#### *Action Items*

- ☐ SEMI F28



- LN to look up usage in SEMIViews (last 10 years) to determine whether the standard should be updated or sent to Inactive Status
- Prepare new SNARF for Line Item or Revision:
  - SEMI F43, F59, F67, F86, F28
    - Review Standards for required sections, Referenced Standards/Related Documents, etc.
  - LN to send Joyce/Mohamed MS Word files
- Review SEMI C14, F36, F21 for Five-Year Review
- LN to send Joyce/Mohamed MS Word files

**Attachment:** FP TF Meeting Summary 11\_07\_2022\_LNN

#### 4.2.2 Mass Flow Controller Task Force

Mohamed Saleem (Brooks Instrument) reported for this task force. Of note:

##### Meeting Summary

- Reviewed Ratification ballot
  - RB received a Disapprove vote, but since it is less than 10% reject, ballot passes and goes straight to A&R.

##### Action Items

- Past due Five-years: SEMI F62, E56, E29, E66, E16, E27, E18
- LN to send MS Word file to Kevin/Mohamed for E62, E56, E29

##### Discussion

- Use of kPa to update “kPa” to “kPa (absolute or gauge)”

**Attachment:** MFC TF Meeting Summary 11\_07\_2022\_LNN

#### 4.2.3 Gases Specification Task Force

Mohamed Saleem (Brooks Instrument) reported for this task force. Of note:

SEMI C54-1116	Gases Specification TF	Specification for Oxygen
SEMI C70-1116	Gases Specification TF	Specification for Tungsten Hexafluoride
SEMI C58-1116	Gases Specification TF	Specification for Hydrogen
SEMI C56-1116	Gases Specification TF	Specification for Dichlorosilane
SEMI C60-0317	Gases Specification TF	Specification for Nitrous Oxide
SEMI C59-0317	Gases Specification TF	Specification for Nitrogen
SEMI C57-0317	Gases Specification TF	Specification for Argon
SEMI C3-0317	Gases Specification TF	Specification for Gases
SEMI F24-1217	Gases Specification TF	Specification for Particle Concentration of Grade 10/0.2 Inert Specialty Gases

- Dr. Fritz reviewed all of the documents and made edits for procedural issues, units, trade marks.
- TF reviewed why the Specification document should have Test Methods. This is consistent with Procedure manual.
- The TF reviewed SEMI C54. Greg from Air Products agreed to review all of the above documents and provide input regarding whether the test methods are consistent with what is stated by instrument manufacturers and/or what is followed by Gas manufacturers for certification.

**Attachment:** Gases Spec TF Meeting Summary 11\_07\_2022\_LNN

#### 4.2.4 Heater Jacket Task Force

David Colquhoun (BriskHeat) reported for this task force. Of note:

- The Task Force reviewed:



- General design guideline for heater. Old spec (SEMI F109) merged with new details of materials use and limits augmented into spec.
- Proposal for specifications for heater particulation study and methods of testing for such.

David Colquhoun addressed the Committee on the below:

**Motion:** Authorize SNARF 6916 “Replacement of SEMI F109-0212, Guide for Heater Systems Requirements, as a New Standard: Guide for Material Selection for Heater Systems” for Letter Ballot in Cycle 1-2023.  
**By / 2<sup>nd</sup>:** By: Kevin Findleton / Ichor Systems  
Second: Matt Milburn / Ham-let  
**Discussion:** None.  
**Vote:** 10-0 in favor. Motion passed.

## 5 Old Business

### 5.1 Five-Year Review

Refer to Staff Report in §2.5 for full list of Five-Year. Contact Laura Nguyen (SEMI) if you like to review any in further detail.

## 6 New Business

There is no New Business.

## 7 Action Item Review

7.1 New Action Items are noted in Table 11. Previous action items are noted in Table 12 in ‘red’ and for recent updates in ‘blue’. There is no further business.

## 8 Next Meeting and Adjournment

8.1 The next meeting is tentatively scheduled for the week of April 3-6, in conjunction with SEMI Standards NA Spring Meetings 2023. Schedule details TBD. Please check [www.semi.org/standards](http://www.semi.org/standards) for updates.

Adjournment: 10:24.

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:

Steve Lewis (Gilbane), Facilities Co-chair	<Date approved>
Mohamed Saleem (Brooks Instrument), Gases Co-chair	<Date approved>

Minutes approved by: **F&G NA OVTCCM on April 4, 2023.**



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

<i>Title</i>	<i>Title</i>
SEMI Standards Required Meetings Elements	SEMI BIM Task Force Meeting_20221107
[2022West] F&G NA TC Chapter Meeting Minutes FINAL	Materials of Constr Meeting Summary 11_07_2022_LNN
20220915_JA_G+F_LiaisonR_v1.0	FP TF Meeting Summary 11_07_2022_LNN
Staff Report Nov 2022 v6_F&G	MFC TF Meeting Summary 11_07_2022_LNN
SEMI VS Task Force Meeting No 16 11072022 Post Mtg summary	Gases Spec TF Meeting Summary 11_07_2022_LNN

#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.