Background Statement for SEMI Draft Document 6060
REAPPROVAL OF SEMI F70-0611, TEST METHOD FOR
DETERMINATION OF PARTICLE CONTRIBUTION OF GAS DELIVERY
SYSTEM

Notice: This background statement is not part of the balloted item. It is provided solely to assist the recipient in reaching an informed decision based on the rationale of the activity that preceded the creation of this Document.

Notice: Recipients of this Document are invited to submit, with their comments, notification of any relevant patented technology or copyrighted items of which they are aware and to provide supporting documentation. In this context, “patented technology” is defined as technology for which a patent has issued or has been applied for. In the latter case, only publicly available information on the contents of the patent application is to be provided.

Background
Per SEMI Regulations ¶ 8.9.1, the Originating TC Chapter shall review its Standards and decide whether to ballot the Standards for reapproval, revision, replacement, or withdrawal by the end of the fifth year after their latest publication or reapproval dates.

The Facilities & Gases NA TC Chapter reviewed and recommended to issue for reapproval ballot.

Per SEMI Procedure Manual (NOTE 19), a reapproval Letter Ballot should include the Purpose, Scope, Limitations, and Terminology sections, along with the full text of any paragraph in which editorial updates are being made.

Voter requests for access to the full Standard or Safety Guideline must be made at least three business days before the voting deadline. Late requests may not be honored.

Review and Adjudication Information

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<thead>
<tr>
<th>Group:</th>
<th>Task Force Review</th>
<th>TC Chapter Review</th>
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<tr>
<td>Filters and Purifiers Task Force</td>
<td>Joint Facilities &amp; Gases TC Chapter</td>
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<thead>
<tr>
<th>Date:</th>
<th>Monday, November 7, 2016</th>
<th>Tuesday, November 8, 2016</th>
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<tr>
<td>Time &amp; Time Zone:</td>
<td>10:00 – 11:00 PST</td>
<td>09:00 – 12:00 Noon PST</td>
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<tr>
<td>Location:</td>
<td>SEMI Headquarters</td>
<td>SEMI Headquarters</td>
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<tr>
<td>City, State/Country:</td>
<td>San Jose, California/USA</td>
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This meeting’s details are subject to change, and additional review sessions may be scheduled if necessary. Contact Standards staff for confirmation.

Telephone and web information will be distributed to interested parties as the meeting date approaches. If you will not be able to attend these meetings in person but would like to participate by telephone/web, please contact Standards staff.

Check www.semi.org/en/standards on calendar of event for the latest meeting schedule.
SEMI Draft Document 6060
REAPPROVAL OF SEMI F70-0611, TEST METHOD FOR DETERMINATION OF PARTICLE CONTRIBUTION OF GAS DELIVERY SYSTEM

1 Purpose

1.1 The purpose of this document is to provide a standardized methodology and procedure for measuring the particle contribution performance of a gas delivery system in terms of number of particles added to gas flowing through the system. This standardized procedure is intended to be used commonly by the gas delivery system suppliers, equipment suppliers, and end-users.

2 Scope

2.1 This test method applies to surface mount and conventional gas delivery systems used in semiconductor manufacturing equipment.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 This test method is limited to a maximum flow rating of 200 slm because this test method is intended for point-of-use components used in the semiconductor equipment.

3.2 The dynamic (pulse) test may be excluded for production-type testing and certification of gas delivery systems because this test is time-intensive and not suitable for production environment.

4 Referenced Standards and Documents

4.1 SEMI Standards and Safety Guidelines
SEMI C57 — Specifications and Guidelines for Argon
SEMI C59 — Specifications and Guidelines for Nitrogen

4.2 ISO Standards¹
ISO 14644-1 — Cleanrooms and Associated Controlled Environments – Part 1: Classification of Air Cleanliness
ISO 21501-4 — Determination of Particle Size Distribution – Single Particle Light Interaction Methods – Part 4: Light Scattering Airborne Particle Counter for Clean Spaces

4.3 Other Documents

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 Abbreviations and Acronyms
5.1.1 CNC — condensation nucleus counter

¹ International Organization for Standardization, ISO Central Secretariat, 1 rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland; Telephone: 41.22.749.01.11, Fax: 41.22.733.34.30, http://www.iso.ch
5.1.2 LPC — laser particle counter
5.1.3 MFC — mass flow controller
5.1.4 MFM — mass flow meter
5.1.5 slm — standard liters per minute

5.2 Definitions
5.2.1 background counts — particle counts contributed by the test apparatus (including false counts) with the spool piece in the place of the test object.
5.2.2 counting efficiency — the ratio of the particle concentration calculated from the particle counts to the actual particle concentration in the sampled gas for particles equal to or larger than a given particle size.
5.2.3 design flow — flow normally applied to the gas delivery system.
5.2.4 dynamic (pulse) test — a test performed to determine particle contribution as a result of actuation of valves in the gas delivery line or system.
5.2.5 false counts — particle counts contributed by electrical noise or by other events and not particles in the sampled gas.
5.2.6 gas delivery system — a system installed in semiconductor manufacturing equipment comprised of one or more lines to supply process and carrier gases to reactors. The system typically includes tubing, fittings, valves, filters, mass flow controllers and regulators. These components can be surface mount or conventional type.
5.2.7 minimum counting particle diameter — a predefined minimum diameter of particles to be counted in this test method.
5.2.8 particle counts — a counted value from a laser particle counter (LPC) or condensation nucleus counter (CNC) obtained for particles larger than or equal to the minimum counting particle diameter.
5.2.9 sample flow — the volumetric flow through the particle counter.
5.2.10 sampling time — the time span over which particle counts are recorded.
5.2.11 standard liters per minute (slm) — the gas volumetric flow measured in liters per minute at 0°C and 101.3 kPa (1 atm).
5.2.12 spool piece — a null component consisting of a straight piece of electropolished tubing or like object and appropriate fittings used in place of the test system to establish the background.
5.2.13 static test — a test performed to determine particle contribution with all components in the gas delivery line or system in open position.
5.2.14 test flow — the volumetric flow through the test system at test pressure and temperature.
5.2.15 test pressure — the pressure immediately downstream of the system under test.

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