Background Statement for SEMI Draft Document 5777
Reapproval of SEMI E92-0302E (Reapproved 0709): Specification for 300 mm Light Weight and Compact Box Opener/Loader to Tool-Interoperability Standard (Bolts/Light)

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 Statement
SEMI E92-0302E (Reapproved 0709) is due for Five Year Review, being proposed for reapproval because it is currently used widely. This process is required by the SEMI Regulations to ensure that this standard is still valid.

At the Japan Standards Fall 2014 Meetings, the Japan TC Chapter of Global Physical Interfaces & Carriers Technical Committee approved the letter ballot distribution for the reapproval of SEMI E92-0302E (Reapproved 0709). This technical ballot is intended for the reapproval of SEMI E92-0302E (Reapproved 0709) and does not present any technical changes to the aforementioned documents. The following a couple of chapters are just for reference and quoted originally as described in the document SEMI E92-0302E (Reapproved 0709).

The ballot results will be reviewed and adjudicated at the meetings indicated in the table below. Check www.semi.org/standards under Calendar of Events for the latest update.

Review and Adjudication Information

<table>
<thead>
<tr>
<th>Group:</th>
<th>Task Force Review</th>
<th>Committee Adjudication</th>
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<tr>
<td></td>
<td>Global PIC Maintenance TF</td>
<td>Japan TC Chapter of Global Physical Interfaces &amp; Carriers Technical Committee</td>
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<tr>
<td>Date:</td>
<td>Friday, November 28, 2014</td>
<td>Thursday, December 4, 2014</td>
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<tr>
<td>Time &amp; Timezone:</td>
<td>8:00-10:00 [JST]</td>
<td>14:00-17:00 [JST]</td>
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<tr>
<td>Location:</td>
<td>Head office of Murata Machinery</td>
<td>Tokyo Big Sight Conference Tower</td>
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<tr>
<td>City, State/Country:</td>
<td>Kyoto, Japan</td>
<td>Tokyo, Japan</td>
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This task force 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.

If you need a copy of the documents in order to cast a vote, please contact the following person within SEMI.
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Please be advised that voter requests for access to the full Standard must be made at least three business days before the voting deadline. Late requests may not be honored, and if the Standard is not available for this reason, the voter may not use this as justification for rejecting the ballot.
SEMI Draft Document 5777

Reapproval of SEMI E92-0302E (Reapproved 0709): Specification for 300 mm Light Weight and Compact Box Opener/Loader to Tool-Interoperability Standard (Bolts/Light)

1 Purpose

1.1 Provide Standard for Box Opener/Loader Interoperability — This standard is intended to provide standard specifications such as interfaces between the component that opens the boxes and presents the boxes to the equipment wafer handler for unloading and loading 300 mm wafers (BOLTS/Light unit) and higher level part of equipment and its functions to provide (see Figure 1):

- High level of interchangeability/ interoperability,
- Quick attachment/detachment capability with high mechanical repeatability,
- Light weight, and
- Compactness.

1.1.1 In order to provide a high level of interchangeability and interoperability, this standard specifies not only interfaces but also some of the box opener/loader’s functions that affect interoperability.

1.2 Usage of This Standard — Interoperability specifications defined by this standard are intended to be used as interfaces and functionality between BOLTS/Light compliant box opener/loader and:

- A BOLTS/M compliant loadport unit (that would conform to SEMI E63).
- An integrated loadport such as four box opener/loader in one chassis.
- High-densely packaged equipment that uses the space under the box opener/loader.

1.3 SEMI Standards Compatibility — This standard is compatible with 300 mm SEMI standards including SEMI E15.1, SEMI E47.1, SEMI E1.9, SEMI E62, SEMI E63 and SEMI E64.

1.4 Open Cassette Application — The BOLTS/Light unit might be configured to handle boxes that would conform to SEMI E47.1 and SEMI E62.

1.5 A similar unit may be compatibly designed which does not have box opener capability, but facilitates placement of an open cassette (that would conform to SEMI E1.9).

1.6 Carrier Capacities — This standard defines one interface for 13 or 25 carrier capacity box opener/loaders.

1.7 The interface specified in this standard is designed for equipment with a sealed mini-environment, but it is not limited to such.

2 Scope

2.1 Items Specified — This standard is intended to set an appropriate level of specification that places minimal limits on innovation while ensuring modularity, interchange-ability, and interoperability including:

- Box opener/loader functions that affect interoperability.
- Mechanical interface features between the box opener/loader and equipment.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 This specification does not apply to the following application:

- Direct insertion of open cassettes into load-lock chambers.
4 Referenced Standards and Documents

4.1 SEMI Standards

SEMI E1.9 — Mechanical Specification for Cassettes Used to Transport and Store 300 mm Wafers
SEMI E15 — Specification for Tool Load Port
SEMI E15.1 — Specification for 300 mm Tool Load Port
SEMI E47.1 — Mechanical Specification for FOUPS Used to Transport and Store 300 mm Wafers
SEMI E57 — Mechanical Specification for Kinematic Couplings Used to Align and Support 300 mm Wafer Carriers
SEMI E62 — Specification for 300 mm Front-Opening Interface Mechanical Standard (FIMS)
SEMI E63 — Mechanical Specification for 300 mm Box Opener/Loader to Tool Standard (BOLTS-M) Interface
SEMI E64 — Specification for 300 mm Cart to SEMI E15.1 Docking Interface Port

4.2 Other Standard

I300I/J300 GJG — I300I/J300 Global Joint Guidance for 300 mm Semiconductor Factories

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

5 Terminology

5.1 Abbreviations and Acronyms

5.1.1 AMHS — Automated Material Handling System

5.2 Definitions

5.2.1 bilateral datum plane — a vertical plane that bisects the wafers and that is perpendicular to both the horizontal and facial datum planes (as defined in SEMI E57).

5.2.2 BOLTS/Light exclusion volume — a volume reserved by equipment or loadport unit to put BOLTS/Light compliant box opener/loader.

5.2.3 BOLTS/Light plane — a vertical plane that interfaces BOLTS/Light compliant box opener/loader and equipment.

5.2.4 bottom interface plane — an interface means between the equipment and box opener/loader.

5.2.5 box — a protective portable container for a cassette and/or substrate(s).

5.2.6 box opener/loader — the equipment component that opens wafer carriers (if needed) and presents the carriers to the equipment’s wafer handler for unloading and loading wafers.

5.2.7 carrier — any cassette, box, pod, or boat that contains wafers (as defined in SEMI E1.9). Also known as wafer carrier.

5.2.8 carrier capacity — the number of substrates that a carrier holds (as defined in SEMI E1.9).

5.2.9 cassette — an open structure that holds one or more substrates.

5.2.10 control connection area — an area to be used for placement of connectors for electrical signals, power supplies, and other inlets/outlets.

5.2.11 docked facial datum plane — a vertical plane that bisects the wafers at the carrier docked position. It is also parallel to the load face plane specified in SEMI E15.

5.2.12 docking stroke — the travel distance of the carrier center between its load position (facial datum plane) and the position where the door opening/closing is done.

5.2.13 facial datum plane — a vertical plane that bisects the wafers and that is parallel to the front side of the carrier (where wafers are removed or inserted). On equipment load ports, it is also parallel to the load face plane.
specified in SEMI E15 on the side of the equipment where the carrier is loaded and unloaded (as defined in SEMI E57).

5.2.14 front-opening unified pod (FOUP) — a box (that complies with SEMI E47.1) with a nonremovable cassette (so that its interior complies with SEMI E1.9) and with a front-opening interface (that mates with a FIMS port that complies with SEMI E62) (as defined in SEMI E47.1).

5.2.15 horizontal datum plane — a horizontal plane from which projects the kinematic-coupling pins on which the carrier sits. On equipment load ports, it is at the load height specified in SEMI E15 and might not be physically realized as a surface (as defined in SEMI E57).

5.2.16 load face plane — the furthest physical vertical boundary plane from the cassette centroid or carrier centroid on the side (or sides) of the equipment where loading of the equipment is intended (as defined in SEMI E15).

5.2.17 loading slider area — two flat surfaces on equipment which may be used by a maintenance supporting mechanism (not defined in this standard) to support the box opener/loader during attachment and detachment.

5.2.18 minienvironment — a localized environment created by an enclosure to isolate the product from contamination and people.

5.2.19 pod — a box having a Standard Mechanical Interface (SMIF) per SEMI E19.

5.2.20 seal zone — a surface on the equipment at the BOLTS/Light plane for sealing to the box opener/loader.

5.2.21 side interface feature — an interface means to perform a seal between the mini-environment of the equipment and box opener/loader.

5.2.22 wafer carrier — any cassette, box, pod, or boat that contains wafers (as defined in SEMI E15).

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