

SEMI E103-0704 (Withdrawn 1110) MECHANICAL SPECIFICATION FOR A 300 mm SINGLE-WAFER BOX SYSTEM THAT EMULATES A FOUP

This standard was technically approved by the global Physical Interfaces & Carriers Committee. This edition was approved for publication by the global Audits & Reviews Subcommittee on August 27, 2010. Initially available at www.semi.org in October 2010. Originally published June 2000; previously published July 2004.

NOTICE: This document was balloted and approved for withdrawal in 2010.

1 Purpose

1.1 This standard specifies the carrier side of the mechanical interface between load ports (or buffers) with FIMS interfaces on process or metrology equipment and a system that includes a box that holds only one wafer (such as a test wafer) and that fits onto an adapter mechanism called a single-wafer interface (SWIF). This system appears to the equipment to be a 300 mm FOUP (except that only the volume around the middle wafer may be accessible).

2 Scope

2.1 This standard is intended to set an appropriate level of specification that places minimal limits on innovation while ensuring modularity and interchangeability at relevant mechanical interfaces. Only the mechanical interface between a load port with a FIMS interface and this system (of a single-wafer box and a SWIF) is specified here; the mechanical interface between the single-wafer box and the SWIF is not specified. Also not specified is the method by which the SWIF raises the carrier sensing pads when the single-wafer box is removed (see § 6.3). This standard does not forbid the SWIF from holding more than just the single-wafer box mentioned in this standard.

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 Referenced Standards and Documents

3.1 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 E19 — Standard Mechanical Interface (SMIF)

SEMI E47.1 — Mechanical Specification for Boxes and Pods Used to Transport and Store 300 mm Wafers

4 Requirements

4.1 *System Components* — A system that conforms to this standard must include a box that holds one wafer and that fits onto a SWIF.

4.2 *Relevant FOUP Dimensions* — The SWIF must have all of the required bottom and front features and be no larger than the maximum dimensions of a 13- or 25-wafer FOUP. However, this system (of single-wafer box and SWIF) must have box placement sensing pads as specified in SEMI E47.1 FOUP standards Requirements § 6.12. For example, the SWIF must comply with dimensions r67, x53, y50, y51, y52, y53, z41, z47 – z48, z47 + z49, and the upper limits on x50 and y40 (as specified in SEMI E47.1) and with dimension y33 (as specified in SEMI E62).

4.3 *Optional Automation Features* — Since the single-wafer box and/or SWIF will usually be delivered manually (possibly with a PGV), the SWIF is not required to have the other automation features of the FOUP such as the robotic handling flange on top or the fork-lift flanges on the side (although this standard does not forbid the SWIF from having such features).

4.4 *SWIF Door* — The SWIF must have a full FOUP-size door (which surrounds the door of the single-wafer box) that mates with a FIMS-compatible interface (as specified in SEMI E62) to avoid contaminating the environment on the equipment side of the FIMS interface.

4.5 Wafer Position — When the FIMS door is opened by the equipment, the end effector may only be able to access the middle wafer slot (wafer 7 for a SWIF that emulates a 13-wafer carrier, and wafer 13 for a SWIF that emulates a 25-wafer carrier), because a surface immediately behind the door may block access to the other wafer slots. Thus, batch wafer handlers will probably not work with this system.

4.6 Wafer Clearances — The clearance below the middle wafer must be the same as the clearance below the bottom wafer in an ordinary FOUP (z8 minus z6, both from SEMI E1.9), and the clearance above the middle wafer must be the same as the clearance above the top wafer in an ordinary FOUP (z15 from SEMI E1.9). These vertical clearances are defined in SEMI E1.9 and SEMI E47.1 and apply throughout the wafer set-down and extraction volumes for the middle wafer. The horizontal clearances shown in Figure 10 of SEMI E47.1 are also required. One possible example of such a system (of single-wafer box and SWIF) is shown in Figures 1 and 2 (with vertical clearances indicated).

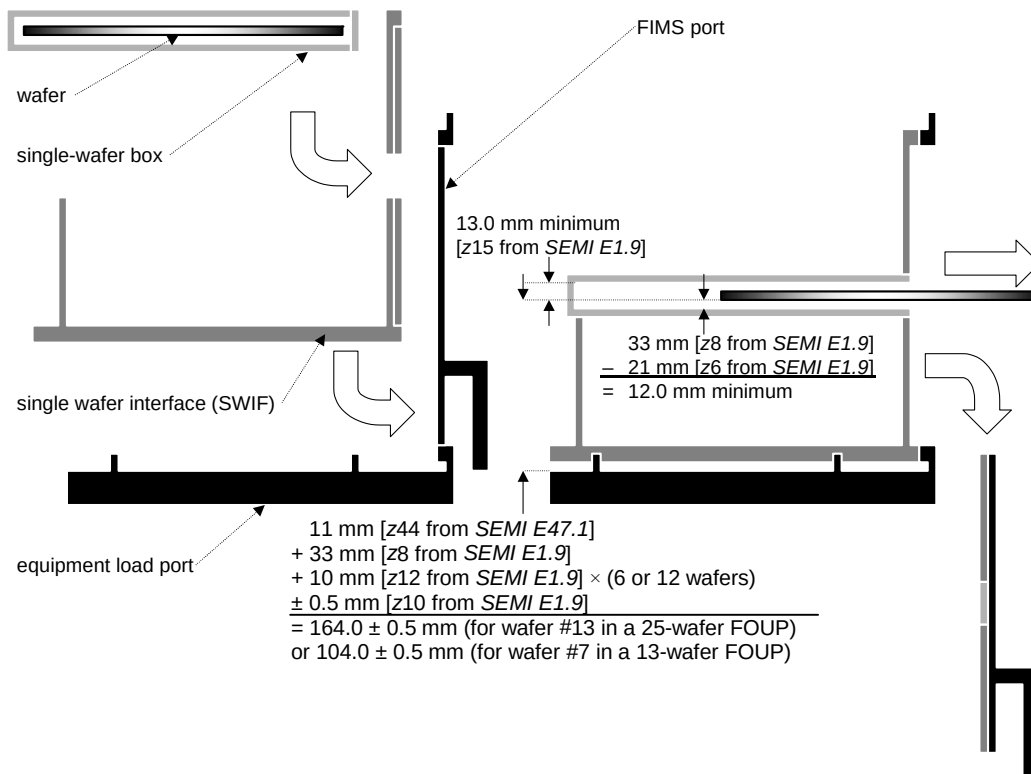


Figure 1
Side View of Example Single-Wafer Box and SWIF on a Load Port with a FIMS Interface