SEMI E48-1101
SPECIFICATION FOR SMIF INDEXER VOLUME REQUIREMENT

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1 Purpose

1.1 The purpose of this Specification is to provide the volume required within a tool that enables integration of SMIF into tools with single or multiple ports.

2 Scope

2.1 This Specification defines the space necessary within a tool with respect to the interface plane. The specification refers to the Standard Mechanical Interface (SMIF) Standard, SEMI E19.

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 Referenced Standards and Documents

3.1 *SEMI Standards and Safety Guidelines*

SEMI E15 — Specification for Tool Load Port

SEMI E19 — Standard Mechanical Interface (SMIF)

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

4 Terminology

4.1 *cassette* — an open structure that holds one or more substrates (e.g., wafers, masks).

4.2 *integrated SMIF* — a unit including a SMIF port and a mechanism for indexing the port door. The entire unit being incorporated within the tool.

4.3 *standard mechanical interface (SMIF)* — the interface plane between a pod and another minienvironment per SEMI E19.

4.4 *wafer transfer plane* — a plane with a maximum distance from the interface plane to the level where a wafer can be transferred.

5 Requirements

5.1 Figure 1 depicts the height dimensions and terminology for integrated SMIF. Figure 2 shows the necessary footprint for the integrated SMIF on a tool. The dimensions are given with reference to SEMI E15.

5.2 The minimum distance between the interface plane and the wafer transfer plane A1 is limited by the thickness of the port plate and any wafer sensing system. This distance should be kept as small as possible for ergonomic reasons.

5.3 The dimension A2 below the interface plane takes into account the distance A1, the cassette dimensions, and the mechanical components. Process tools must provide this free space to allow integration of SMIF.

5.4 Referring to Figure 2, it can be seen that the axis of the wafer transfer, B2, does not necessarily correspond to the center line of the integrated SMIF unit. This is to allow the indexing mechanism to be placed in different locations, so that multiple ports can be furnished, still adhering to SEMI E15.

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Table 1 Integrated SMIF Dimensions

		Up to 150 mm	*200 mm*
Installation Height	A1	63 mm max. (2.48 in. max.)	63 mm max. (2.48 in. max.)
	A2	400 mm min. (15.75 in. min.)	400 mm min. (15.75 in. min.)
Footprint	B1	355 mm min. (13.98 in. min.)	355 mm min. (13.98 in. min.)
	B2	177.5 mm max. (6.99 in. max.)	177.5 mm max. (6.99 in. max.)
	B3	157 mm max. (6.18 in. max.)	182 mm max. (7.17 in. max.)
	B4	390 mm min. (15.35 in. min.)	390 mm min. (15.35 in. min.)
	B5	20 mm max. (0.79 in. max.)	20 mm max. (0.79 in. max.)
SEMI E15 (Recommendation)	S	350 mm (13.8 in.)	400 mm (15.7 in.)

Dimension Definitions

A1 — Maximum distance from the SMIF interface plane to the wafer transfer plane.

A2 — Minimum depth, from the interface plane, required in a tool.

B1 — Minimum width required in a tool.

B2 — Maximum distance from the side of the indexer unit to the cassette or container centroid.

B3 — Maximum distance from the front of the indexer unit to the cassette or container centroid.

B4 — Minimum breadth required for the indexer unit in a tool.

B5 — Maximum distance that can be penetrated underneath the port plate.

S — Recommended minimum spacing between cassette or container controids.

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