SEMI E15.1-1296

PROVISIONAL SPECIFICATION FOR 300-mm TOOL LOAD PORT

1 Purpose

This specification defines dimensional requirements for the load ports of 300-mm wafer process and inspection equipment. It is intended to promote a uniform physical interface between equipment and the factory, to facilitate the use of automated wafer carrier transport systems, and to meet ergonomic requirements for manually loaded equipment.

2 Scope

This is a provisional standard covering 300-mm equipment only. Similar requirements covering equipment for 200-mm wafers and smaller are covered in SEMI E15. The provisional status is dictated by the immaturity of designs for 300-mm equipment and additional specifications may yet be defined.

3 Limitations

This standard is not met by direct loading/unloading of enclosed interfaces, such as vacuum load locks. Requirements of such interfaces may differ from those in this document.

4 Referenced Documents

SEMI Documents

SEMI E15 — Specification for Tool Load Port

SEMI E57 — Provisional Mechanical Specification for Kinematic Couplings Used to Align and Support 300-mm Wafer Carriers

5 Terminology

See SEMI E15.

6 Ordering Information

Per Section 6 of SEMI E15, except for paragraphs 6.1.3 and 6.1.4.

7 Requirements

7.1 The dimensional requirements for the load port of a tool are given in Table 1 with reference to Figure 1 of this document and Figure 2 of SEMI E15.

7.2 The dimensional requirements for the placement of a wafer carrier on the load port are given in Table 1 with reference to Figure 2 of SEMI E15.

7.3 The wafers are to be oriented horizontally face up with zero nominal tilt at the time they are placed on the load port. The tolerance in the horizontal plane is determined by the registration and alignment feature between the carrier and the load port, as specified in SEMI E57.

7.3.1 The carrier shall be loaded and unloaded with its front parallel to and away from the load face plane (see Figure 1).

7.4 Dimension H is nominally 900 mm, fully adjustable at installation over the range of 890 to 910 mm. The precision with which the load port height must be maintained is dictated by the needs of the carrier delivery system.

7.5 The maximum allowable height (H1) of an obstruction in front of the load port between the load face plane and the carrier envelope is 25 mm. Examples of such an obstruction may be an alignment device or identification tag reader.

7.6 All tool load ports shall be open from above to facilitate automatic carrier delivery from an overhead transport system. The open volume required for vertical delivery is defined by a projection of the tool load port area, including the area required for C1 and C2 clearances, projected upward to the top of the tool. Note that this condition need only be met when the tool is being loaded. For example, the load port may be formed by a surface that extends outward during loading to provide overhead access.

7.7 Clearances C1 and C2 are defined with respect to the pod standard defined in a separate document currently under development (see Application Notes on side opening pods).

7.8 Dimension S specifies the recommended minimum spacing between cassette/wafer carrier centroids. In any case, if S violates C1, then C1 prevails.

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Table 1. Dimensional Requirements for 300-mm Load Ports

Dimension	*Application*	*Value, mm (in.)*	*Notes*
C1	minimum	75 (3.0)	
C2	minimum	30 (1.2)	
D	maximum	250 (9.8)	
H	nominal	900 (35.4)	1
H1	maximum	25 (1.0)	
S	recommended	475 (18.7)	2

NOTES:

1. This value is ergonomically compatible with the proposed 13 wafer carriers and may not be ergonomically compatible with the proposed 25 wafer carriers. Such carriers may require assisted loading. H to be fully adjustable at installation over the range of 890 to 910 mm (35 to 35.8 inches).

2. This value is ergonomically compatible with the proposed ledge grip on carriers and may not be ergonomically compatible with a pistol-type grip, which could require a minimum S of 535 mm (21.1 inches).

Dimension Definitions — See SEMI E15 for applicable definitions.

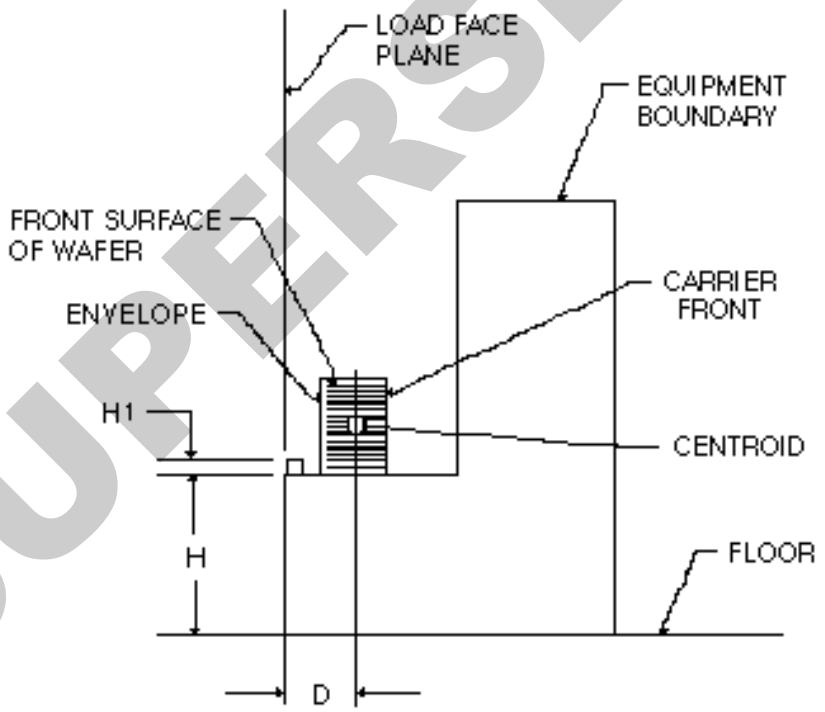

Figure 1

Load Port Requirements, Elevation View w/ Wafer and Cassette Orientation, Wafer Horizontal

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