

SEMI E83-1000

SPECIFICATION FOR 300 mm PGV MECHANICAL DOCKING FLANGE

This Provisional Specification was technically approved by the Global Physical Interfaces & Carriers Committee and is the direct responsibility of the North American Physical Interfaces & Carriers Committee. Current edition approved by the North American Regional Standards Committee on July 14, 2000. Initially available at www.semi.org August 2000; to be published October 2000. Originally published June 1999.

1 Purpose

1.1 This specification is intended to promote consistent interface features between Person Guided Vehicles and SEMI E15.1 equipment.

2 Scope

2.1 This specification defines a mechanical standard for the stationary (equipment) side of the docking flange used by 300 mm Person Guided Vehicles (PGVs). This flange is to be mounted to the floor within the volume defined by SEMI E64 at SEMI E15.1 and SEMI E64 compliant equipment.

2.2 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 limitations prior to use.

3 Limitations

3.1 This standard does not define the PGV (active) side of the docking interface or carrier transfer. The PGV and the PGV side of the docking interface designs should comprehend the physical limitations of equipment to which they are being applied.

4 Referenced Standards

4.1 SEMI Standards

SEMI E15 — Specification for Tool Load Port

SEMI E15.1 — Provisional Specification for 300 mm Tool Load Port

SEMI E64 — Provisional Specification for 300mm Cart to SEMI E15.1 Docking Interface Port

5 Terminology

5.1 Acronyms and Abbreviations

5.1.1 *PGV* — Person Guided Vehicle (cart)

5.2 Definitions

5.2.1 *carrier* — Any cassette, box, pod, or boat that contains wafers (per SEMI E15).

5.2.2 *cart* — A floor based carrier transfer vehicle (per SEMI E64).

5.2.3 *docking* — The act of locating a floor-based carrier transport vehicle for carrier transfer to/from equipment (per SEMI E64).

5.2.4 *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 tool load ports, it is also parallel to the load face plane specified in SEMI E15 on the side of the tool where the carrier is loaded and unloaded (per SEMI E57).

5.2.5 *load face plane* — The furthest physical vertical boundary plane from carrier centroid on the side(s) of the equipment where loading of the tool is intended (per SEMI E15).

5.2.6 *load port* — The interface location on a tool where carriers are placed to allow the tool to process wafers (per SEMI E15).

5.2.7 *transfer* — To either load or unload (per SEMI E15).

6 Requirements

6.1 The dimensions that define the universal docking flange are listed in Table 1 and shown on Figure 1.

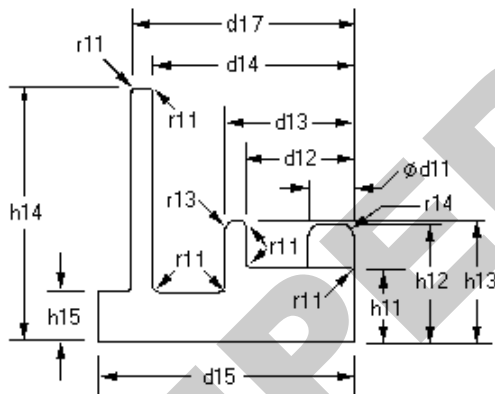
6.1.1 The minimum length of the docking flange is defined by 2×w11. This minimum length is intended to fit under the shadow of the smallest possible width SEMI E15.1 compatible load port. The PGV and PGV docking must provide full functionality given a minimum length docking flange. No maximum length has been specified.

6.1.2 One vertical pin (labeled VP in Figure 2) is intended to be used for horizontal registration of the PGV to the docking flange. This pin is also intended as a feature for an active mechanism on the PGV to lock on to.

6.2 There are three surfaces on the flange and a vertical pin that can be used as the initial docking contacts point(s) with the PGV. These have been identified as surfaces A, B and C and pin VP as shown in Figure 2. These features are the primary load bearing features during the act of docking, no other features or surfaces shall be used as initial docking contact points.

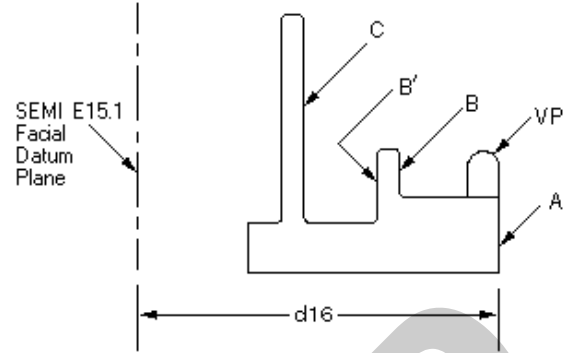
Table 1 Dimensional Requirements

Symbol	Value, mm (in.)	Tolerance (mm)	Type
a11	0 deg.	+/- 0.25 deg.	angle
Ød11	15.0 (.591)	+/- 0.2	diameter
d12	33.0 (1.299)	+/- 0.2	distance
d13	39.0 (1.535)	+/- 0.2	distance
d14	62.0 (2.441)	+/- 0.2	distance
d15	80.0 (3.150)	+/- 0.2	distance
d16	237.5 (9.350)	+/- 2.5	distance
d17	68.0 (2.677)	minimum	distance
h11	24.0 (.945)	+/- 0.2	distance
h12	39.0 (1.535)	+/- 0.2	distance
h13	40.0 (1.575)	+/-0.2	distance
h14	83.0 (3.268)	+/-0.2	distance
h15	20.0 (.787)	maximum	distance
r11	2.0 (.079)	+/-0.2	radius
r13	4.0 (.157)	+/-0.2	radius
r14	5.0 (.197)	+/-0.2	radius
w11	200 (7.874)	minimum	distance


**Figure 1
Side Elevation View I**

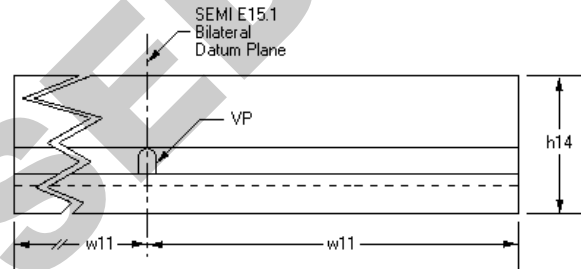
6.3 The flange must be installed such that the vertical pin (VP) is capable of being aligned with the load port bilateral datum plane (as defined in SEMI E15.1) and surface A is a distance of $d16$ from the load port facial datum plane (as defined in SEMI E15.1). The angle of incidence between surface A and the facial datum plane should be capable of adjustment to $a11$ listed in Table 1.

6.3.1 The docking flange is to be physically isolated from the equipment and should be mounted such that the equipment and equipment load port are protected from the impact incurred during docking.


**Figure 2
Side Elevation View II**

6.4 When the flange is removed, no mounting hardware shall remain protruding from the floor.

6.5 Surfaces A, B, B' and C shown on Figure 2 must exist per tolerances listed in Table 1.


**Figure 3
Front Elevation View**

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