



SEMI E72-0299

PROVISIONAL SPECIFICATION AND GUIDE FOR 300-mm EQUIPMENT FOOTPRINT, HEIGHT, AND WEIGHT

1. Purpose

1.1 Currently, device manufacturers cannot easily plan or retrofit their fabs, because equipment volumes are not predictable. Similarly, equipment suppliers cannot predict fab designs, because there are too many configurations. In general, fab space is not used efficiently, and there seems to be a trade-off between space efficiency and maintainability. This standard is a guide for equipment design and a specification for maximum limits on equipment volume and weight.

2. Scope

2.1 This standard specifies limits on the footprint, height, and weight of equipment for 300-mm fabs. Separate limits are given for the parts of the equipment in the main fab and in the sub-fab. Separate limits are also given for the equipment after it is installed and for the components of the equipment as it is moved into the fab. The actual footprint may vary by equipment type.

2.2 This standard is intended to set an appropriate level of specification that places minimal limits on supplier innovation while ensuring opportunities for users to be globally (though possibly not locally) efficient with equipment volumes.

2.3 This standard is provisional because most equipment for processing 300-mm wafers is still in the prototype phase and because further specifications may be added. For example, each equipment category may have a common depth defined to allow consistent bay sizes. Once most of the equipment development is finished, this standard should be modified and upgraded from provisional status.

3. Referenced Documents

3.1 SEMI Standard

SEMI E15 — Specification for Tool Load Port

4. Terminology

4.1 *cost footprint* — The area (A) of the smallest horizontal rectangle that contains all of the shadow footprint and half of the easement space around the equipment (for use as the floor space metric in Cost of Ownership calculations). As shown in Figure 1, this is computed as

$$A = [Wt + \frac{1}{2} (Ws - Wt)] \times [Dt + \frac{1}{2} (Ds - Dt)] \\ = \frac{1}{4} (Wt + Ws) \times (Dt + Ds)$$

Where W represents width and D represents depth

4.2 *depth* — The horizontal dimension perpendicular to the load face plane.

4.3 *easement space* — The floor space that must remain clear to the rear and sides of the equipment (but not in front of the load face plane). This includes safety aisles, ergonomic maintenance access space, component removal space, and room for doors to swing out (see Figure 1).

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

4.5 *shadow footprint* — The area of the floor space directly under every part of the equipment during its operation (see Figure 1). This includes any temporary projections from the equipment during loading or processing (such as carriers that stick out from the equipment or equipment load ports that protrude only when the equipment is being loaded).

4.6 *width* — The horizontal dimension parallel to the load face plane.

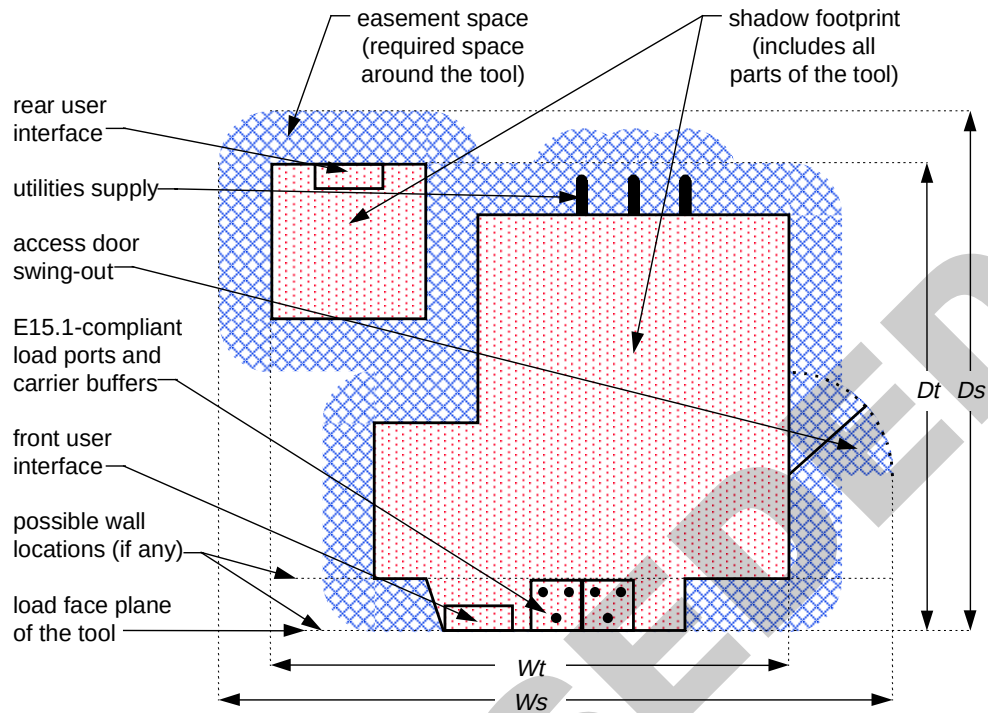


Figure 1
Equipment Footprint Dimensions

Table 1. Equipment Footprint, Height, and Weight Dimensions

Symbol Used	Value Specified	Dimension Description
H	3.5 m (11 ft. 5 in.) maximum	height of equipment in the main fab
H_s	2 m (6 ft. 6 in.) maximum	height of equipment in the sub-fab
M	1500 kg/m ² (2.1 lbm./in. ²) maximum	mass of equipment divided by its shadow footprint
M_m	6000 kg (13227 lbm.) maximum	mass of equipment move-in packages
M_t	1000 kg (2204 lbm.) maximum	mass of equipment on any 0.6 m by 0.6 m (2 ft. by 2 ft.) floor tile
X	2.2 m (7 ft. 2 in.) maximum	length (perpendicular to Y) of equipment move-in packages destined for the main fab
X_s	2 m (6 ft. 6 in.) maximum	length (perpendicular to Y_s) of equipment move-in packages destined for the sub-fab
Y	2.8 m (9 ft. 2 in.) maximum	length (perpendicular to X) of equipment move-in packages destined for the main fab
Y_s	1.7 m (5 ft. 6 in.) maximum	length (perpendicular to X_s) of equipment move-in packages destined for the sub-fab
Z	2.8 m (9 ft. 2 in.) maximum	height of equipment move-in packages destined for the main fab
Z_s	2 m (6 ft. 6 in.) maximum	height of equipment move-in packages destined for the sub-fab