SEMI F87-0312
SPECIFICATION FOR DIMENSION OF THREE PORT COMPONENTS (EXCEPT MFC/MFM) FOR 1.125 INCH TYPE FOUR FASTENER CONFIGURATION SURFACE MOUNT GAS DISTRIBUTION SYSTEMS

This Standard was technically approved by the global Gases & Facilities Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 24, 2011. Available at www.semiviews.org and www.semi.org in March 2012; originally published March 2004.

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1 Purpose

1.1 This Standard establishes the properties and physical dimensions of two port components for 1.125 inch type surface mount gas distribution system.

2 Scope

2.1 This Document includes common requirements, layout, size, detailed specifications, and dimensions of the components.

2.2 This Standard applies to all three port four fastener components (except mass flow controllers and mass flow meters). The components (i.e., valves, pressure regulators, pressure transducers, filters and purifiers) are mounted on substrates with fasteners accessible from the top.

2.3 This Standard only applies to components, which control flow of ≤50 slm nitrogen equivalent at 308 kPa (44.7 psia). This Standard also only applies to components with operating pressures less than 3445 kPa (500 psia) at 20°C.

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 Limitations

3.1 This Standard only addresses the component; it does not address the seals, the sealing system, or the assembly process and does not guarantee the performance of the sealing system. The user should be aware that gas delivery system performance and sealing system performance are addressed elsewhere in the SEMI Standards.

3.2 The user should be aware that alternative technologies are commercially available.

3.3 International, national, and local codes, regulations, and laws should be consulted to ensure that the equipment meets regulatory requirements in each location of use.

4 Referenced Standards and Documents

4.1 *SEMI Standards and Safety Guidelines*

SEMI E49.9 — Guide for Ultrahigh Purity Gas Distribution Systems in Semiconductor Manufacturing Equipment

SEMI F20 — Specification for 316L Stainless Steel Bar, Extruded Shapes, Plate, and Investment Castings for Components Used in High Purity Semiconductor Manufacturing Applications

4.2 *ASME Standards*[1]

ASME Y14.5 — Dimensioning and Tolerancing

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

[1] American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990, USA; Telephone: 973.882.1170, Fax: 973.882.1717, https://www.asme.org

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5 Terminology

5.1 *Definitions*

5.1.1 *components for surface mount* — a gas distribution system component having inlets and outlets located on the bottom of the component with the attachment mechanism accessible from the top.

5.1.2 *four fastener configuration* — the component has four fasteners located on an interface, independent of number of sealing point.

5.1.3 *roughness average (Ra)* — the arithmetic average of the absolute values of the measure profile height deviations taken within the sampling length and measured from the graphical centerline.

6 Common Requirements

6.1 *Dimensional Requirements* — All components shall meet the requirements outlined in Figure 1. All geometric dimensioning and tolerancing complies with ASME Y14.5 and/or the applicable ISO standard.

NOTE 1: All dimensions are in millimeters unless otherwise noted.

NOTE 2: The through hole of the sealing port will be elliptical if the through hole is drilled at an angle. In this case, the diameter shall apply to the major diameter of the ellipse.

6.2 *Material* — The material used to manufacture the base of the components shall comply to SEMI F20 with the exception that the sulfur content shall comply to SEMI E49.9.

NOTE 3: SEMI E49.9 was withdrawn. However, a ballot to combine SEMI E49.8 and SEMI E49.9 in one single Standard was submitted for SEMICON West 2003.

6.3 *Burrs and Sharp Edges* — Unless specifically noted on the drawing, remove all burrs and sharp edges.

6.4 *Handles and Displays* — Rotating handles and removable displays shall stay within the maximum envelope of the base of the component with the exception of toggle and/or lockout/tagout valves at the discretion of the system designer. They shall be movable or removable such that they do not interfere with the access of the mounting fasteners from above.

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