

SEMI D6-0623

SPECIFICATION FOR FLAT PANEL DISPLAY (FPD) MASK SUBSTRATES

This Standard was technically approved by the Flat Panel Display – Materials & Components Global Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 21, 2022. Available at www.semiviews.org and www.semi.org in June 2023; originally published in 1992; previously published January 2017.

NOTICE: The section symbol (§) is used to reference a numbered section, paragraph, or header and all subordinate paragraphs, headers, and embedded material (i.e., EXCEPTIONs, lists) therein. The paragraph symbol (§) is used to reference a particular numbered paragraph and embedded material therein. When duplicated (i.e., §§ and §§) the symbols are used to reference more than one section or paragraph, respectively.

1 Purpose

1.1 This Specification defines the standard for substrates used to fabricate flat panel display masks.

2 Scope

2.1 This Specification applies to photomasks that are principally used in fabricating flat panel displays. The edge lengths specified range from 202.8 mm × 202.8 mm to 1620 mm × 1780 mm.

2.2 Substrates with an edge length less than 200 mm follow the specifications for a semiconductor mask (refer to SEMI P1).

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 P1 — Specification for Hard Surface Photomask Substrates

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

4 Terminology

4.1 None.

5 Test Methods

5.1 *Edge Length* — Measure two or more points on each side using the caliper or the three-dimensional measuring tool.

5.2 *Plate Thickness* — Measure the plate thickness within the effective area using the laser length measuring tool or the micrometer.

5.3 *Special Chamfered Edge* — Measure one or more points on long and short sides using the measuring Magnifier.

6 Ordering Information

6.1 Ordering information shall be discussed between suppliers and users.

7 Edge Length and Thickness Specification

7.1 *Edge Length* — Units are in mm. Refer to Tables 1, 3, 5, 7, 9, 11, and 13 for a combination of materials, edge length, and thickness.

7.2 *Edge Length Tolerance* — ±0.4 mm. Applies to all groups.

7.3 Thickness, Tolerance

7.3.1 Thickness of substrates shall be specified by the edge length group and materials as shown in Tables 2, 4, 6, 8, 10, 12, and 14.

7.3.2 *Tolerance* — For Groups A and B: -0.4 mm through $+0.2$ mm. For Group C: Refer to Table 6. For Group D: Refer to Table 8. For Group E: Refer to Tables 9 and 10. For Group F: Refer to Tables 11 and 12. For Group G: Refer to Tables 13 and 14.

7.4 *Material* — Refer to § 8.

7.5 *Special Chamfered Edge* — Refer to Figure 1 and Table 15 for dimensions of parts involving special chamfered edge.

Table 1 Edge Length (Group A) in mm

202.8 × 202.8				
200 × 250	250 × 250			
	250 × 300	300 × 300		
		300 × 350	350 × 350	
			350 × 400	400 × 400

Table 2 Plate Thickness and Materials (Group A) in mm

<i>Material</i>			
<i>HTE</i>	<i>MTE/LTE</i>	<i>ULTE</i>	<i>Thickness (mm)</i>
+	+	+	3.0
+			4.8
	+	+	5.0

Table 3 Edge Length (Group B) in mm

330 × 450			
	400 × 500		
		450 × 550	
			500 × 600

Table 4 Plate Thickness and Materials (Group B) in mm

<i>Material</i>			
<i>HTE</i>	<i>MTE/LTE</i>	<i>ULTE</i>	<i>Thickness (mm)</i>
+			4.8
	+	+	5.0

Table 5 Edge Length (Group C) in mm

520 × 610
500 × 750
520 × 800
620 × 720
650 × 750
650 × 800