

SEMI D11-95 (Reapproved 0703) SPECIFICATION FOR FLAT PANEL DISPLAY GLASS SUBSTRATE CASSETTES

This specification was technically approved by the Global Flat Panel Display Committee and is the direct responsibility of the Japanese FPD Materials and Components Committee. Current edition approved by the Japanese Regional Standards Committee on April 28, 2003. Initially available at www.semi.org June 2003; to be published July 2003. Originally published in 1995.

1 Purpose

1.1 This document describes cassettes that are used with glass substrates in the fabrication and processing of subassemblies and masks for flat panel displays (FPD).

2 Scope

2.1 This document applies to cassettes that hold a quantity of rectangular FPD substrates. Selected terms and definitions and summary specifications are included. The specifications for single-substrate cassettes will be developed in other documents.

NOTICE: 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 or other limitations prior to use.

3 Referenced Standards

3.1 SEMI Standards

SEMI D3 — Quality Area Specification for Flat Panel Display Substrates

SEMI D5 — Standard Size for Flat Panel Display Substrates

SEMI D6 — Specification for Edge Length and Thickness for Liquid Crystal Display (LCD) Mask Substrates

SEMI D9 — Terminology for FPD Substrates

SEMI D21 — Definitions for Flat Panel Display Masks

SEMI E1 — Specification for 3 inch, 100 mm, 125 mm, and 150 mm Plastic and Metal Wafer Carriers

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

4 Terminology

4.1 The following descriptions assume that the cassette orientation places the substrates in a horizontal plane.

4.2 Definitions

4.2.1 *cassette bottom plate* — the bottom plate of the cassette. It is parallel to the substrate plane. It is physically different from the cassette top plate for purposes of machine interface and for mechanical positioning by operators.

4.2.2 *cassette front* — the area between top and bottom cassette plates through which substrates pass during loading and unloading.

4.2.3 *cassette plate opening* — an opening in the cassette top and bottom plate that provides access to the glass substrates for external roller driver mechanisms to move substrates into/from the cassette.

4.2.4 *cassette rear* — the area between top and bottom cassette plates opposite the cassette front.

4.2.5 *cassette top plate* — the upper plate of the cassette. It is parallel to the substrate plane. It is physically different from the cassette bottom plate for the purpose of machine interface and for mechanical positioning by operators.

4.2.6 *first mizo clearance* — the distance between the inside surface of the bottom plate and the centerline of the nearest mizo.

4.2.7 *first mizo dimension* — the distance between the outside surface of the bottom plate and the centerline of the nearest mizo.

4.2.8 *glass substrate cassette* — a container for holding glass substrates for processing, storage, and transportation during the fabrication of FPD.

4.2.9 *inner height* — the shortest distance between the inside surface of the bottom plate and the inside surface of the top plate.

4.2.10 *mizo* — a term (plural form = mizo) describing a family of rails that support the substrates. They may be smooth-sided, toothed symmetrically, or toothed non-symmetrically. Precise mizo contours are not described in this document.

4.2.11 *mizo base* — the innermost portion of a mizo.

4.2.12 *mizo centerline* — 1/2 the mizo clearance.

4.2.13 *mizo clearance* — the minimum dimensions between two adjacent mizo teeth, into which a substrate can be placed.

4.2.14 *mizo depth* — the distance between the base of the mizo and the top of the tooth. It is also called ‘tooth height.’

4.2.15 *mizo flat* — the distance along the mizo base between two adjacent mizo teeth.

4.2.16 *mizo opening width* — the distance between the extreme ends of two adjacent mizo teeth.

4.2.17 *mizo pitch* — the distance between adjacent mizo centerlines.

4.2.18 *mizo plate* — a plate that contains mizo for supporting glass substrates.

4.2.19 *mizo plate space* — the distance between adjacent mizo plates. It is used in the alignment of substrates after loading.

4.2.20 *mizo size* — the distance between opposite mizo bases.

4.2.21 *substrate clearance* — the difference between the substrate width and the mizo size.

4.2.22 *substrate load depth* — the shortest distance between the front surface of the cassette and the front surface of the substrate stops.

4.2.23 *substrate stop* — a portion of the cassette, located at the cassette rear, that provides a mechanical stop for substrates during their insertion.

4.2.24 *tooth* — the protrusion, on the inner surface of the mizo-pocket plate, that contains the mizo shape.

4.2.25 *tooth height* — see “mizo depth.”

figures explain application of the above definitions and located related dimensions.

5.4 *Material* — To be agreed upon between supplier and user. Construction may be of one or more molded or machined parts.

Table 1 Cassette Designations

<i>Symbol</i>	<i>Description</i>
A1	Outer height
A2	Outer width
A3	Outer length
B1	Mizo per plate
B2	Mizo pitch
B3	The distance between the first mizo centerline and the last mizo centerline
B4	Substrate load depth
B5	The distance between the cassette rear and the inside surface of the substrate stop
B6	The distance between the cassette front and the front edge of the substrate
C1	Mizo opening width
C2	Mizo depth
C3	Mizo clearance
C4	Mizo size
C5	Tooth size
C6	Substrate clearance
D1	First mizo dimension
D2	First mizo clearance
D3	Thickness of the cassette bottom plate
D4	Thickness of the cassette top plate
D5	Inner height
D6	Width of mizo plate space

5 Cassette Specification

5.1 An FPD substrate cassette contains the following items:

5.1.1 One cassette bottom plate.

5.1.2 One cassette top plate.

5.1.3 One or more substrate stops. A mizo plate may be used as a substrate stop.

5.1.4 Three or more mizo plates.

5.2 *Capacity* — Two or more substrates.

5.3 *Dimensions and Tolerances* — To be agreed upon between supplier and user. The following table and