

SEMI D52-0708^E

SPECIFICATION FOR REFERENCE POSITION OF SUBSTRATE ID

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^E This Standard was editorially modified in September 2008 to correct an error. Changes were made to ¶¶ 6.1.3 and 6.1.4.

1 Purpose

1.1 SEMI D32 only specifies one Bare Glass ID position, however, it is necessary to assign multiple substrate IDs for efficient operation as the sizes become larger. Therefore, this Standard specifies substrate ID positions for efficient operation based on SEMI D32.

2 Scope

2.1 This Standard specifies the substrate ID positioning with 2D Code.

2.2 When the IDs are required to be individually distinguished, they are called Bare Glass or Resin ID, but when they are not required to be distinguished, they are generally called Substrate ID.

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 does not define the tolerance of ID positions derived from the substrate tolerance.

3.2 This Standard does not define the tolerance of the substrate ID itself toward the substrate nor the tolerance specific to the equipment. This Standard, even when the datum line is utilized, does not increase the accuracy of the substrate ID positioning and 2D-ID reading, nor, evaluate any traceability using 2D-ID.

3.3 Though tolerances to the datum line may differ depending on installation regulations of equipment suppliers, operations purposes, and transportation methods of the substrates, this Standard does not apply to those tolerances.

3.4 In addition to the substrate ID, there are another two IDs; Cut ID and Panel ID on the substrate. This Standard does not cover these two IDs. There are cases when these two IDs have an influence on the substrate ID position as their positions may have preference to the substrate ID or the ID reading efficiency degrades depending on the layout and equipment. These special cases are excluded.

3.5 This Standard is not intended to have any influence on the definition of 2D codes.

4 Background

4.1 As the sizes of mother glass in TV manufacturing become larger, a need arises for efficient identification of substrate IDs during transportation to enable process control, which is an important element of product quality management, leading to the standardization of the substrate ID positioning. By standardizing the substrate ID positioning with 2D Code specification, ID reading position can be determined. This allows users and automated material handling system (AMHS) manufacturers to reduce their confirmation work for the substrate ID positioning readout and AMHS manufacturers to reduce the amount of design work, as well as reducing the workload for installation and adjustment of reader units in the field. Also, the reading accuracy, which is an important element of traceability, is expected to be improved as a result of the standardization of the substrate ID positioning.

5 Referenced Standards and Documents

5.1 *SEMI Standards and Safety Guidelines*

SEMI D9 — Terminology for FPD Substrates

SEMI D24 — Specification for Glass Substrates Used to Manufacture Flat Panel Displays

SEMI D32 — Specification for Improved Information Management for Glass FPD Substrates Through Orientation Corner Unification

SEMI D48 — Specification for Reference Position of Substrate ID to Specify Datum Line for ID Reader for Handling Off/On Tool

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

6 Terminology

6.1 Abbreviations and Acronyms

6.1.1 *LRE* — long reference edge

6.1.2 *SRE* — short reference edge

6.1.3 *IDCL* — datum line for ID center point on long edge side

6.1.4 *IDCS* — datum line for ID center point on short edge side

6.1.5 *IDC* — datum point for 2D-ID center

6.1.6 *SCL* — substrate center line parallel with long reference edge

6.2 Definitions

6.2.1 Substrate Definitions

6.2.1.1 *orientation corner* — due to the nature of the substrate manufacturing process, a substrate has an orientation corner (also called orientation flat) at a specific location. Opposite edges of the substrate are parallel (see Figure 1). [SEMI D9, SEMI D44, SEMI D48, SEMI D49]

6.2.1.2 *pattern surface* — a surface defined as the orientation corner, where device patterns are mainly formed. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3 Definitions of Substrate Datum Line (see Figure 1)

6.2.1.3.1 *length (L)* — datum line for a long edge of a substrate. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.1.1 *long reference edge (LRE)* — two long edges of a substrate and their extension lines. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.1.2 *LRE1* — extension line of LRE on the orientation corner. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.1.3 *LRE2* — extension line of LRE on the opposite side of the orientation corner [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.2 *width (W)* — base line for short edge of a substrate. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.2.1 *short reference edge (SRE)* — two short edges of a substrate and their extension lines. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.2.1.1 *SRE1* — extension line of SRE on the orientation corner side. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.3.2.1.2 *SRE2* — extension line of SRE on the opposite side of the orientation corner. [SEMI D44, SEMI D48, SEMI D49]

6.2.1.4 *Definition of Substrate Center Line(SCL see Figure 1)* — the bisection line of LRE1 and LRE2, or the bisection line of SRE1 and SRE2. This Standard uses only the bisection line of LRE1 and LRE2.

6.2.2 ID Definitions

6.2.2.1 *ID position on a substrate* — reference Size of Substrate and ID as specified in SEMI D32 (see Figure 2). 2D Code is not always parallel with LRE1/LRE2 or SRE1/SRE2 (see Figures 4 through 7) as specified in SEMI D48. Also, an ID denotes a 2D Code in this Standard.

6.2.2.2 *IDC* — center point of 2D Code.

6.2.2.3 *IDCL* — a datum line on a substrate which is parallel with LRE and runs through the center point of the ID.