

# SEMI M23.2-0211 (Reapproved 0623) SPECIFICATION FOR ROUND 76.2 mm (3 inch) DIAMETER POLISHED MONOCRYSTALLINE INDIUM PHOSPHIDE WAFERS

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## 1 Purpose

1.1 This Specification defines properties of round 76.2 mm monocrystalline indium phosphide wafers, in agreement with presently established industry practice. It uniquely defines those mechanical parameters that do not need, for technical reasons, a choice of different values.

## 2 Scope

2.1 The parameters defined include the values and tolerances of wafer diameter, thickness, and surface orientation.

2.2 The complete specification for this product includes all requirements of SEMI M23, excluding those that are not relevant to this Specification.

**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 M23 — Specification for Polished Monocrystalline Indium Phosphide Wafers

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

**Table 1 Dimension and Tolerance Requirements**

| <i>Property</i>           | <i>Dimension</i> | <i>Tolerance</i> | <i>Units<sup>#1</sup></i> |
|---------------------------|------------------|------------------|---------------------------|
| Diameter                  | 76.2             | ±0.5             | mm                        |
| Thickness, Center Point   | 600              | ±25              | µm                        |
| Primary Flat Length       | 22               | ±2               | mm                        |
| Secondary Flat Length     | 11               | ±2               | mm                        |
| Bow                       | To be specified. |                  |                           |
| Total Thickness Variation | To be specified. |                  |                           |

#1 For reference purposes, the metric (SI) units apply.

**Table 2 Orientation and Flat Location Requirements**

| <i>Property</i>                   | <i>Requirement</i>                                                                                                                                 |                                                                                                                                                      |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Option</i>                     | <i>Dove-Tail</i>                                                                                                                                   | <i>V-Groove</i>                                                                                                                                      |
| Primary Flat Orientation          | $(011) \pm 0.5^\circ$ , <sup>#1</sup> under an indium facet. The primary flat shall be perpendicular to the 'Dove-tail' etch figure. <sup>#2</sup> | $(011) \pm 0.5^\circ$ , <sup>#1</sup> under a phosphorus facet. The primary flat shall be perpendicular to the 'V-Groove' etch figure. <sup>#2</sup> |
| Secondary Flat Orientation        | $90^\circ \pm 5^\circ$ clockwise from the primary flat.                                                                                            | $90^\circ \pm 5^\circ$ counterclockwise from the primary flat.                                                                                       |
| Surface Orientation <sup>#3</sup> |                                                                                                                                                    |                                                                                                                                                      |
| A                                 | $\{100\} \pm 0.5^\circ$ (refer to SEMI M23, Figure 1)                                                                                              | $\{100\} \pm 0.5^\circ$ (refer to SEMI M23, Figure 2)                                                                                                |
| B                                 | $\{100\}$ off $2^\circ \pm 0.5^\circ$ toward any $\{110\}$ plane (refer to SEMI M23, Figure 3)                                                     | $\{100\}$ off $2^\circ \pm 0.5^\circ$ toward the $\{110\}$ plane which is between the primary and secondary flats (refer to SEMI M23, Figure 4)      |
| Orthogonal Misorientation         | $\pm 5^\circ$ (refer to SEMI M23, Figure 5)                                                                                                        | $\pm 5^\circ$ (refer to SEMI M23, Figure 5)                                                                                                          |

#1 Refer to Table 1 in SEMI M23.

#2 Refer to Figures 1 and 2 in SEMI M23, which show the orientation of the Dovetail and V-groove figures relative to crystallographically anisotropic pits (refer to #4).

#3 The frame of reference is the (100) plane of the crystal. It is the wafer normal that is tilted towards the (110) plane of the crystal.

#4 Relating to the etchant used for identifying V-groove and/or dovetail direction, refer to SEMI M23, ¶ 13.1.

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