

SEMI G103-1122

SPECIFICATION FOR VISCOSITY OF ENCAPSULATION MATERIALS FOR WAFER LEVEL PACKAGING AND PANEL LEVEL PACKAGING

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1 Purpose

1.1 Mold resin material characteristics are specified for legacy packages such as leaded and ball grid array packages, but there is no specification for encapsulation characteristics for wafer level packaging (WLP) and panel level packaging (PLP). Three different types of encapsulations such as liquid, granular and sheet material are used for WLP and PLP and these requires the different characteristics and performances.

1.2 The characteristics of encapsulation materials such as viscosity needs to be recognized and defined to enable the qualified encapsulation processes for large panel size.

2 Scope

2.1 This Specification focuses on the viscosity of encapsulation material used in the manufacturing of WLP and PLP processes.

2.2 This methodology is defined to measure the viscosity by rotational method.

2.2.1 This viscosity methodology can be applied to all three types of encapsulation material such as granule, sheet, and liquid type.

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 Specification applies to encapsulation materials of granule, sheet and liquid type for WLP and PLP processes.

3.2 This Specification does not describe the use for leadframe based packaging processes.

4 Referenced Standards and Documents

4.1 *SEMI Standards and Safety Guidelines*

SEMI G83 — Specification for Bar Code Marking of Product Packages

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

5 Terminology

5.1 *Abbreviations and Acronyms*

5.1.1 *PLP* — panel level packaging

5.1.2 *WLP* — wafer level packaging

5.2 *Definitions*

5.2.1 *plate* — a part on which material be set.

5.2.2 *rotating cone* — a part which gives certain shear force to material on plate.

6 Test Methods

6.1 Measurements shall be made or certifiable to one of the SEMI or ASTM standard test methods and specified in the purchase order.

6.2 If several different standard test methods for an item are commonly used within a region, it is particularly important that the applicable method of test be identified in the purchase order.

6.3 If no method of test is specified in the purchase order and if standard test methods from different geographic regions are available, the default method shall be a method in common usage for the region of the purchaser of the panel.

6.4 If no standard test method for an item is available, the test procedure to be used must be agreed upon between supplier and customer.

7 Ordering Information

7.1 Purchase orders for encapsulant materials to this Specification shall include the properties below by the measurement of below defined methods.

7.2 In addition, the purchase order must indicate the test method to be used in evaluating each of those items for which alternate test procedures exist.

7.3 The following items must also be included in the purchase order:

7.3.1 Lot acceptance procedures,

7.3.2 Certification (if required),

7.3.3 Packing and shipping container labeling requirements.

8 Requirements

8.1 *Measurement Principle*

8.1.1 Measure torque of material under conditions of certain rotation of cone plate with respect to measurement temperature.

8.1.2 The cone is rotated with a variable rotational speed. And it detects resistance of rotation as a torque caused by presence of sample between cone and plate.

8.1.3 Viscosity chart is calculated from measured torque at each time. The lowest viscosity will be judged from that chart.

8.1.4 Measurement temperature will be set at which a sample can show a fluidity.

8.1.5 Figure 1 shows the schematic diagram of rotational viscosity measurement. that testing fixture with a plate port at the bottom and a rotating cone port at the top.

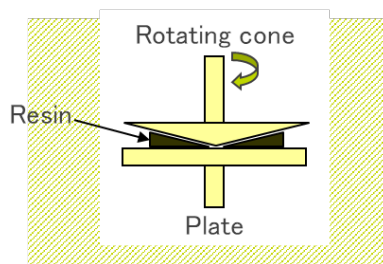


Figure 1
Schematic Diagram of Viscosity Measurement

8.2 *Viscosity Measurement Equipment*

8.2.1 Constant torque sensing machine that can set the thickness, temperature, and speed of the rotation.

8.2.2 *Measuring Equipment Ancillary Equipment*

8.2.2.1 Electronic balance-accuracy 0.1 g.