

SEMI G15-93 (Reapproved 0811) STANDARD TEST METHOD FOR DIFFERENTIAL SCANNING CALORIMETRY OF MOLDING COMPOUNDS

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NOTICE: This Standard or Safety Guideline has an Inactive Status because the conditions to maintain Current Status have not been met. Inactive Standards or Safety Guidelines are available from SEMI and continue to be valid for use.

NOTICE: This Document was reapproved with minor editorial changes.

1 Scope

1.1 This Document describes procedures for evaluating epoxy molding compounds by differential scanning calorimetry (DSC).

1.2 *Units* — This test method uses SI units.

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.

2 Referenced Standards and Documents

2.1 *ASTM Standards*¹

ASTM E793 — Test Method for Heats of Fusion and Crystallization by Differential Scanning Calorimetry

ASTM E967 — Practice for Temperature Calibration of Differential Scanning Calorimeters and Differential Thermal Analyzers

ASTM E968 — Practice for Heat Flow Calibration of Differential Scanning Calorimeters

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

3 Significance

3.1 DSC provides a rapid method at incoming inspection for evaluating molding compounds for consistency in subsequent molding processes.

4 Interferences

4.1 Very small quantities of material are used in the test. Lack of homogeneity may cause variable results.

4.2 *Gas Purge* — See § 5.

4.3 *Sample Pans* — See § 5.

5 Equipment

5.1 *Differential Scanning Calorimeter* — Capable of heating a sample from room temperature to 300°C with a controlled heating rate.

NOTE 1: *Gas Purge Considerations* — A reactive gas purge affects the material under test. A gas must be chosen that reflects the molding conditions normally used for that material (i.e., air or nitrogen).

5.2 *Sampling Pans for DSC Cell* — (Aluminum with crimping or hermetically sealed.) The pans must not be reactive to the sample under test.

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5.3 *Process Controller* — Capable of collecting, calculating, and plotting the data resulting from the calorimeter.

5.4 *Analytical Balance* — Accuracy 0.001 mg.

5.5 Tweezers and Microspatula.

6 Sampling

6.1 When the method is used to evaluate incoming molding materials, the sampling plan shall be agreed between supplier and customer.

6.2 Powdered or granular molding compounds shall be thoroughly mixed before sampling. If the compound is supplied in a preform, a small section may be cut off the preform with a blade.

7 Preparation of Samples

7.1 Protect samples from moisture absorption while awaiting test.

8 Equipment Setup and Calibration

8.1 *Temperature Calibration* — Refer to ASTM E967.

8.1.1 Follow the manufacturer's operating manual to set up and run a calibration curve using indium (Melting Point 156.6°C) (see Figure 1).

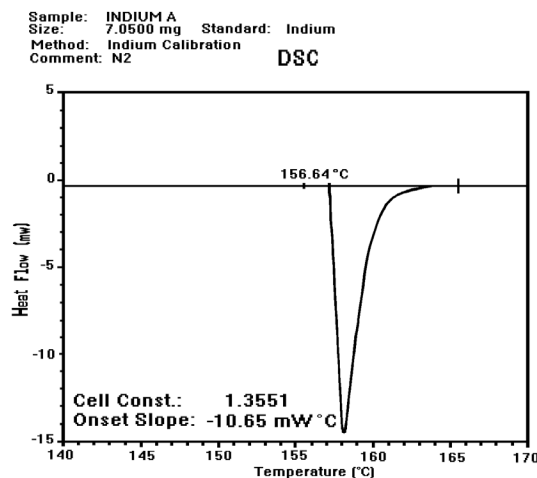


Figure 1

8.2 Determine the onset of melting and refer to the manual for the temperature correction method.

NOTE 2: There are other standard reference materials with higher melting points (see Table 1). Choose the standard which best matches the range of interest for the material under test.

Table 1

Reference Material	Melting Point (°C)
Indium	156.6
Tin	232.0
Zinc	419.6