



IPC-TM-650 TEST METHODS MANUAL

1.0 Scope This test method defines the procedure for determining the Volumetric Thermal Expansion of polymer coatings on inorganic substrates, such as polyimide on a silicon wafer. The expansion is measured using an apparatus designed for the determination of the Pressure/Volume/Temperature behavior of solid samples.

2.0 Applicable Documents None

3.0 Test Specimens See Sample Preparation 5.1.

4.0 Apparatus or Material GNOMIX PVT or equivalent capable of providing PVT data over its pressure range 0-200 MPa (2000 bar or 29,000 psi), and from ambient temperatures to 400°C.

5.0 Procedure

5.1 Sample Preparation Samples are prepared by forming a 25 mm thick film on a wafer and lifting the specimen free according to manufacturer's recommendations. Sample is cut and folded to fit in the sample chamber of the PVT apparatus.

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5.2 Test Procedure The film sample (1 to 2 grams mass) is placed in a rigid stainless steel cell. The cell is surrounded by a "sample cup" which guarantees a hydrostatic state of stress in the sample at all times. Follow the testing protocol according to the PVT Operations Manual for the measurement of the volumetric expansion.

5.3 Test Analysis Report the volumetric expansion of the material from room temperature to 300°C and the temperature of any observed transitions.

6.0 Notes

6.1 Pressure/Volume/Temperature (PVT) Apparatus: One source is Gnomix, 3809 Birchwood Drive in Boulder, CO (303) 444-3395.