

Dynamic Mechanical Thermal Analysis (DMTA)

ASTM D4065, D4440, D5279

Scope:

Dynamic Mechanical Analysis determines elastic modulus (or storage modulus, G'), viscous modulus (or loss modulus, G'') and damping coefficient (Tan Delta) as a function of temperature, frequency or time. Results are typically provided as a graphical plot of G' , G'' , and Tan Delta versus temperature. DMTA identifies transition regions in plastics, such as the glass transition and melting point and may be used for quality control or product development. DMTA can recognize small transition regions that are beyond the resolution of DSC (Differential Scanning Calorimetry).

Test procedure:

The test specimen is clamped between the movable and stationary fixtures, and then enclosed in the thermal chamber. Frequency, amplitude, and a temperature range appropriate for the material being tested are input. The Analyzer applies tensional oscillation to the test sample while slowly moving through the specified temperature range.

Specimen size:

Test specimens are typically 56 x 13 x 3 mm, cut from the center section of an ASTM Type I tensile bar, or an ISO multipurpose test specimen.

Data:

Elastic Modulus (G') versus temperature, frequency, or strain
Viscous Modulus (G'') versus temperature, frequency, or strain
Damping Coefficient (Tan Delta) versus temperature, frequency, or strain

