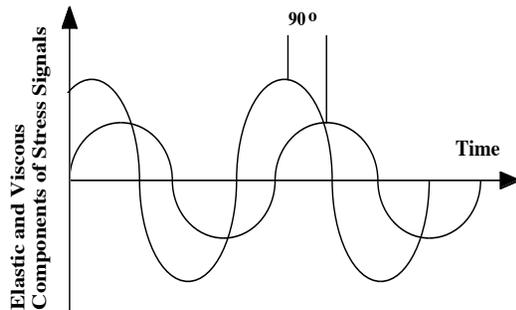
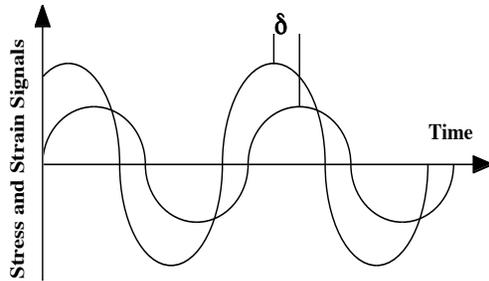


Tests and Fixtures Were Recommended for Testing Investment Casting Waxes at ICI

Adrian S. Sabau (ORNL, sabaua@ornl.gov)



All ASTM standards were developed for other applications and industries than those in investment casting. The applicability of ASTM standards to measure of wax properties were assessed.

ASTM Standard	Test description
D4440	Measurement of Polymer Melts Shear oscillatory / disk
D5023	DMA in Three Point Bending
D5024	DMA in Compression
D5026	DMA in Tension
D5279	DMA of Plastics in Tension
D5418	DMA in Dual Cantilever
D5023	DMA in Three Point Bending
D6648-01; D4 P 245	BBR: Flexural Creep Stiffness of Asphalt Binder (Standard; Test)
D5279	DMA (Torsion bar)

Dynamical mechanical analysis (DMA) can be used to analyze viscoelastic behavior of waxes. For the first time in the investment casting industry, the thermo-mechanical properties of unfilled and filled waxes were measured.

Test standards were recommended to the Investment Casting Institute (ICI).

Stiffness/material form	Test	Instrument (ASTM)	Fixture	Temperature range [°C]
Hard/solid	Flexural (3-pt. Bending)	BBR (D6648) 3-pt. (D5023)	Rectangular bar	RT < T < 40
Hard/hard paste or Soft/paste	Torsion oscillatory	DMA (D5279)	Rectangular bar	RT < T < T _{SP} -5
Soft and Gooney/Paste	Shear oscillatory	DMA (D4440)	Disk	T _{SP} -10 < T < T _{SP}
Liquid	Shear oscillatory	Melt rheometer (D4440)	Disk	T _{SP} +5 < T < T _{SP} +20