

# PREMIER™ ESR

Encapsulated Sample Rheometer

Designed for the composite, thermoset, and thermoplastic industries. The ESR can characterize resins and composite materials in a single test, measuring dynamic mechanical properties before, during, and after cure. The ESR is geared towards Quality Control and Research & Development. This instrument provides data such as viscosity, gel time, cure time, reaction rate, final modulus, and glass transition temperature. The ESR's advanced temperature control system allows measurements under isothermal and non-isothermal conditions.

## Features

- Measure prepreg viscosity, gel point, cure, and final modulus in a single test without removing resin from fiber
- Optimize curing conditions for consistent product quality
- Improved incoming raw material quality
- Check quality of shelf-aged materials
- Test under isothermal conditions, temperature ramp & hold, or mimic the cure in an oven or autoclave
- Rapidly evaluate materials from new sources
- Reduce waste, improve efficiency, and reduce cost
- Includes pressure transducer for pressure measurement
- Operates using Enterprise software, a flexible LIMS software based on a SQL server database

## Performance

- Measure the complex shear modulus during cure using:
  - True isothermal conditions
  - Ramp and hold temperature program
  - Replicate the temperature during an autoclave cure
- Determine the glass transition temperature (T<sub>g</sub>) immediately after cure by measuring the viscoelastic properties during a temperature ramp

## Options

- CSS 400™ from AvPro Inc.
- Multiple languages
- Wide assortment of films

## Specifications

Heating Rate:	0.36°F/min (0.20°C/min) to 90°F/min (50°C/min)	ASTM Standards:	Meets ASTM D7750
Max Cooling Rate:	54°F/min (30°C/min)	Electrical:	100/110/120/130 VAC ±10%, 60 ±3 Hz, 20 amp single phase. 200/220/240/260 VAC ±10%, 50 ±3 Hz, 10 amp single.
Measurements:	Torque ( $S'$ , $S''$ , $S^*$ ), $\text{Tan}\delta$ , Dynamic Viscosity ( $\eta'$ , $\eta''$ , $\eta^*$ ), shear modulus ( $G'$ , $G''$ , $G^*$ ), temperature (°C or °F), strain (degrees, %, fractional strain), frequency (cpm, Hz, radians/sec), pressure (kPa, psi)	Dimensions:	Width: 22 in (56 cm) Height: 48 in (122 cm) Depth: 25 in (64 cm)
LCD Screen:	6.1 in x 3.3 in (155 mm x 85 mm), Resolution 800 x 480	Weight:	Net 346 lbs (157 kg), gross 616 lb (280kg)
Air Pressure:	80 psi (5.6 kg/cm 2551 kPa) minimum	Sample Cavity:	3.5 ccm
Temperature Range:	Ambient to 662°F (350°C)	Sample Dimensions:	41 mm in diameter, 2.6 mm nominal thickness