

Description



Pressure DSC is differential scanning Calorimetry under either high or low-pressure conditions. Raw materials and finished products are often processed or intended for use at conditions other than ambient temperature and pressure. Conventional calorimetry characterizes well the physical and chemical properties of materials. Now, pressure DSC extends characterization of materials to extreme pressures. A calorimeter measures phase changes, reactions or processes that absorb or release heat. A pressure DSC measures the effects of pressure on these measurements. DSC results are often different for samples analyzed in open versus hermetically sealed pans due to changes in pressure inside sealed pans. Pressure DSC controls pressure to study and understand the reason for those differences. Materials processed at conditions other than ambient temperature or products designed for extreme end use conditions can be better characterized at operating conditions using a controlled pressure DSC. The heart of the pressure DSC is a heat flux plate designed for to measure small energy changes with reliability versus not just versus temperature but also versus pressure.

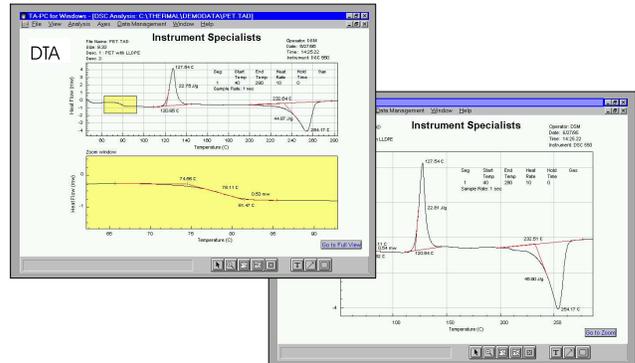
Uses for Pressure DSC

- Accelerated Aging
- Crystallization temperature
- Curing and cross-linking reactions vs. pressure
- Effect of additives or processing conditions
- Elastomer vulcanization
- Heats of reaction
- Hydrogenation and carbonization reactions
- Increased Oxidation rate under high oxygen pressure
- Measurements under process conditions, lyophilization for example
- Melting / Boiling points
- Oxidation Induction Time
- Oxidative stability of oils, lubricants, fats, foods Or plastics
- Pharmaceutical Hydrates/Solvates - vaporization versus pressure
- Physical processes / chemical reactions influenced by pressure
- Pressure dependent chemical reactions
- Pressure effect on polymorphic transitions, recycled material, glass transition
- Pressure induced phase transitions
- Reaction rates and temperatures
- Simulate process and operating conditions
- Stabilizer effectiveness
- Suppression of volatiles vaporization
- Thermal stability
- Vapor pressure measurements

PDSC System

Specifications

- Windows XP, 7 or 10.
- Temperature Range: Ambient to 600C (Quench cooling to -150 using the standard cooling can)
- Temperature accuracy: 0.1 C
- Temperature Precision: 0.1 C
- Pressure to 1000 psi
- Noise: .5 uW
- Stability: < 1mW ambient to 600 C
- Heat flux plate material: Chromel or Constantan (Choice of 4 sensor plate designs)
- Sample and reference thermocouples: Type K
- Furnace thermocouple: Type K
- Dual PID control
- 10 temperature segments each has 1 ramp, 1 isotherm
- Program rates of 0.1 - 200 degrees C/min
- Gases: Air or Oxygen recommended (hazardous gases are used at the customer risk)



DSC

Peak integration, Fused peak analysis, Onset and peak temperature determination, Glass transition analysis, Baselines slope correction.

Software

- Real-time color display of data collection
- Auto and manual scaling
- Time vs. temperature profiles
- First and second order derivative plots
- Analysis save feature
- Background, simultaneous and multiple
- Instrument data collection
- On-line help manual
- Individual segment display
- Annotation and drawing tools
- Copy to clipboard function
- Post Collection editing
- Multiple curve/module overlay
- Split screen zoom mode
- Quadratic temperature and ordinate
- Correction
- ASCII export
- Data smoothing
- Baseline file subtraction
- Y-axis shift operation
- Subfile operations
- Custom display configuration
- User selectable units
- Advanced analysis packages available

Materials

- Thermoplastics
- Thermosets
- Rubbers
- Phenolics
- Cosmetics
- Foods
- Pharmaceuticals
- Chemicals
- Petrochemicals
- Coals and other Fuels
- Nuclear Research
- Propellants
- Explosives
- Dental Materials
- Catalysts
- Waxes

Specifications subject to technical change
PDSCv1

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