



PHASE TRANSITION ANALYZER[®]

Accurately measure the phase points of a mixed polymer



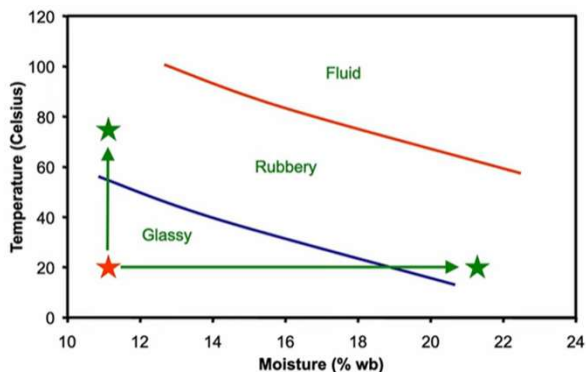
Within an extruder, it's necessary for the product to be *near* its melting point for optimal blending and cooking, and *above* its melting point to exit the die. However, changes in recipes and raw material sources can create process challenges for an extruder operator, especially to maintain output consistency.

To maximize extrusion cooking performance, it's vital to predict how the product (a mixed biopolymer) will change at different temperatures and moisture levels under pressure.

This is the Phase Transition Analyzer® (PTA)

It was designed and patented by Wenger to provide data needed to ensure quality and process optimization, even when ingredients or recipes change.

The PTA is a closed-chamber capillary rheometer that measures the transition points (T_g and T_m) of a biopolymer sample as it moves from a glassy state to a flexible semi-solid, to a liquid - at different temperatures and moisture levels.

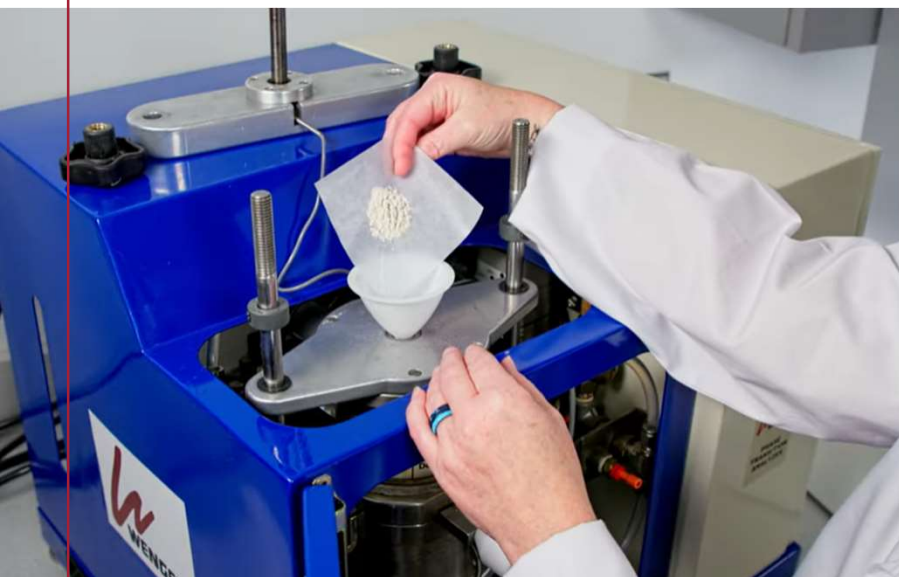


The “controlling” T_g and T_m is the temperature at which a sufficient amount of the sample is softened to allow for particle compaction (T_g) or melted to allow for flow (T_m) through an orifice.

The Phase Transition Analyzer provides data to accurately map the entire extrusion cooking process - from preconditioning, to extrusion, to drying/cooling.

This allows an extruder operator to improve management of moisture and energy inputs during operation.

HOW IT WORKS



The PTA main unit consists of two sealed chambers, separated by an interchangeable capillary die, that prevents sample moisture loss so testing can be at temperatures far exceeding 100°C.

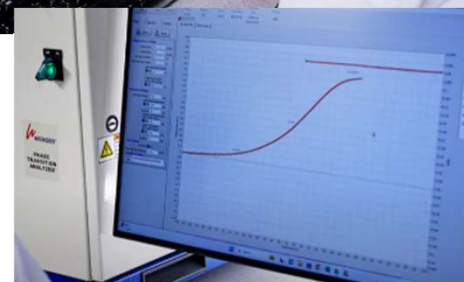
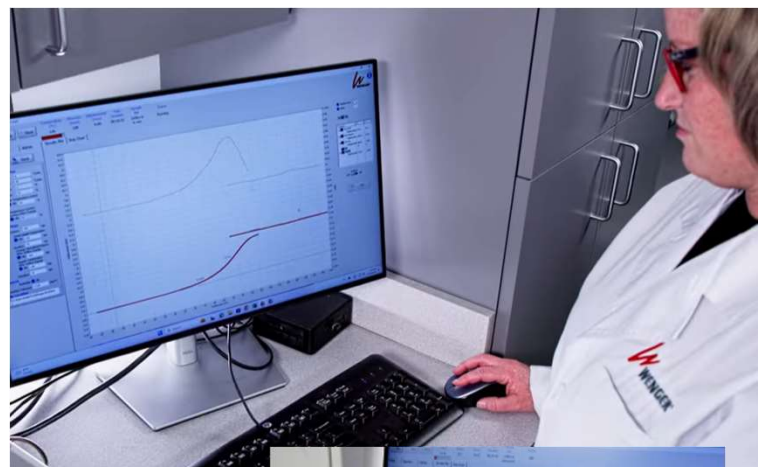
A small sample of product is all that is needed for a successful analysis. The sample is heated at a gradually increasing temperature under fixed pressure.

The sample movement, which is tracked and recorded during testing, is used to determine the controlling T_g and T_m .

Within minutes, the data is recorded and ready to be analyzed. The PTA software creates easy-to-understand charts that display a variety of important information including glass transition, melt transition, and rate of change (compaction).

This data enables an extrusion technologist to accurately map and predict the process for a particular biopolymer – which can be used to improve extruder operation and can also be an aid for troubleshooting the extrusion cooking process.

Post-test clean-up is simple, and the PTA can be ready for another test quickly. This rapid turnaround is especially helpful for high volume operations, and those in which an extruder is producing different & unique products with a variety of ingredients.



FEATURES AND REQUIREMENTS

- Temperature range: 5 – 200°C
- Heating and cooling rates up to 25°C/min
- Pressure measurement and control up to 210 bar
- Software package to measure and record temperature, pressure, and sample movement
- Real time graphical display of data during testing
- Data analysis software to determine T_g and T_m
- CE compliance
- Weight: 45 kg

SYSTEM OVERVIEW

The Phase Transition Analyzer system comes with components needed for efficient installation and immediate use, including:

- Analyzer main unit
- Desktop computer
- PC software
- Monitor

UTILITY REQUIREMENTS

- Compressed air 6 – 8 bar (90 – 115 psi)
- Dedicated circuit:
 - 240V, single phase, 50/60 hz, 10 amp or
 - 120V, 60 hz, 20 amp
- Cooling medium capable of 8 liter/min (2 gal/min) with operating temperature range of 0 – 40°C (32 -104°F)

NOTE: A chilled coolant supply is required to achieve temperatures below room temperature.

Chiller specifications for best performance with the PTA:

Temperature range: -10 to 30°C
Cooling flow requirements: 5 to 8 liters per min. at 4 bar
Cooling capacity: 1000 watt cooling capacity at 20°C



Global Leader in Extrusion Cooking and Drying Systems

Research & Product Development

The Wenger Technical Center is a 50,000 ft² agrifood laboratory with production scale extrusion cooking and drying systems for researching and testing customer product ideas. Located in Sabetha, Kansas USA.



Services and Parts

Wenger has earned a reputation for providing the best service in the industry, including installation, inspections, repairs, upgrades, and training. Wenger replacement parts are manufactured to the same exacting standards as the original.



Equipment Solutions

Twin Screw Extrusion Systems
Single Screw Extrusion Systems
Horizontal Dryers and Coolers
Coating and Enrobing Systems
Automated Controls



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