TORONTECH

HOT TACK TESTER

Hot Tack Tester - ToronHTT™ 1921

Hot Tack and Heat Seal Strength Tester for Flexible Packaging

The ToronHTT™ 1921 is a hot tack tester that measures the hot tack and heat-seal strength of flexible packaging films. The instrument seals a specimen between two heated jaws at a set temperature, pressure, and time, then peels the seal at a servo-controlled speed and records the force. Testing while the seal is hot gives the hot tack; testing after cooling gives the heat-seal strength.

The ToronHTT™ 1921 controls the sealing temperature to 300°C with independent upper and lower jaws, and a servo drive sets the peel speed over 0.5 to 3000 mm/s. A strain-gauge sensor holds the sealing pressure steady, and sealing and cooling times set to the millisecond. Hot tack, peeling, and overlay curves display directly.

Automatic clamps, sample auto-feed, and foot-pedal operation speed repeated tests, and the standard 0-100N force range extends to 500N as an option. The ToronHTT™ 1921 (Hot Tack and Heat Seal Strength Tester) suits flexible-packaging, film, and converting labs that set and verify sealing conditions. Ethernet and USB ports support data handling and traceability.

APPLICATIONS

Hot Tack Tester - ToronHTT™ 1921 Applications

The ToronHTT™ 1921 measures sealing performance wherever a heat seal must form correctly and hold.

- **Form-Fill-Seal Films**: measures hot tack so seals hold product weight before cooling on form-fill-seal lines.
- **Flexible Packaging Films**: measures the heat-seal strength of packaging films and laminates.
- **Sealing Window Development**: maps seal strength against temperature to find the sealing window.

- **Laminates and Coextrusions**: tests multilayer structures with independent upper and lower jaw temperatures.
- **Sealant and Resin Development**: quantifies hot tack and seal strength for sealant formulation.
- **Lidding Films and Trays**: characterizes lidstock sealing to trays and cups.
- **Medical and Food Packaging**: verifies sealing conditions for pouches and sachets.
- **Quality Control**: verifies sealing performance against specification batch to batch.

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ToronHTT™ 1921
Hot Tack Tester
HOT
Test
Data
Settings
Help
New
Open
Save
Print
Report
Language
Load (N)
Temperature (°C)
Displacement (mm)
Test Info
Load
Displacement
Temperature
Dwell Time
Peak Load
Tear Load
Elongation(%)
Elongation at Break(%)
Failure Mode
Start
Stop
Reset
Ready
2024-06-20 10:24:17

Standards

The ToronHTT™ 1921 is designed to align with internationally recognized standards for hot tack and heat-seal strength testing.

- ASTM F1921 - Standard Test Methods for Hot Seal Strength (Hot Tack) of Thermoplastic Polymers and Blends Comprising the Sealing Surfaces of Flexible Webs
- ASTM F2029 - Standard Practice for Making Heat Seals for Determination of Heat Sealability of Flexible Webs as Measured by Seal Strength
- DIN 55571 - Testing of Packaging Materials: Hot-Tack Measurement of Heat-Sealable Webs

FEATURES

Hot Tack Tester - ToronHTT™ 1921 Key Features

The ToronHTT™ 1921 pairs servo-controlled peeling with precise temperature, pressure, and time control for sealing analysis.

- **Hot Tack and Heat-Seal Strength**: measures seal strength both while hot and after cooling on one instrument.
- **Servo-Driven Peeling**: a servo drive sets the peel speed over 0.5 to 3000 mm/s for accurate, repeatable results.
- **Sealing Temperature to 300°C**: independent upper and lower jaw temperatures suit asymmetric structures.
- **Precise Time Control**: sealing and cooling times set from 0.1 s with 10 ms resolution.
- **Strain-Gauge Pressure Control**: a strain-gauge sensor holds the sealing surface pressure steady and consistent.
- **Selectable Force Range**: a 0-100N standard range, with 0-50N, 0-250N, and 0-500N options.
- **Automatic Clamps and Auto-Feed**: air-activated clamps and sample auto-feed speed repeated tests.
- **Direct Curve Display**: hot tack, peeling, and overlay curves display directly for comparison.
- **Touchscreen and Foot Pedal**: a touchscreen and foot pedal give flexible, hands-free operation.

- **Traceable Data**: parameters are quantified, visualized, and traceable, with Ethernet and USB ports.
- **Safety Guards**: guards and safety switches protect the operator during sealing.

THEORY & METHOD

Theory and Method

Hot tack is the strength of a heat seal while it is still hot, before the sealed film has cooled and set. It matters on form-fill-seal lines, where a freshly made seal has to hold the weight of the product before it has time to cool. A weak hot seal can open under that load and spill the contents.

The instrument makes a seal by pressing the film between two heated jaws at a set temperature, pressure, and dwell time. It then peels the seal apart at a controlled speed and records the force. For hot tack, the peel happens immediately, while the seal is still hot; for heat-seal strength, the seal is peeled after it cools.

Running the test across a range of sealing temperatures builds a curve of seal strength against temperature, which shows the sealing window: the temperature range that gives a strong seal without burning or distorting the film. A servo drive sets the peel speed precisely, and independent upper and lower jaw temperatures suit asymmetric structures.

TECHNICAL SPECIFICATIONS

Hot Tack Tester - ToronHTT™ 1921 Technical Specifications

Parameter	Specification
Sealing Temperature	Ambient to 300°C

Parameter	Specification
Temperature Resolution	±0.1°C
Temperature Accuracy	±0.2°C
Sealing Jaws	10 mm × 40 mm standard (5 mm, 15 mm optional)
Sealing Pressure	0.1 to 4.0 N/mm²
Sealing Pressure Sensor	Strain gauge
Sealing Pressure Resolution	0.01 kgf
Sealing Pressure Accuracy	0.09 kgf
Sealing Time	0.1 to 999.9 s (10 ms resolution)
Sealing Time Control	±20 ms
Cooling Time	0.01 to 999.9 s
Hot Tack Force Range	0-100 N standard (0-50 N, 0-250 N, 0-500 N optional)
Hot Tack Force Accuracy	Max 0.01% FS
Peeling Speed	0.5 to 3000 mm/s (servo controlled)
Sample Length	Greater than 300 mm
Sample Width	Less than 40 mm (standard)
Sample Thickness	Less than 1 mm (flexible)
Gas Supply	5 to 8 bar (user-supplied)
Gas Interface	Ø6 mm
Voltage	85-250 VAC, 50/60 Hz

Parameter	Specification
Dimensions	390 mm (L) × 420 mm (D) × 730 mm (H)
Net Weight	79 kg

Standard Delivery

Item	Description
Main Unit	Servo-driven hot tack and heat-seal test instrument
Computer	Dedicated control PC
Foot Pedal	Foot-pedal control for hands-free operation

Optional Accessories

Item	Description
Strip Sample Cutter	Cuts test strips to width (10, 15, 20, 25.4 mm on demand)
Sample Plate	Sample preparation plate
High-Temperature Cloth	Protective cloth for the sealing surface

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