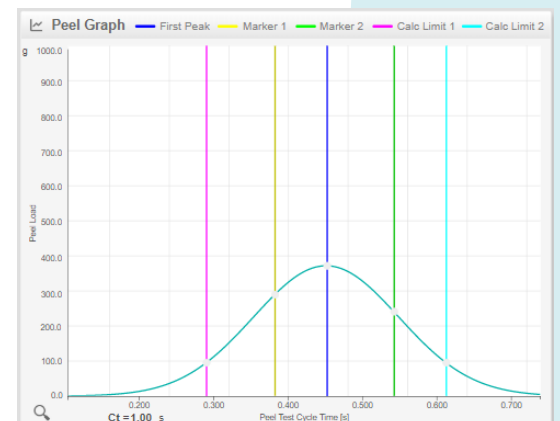


HT-2PC

Automatic Hot Tack Tester

HOT TACK TESTER WITH AUTOMATIC FILM FEEDING AND INDUSTRIAL PC FOR FAST, EASY AND REPEATABLE MEASUREMENT OF HOT TACK SEAL STRENGTH OF PACKAGING FILMS, TO ASTM F1921.



- Automatic film feeding for fast, error free results. Manual feeding when needed.
- Flexibility and data integrity for 200 tests across 20 sealing settings, per study.
- Heat seal/peel graphs & trend graph for peak load & selected variable parameter: Jaw Temperature, Pressure, Dwell, or Cooling Time.
- Easy operation via pre-set 'Parameter Templates' for Single, Replicate and Sequential Tests; simple to set-up, fully automatic and fast results.
- 'Playlist' controls (like a music playlist) automatically advances sealing conditions.
- PLC control of sealing & peeling parameters. Accurate PID temperature, precision load cells for pressure and high speed peel measurement.
- Industrial PC, Windows 10 IoT, USB and Ethernet connectivity. Export, print and create pdf and csv files.



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The HT-2PC Automatic Hot Tack Tester is designed to measure the Hot Tack Seal Strength of flexible packaging materials. It meets the requirements of ASTM F1921 Standard Test Method for Hot Seal Strength (Hot Tack) of Thermoplastic Polymers and blends comprising the sealing surfaces of flexible webs. The HT-2PC can be used with fixed and variable cooling times, for ASTM Methods A & B.

What is Hot Tack Seal Strength?

Hot Tack is the seal strength of a hot heat seal, measured within milliseconds of the heat sealing process.

On automated packaging lines, the hot seals of newly formed packs are subjected to disruptive forces, such as dropping onto a conveyor. These forces act on the hot seal and if there is inadequate resistance they can break open all or part of the seal.

Therefore it is important to measure the amount of force the seal can withstand across a range of cooling times, sealing temperatures, pressures and dwell times.

A heat seal will reach its maximum seal strength after several minutes, sometimes longer. Therefore, measuring strength of cooled seals prepared on a Lab Heat Sealer and tested on a separate Tensile Tester does not correlate with the strength of a hot seal.

Principle of Operation

The HT-2PC Automatic Hot Tack Tester replicates the heat sealing processes employed on automatic packaging lines, combined with a high speed Tensile Tester.

The operator selects a 'Parameter Template' from the library and sets the machine to seal and peel at defined values for temperature, pressure, dwell time, cooling time and peeling speed.

These can be in Single Tests, Replicate Tests, or Sequential Tests. Often Hot Tack is studied by taking tens or hundreds of tests and therefore the software includes a 'Playlist' that controls the settings and advances to the next test.

Once the playlist is started, operation is sequenced automatically. Sample film is pushed into the sealing jaws and is clamped. The hot sealing bars close to the desired pressure, after the dwell time elapses the jaws open, the programmed cooling time elapses and then the sealed film is peeled open at the test speed. Measurements of the seal strength properties are recorded at high speed to ensure transient forces are captured accurately. Results are displayed and saved automatically on the industrial pc for later recall, printed reporting or export to other software. The playlist then progresses to the next test, the film is indexed to the next position and the test sequence starts again.

Automatic testing saves time and reduces potential errors. Sample preparation can be reduced to one long sample, rather than multiple short samples.

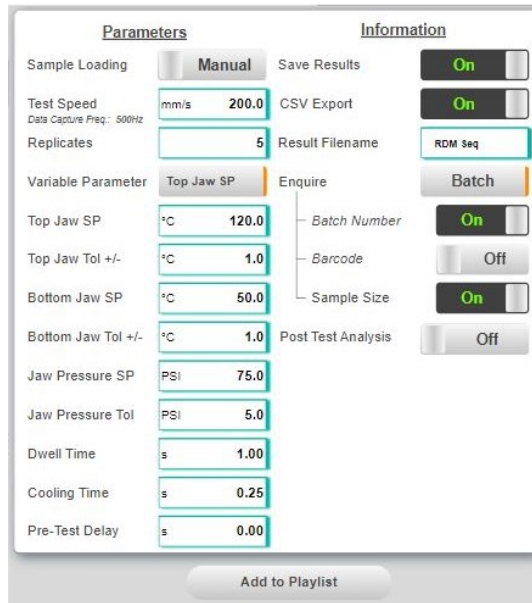


Parameter Templates

Parameter Templates define the required sealing and peeling settings for Single Tests, Replicate Tests, and Sequential Tests.

The PLC automatically controls all parameters within the defined process tolerances. A wide range of settings for each parameter enables testing of many heat sealable materials:

- Sealing temperature for top and lower sealing jaws, set individually.
- Sealing pressure
- Sequence timers for Delay Time, Dwell time, and Cooling Time
- Peeling Speed
- Output Configuration



Film Feeding Blade & Clamps



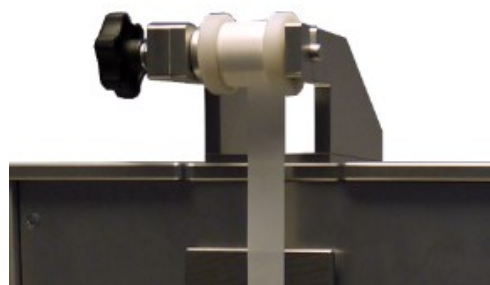
Two sample clamps above and below the Film Feeding Blade are used to hold the sample. In manual loading mode the user controls the clamps and loads a single sample. In automatic mode, the sample clamps are controlled by the PLC after initial loading on to a spool.

The powered Film Feeding Blade located in the front panel mechanically folds and positions the sample film perfectly within the sealing jaws. It withdraws just in time for the sealing jaws to close, and the peel test to start.

Automatic Sample Loading Device

The optional Auto Sample Loading Device is required to use the auto sample loading feature of the instrument. It consists of a spool with clamped end buffers adjustable for widths of sample material 10 to 30mm. Depending on the sample thickness, the spool can hold approx. 10 metres of material.

In Auto Sample Loading mode, between each individual test, the powered lower clamp draws down the next 100mm of sample film into position ready to start the next test.



Precision Sealing Jaws



Interchangeable precision Sealing Jaws locate into heater blocks, making changeover simple.

Precision ground brass sealing jaws 10mm x 40mm, and lower rubber sealing bed are supplied as standard, with optional 5mm x 40mm and 15mm x 40mm. The heater blocks incorporate heating elements and sensors to complete the feedback loop of the PID temperature controller.



Strip Film Sample Cutter



The optional Strip Film Cutter is designed for cutting very long strips of material, used on the Hot Tack Tester.

Two blades are mounted on a spacer block 10mm, 15mm, 25mm, or 1 inch apart. This blade holder is safely mounted within a carriage that is drawn down on guide rods to ensure a perfect cut. The blades are easy to replace when needed. Thin flexible materials can be cut, typically up to 10 metres long.

Heavy Plastic Front Cover

An optional heavy plastic front cover can be mounted to the HT-2PC to give the machine front area greater protection from the surrounding environment.

The hinged front cover includes a magnetic interlock that, when opened, causes the machine to pause at the end of the next cycle.



HT-2PC Touchscreen PC Panel

A high quality full HD TFT 15.6" automation panel is included as standard, to provide all the benefits of PLC automation control, and seamless integration with Windows 10 IoT.

The 1980 x 1080 pixel (16:9) multi-touch projected capacitive display is set up in portrait, and is attached to the machine via a tilting support arm.

The 64 bit system is pre-loaded with the HT-2PC dedicated software, and Windows 10 IoT.



HT-2PC Electronics & Software

The dedicated HT-2PC electronics and software guarantee the precision needed for accurate machine control and repeatable measurements. The electronics respond every 2 milliseconds ensuring accuracy of all machine parameters such as position, force, temperature, pressure and process timers.

The HMI display software is designed in a 'Dashboard' view, minimising navigation and clicks within a single window where the user can quickly become familiar with the machine operation.

Supervisor users gain deeper access to machine global settings, default units/ results and calibration data.

Result data is handled efficiently, for example, a heat seal trend graph is automatically populated, individual and batch data printed or exported in formatted csv, templated pdf and stored locally or over a network.

The designers truly appreciate that a Hot Tack Tester is often used periodically, and therefore fast and confident familiarisation is critical to user acceptance. The machine is suitable for use by any person involved in testing, in production, quality control and R&D.

HT-2PC Software Features

User Interface:

Graphical user interface operated from one main 'Dashboard' screen.

Touchscreen with optional use of keyboard and mouse.

15" tilting panel PC with Intel Atom CPU.

Comprehensive user access control for Engineer, Supervisor and Operator users.

Set Up:

Parameter templates for Single, Replicate, and Sequential tests.

Save user defined parameter templates for later recall & re-use.

Define a variable parameter within a test series.

Add custom fields for traceability, e.g. batch number.

Choose results to be viewed in results table.

Measuring:

Each series of tests saves to a single file, for a series of measurements.

Variable parameter (temperature, pressure, time) per file.

Exclusion of invalid measurements, Supervisor limited deletion

Playlist of tests runs automatically.

Rearrange, add or delete tests from playlist during measuring.

Analysis:

Tabular view of measurement results.

View included and/or excluded results

User definable columns in tabular view

Import/Export/Reports:

Export to Microsoft Excel® as .csv

Export reports to pdf

Print selected items as individual or batch reports and/or create pdf

Print preview, with graph zoom and pan.



Specification

Sealing specification:

- Sealing Jaws: 2 x brass sealing jaws mounted within heater blocks with sensors and heaters
- Sealing Jaws: 10 x 40mm standard (5mm and 15mm optional)
- Sample width: max 30mm allowing 5mm each side
- Sample thickness max 1mm (material must be flexible to fold)
- Sealing dwell time: 0.01 to 99.99s
- Sealing temperature: ambient to 350°C depending on sealing jaws
- Sealing pressure: 0.1 to 3.0 N/mm²
- Sealing pressure sensor: Strain gauge
- Sealing temperature control: electronic PID

Peeling specification:

- Cooling time: 0.01 to 99.9sec
- Peeling speed: 21 to 750mm/s
- Peeling by vertically moving lower sample clamp
- Peel control: electric servo motor
- Sample length: min 300mm

Hot tack force measurement:

- Measurement range: 0 to 100N
- Sampling speed: max 500Hz depending on peel speed
- Number of readings: 2000 per measurement
- Sensor: strain gauge force transducer

Testing Mechanics:

- Sample clamps: 2 auto air activated
- Sample folding blade: auto motor controlled

Software:

- Microsoft Windows®10 IoT preloaded on touchscreen pc
- Setting, storing and recalling of test parameters
- Storing, recalling and reporting of measured results

Reporting:

- Measurement trend graphs: hot tack force vs temperature, pressure, dwell time, and cooling time. Peak Load vs time.
- Data Table: measured results, traceability data, date & time, variable parameter

Outputs:

- USB and Ethernet connections

Connections:

- Power: 85 to 250VAC, 50/60Hz 180VA
- Air supply: 6 to 8 bar clean dry compressed air

Physical:

- Weight: 60kg
- Size: 430W x 430D x 700H mm

Design:

- Meets international standards including; ASTM F1921, DIN 55571

