



TORONTECH

GRADIENT HEAT SEAL TESTER



Gradient Heat Seal Tester - ToronHST™ G

Heat Seal Gradient Tester with Six Independent Temperature Zones

The ToronHST™ G is a gradient heat seal tester that makes seals at several temperatures at once to map the heat sealability of a film. Five upper jaws, each with independent temperature control, press against a common lower jaw, so one operation produces five seals at five set temperatures. This finds the optimum sealing temperature quickly.

The ToronHST™ G seals over a room-temperature to 300°C range with $\pm 0.2^\circ\text{C}$ accuracy, at a set pressure of 0.05 to 0.6 MPa and a dwell time of 0.1 to 999.9 seconds. Because pressure and time stay fixed across the five jaws, temperature is the only variable, which gives a clean sealing-window comparison. A touchscreen sets each jaw.

Once made, the seals are peeled on a tensile tester to read strength against temperature. Safety features include an emergency stop, over-temperature and over-pressure protection, and a burn guard, and the unit runs silently with no cooling fan. The ToronHST™ G (Heat Seal Gradient Tester) suits R&D and packaging-development labs that optimize sealing conditions.

APPLICATIONS

Gradient Heat Seal Tester - ToronHST™ G Applications

The ToronHST™ G optimizes sealing conditions wherever the sealing temperature window drives packaging performance.

- **Sealing Window Optimization:** finds the temperature range that gives a strong seal in a single gradient run.
- **Optimum Temperature Determination:** pinpoints the best sealing temperature for a film quickly.
- **Film and Sealant Development:** qualifies new films and sealant layers across a temperature profile.

- **Laminates and Coextrusions:** characterizes the sealing behavior of multilayer structures.
- **Food and Pharmaceutical Packaging:** sets sealing conditions for food and drug packaging films.
- **R&D Seal Studies:** speeds seal development by testing five temperatures at once.
- **Process Setup and Transfer:** builds a sealing recipe to transfer to production lines.
- **Quality Control:** verifies sealing behavior against specification across a temperature range.



Standards

The ToronHST™ G is designed to align with the internationally recognized practice for making heat seals to evaluate heat sealability.

- ASTM F2029 - Standard Practice for Making Heat Seals for Determination of Heat Sealability of Flexible Webs as Measured by Seal Strength

Sealing conditions depend on the film and the application, so the temperature range, pressure, and dwell time can be set to a laboratory's chosen protocol.

FEATURES

Gradient Heat Seal Tester - ToronHST™ G Key Features

The ToronHST™ G makes five seals at five temperatures in a single press for fast sealing-window mapping.

- **Five-Temperature Gradient:** five independently heated upper jaws make five seals at five temperatures in one operation.
- **Six Temperature Controllers:** six independent controllers cover the five upper gradient jaws plus the lower jaw.
- **Single-Variable Comparison:** fixed pressure and dwell time across all jaws leave temperature as the only variable.
- **Sealing Temperature to 300°C:** a wide temperature range with $\pm 0.2^{\circ}\text{C}$ accuracy covers most sealant films.
- **Adjustable Pressure:** a 0.05 to 0.6 MPa sealing pressure range, set easily for the material.
- **Precise Dwell Time:** a dwell time of 0.1 to 999.9 seconds, set on the touchscreen.
- **Touchscreen Control:** each jaw temperature, plus pressure and time, are set on a color TFT touchscreen.
- **Built-In Micro-Printer:** prints the sealing parameters for each run.
- **Safety Design:** an emergency stop, over-temperature and over-pressure protection, and a burn guard protect the operator.

- **Quiet Operation:** the sealer runs silently with no cooling fan.
- **RS232 Communication:** a serial port connects the instrument to a PC.
- **Laboratory Data Management Integration:** optional lab data management software centralizes records.

THEORY & METHOD

Theory and Method

Finding the best sealing temperature for a film usually means making one seal, testing it, changing the temperature, and repeating. A gradient heat sealer collapses that into a single step. It carries several heated jaws, each set to its own temperature, so one press makes several seals at several temperatures at the same time.

The five upper jaws each hold an independent temperature and press together against a common lower jaw. A strip of film passed under them takes five seals in one operation, each made at a different set temperature but the same pressure and dwell time. The seals are then peeled to read strength against temperature.

Plotting seal strength against temperature reveals the sealing window: the range that gives a strong seal without burning or distorting the film. Because all five seals are made in one pass under identical pressure and time, the temperature is the only variable, which makes the comparison clean. This finds the optimum sealing temperature far faster than one seal at a time.

TECHNICAL SPECIFICATIONS

Gradient Heat Seal Tester - ToronHST™ G Technical Specifications

Parameter	Specification
Heat Temperature	Room temperature +6 to 300°C
Temperature Accuracy	±0.2°C
Dwell Time	0.1 to 999.9 s
Heat Pressure	0.05 to 0.6 MPa (standard)
Upper Heat Jaws	5, independently controlled
Lower Heat Jaw	1, independently controlled
Upper Jaw Heat Surface	(40 mm × 10 mm) × 5
Upper Jaw Surface	Smooth plane (standard)
Gas Source Pressure	0.05 to 1.1 MPa (user-supplied)
Gas Source Interface	Ø6 mm
Dimensions	570 mm (L) × 500 mm (W) × 470 mm (H)
Voltage	AC 220 V, 50 Hz (110V is also available)
Net Weight	63 kg

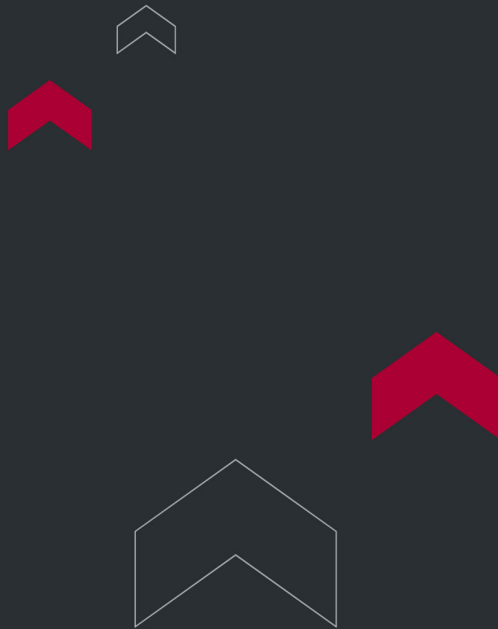
Standard Delivery

Item	Description
Main Unit	Five-zone gradient heat sealer with touchscreen
Micro-Printer	Built-in printer for sealing parameters
Foot Pedal	Foot-pedal control for hands-free sealing

Item	Description
Sample Feeding Rod	Guides the film into the jaws

Optional Accessories

Item	Description
Communication Cable	Connects the instrument to a PC
Laboratory Data Management System	Centralized data management and reporting software



Torontech Inc.

251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada 🇨🇦

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC

601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA 🇺🇸

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE

Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE 🇦🇪

Phone: +971 488 19252
Email: me@torontech.com

