Melting Point Apparatus

OptiMelt — Automated melting point system



- Completely automated operation
- PID-controlled temperature ramping
- Digital movie of each melt
- Stand-alone operation and computer control (USB)
- Conforms to Pharmacopeia and GLP
- Printer output

- OptiMelt (MPA100) ...

OptiMelt

OptiMelt provides a fast and accurate means of automatically determining the melting points and melting ranges of chemical substances. Up to three samples can be analyzed simultaneously. A wide observation window, with an illuminated magnification lens, allows users to observe the samples at all times. A small aluminum heating block is kept under tight computer temperature control, providing extremely linear temperature ramping. A precision Pt RTD sensor provides fast and accurate temperature readings from room temperature to 400 °C with 0.1 °C resolution.

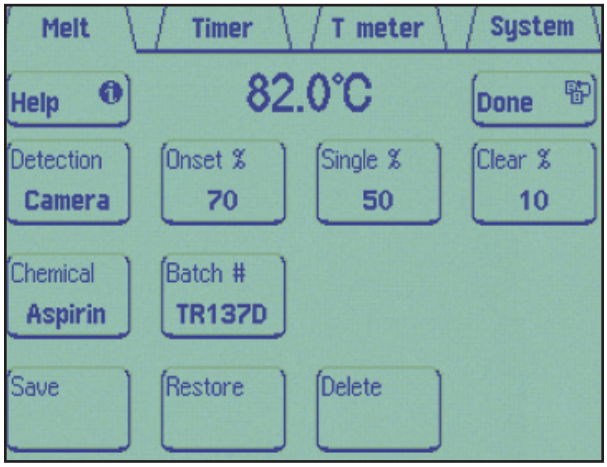
Automated Measurements

OptiMelt is specifically designed for unattended operation. It has a built-in digital camera that continuously captures real-time images of the samples, and it uses digital image processing to determine results. The melting points and melting ranges are prominently displayed on the front panel and automatically recorded into memory for later review.

OptiMelt provides a dramatic improvement over instruments that rely on optical absorption or reflection techniques. OptiMelt's high-resolution camera can easily detect minute changes in the optical characteristics of the samples, eliminating the need for an operator to be present.

Simple Operation

OptiMelt has an intuitive front panel and is very easy to use. You simply select the start temperature, ramp rate, stop

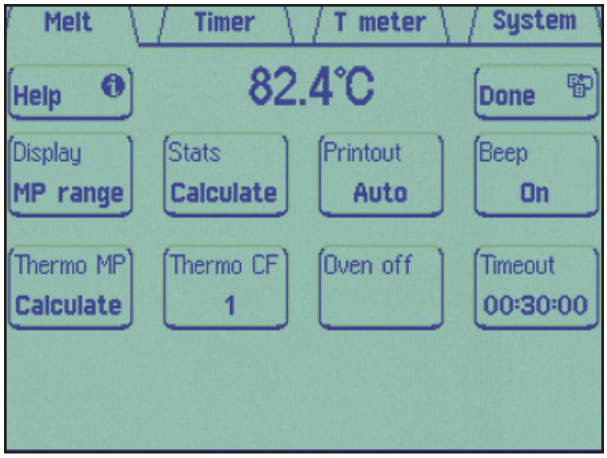


Setup menu

temperature, and hit start. Results can be easily seen from across the lab on the large LCD display.

Distinct beeps and bright, front-panel LEDs announce important events like temperature stabilization or end of melt. Two separate glass holders, located on top of the instrument, are available to store empty or discarded capillary tubes.

Four, nearly indestructible, white-light LEDs provide constant illumination of the sample chamber. Samples can be viewed on the front panel through a removable magnification lens.



Option menu

During a measurement, you can flag relevant events by pressing dedicated front-panel buttons. Up to six individual temperatures can be tagged for each sample.

Interactive help is available for all functions and parameters of the instrument. Text and numerical entry keypads are built into the touchscreen interface so that no external keyboard is required.

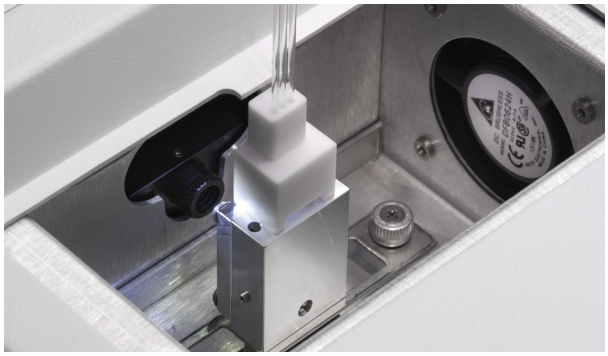
Accurate Results

OptiMelt uses a platinum RTD sensor and makes temperature measurements to 400 °C with 0.1 °C resolution.

The instrument is easily calibrated in the field against certified reference standards and complies with modern Pharmacopeia protocols. The instrument remembers the date of the last calibration which is included in all reports.

Fast Measurements

The aluminum oven design, along with microprocessor-controlled temperature ramping, provides fast and repeatable warm-up and cool-down cycling. Programmable ramp rates from 0.1 °C/min to 20 °C/min, in 0.1 °C/min increments, provide measurement flexibility.

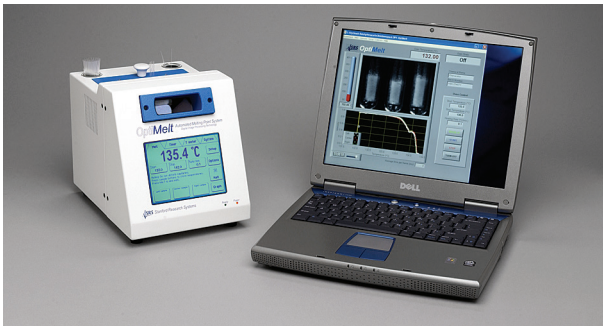


The heating chamber consists of a removable aluminum block. Its small size ensures excellent sample-to-sample reproducibility and minimizes thermal lag between the thermometer and samples.

The ability to rapidly preheat the oven to a temperature slightly below the expected melting point minimizes analysis time.

Data Logging

OptiMelt meets modern GLP requirements for melting point determinations. Up to 24 different analysis methods can be stored in memory. Eight complete melting point reports can also be saved. Records can displayed on the front panel, printed, or transferred to a PC via USB. Printouts include technician identification and space for a signature.



MeltView Software

The MeltView software allows you to display live, high-resolution images of your samples during analysis.

The three screen-captured images below were collected during a typical melt. Figure 1 shows the unmelted solid samples, figure 2 reveals the meniscus point, and figure 3 corresponds to the end of the melt (clear point). Stored images may be recalled at any time, and can be played back frame-by-frame or as a movie.

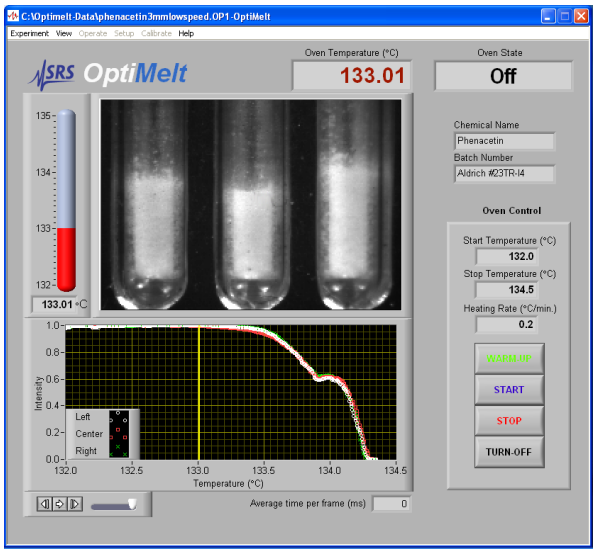


Figure 1 — Solid samples

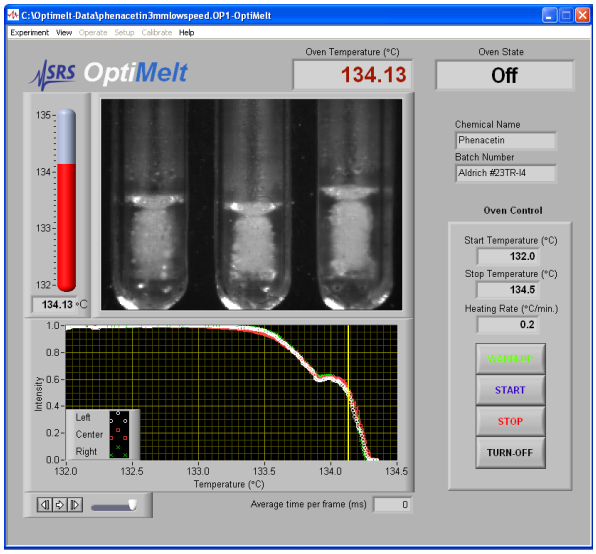


Figure 2 — Meniscus point

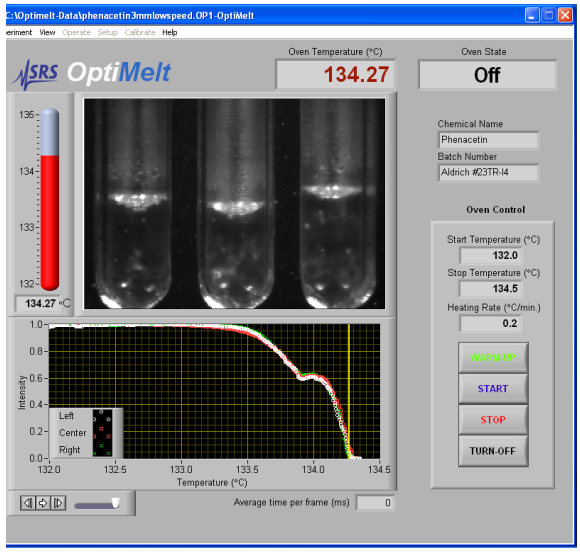


Figure 3 — Clear point

Thermometer Input and Timers

OptiMelt is the only melting point apparatus that can also be used as a general-purpose digital thermometer and timer. Between melting point determinations, OptiMelt may be used with a Pt RTD to measure and log temperatures around the lab. Three built-in timers are also available to keep track of timed events during experiments.

Digital Image Processing

The OptiMelt system is unique among melting point analyzers. It has a built-in digital camera to capture real-time images of the samples. It then uses digital image processing to determine phase transitions in the samples.

The unattended melting points and melting point ranges determined by OptiMelt closely match visual results. OptiMelt's digital image processing algorithm provides a dramatic improvement over optical absorption or reflection techniques.



MPA100 Specifications

Operation

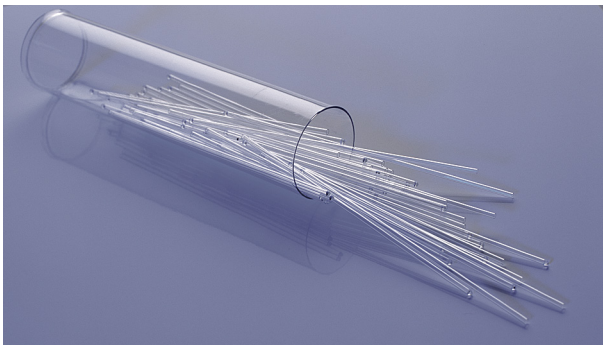
Temperature display	Melting point and melting point range
Start temp. range	(Ambient + 10 °C) to 396 °C, 0 °C minimum set point
Stop temp. range	(Start temperature + 4 °C) to 400 °C
Temperature resolution	0.1 °C
Ramp rate	0.1 °C to 20 °C per minute (0.1 °C increments)
Heat-up time	~10 minutes (50 °C to 350 °C)
Cool-down time	~10 minutes (350 °C to 50 °C)
Temperature accuracy	±0.3 °C (up to 100 °C) ±0.5 °C (up to 250 °C) ±0.8 °C (up to 400 °C)
Reproducibility	0.2 °C
Temperature sensor	Pt RTD (built-in)
Oven control	Closed-loop PID

General

Display	Back-lit, touchscreen LCD (5.8")
Printer interface	RS-232 serial port. Supports Epson compatible dot-matrix printers.
Computer interface	USB. All instrument functions can be queried and controlled through a high-level command set.
MeltView software	Windows compatible (USB port)
Capillaries	
Dimensions	1.4 mm to 2.0 mm outside dia., 100 mm length
Capacity	Up to 3 tubes simultaneously
Fill height	2 mm to 3 mm
Ext. RTD input	100 Ω Pt RTD, α = 0.00385 Ω/Ω/°C
Power	90 to 264 VAC, 47 to 63 Hz, 125 W
Operating temperature	0 °C to 40 °C, non-condensing
Weight	9 lbs.
Dimensions	7.5" × 10" × 8.5" (WHD)
Warranty	One year parts and labor on defects in materials and workmanship



OptiMelt rear panel



Option O100MPC capillaries



Option O100P printer

Ordering Information

OptiMelt (MPA100)	Melting point apparatus with USB port and MeltView software
O100P	Printer with cable and paper
O100MPC	Capillaries (300 pcs.)
O100MPS	Melting point standards