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HANATEK MFI
MELT FLOW INDEXER

Melt Flow Indexer (MFI)

- Precise Measurement
- Fully Automated
- Operator Safe

What is a melt flow test?



A melt flow test measures the melt mass flow rate (MFR) and melt volume flow rate (MVR) of a molten polymer under standardised load and temperature conditions.

The two most important standards are the European ISO 1133 and American ASTM D1238. MFR is also referred to as melt flow index, or MFI.

MFR provides an efficient way of indicating the viscosity of a polymer in the melt phase and also serves as a recognised and well established quality control parameter; most polymers are described by their MFR and this often forms the basis of a suppliers certificate of conformity. A high MFR value indicates a low viscosity and conversely, a low MFR, a high viscosity. By implication, MFR is also indicative of average molecular weight (Mw); low MFR equates to high Mw and high MFR, low Mw.

The MFR value gives a value to the polymer's ability to be processed. MFR is a fast and reliable test which can be implemented on the shop-floor with minimal training.

The Hanatek MFR has been designed to meet both standards and provide the most accurate values by virtue of its sophisticated temperature control.



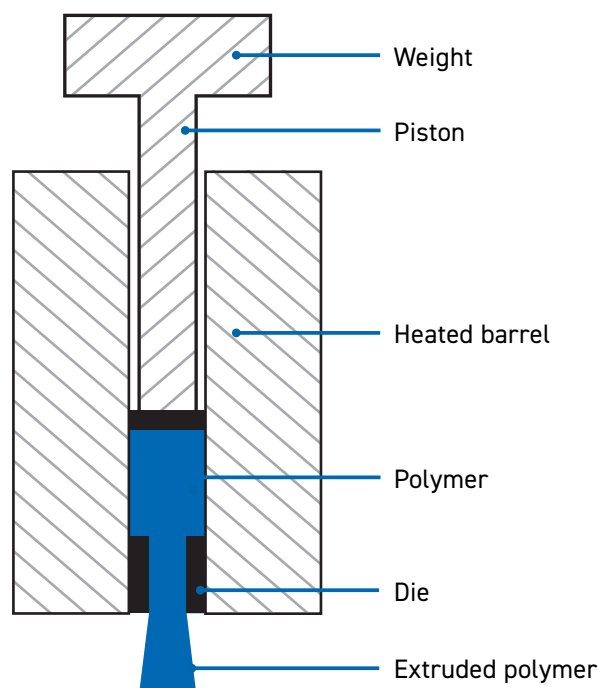
Why measure melt flow?

Understanding melt flow is a key indicator for producers, processors and converters of plastic materials as it dictates the temperatures and pressures required to manufacture consistent quality products.

How to calculate Melt Flow Rate

Testing is performed using a melt flow indexer in accordance to either ASTM D1238 (Melt Flow Rates of Thermoplastics by Extrusion Plastometer) or ISO 1133 (Determination of the Melt Mass-Flow Rate and Melt Volume Flow Rate of Thermoplastics).

The instrument consists of a temperature-controlled cylindrical annulus through which a polymer melt is forced to flow through a die of specific length and diameter using a piston actuated by a standard weight. The weight of melt in grams flowing through the capillary in 10 minutes is the MFI of the polymer.



Standards:
ASTM D1238
ISO 1133

Precise measurement

The Hanatek MFI measures a number of parameters to ensure accurate results.

MFI Test Types

Parameter	Description
MFI/Melt Flow Rate (MFR)	The speed in which a molten polymer flows through an orifice of a given dimension over a certain time
Melt Volume Rate (MVR)	How quickly a material melts
Melt Density	Melt Density is a measurement provided by dividing the mass from the MFR test by the volume from the MVR test
Shear Stress/Rate	Shear rate is the rate at which a fluid is sheared or “worked” during flow
Melt Viscosity	Melt Viscosity measures the extrusion rate of thermoplastic materials through an orifice at a prescribed temperature and load. It provides a means of measuring the flow of a melted material which can be used to evaluate the consistency of materials

Features

Tri-Zone barrel heating and control

Stable and accurate temperature is maintained across the entire barrel length ensuring exact compliance to all international standards.

Accurate results

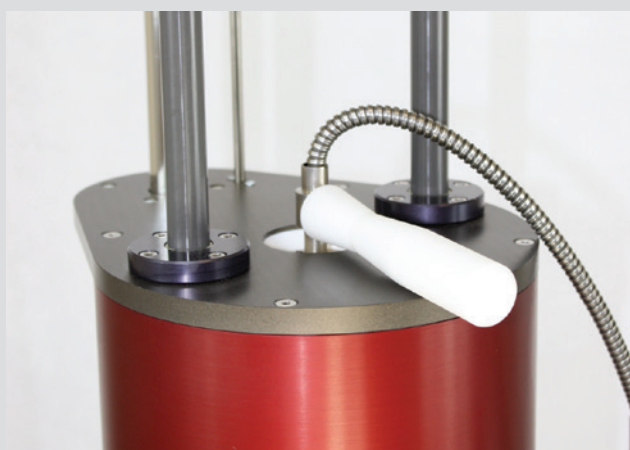
The piston travel sensor accurately reports the flow rate of the polymer throughout the test.

Temperature monitor and control

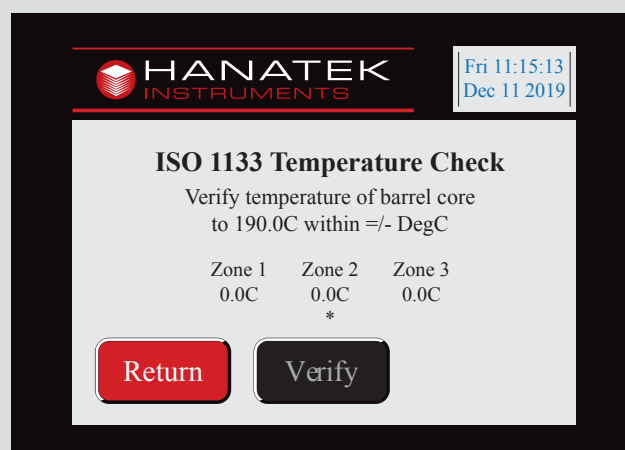
The included barrel temperature monitor ensures that every test is made to exact temperature specifications. Deviations in measurement can be quickly identified and fine tuning of the barrel can be actioned.

Why is this important?

Almost 80% of MFI in current use have temperature variations of up to 20C across the barrel*, leading to inaccurate test results and potential raw material failures.



*Source Hanatek calibration survey 2010



Repeatable measurement and easy to use

Fully automated

Automatic Testing

With automatic weight control and displacement sensors every test is fully motorised; no user intervention is required to start tests or monitor conditioning times.

Automatic Calculation

Touch screen control with preloaded test routines for MFI / MFR / MVR / melt density / shear rate / stress / melt viscosity / spread values.

Results are automatically calculated for each polymer type, eliminating the chance of human error.

User Changeable Barrel Core

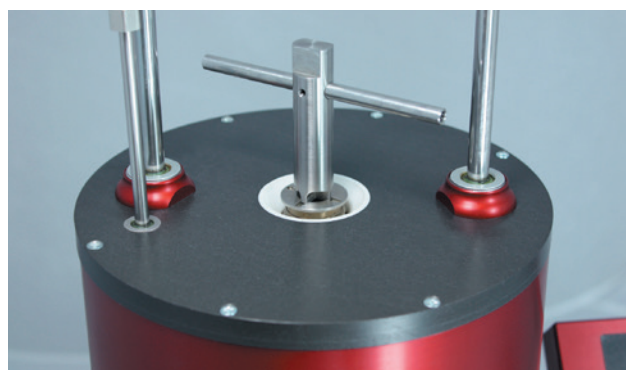
This feature eliminates the high cost and inconvenience of an offsite repair due to barrel damage.

A replacement barrel can be fitted to the Hanatek MFI at any time to ensure instrument fully complies to international standards.

User certifiable

UKAS Certified Calibration Kit

The Hanatek MFI can be annually serviced by the user whilst maintaining full UKAS/ISO 17025 certification, eliminating the cost of an onsite calibration service or return to manufacturer calibration.



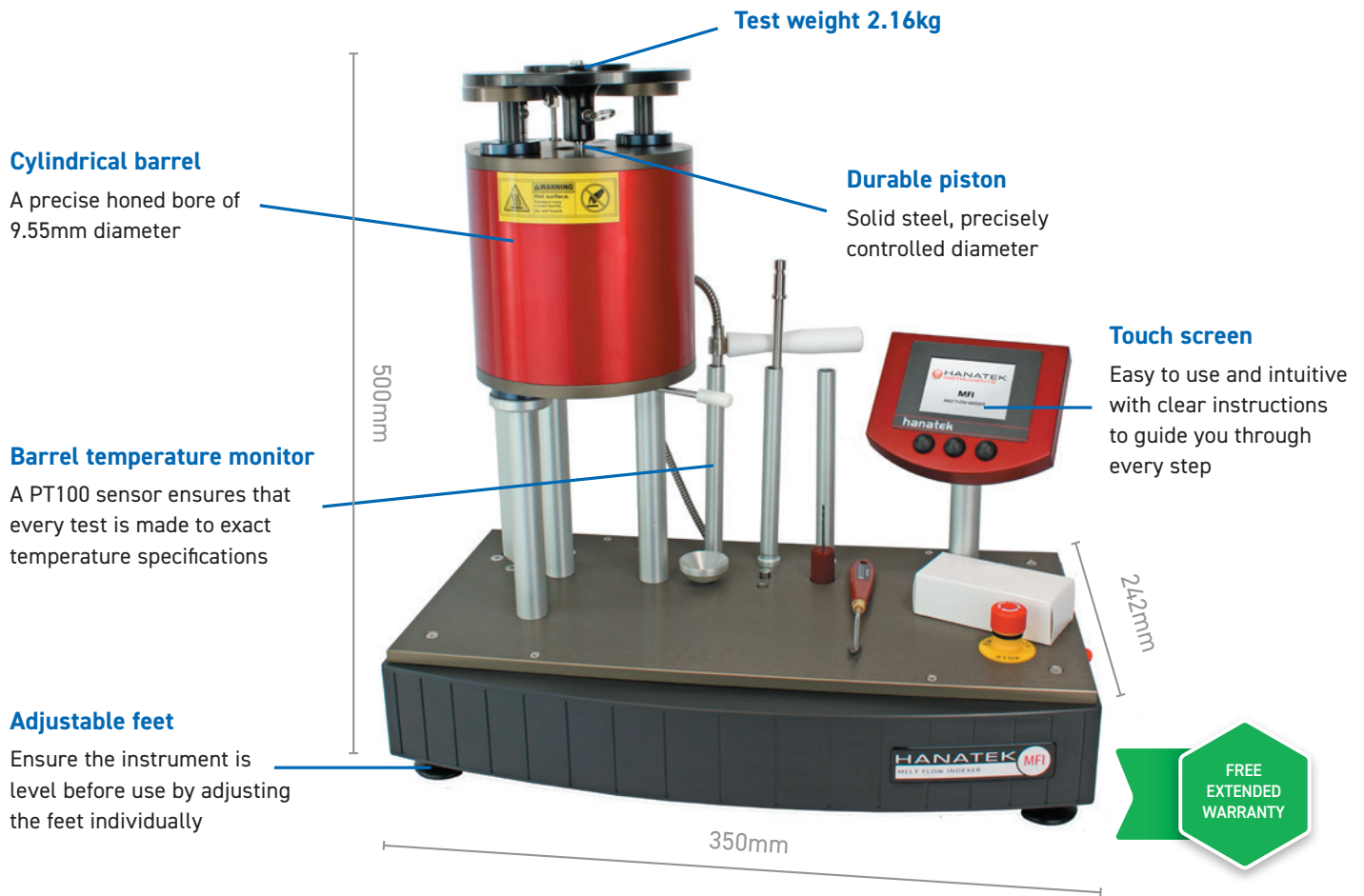
Operator safe

Automatic Cleaning Cycle

An automated cleaning process minimises the risk of contact with hot apparatus whilst completely eliminating the risk of RSI.



Features & Applications



Barrel temperature monitor

External probe verifies the temperature of the barrel prior to test



Printer available

A time and date stamped self adhesive label that can be attached to the job sheet



Accurate results

Total barrel length to be controlled to $\pm 0.2^{\circ}\text{C}$



Insulated barrel

The barrel is fully insulated minimising heat transfer from barrel to casing



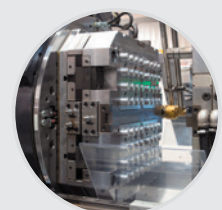
Resin production



Extrusions



Film manufacturing



Injection moulding

Accessories

The package includes:



Temperature probe



Piston



Barrel core



Filling funnel



Palette knife



Die



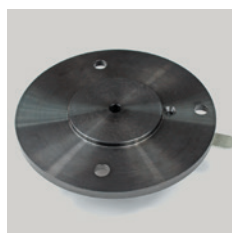
Die cleaning tool



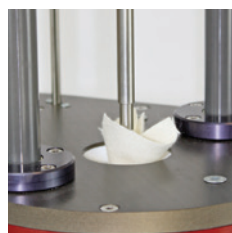
Die retainer



Cleaning probe



2.16kg weight

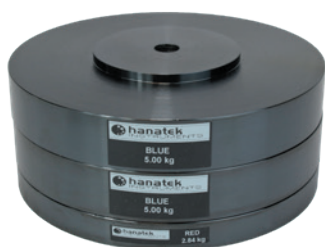


Cleaning patches



Heat resistant gloves

Optional accessories:



Test weights
range: 5 – 21.6kg



Results printer



UKAS Certified re-calibration kit:

- Barrel core
- Barrel changing tool
- Die (2.095mm diameter)
- Temperature calibration probe
- Calibration activation code
- Piston



Calibrated Accessories and Calibration Kits supplied by Rhopoint Metrology Limited (Calibration Laboratory No. 0720) and traceable to UKAS

Specifications

Instrument	Specification
Standards	ISO 1133, ASTM D1238 (Part A, B & C), BS 2782
Range	40°C - 400°C
Resolution	0.1°C
Accuracy	0.2°C
Power	120V 50Hz / 230V 60Hz
Weight	14kg
Dimensions	500mm (H) x 350mm (W) x 242mm (D)
Packed weight	34kg
Packed dimensions	870mm (H) x 670mm (W) x 420mm (D)
Commodity code	9026 1029

Temperature probe	Specification
Measurement	3 x PT100 Sensors
Range	0°C - 500°C
Accuracy	0.1°C
Calibration	UKAS / ISO 17025

Order code	
MFI 240V	HAN-A4050MFI
MFI 115V	HAN-A4050MFI/115V

Free extended 2 year warranty: Requires registration at www.rhopointinstruments.com/instrument-registration within 28 days of purchase. Without registration, 1 year standard warranty applies.

Calibration & Services: Fast and economical service via our global network of accredited calibration and service centres. Please visit www.rhopointinstruments.com/support for detailed information.

Factory Sample Evaluation

Send in your material and we will prepare your samples according to the test required and return for your evaluation

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