RHOPOINT INSTRUMENTS

RHOPOINT AMERICAS


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HANATEK MFI
MELT FLOW INDEXER

## Melt Flow Indexer (MFI)

- Precise Measurement
- Fully Automated
- Operator Safe

Manufactured by Rhopoint Instruments in the United Kingdom

# 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.

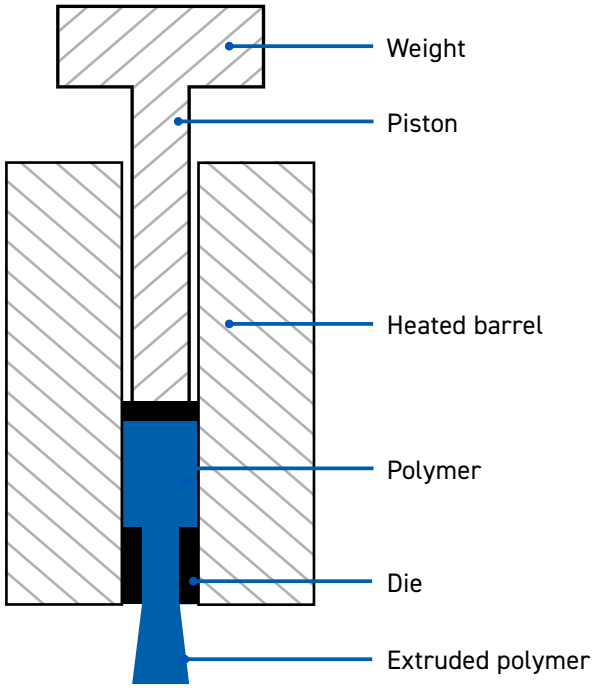
# Why measure melt flow?

**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

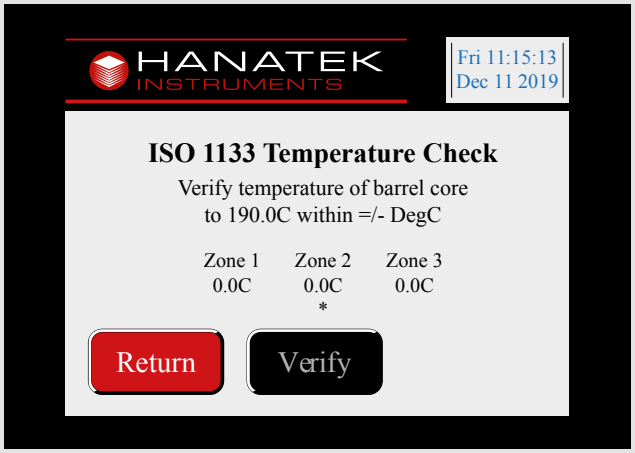
The piston travel sensor accurately reports the flow rate of the polymer throughout the test.

#### 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

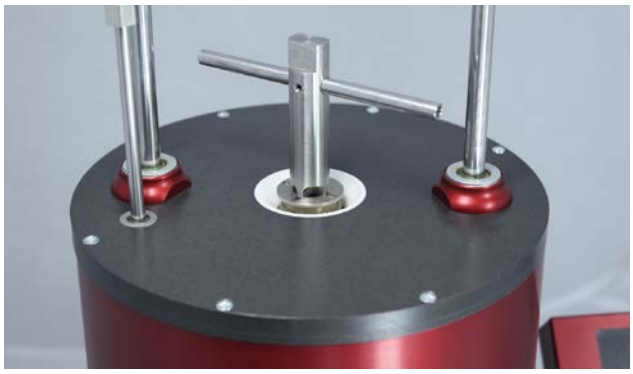
# Repeatable measurement and easy to use

## 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, elimination 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


**Cylindrical barrel**

A precise honed bore of 9.55mm diameter

**Durable piston**

Solid steel, precisely controlled diameter

**Touch screen**

Easy to use and intuitive with clear instructions to guide you through every step

**Barrel temperature monitor**

A PT100 sensor ensures that every test is made to exact temperature specifications

**Adjustable feet**

Ensure the instrument is level before use by adjusting the feet individually

FREE EXTENDED WARRANTY

### 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 ±0.2°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**

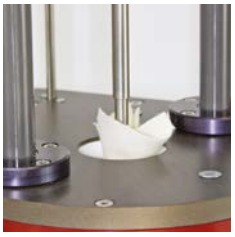
**Die**

**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

ilac-MRA UKAS CALIBRATION 0720

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 within 28 days of purchase. Without registration, 1 year standard warranty applies.

**Calibration and service:** Fast and economical service via our global network of accredited calibration and service centres. Please visit www.rhopointinstruments.com 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

Ready to receive a quote? **Click here**

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