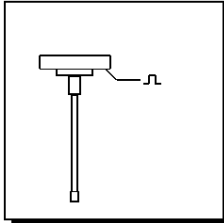


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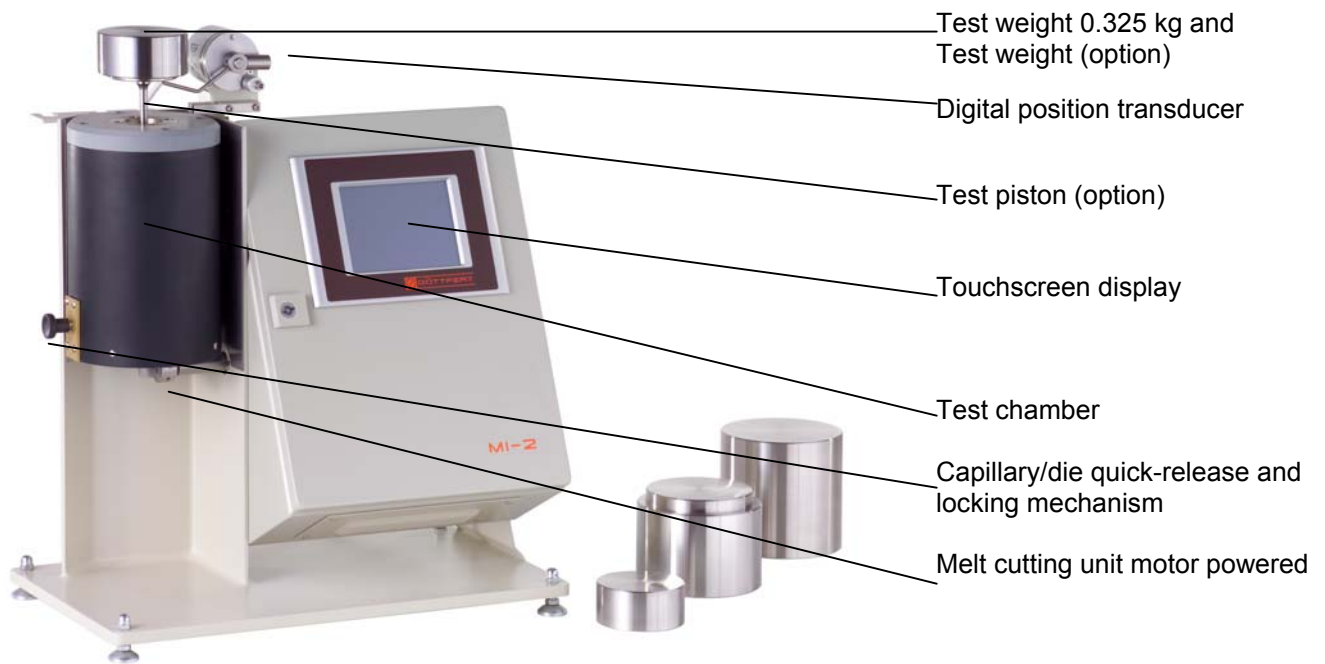


## MI-2 Melt Flow Indexer

**This unique melt indexer can carry out a single weight test according to ISO 1133 and ASTM D1238, procedures B, as well as ISO 1133 and ASTM D1238 Procedure C for the “Half Height / Half Diameter” standard.**

**The Melt Indexer MI-2 has the following features:**

- Brilliant 5.7“ Color-QVGA Touch screen display for the operation, program control and display of the measurement results
- Two heater elements / zones, resolution 0.01°C
- 5 Calibration settings for set temperatures with dedicated parameter files
- High-resolution position transducer to measure volume output
- High-precision timer with a resolution better than 0.001 s
- Built-in USB-connection (Data Stick) for data back-up
- USB printer port
- Serial connection to communicate with the MFR Host software or the optional scale
- Ethernet-connection (LAN, WEB-Server)
- Integrated Web-Server
- Electrically heated test chamber with easily exchangeable test channel and die quick closure
- Capillary/die quick-release and locking mechanism
- Base weight 0.325 kg, Test weights from 1.000 kg and 21.600 kg (option)
- Electric weight handling system (option)
- Manual or automated melt cutting unit (option)
- Die plug (option)
- Nitrogen purge (option)



Picture: Total view of MI-2

The Melt Indexer consists of the following components:

### **Housing**

Sturdy frame on 4 feet. The feet are adjustable in height to facilitate leveling of the equipment.

### **Test chamber**

The insulated test chamber is heated with two heating zones and is easily accessible from top and below for cleaning.

### **Test channel**

Diameter 9.55 mm.

### **Die**

Standard-die, 2,095 mm diameter, 8 mm length, is constructed from tungsten carbide and has a serial number engraved.

### **Die quick release and locking mechanism**

The die is held and released by a quick-locking mechanism to allow easy cleaning of the test channel and die.

### **Test weight 0.325 kg**

This test weight is affixed atop the ISO or ASTM specified piston. The assembly has a total weight of 0.325 kg.

### **Digital position transducer**

High-resolution digital encoder to measure volume output.

### **Color-QVGA-Touch screen**

For the input of parameters, for program control and for the display of results.

### **Compact I/O-Module**

For control and to receive input signals.

### **Temperature controller**

The temperature is controlled by two microprocessors for the 2 heater zones in the test chamber. The temperature setpoint entry is made via push buttons on the temperature controllers. The actual temperature values are displayed to 0.1°C resolution.

### **USB Connections (USB 1.1)**

1. to connect to a printer (port 2). Suitable printers, please see options.
2. to communicate with a PC, or to connect to a data stick for data back-up in ASCII-Format.

### **Ethernet-connection**

LAN connection and communication with HOST software via TCP/IP, FTP, or Web-Server

### **Serial Connection**

Connection to a scale or PC. The HOST software program is available as an option (see separate product description).

## **Technical Data**

Test chamber:	Two heater circuits, electrically heated, Temperature transducer PT 100 1/3 DIN Temperature deviation over time: less than $\pm 0.2$ °C Spatial temperature distribution over the used barrel range: $\leq \pm 0.2$ °C of operating temperature ( 60 to 400 °C) $\leq \pm 0.3$ °C of operating temperature ( >400 with 500 °C - option)
Temperature controller:	Two controllers regulate two independent heater elements / zones
Temperature input:	At touch screen from 60.0 ... 400.0 °C (Extended range to 500.0 °C see options)
Display of temperature:	000.00 – 500.00 °C on Touch screen Display

Temperature Acquisition:	via 16 Bit converter. Temperature resolution from 0 to 320°C: 0.01°C, from 320 to 500°C: 0.1°C
Test barrel:	9.555 - 0.01 mm diameter
Die:	2.095 ± 0.003 mm diameter, 8 ± 0,025 mm length Material: tungsten carbide
Die ASTM D1238 Method C:	1.048 ± 0.005 mm diameter, 3,985 ± 0,025 mm length (Option) Material: tungsten carbide
Weights:	1.200 kg (Option 1.000kg or 1.050 kg ; 12.5 kg / 15.000) 2.16 kg / 3.8 kg / 5.0 kg / 10.0 kg / kg / 21.6 kg Tolerance ± 0.5 %
Weights:	1.200 kg (Option 1.000kg or 1.050 kg ; 12.5 kg / 15.000) 2.16 kg / 3.8 kg / 5.0 kg / 10.0 kg / kg / 21.6 kg Tolerance ± 0.5 %
Digital position transducer:	Digital encoder, resolution 0.006 mm/impulse
Color touch screen display:	5.7" color-QVGA touch screen
Power supply:	See options. Please note that the instrument is fitted with microprocessors. The power supply must be free of any interference in order to guarantee trouble-free operation. Mains filters and/or stabilizers must be connected on the line side if any interference occurs.
Ambient temperature:	+ 10 to + 40 °C
Air humidity:	max. 90% non-condensing
Dimensions:	Width: 490 mm, Depth: 400 mm, Height: 580 mm
Color:	Cover plates: beige-mat Frame: grey brown RAL 8019
Weight:	Approximately 30 kg / 60 lbs.

**GOETTFERT provides full warranty for machines that have been supplied as a complete system; i.e. with PC and printer by GOETTFERT. The PC means generally the complete system comprising of PC, monitor, keyboard, interfaces and if applicable joysticks. In general, we do not give a functioning guarantee for connecting externally supplied PCs and printers (non-GOETTFERT supply).**

**If the customers provide the PC by themselves, GOETTFERT cannot guarantee the trouble free functioning of the PC and the GOETTFERT unit.**

**Service work, which may become necessary due to problems appearing in regard to configuration, serial interfaces, connection cables, communication etc., are not covered by warranty and will therefore be invoiced on an actual expense basis.**

**Due to the various printer executions that are available on the market, we do not give any function guarantee for printers not supplied by GOETTFERT. Support for possible adjustments will be charged on an actual expense basis.**

### **Accessories**

- 1 Material filler
- 1 Die scraper
- 1 Barrel scraper
- 1 Steel brush with handle
- 1 Cleaning piston with handle
- 1 Material compressor
- 1 Tweezers
- 1 Set of micro fuses
- 1 Mains cable
- 1 User Information

### **Melt Indexer MI-2**

Base Unit

Order Number .....5.07.200

## Options

The base instrument is not a functioning device without adding the following units:

- the **German version** or the **English version**
- power supply 230 V** or **power supply 115 V** for the appropriate test temperature range.
- test piston** for ISO and/or ASTM measuring zone
- one or several **test weights**

### German version

Lettering and user information in German.

Order Number.....5.07.201

### English version

Lettering and user information in English.

Order Number.....5.07.202

### German user information

Additional user information.

(One set of user information is already contained in the basic model.)

Order Number.....5.07.203

### English user information

Additional user information.

(One set of user information is already contained in the basic model.)

Order Number.....5.07.204

The user information contains user manual and technical documentation.

### Power supply 230 V and test temperature to 400 °C

Voltage: 230V, + PE

Permissible voltage fluctuations: +/- 10%

Frequency: 50 Hz +/- 1%

Power consumption: approx. 870 W

Order Number.....5.07.105

### Power supply 115 V and test temperature to 400 °C

Voltage: 115V, + PE

Permissible voltage fluctuations: +/- 10%

Frequency: 60 Hz +/- 1%  
Power consumption: approx. 870 W  
Order Number .....5.07.106

If you need test temperatures over 400°C then you need a special test chamber with ceramic heating elements. Please note that at temperatures from 60°C to 500°C the spatial temperature deviation is  $\leq \pm 0.3$  °C:

**Power supply 230 V and test temperature to 500 °C**

Voltage: 230V, + PE  
Permissible voltage fluctuations: +/- 10%  
Frequency: 50 Hz +/- 1%  
Power consumption: approx. 1 kW  
Thus the test temperature can be increased to 500°C.  
Order Number .....5.07.107

**Power supply 115 V and test temperature to 500 °C**

Voltage: 115V, + PE  
Permissible voltage fluctuations: +/- 10%  
Frequency: 60 Hz +/- 1%  
Power consumption: approx. 1 kW  
Thus the test temperature can be increased to 500°C.  
Order Number .....5.07.108

**Capillary**

2,095 ± 0,003 mm diameter, 8 ± 0,025 mm length, constructed from tungsten carbide.  
Order Number .....4.23.000

**Capillary ASTM D 1238 Method C**

1,048 ± 0,005 mm diameter, 3,985 ± 0,025 mm length, constructed from tungsten carbide.  
As replacement for the optional unit ASTM D 1238 method C, article No. 5.02.586.  
Order Number .....4.23.043

**Test piston ISO**

For measurement according to ISO 1133 the test piston has two reference marks inscribed, representing the prescribed measuring distance of 30 mm on the test piston shaft. The lowest reference ring is the reference mark for the measuring beginning 50 mm before the die, the second reference ring for the measurement end 30 mm thereafter.

ISO test piston for capillary length 8 mm  
Order Number .....5.02.579

### Test piston ASTM

For measurement according to ASTM D 1238 the test piston has three reference marks inscribed. The lowest one marks the test beginning at 46 mm before the die. The other two scribe marks are found at a distance of 25.4 mm and 6.35 mm respectively, on the test piston shaft.

ASTM test piston for capillary length 8 mm

Order Number .....5.02.587

Test weights for Single Tests:

### Test weight 1.000 kg

Order Number .....5.07.132

### Test weight 1.050 kg

Order Number .....5.07.133

### Test weight 1.200 kg

Order Number .....5.07.123

### Test weight 2.160 kg

Order Number .....5.07.124

### Test weight 3.800 kg

Order Number .....5.07.125

### Test weight 5.000 kg

Order Number .....5.07.126

### Test weight 10.000 kg

Order Number .....5.07.127

Additional Weights to work in combination with and coupled to the test weight 10.000 kg:

### Additional weight 2.500 kg

Total weight: 12.500 kg

Order Number .....5.07.128

### Additional weight 5.000 kg

Total weight: 15.000 kg

Order Number .....5.07.129

### Additional weight 11.600 kg

Total weight: 21.600 kg

Order Number .....5.07.130



### **ASTM D1238 Procedure C (Half Height, Half Length) - Set**

Procedure-C-die, 1.048 mm diameter, 4 mm in length made from tungsten carbide. Including special length piston.

Order Number.....5.02.586

### **Test Load Lifting Unit**

The control of the electrical test load lifting option is done via the menu in the 5.7" colored QVGA touch screen monitor. The reception of the test load lifting unit can receive any test load from 1.0 kg upto 21.6 kg . For cleaning the test barrel the test load can be swivelled together with the reception sideways to guarantee free access to the test barrel.

Order Number.....5.07.250

### **Melt cutting tool - manual**

Cutting the strand is done by a tool mounted close to the die. The cutter is operated manually by the user. The cutting device has been proven to work with a number of polymers over a wide MFR/MVR range.

Nevertheless, some polymers cannot be cut properly because of their material characteristics (e.g. sticky, adhesive materials, or rheological complex materials). For such materials it is not possible to guaranty that the cutting device will operate properly. Please ask for details.

Order Number.....5.07.175

### **Melt cutting tool – motor powered**

Cutting the strand is done by a motor powered tool mounted close to the die. The cutter is activated via program control. The cutting device has been proven to operate with a number of polymers over a wide MFR/MVR range.

Nevertheless, some polymers cannot be cut properly because of their material characteristics (e.g. sticky, adhesive materials, or rheological complex materials). For such materials it is not possible to guaranty that the cutting device will operate properly. Please ask for details.

Order Number.....5.07.251

### **Scale**

Analytical scale with serial connection for connection to the MI-3.

In combination with the automated cutter, the program control can calculate the density of the material measured.

Order Number.....5.07.309

### **HP Deskjet**

Printer for measurement data.

- Included: 1 Printer cartridge, black
- 1 Mains cable
- 1 Manual

Printer with AC 100-240V / 50-60Hz and Manual (or similar system)

Order Number .....8.94.054

### **USB-Printer cable**

Cable to connect to the MI-3

Order Number .....8.90.066

### **Pneumatic cleaning device**

Air driven rotary cleaning tool for quick, easy and thorough cleaning of the test barrel.

This device needs an air supply of 4- 6 bar . The air supply must be oil and water free.

- Accessories supplied: 1 Quick connect coupling for a 9 mm air hose (NW9)
- 1 Air hose

Order Number .....5.11.082

### **Wire brush**

For the cleaning of the test barrel. With coupling part for the pneumatic cleaning device.

Order Number .....5.03.188

### **Cleaning piston**

For cleaning the test barrel with a cloth patch. With coupling part for the pneumatic cleaning device.

Order Number .....5.03.189

### **Die plug (heatable)**

To manually close the die while system is packed and material melted. Recommended for certain high flow materials.

Order Number .....5.07.160

### **Nitrogen purge**

Contains ring injection nozzle with socket for nitrogen purge to mount to the top of the test chamber.

Material must be appropriately conditioned by user and carefully loaded.

Order Number .....5.07.165

### Special Table I

For reception of the test machine and accessories.

The table includes a European style multiple socket outlet (6x).

Width: 1100 mm, depth: 750 mm, height: 720 mm.

Order Number .....5.13.300

### Special Table II

For reception of the test machine and accessories.

The table includes a European style multiple socket outlet (6x).

Width: 1600 mm, depth: 750 mm, height: 720 mm.

Order Number .....5.04.810

The following control thermometers can be used for testing the channel temperature. The control thermometers have a 90 ° bend

#### Control thermometer +50 °C to +100 °C

Scale 0.1 °C.

Order number .....4.55.100

#### Control thermometer +100 °C to +150 °C

Scale 0.1 °C.

Order number .....4.55.101

#### Control thermometer +150 °C to +200 °C

Scale 0.1 °C.

Order number .....4.55.102

#### Control thermometer +200 °C to +250 °C

Scale 0.1 °C.

Order number .....4.55.103

#### Control thermometer +250 °C to +300 °C

Scale 0.1 °C.

Order number .....4.55.104

#### Control thermometer +300 °C to +350 °C

Scale 0.1 °C.

Order number .....4.55.105

#### Control thermometer +350 °C to +400 °C

Scale 0.1 °C.

Order number .....4.55.106

#### Control thermometer +400 °C to +500 °C

Scale 0.5 °C.

Order number .....4.55.107

**MI-2**

Short text for quotation, delivery note and invoicing

Order Number	Description
5.07.200	<b>Melt Indexer MI-2</b> Basic model
5.07.201	<b>German version</b> For MI-2 basic model
5.07.202	<b>English version</b> For MI-2 basic model
5.07.203	<b>German user information</b> For MI-2 basic model German
5.07.204	<b>German user information</b> For MI-2 basic model English
5.07.105	<b>Power supply 230V/50 Hz</b> Test temperature to 400 °C For MI-2 basic model
5.07.106	<b>Power supply 115V/60 Hz</b> Test temperature to 400 °C For MI-2 basic model
5.07.107	<b>Power supply 230V/50 Hz</b> Test temperature to 500 °C For MI-2 basic model
5.07.108	<b>Power supply 115V/60 Hz</b> Test temperature to 500 °C For MI-2 basic model
4.23.000	<b>Capillary</b>
4.23.043	<b>Capillary ASTM D 1238 method C</b>
5.02.579	<b>Test piston ISO</b> For die length 8 mm
5.02.587	<b>Test piston ASTM</b> For die length 8 mm
5.07.132	<b>Test weight 1.000 kg</b>

- 5.07.133    **Test weight 1.050 kg**
- 5.07.123    **Test weight 1.200 kg**
- 5.07.124    **Test weight 2.160 kg**
- 5.07.125    **Test weight 3.800 kg**
- 5.07.126    **Test weight 5.000 kg**
- 5.07.127    **Test weight 10.000 kg**
- 5.07.128    **Test weight 2.500 kg**
- 5.07.129    **Test weight 5.000 kg**
- 5.07.130    **Test weight 11.600 kg**
- 5.02.586    **Capillary L/D = 4/1,05 - set**
- 5.07.250    **Test load lifting unit**
- 5.07.175    **Melt cutting tool - manual**
- 5.07.251    **Melt cutting tool - motor powered**
- 5.07.309    **Scale**
- 8.94.054    **HP Deskjet 110-240V/50-60Hz**
- 8.90.066    **USB printer cable**
- 5.11.082    **Pneumatic cleaning device**  
With quick connection coupling and  
Hose extension.
- 5.03.188    **Wire brush with coupling part**  
For pneumatic cleaning device.
- 5.03.189    **Cleaning piston with coupling part**  
For pneumatic cleaning device.
- 5.07.160    **Die plug heatable**
- 5.07.165    **Nitrogen purge**
- 5.13.300    **Special table I**  
Width: 1100 mm, depth: 750 mm, height: 720 mm

- 5.04.810 **Special table II**  
Width: 1600 mm, depth: 750 mm, height: 720 mm
- 4.55.100 **Control thermometer +50°C to +100°C**  
90° bent, 0.1°C division
- 4.55.101 **Control thermometer +100°C to +150°C**  
90° bent, 0.1°C division
- 4.55.102 **Control thermometer +150°C to +200°C**  
90° bent, 0.1°C division
- 4.55.103 **Control thermometer +200°C to +250°C**  
90° bent, 0.1°C division
- 4.55.104 **Control thermometer +250°C to +300°C**  
90° bent, 0.1°C division
- 4.55.105 **Control thermometer +300°C to +350°C**  
90° bent, 0.1°C division
- 4.55.106 **Control thermometer +350°C to +400°C**  
90° bent, 0.1°C division
- 4.55.107 **Control thermometer +400°C to +500°C**  
90° bent, 0.1°C division

Subject to change due to technical developments