

## M3350

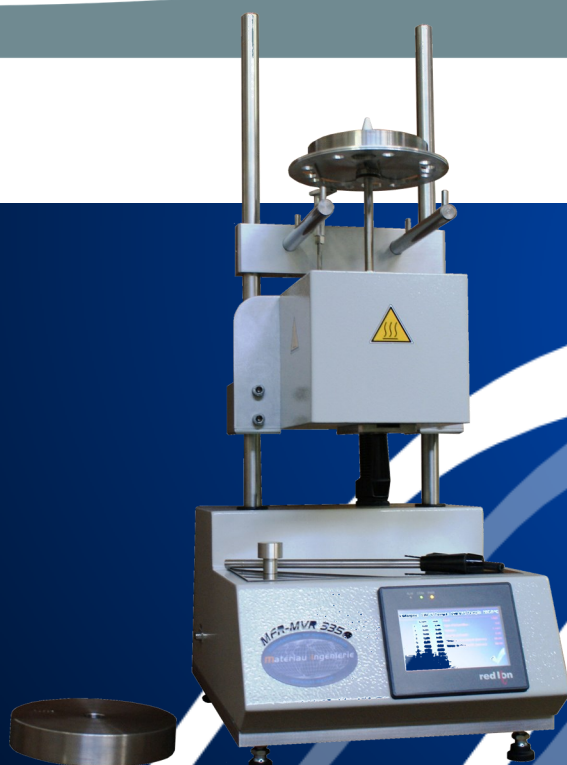
### MELT FLOW OF THERMOPLASTICS

Commercial reference(s): MO14-00

**Type of test:**  
Viscosity & rhéologie

**Type of materials:**  
Thermoplastics

**Standards:**  
ISO 1133  
ASTM D1238  
ASTM D3364  
BS 2782  
JIS K7210  
...



Melt-Index M3350

#### INTRODUCTION

The **M3350** allows a simple, reproducible and repetitive, melt flow index of thermoplastics (MFI / MFR and MVI / MVR).

Base value of the reception control of these materials, the grade (or melt flow index) describes the ability to melt a thermoplastic extrusion under operating conditions.

This allows, among others, to ensure consistency and compliance of lots of material, and thus reduce the number of parameters affecting the quality of the parts produced.

The **M3350** has been designed to meet the requirements of quality laboratory business and teaching control. Its handling is quick with a touch screen interface (English and French), which includes configuration elements and results ■

## APPLICATIONS

This device is suitable for all materials including thermoplastic polymers test is standardized or not. Drying may be required in some cases.

Testing standards are numerous and sometimes require adaptations or different components ■

## PRINCIPLE

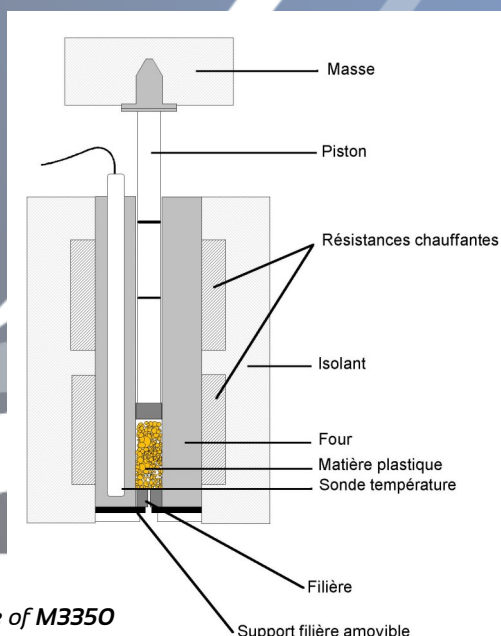
This is to determine the quantity (volume or mass) of molten material extruded in 10 minutes through a die under a stress and a temperature determined.

For this, the apparatus comprises a vertical cylindrical test chamber of the lower end of which is blocked by an extrusion die. According to the standard followed by \*, the die may differ. ISO 1133 industry has the following characteristics:

- Material Hardened steel
- Ø capillary  $2.095^{+0.005}$  mm
- Capillary length 8 mm

(\*) Other extrusion dies available on request.

This room is heated on both regulated entirely independently zones.



Principle of M3350

The stress is imposed on the material using a mass based on a piston. Temperatures and weights are selected according to the material, in accordance with international standards as described in the table below ■

## DESCRIPTION

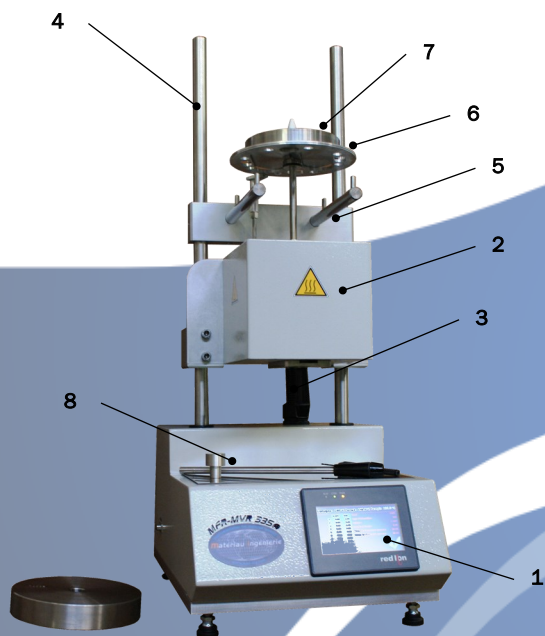
Standard	Material		Test temperature	Nominal mass combined
			(°C)	(g)
ISO 1622/2	PS	H	200	5 000
ISO 2897/2	PS-I	H	200	5 000
ISO 1872/2	PE	D	190	2 160
ISO 1872/2	PE	G	190	21 600
ISO 1872/2	PE	T	190	5 000
ISO 1872/2	PE	E	190	325
ISO 1873/2	PP	M	230	2 160
ISO 15494/2	PP	U	230	5 000
ISO 1873/2	PP	T	190	5 000
ISO 2580/2	ABS	U	220	10 000
ISO 2580/2	ABS		240	10 000
ISO 2580/2	ABS		265	10 000
ISO 2897/2	PS CHOC	H	200	5 000
ISO 4613/2	E/VAC	B	150	2 160
ISO 4613/2	E/VAC	Z	125	325
ISO 4613/2	E/VAC	D	190	2160
ISO 4894/2	SAN	U	220	10 000
ISO 6402/2	ASA/ACS/AEDPS	U	220	10 000
ISO 6402/2	ASA/AEDPS		240	10 000
ISO 6402/2	ASA/AEDPS		265	10 000
ISO 7391/2	PC	W	300	1 200
ISO 8257/2	PMMA	N	230	3 800
ISO 8986/2	PB	F	190	10 000
ISO 15876-3	PB	T	190	5 000
ISO 8986/2	PB	D	190	2 160
ISO 9988/2	POM	D	190	2 160
ISO 10366-2	MABS	U	220	10 000

The **M3350** uses the specifics of *ISO 1133*. It therefore comprises the following main elements:

- 1 - Temperature stability is ensured by two PID controllers each controlling a heating zone (a third zone can be added if the standard is evolving in this direction).

2 - Handling of loads is simplified by the use of a pneumatic cylinder (optional) to raise and lower the weight (the preheating period to be massless, except when automatic compaction).

3 - The whole is controlled by a touchscreen controller which manages almost all operations. It can monitor the progress of the cycle ■

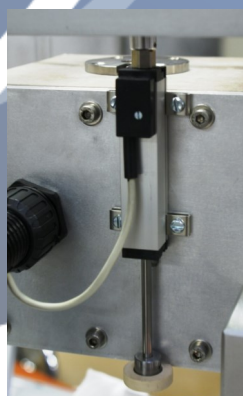


Caption:

- |  |                          |
|--|--------------------------|
| 1- Touchscreen IHM                     | 5- Mass support          |
| 2- Regulated test chamber              | 6- Magnetic plate        |
| 3- Pneumatic cylinder up / down masses | 7- Mass                  |
| 4- Guiding column                      | 8- Delivered accessories |



Touchscreen IHM



Displacement sensor

## MFI/MFR AND MVI/MVR

Usually, the MFI (called MFR since the last update of ISO 1133) is the preferred value in the field of plastic injection. The Melt Flow Index (or Rate) is the thermoplastic extruded in 10 minutes under a load of mass and at given temperature, expressed as « g.10 min<sup>-1</sup> ».

Its determination requires a balance with a reading of 0.5 mg.

The MVI (or MVR), is also a melt flow index. Instead of expressing an extruded thermoplastic mass in 10 minutes, it is for the MVR (Melt Volume Rate) the volume extruded in 10 minutes. 10 minutes, expressed « cm<sup>3</sup>.10 min<sup>-1</sup> ».

This latter mode of expression of this melt index allows direct calculation, without weighing, unlike the MFR. Thus, the operator saves time and gains in precision measurement. Indeed, the **M3350** firmware supports the user in all stages of the test, and automatically calculates the MVR. The MFR of the calculation is possible with prior information of the heat density.

Furthermore, a relationship exists between MFR and MVR, it is the heat density:

$$\text{MFR} = \text{MVR} \times \text{heat density}$$

Matériau Ingénierie recommends MVR for determining the heat density ■

## OPTIONS

### Auto Up / Down masses

Allows lowering of the load test at beginning of test, and the lifting of the load at the end of the test. This option is advantageous in the case of many tests or the use of large masses (21.6 kg).

Ref.: MO14-01

### Masses

Depending on the type of material tested and the standards followed, the masses are different. Below are listed the proposed optional standard masses. The first number represents the actual mass, the second the total mass (with accessories).

875 g. / 1200 g.	Ref.: MO14-10
3475 g. / 3800 g.	Ref.: MO14-11
3375 g. / 3700 g.	Ref.: MO14-12
5000 g. / 5000 g.	Ref.: MO14-13
1600 g. / 1600 g.	Ref.: MO14-14

### Dies available.

- Special die for PVC testing, in tungsten carbide Ø 2.095 mm.  
Ref.: MO14-15.
- Die Ø 1.181 mm according to the ISO 1133 standard.  
Ref.: MO14-16.

### Transfer software and data processing

Ref.: MO14-02 ■

## COMPUTER TRANSFER

Via an RS 232 output, the results can be processed by software (compatible PC: Windows® XP and later) adapted. The main functions of this software are:

- Statistics
- Archiving
- Edition of test reports
- Conversion for personalized treatment in a spreadsheet ■

## DELIVERED ACCESSORIES

- Set of cleaning tools (1 swab, 1 drill holder + 1 drill)
- IEC power cable
- Mass of 2016 g.
- Mass of 5000 g.
- Calibration certificate
- User manual
- CE certificate ■

## TECHNICAL CHARACTERISTICS\*

### Thermal regulation :

- |                 |                           |
|-----------------|---------------------------|
| - Heating areas | 2, expandable to 3        |
| - Type          | PID adaptive              |
| - Regulation    | 40-350 <sup>±0.5</sup> °C |

### Displacement measurement:

- |                          |          |
|--------------------------|----------|
| - Set measuring          | 50 mm    |
| - Error on the linearity | 0.075 mm |
| - Repeatability          | <2 µm    |

### HMI:

- Management of test parameters
- Management of thermal regulation
- Control of the up / down masses
- Display time
- Calculation of MFI  
(from a density hot back before) and MVI
- Language

French and English

### Output: RS 232

### Software:

option, Windows® XP and later supports

### Weight:

25kg

### Dimensions (WxDxH):

360x310x800 mm

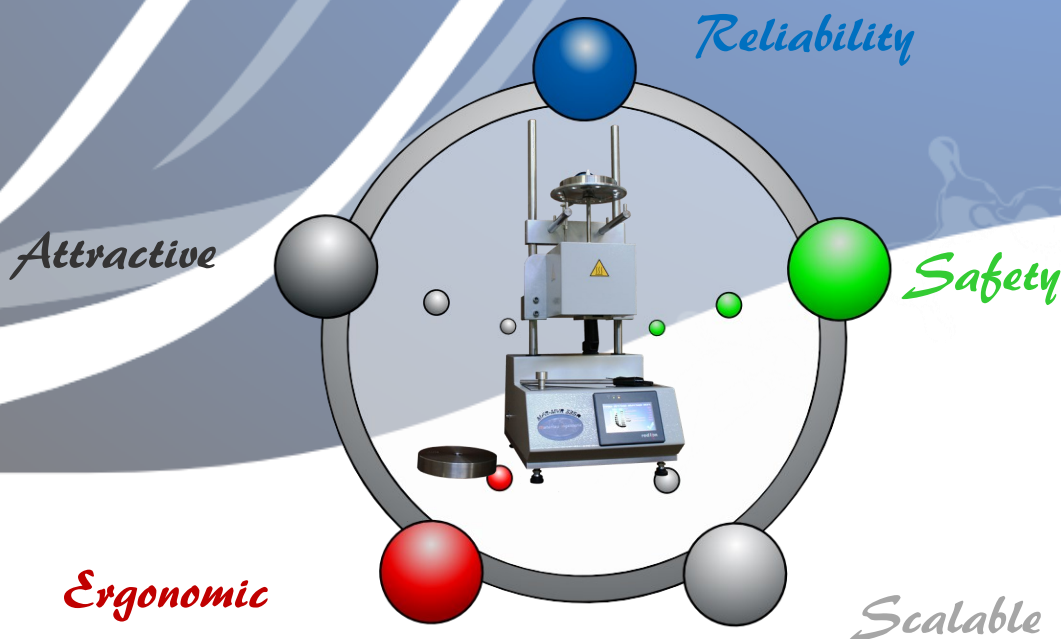
### Power supply:

Single-phase, 230 V,  
50 Hz, 1 kW

### Compressed air:

6 bars

\* Features purely illustrative, we reserve the right to change freely in order to improve the performance of our instrument.



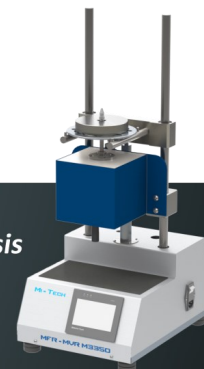
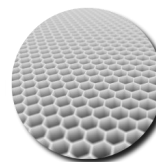
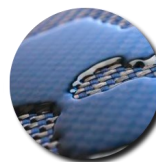
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## Non-destructive testings

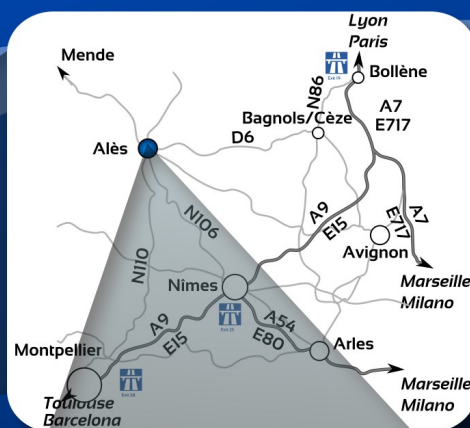
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