Zwick / Roell

Product Information

Aflow extrusion plastometer

CTA: 168420 169603

Aflow extrusion plastometer

Applications

Speed, operator-independence and high test-result reproducibility and repeatability – all these things matter in research and development and in 24-hour operation, as in production control.

A defining feature of Aflow is its high level of automation - easy cleaning and defined pre-compacting at the touch of a button, stepless test-load settings - Aflow adapts to your testing requirements.

Aflow can be operated in stand-alone mode via a modern touch display or on a PC with ZwickRoell testing software.

The basic version of the Aflow extrusion plastometer is designed to perform MFR and MVR tests in accordance with Methods A, B, C and D. This can be done using an automatic extrudate cutter and balance. Tests can be performed in accordance with the following standards:

- ISO 1133, ASTM D1238, ASTM D3364, JIS K 7210.

Advantages and features

Fast, effortless cleaning and pre-compacting

- Aflow's pneumatic cleaning device enables cleaning and pre-compacting to be performed at a preset pressure. The Clean and Pre-compact option allows variable adjustment of the cleaning and pre-compacting pressure, while a switch on the cleaning unit allows one of the two pressure steps to be selected.

Optimum test sequence - time-saving and operator-friendly

- The pneumatic pre-compaction feature allows the polymer to be defined and evenly pre-compacted at the press of a button—saving time and effort. To further accelerate the test procedure after the test, it is possible to eject the remaining material from the extrusion barrel with a force of up to 80 kg and then clean it with a pneumatic cleaning device at the press of a button.

Flexibility via stepless test load up to 50 kg

- Test loads in Aflow can be adjusted steplessly from 0.325 kg to 50 kg. A multi-stage test can be performed effortlessly to Method D purely by means of presets in the software. This allows several tests with different weight stages to be carried out with a single barrel filling.

APC function

- The APC Function, available with some ZwickRoell extrusion plastometers, enables the instrument's software to identify the current MVR rate during the test and automatically select pre-programmed, ready-optimized test parameters. Correct use of test parameters for both ISO and ASTM can therefore be ensured without the need for pre-tests.

Flexible - use with or without PC

- The new standardized operating philosophy allows the operator to move easily between instrument and PC and always feel at home.

PI 780 725

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Intuitive, workflow-based touch operation

- All test-related settings are grouped logically and are separated from higher-level system settings. The operator is guided through test configuration step by step. The saved test configuration can easily be exported and transferred to other instruments.

Rapid familiarization with user management, including stand-alone mode

- Integrated user management allows the operator's input options to be reduced to a minimum. Users see only what is important to them, allowing them to focus on the task at hand right from the start.

Live MVR

- The MVR is shown "live" in graphic form in stand-alone mode and in the ZwickRoell testing software. This allows both melting process and behavior to be followed precisely during measurement.

Managing multiple extrusion plastometers via one PC

- With multi-instrument operation up to 6 extrusion plastometers can be controlled from one PC. Central operation and results saving from a single work station makes for efficiency and provides a quick overview of all tests currently in progress. For multi-instrument operation the required Ethernet interfaces must be available on the PC; otherwise Ethernet hubs must be used.

Product Information

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Technical data
Basic instruments
Please note:

requires dry, oiled air

Type	**Aflow extrusion plastometer (230 V)**	**Aflow extrusion plastometer (110 V)**	
Item No.	**1043954**	**1043955**	
Test load	0.325 ... 50 (step by step or stepless)	0.325 ... 50 (step by step or stepless)	kg
Compressed air, oiled, dry	5 ... 10	5 ... 10	bar
Dimensions			
Height	1021	1021	mm
Width	580	580	mm
Depth	625	625	mm
Weight, approx.	114	114	kg
Test temperature	+50 ... +450	+50 ... +450	°C
Display	Capacitive touch display	Capacitive touch display	
Resolution of the temperature display	< 0.001	<0.001	K
Number of savable parameter sets	> 100	> 100	
Interfaces	• **Ethernet port** to connect a PC • **2 x USB port** to connect a printer or USB stick • **RS-232 port** for raw data export, data output: serial number, specimen number, number of extrudates, density (user specifications) density at test temperature, overall weight of the extrudates, MFR average value, MVR average value, MFR and MVR individual values • **RS-232 port** for connecting the analytical balance (from the ZwickRoell product portfolio)		
Temperature accuracy in the range of 0 ... 75 mm above the die in the temperature range of 50 °C ... 450 °C	< 0.3[1)]	< 0.3[1)]	K
Time measurement:			
Error limit (Method A)	±0.02 (with automated extrudate cutter)	±0.02 (with automated extrudate cutter)	s
Error limit (Method B)	± 0.01	± 0.01	s
Travel measurement			
Error limit (Method B)	±0.02 mm (ISO 1133) / ±0.4% of 6.25 mm (ASTM D1238)	±0.02 mm (ISO 1133) / ±0.4% of 6.25 mm (ASTM D1238)	
Resolution	< 0.0005	< 0.0005	mm
Piston speed, max.	2000[2)]	2000[2)]	mm/min
Multi-instrument operation on one PC:			
Available RAM, min.	1.54	1.54	GB
Clock frequency	3	3	GHz
Connectible Aflow extrusion plastometer per PC	6	6	
Scope of delivery	• Ethernet cable		

All data at ambient temperature.

Subject to change in the course of further development.

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Type	Aflow extrusion plastom-eter (230 V)	Aflow extrusion plastom-eter (110 V)	
Item No.	**1043954**	**1043955**	
	• Cleaning accessories (cleaning piston, cleaning brush, cleaning pads (500 pieces)) for barrel • Test granulate and filling chute for granulate		
Power input specifications			
Power supply	220 ... 240 V, 1L/PE/N	100 ... 127 V, 1L/PE/N	
Power consumption (full load), approx.	0.6	0.6	kVA
Power frequency	50/60	50/60	Hz
Environmental conditions			
Temperature during storage and transport	-25 ... +55	-25 ... +55	°C
Relative humidity (non-condensing)	20 ... 90	20 ... 90	%

1) Spatial and temporal, to ISO 1133-2

2) To ensure proper force control, the piston speed cannot exceed 75% of this value

Accessories required

Extrusion barrel (1 x required)

An extrusion barrel must be chosen to suit the materials to be tested. Different plastics containing fluoride, such as PTFE and PFA, release hydrofluoric acid, which corrodes the material of the extrusion barrel. This also applies to PVC, as hydrochloric acid can be produced. For these types of plastics, extrusion barrels made from a special type of steel alloy are used.

Test material	Diameter, inner [mm]	Hole	Properties	Item No.
Plastic, fluorine-free	9.55	Finely honed	Wear-resistant	050888
Plastic, containing fluorine / not containing fluorine	9.55	Finely honed	Acid-resistant, wear-resistant	1069372

Piston (1 required)

At least one piston must be selected. It should suit the materials to be tested. Different plastics containing fluoride, such as PTFE and PFA, release hydrofluoric acid, which corrodes the material of the piston. This also applies to PVC, as hydrochloric acid can be produced. For these types of plastics, pistons made from a special type of steel alloy are used. For filled plastics, these pistons are only suitable to a limited extent. In this case, we recommend the wear-resistant versions. If you are testing to ISO 1133-1997, a sharp-edged piston is required.

Test material	Standard	Properties	Item No.
Plastic, fluorine-free	ISO 1133	Wear-resistant	032298
Plastic, containing fluorine	ISO 1133	Acid-resistant	032299
Plastic, fluorine-free	ISO 1133-1997	Sharp edged, wear-resistant	032300
Plastic, fluorine-free	ASTM D1238	Wear-resistant	1015333

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Dies (scope of supply 2 pieces, 1 x required)

Depending on the materials to be tested and the specified standards, at least one pair of dies must be selected. All dies are made of sintered material, which makes them particularly wear-resistant and acid-resistant.

The scope of delivery includes two dies and a matching die cleaning rod.

Test material	Standard	Dimensions		Item No.
		Height [mm]	Diameter, inner [mm]	
Plastic, containing fluorine, not containing fluorine	ISO 1133 and ASTM D1238	8	2.095	312342
Plastic, containing fluorine, not containing fluorine	ISO 1133 and ASTM D1238 Method C	4	1.05	325554
Plastic, containing fluorine, not containing fluorine	BS 2782-7, Method 720A-1997	8	1.18	001351
PVC	ASTM D3364	25.4	2.095	092326

Optional accessories

Extrudate cutters

Description	ArticleNumber
Extrudate cutters The automatic extrudate cutter is used for precision cutting of the extrudate.	
Extrudate cutter, automatic activation, automatic control via time intervals or manual at the touch of a button, includes replacement blades (4 pieces)	**032301**

Die plug

When using the die plug, you must use the extrudate cutter in order to eject the die plug automatically when the test begins. The die plug prevents premature flow of the material when testing plastics with high flow rates (> 10 cm^3/10 min. at a load of 0.325 kg).

Description	ArticleNumber
Die plug for testing plastics with high flow rate, including ceramic stopper[1)]	**032302**

1) Required: 1x extrudate cutter

Separating pane

Description	ArticleNumber
Separating pane for automatic extrudate cutter, for collecting individual extrudates	**032303**

Cleaning

Dimensions of pneumatic cleaning device unit including basic instrument: 1200 x 580 x 596 mm (H x W x D)

Description	ArticleNumber
Pneumatic cleaning device	**032304**
Option cleaning/pre-compaction: Software-controlled, variable switching option for pressure setting for pre-compaction and cleaning[1)]	**032306**

1) Required for this: Pneumatic cleaning device