

Thermo Scientific Process 11

Unique and flexible twin-screw extruder

Requiring just 20 grams of material per hour, the new Thermo Scientific Process 11 small-scale extruder is designed to meet the key challenges faced by research and development formulation scientists.

Applications

- Polymer research & development
- Expensive material incorporation
- Nano compound processing



Versatile Setup

The Thermo Scientific Process 11 twin-screw extruder includes several setup possibilities: multiple split feeding and venting ports, a die design for quick changes of the strand diameter, and eight barrel segments (length: 5 L/D) for accurate temperature profiles.

We offer a complete compounding line including feeding solutions and downstream equipment such as waterbaths or variable length pelletizers.

As a workflow solution, the Thermo Scientific HAAKE MiniJet mini injection molding machine can be used to shape the compounded materials into test specimens for further testing of mechanical or optical properties.

Flexible Design

The instrument's segmented screw design allows adapting the processing conditions to simulate various compounding applications. Due to the constant processing geometry within the Thermo Scientific extruder portfolio, knowledge obtained from the lab trials using the Process 11 can directly be transferred to pilot or production scale equipment. This scale-up transfer is based on the specific energy introduced into the material. Figure 1 displays the residence time distributions for trials run using a Process 11 extruder with 1 kg/h (orange) and a 16 mm diameter extruder (blue). Achieving equal specific energy levels leads to an almost perfect match for the material's residence time within the extruder.

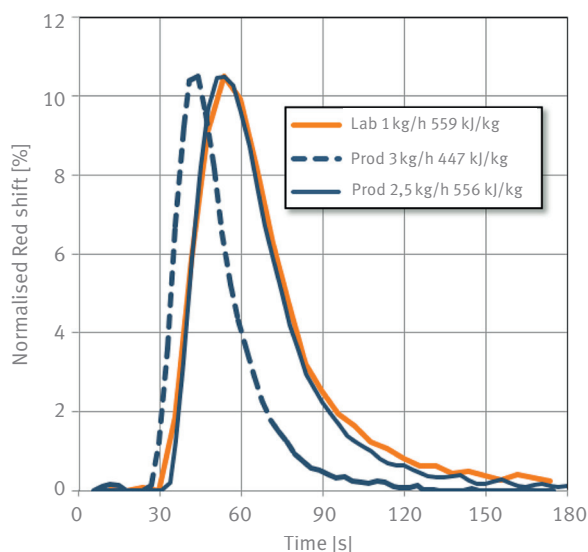


Fig. 1: Residence Time Distributions

Key Benefits:**Small**

- The only real bench-top compounder available on the market (no hidden electric cabinet) maximizes the usage of the available lab space.
- Minimized material usage. Throughput rates of 20 g/h to 2.5 kg/h with realistic processing conditions.

Simple

- Easy-to-operate by intuitive touch screen control.
- Integrated feeder control.
- Easy cleaning due to clam shell barrel design with removable top half barrel.

Scalable

- Direct scalable processing conditions, due to portfolio wide similar screw geometry.
- Transfers knowledge obtained in the lab to pilot and production scale processes.
- Segmented screw design with common screw element types.

Technical Data

Barrel diameter	11 mm
Barrel length	40 L/D
Barrel material	Nitriding steel 1.7365 (EN40B)
Screw speed	10 ... 1000 rpm
Torque per shaft	6 Nm, constant torque, safety monitored.
Pressure	100 bar, safety monitored
Temperature	RT ... 350 °C (optional 450 °C)
Feed zone	Permanently water cooled
Heating zones	7 x 5 L/D electrical heated (optional water cooled)
Dimensions	820 x 480 x 410 mm (L x W x H)
Weight	55 kg
Power supply	230 V, 16 A, 50/60 Hz

Selected Options:

567-7602	High temperature option up to 450 °C especially for high performance polymers.
567-7604	Controlled liquid cooling for the barrel for low temperature applications.
567-7606	Fully ported barrel allows maximum flexibility for split feeding and venting.
567-7635	Screw length adjustment kit, allows reducing the extruder's processing length in 5 L/D steps.
567-7623	Vacuum venting stack.



Easy cleaning due to clam shell barrel design with removable top half barrel.

Hot melt extrusion is gaining importance in the pharmaceutical industry. Our 11 mm compounder is also addressing the specific needs in the pharmaceutical industry and is available as a pharma version, too – manufactured according to GMP standards.

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