

# 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

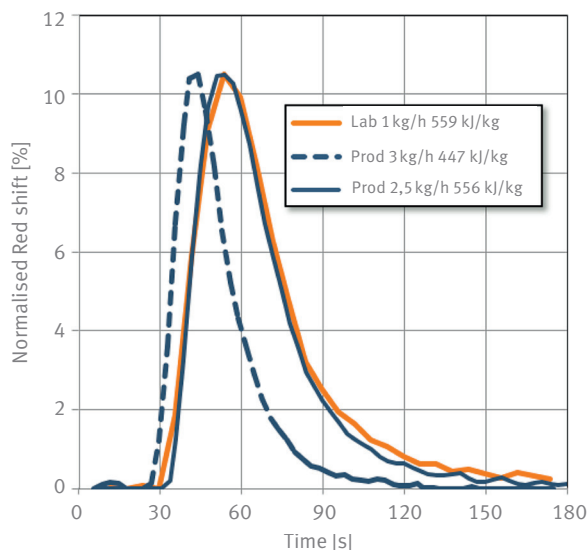


Fig. 1: Residence Time Distributions

### 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.

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

[thermoscientific.com/mc](http://thermoscientific.com/mc)

© 2012/03 Thermo Fisher Scientific Inc. - Copyrights in and to all photographs of instruments are owned by Thermo Fisher Scientific. This document is for informational purposes only. Specifications, terms and pricing are subject to change. Not all products are available in every country. Please consult your local sales representative for details.

**Material Characterization****Benelux**

Tel. +31 (0) 76 579 55 55  
info.mc.nl@thermofisher.com

**China**

Tel. +86 (21) 68 65 45 88  
info.mc.china@thermofisher.com

**France**

Tel. +33 (0) 1 60 92 48 00  
info.mc.fr@thermofisher.com

**India**

Tel. +91 (20) 6626 7000  
info.mc.in@thermofisher.com

**Japan**

Tel. +81 (45) 453-9167  
info.mc.jp@thermofisher.com

**United Kingdom**

Tel. +44 (0) 1606 548 100  
info.mc.uk@thermofisher.com

**USA**

Tel. +1 603 436 9444  
info.mc.us@thermofisher.com

**International/Germany**

Dieselstr. 4  
76227 Karlsruhe  
Tel. +49 (0) 721 4 09 44 44  
info.mc.de@thermofisher.com

**Thermo**  
SCIENTIFIC

Part of Thermo Fisher Scientific