

Thermo Scientific Micro-Compounding Solutions

Unleash new potential in material development with micro-compounding

Whether you are interested in compounding new materials for 3D filaments, sheets, nanomaterials, reactive extrusion, monitoring structural changes, pharmaceutical or food applications—micro-compounding enables you to start with a very small amount of material. Find the best solution for your lab with either a parallel or conical twin-screw compounder.

Improve your initial stage of product development starting with as little as 20 grams

The Thermo Scientific™ Process™ 11 Twin-Screw Extruder and accessory design, as well as the parallel segmented screws enable batch process, continuous processing, and ensures scale-up to pilot scale and production.

Split feeding and venting ports along the barrel for pellets, powders, liquids

Allows the work with standard pellets and makes pre-mixing steps redundant. Up to 6 additional ports are available for further material feeding or venting.

Continuous processing at lab scale to boost “Design of Experiment” efficiency

Material compositions can be changed during processing without cleaning steps in between and thus saves time and material, compared to batch process.

Comprehensive portfolio of downstream equipment

The portfolio of accessories and downstream equipment enable application solutions such as 3D filament production, sheet extrusion, co-extrusion, fiber spinning, wet and melt granulation, and food applications for product evaluation and up-scaling tests.

Monocoque design

The compact monocoque design with integrated liquid cooling of motor and electronics enables an airtight instrument. The compact design minimizes the laboratory footprint and allows fume hood or glove box applications. The top half barrel opens for easy cleaning.

Segmented screw design, adjustable barrel length and temperature zones

Enables excellent mixing results from as little as 20 grams up to compounding of 2 kg per hour. With minimum sample quantity, design of experiments (DoE) can be conducted in a single continuous process. Different applications are supported by a flexible, segmented screw design and seven independently adjustable temperature zones along the barrel.

Similar screw geometry and common screw element types across the Thermo Scientific Parallel Twin-Screw Extruder portfolio

Enables direct scalable processing conditions and transfer of development results to pilot scale or production.



Process 11 Twin-Screw Extruder

Meet your discovery stage development requirements starting with as little as 5 grams of material

The design, screw speed and pressure range of the HAAKE™ MiniLab™ 3 Micro-compounder makes it an ideal tool for compounding small amounts of materials and for performing reactive extrusions

Defined conical co- and counter-rotating twin-screws

Enables micro-compounding starting with 5 grams up to 100–200 grams per hour and is ideal for expensive materials or materials available only in small quantities. Two heating zones ensure homogenous material temperature.

From batch to continuous processing

Material residence time is very well defined by the number of cycles and enables high mixing quality in a batch process. When using the optional force feeder, continuous processing of very low sample amount is possible.



HAAKE MiniLab 3 Micro-compounder

Monitor online viscosity measurements for analytical characterization

The two pressure transducers integrated in the backflow channel, allow the measurement of relative melt viscosity with only 5 grams of material and thus enables the monitoring of structural changes during processing.

Compact horizontal barrel design for sample inspection and cleaning

The compact design is optimized for small usage of lab space, fume hood or glove box applications. The top half of the horizontal barrel opens for visualization of the sample, with no dripping, and allows easy access for cleaning.

Which micro-compounder is best for me?

	HAAKE Micro-Compounder Series	Process 11 Twin-Screw Extruder Series
Horizontal screw design	2-fixed conical screw designs, co-rotating and counter-rotating	Parallel, segmented, modular
Minimum sample quantity*	Between about 3 to 7 grams	Batch from about 20 grams
Throughput for continuous process	Up to 100–200 g / h	Up to 2.5 kg / h
Split feeding & venting	One feed port, pre-mixing of samples needed	Up to 7 ports for feeding and venting
Low to high shear application	Limited	Yes—full control due to the variable screw design
Residence time	Controlled via the by-pass to improve mixing	From 30 sec up to 4–5 min tailored by the screw profile
Independent temperature zones	Not available	Up to 7 temperature zones along the barrel
Accessories and downstream equipment	Rod, sheet, and tubing dies	Melt pump, various dies incl. for fiber spinning, pelletizer, winder, and sheet take-off system
Pharma grade version	Available	Available

* Minimum sample quantity is material dependent

Contact us to learn about saving material, time, and costs when conducting your DoE. Visit us at thermofisher.com/microcompounding_inquiry

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