Brabender®



Brabender® Twin Screw Extruders

for Laboratory and Pilot Plant Applications



… where quality is measured.

Twin Screw Extruders

Principle - application area

The basic steps of compounding can perfectly be realized with co-rotating twin screw extruders. This makes modular co-rotating twin screw extruders the ideal companion for plastics from synthesis up to recycling.

Users will benefit from the harmonized, modular conception of screws and barrels for optimally realizing all processing steps (feeding, conveying, plasticizing, dispersing, reacting, venting, pressure build-up).

The system configuration of each model can easily be adapted to the individual processing task – anytime and at low cost.

Or combine several processing steps within a continuously working extruder and use your Brabender twin screw extruder as a modern in-line compounder.

Depending on the extruder size, the type of material to be tested, as well as the processing task, throughputs as low as 0.06 kg/h or up to 30 kg/h can be reached. This opens up the entire application range to these extruders – from material development up to small scale production.

Of course, the necessary additional equipment like measuring and control units, feeders (gravimetric, volumetric, liquid) and downstream equipment (water bath, pelletizer, conveyor belt) is available as well and allows for modular setup of complete extrusion lines.

Expansion with different kind of feeders or follow-up machines is possible whenever needed.

The design allows a complete instrumentation of the extruders. All of the measured values such as torque, melt and zone temperatures, melt pressure are recorded continuously and can be visualized in various graphs or sheets. With these parameters, you will easily find the optimum processing conditions on your production scale.

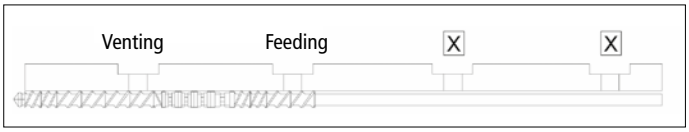
Advantages

Intermeshing co-rotating twin screw extruders stand out for decisive processing features:

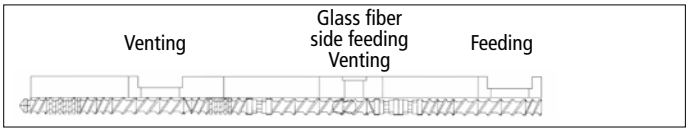
- Self-cleaning of the screws by intermeshing flights
- Good feeding characteristics, even with materials with poor flow properties
- High conveying constancy without pulsation or irregular thermal loads
- Constantly high quality of the extrudate
- Narrow residence time spectrum of the melt within the screw area
- Well-defined plastification time and purposive shearing
- High output at long energy transfer
- High energy input as compared to the free screw volume
- Good distributive and dispersive mixing properties
- Very high screw speeds
- Gentle mixing at low shear rate and high quality homogenization
- Gentle material treatment without temperature peaks even at high speed
- Variable shearing by using manifold mixing and kneading elements
- Kneading blocks with different disk widths and offset angles
- Good control of the pressure in the melt for optimum venting

Application examples

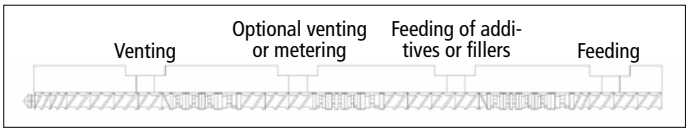
TSE 20/40 used as a 20 D
Venting of polyethylene/polypropylene



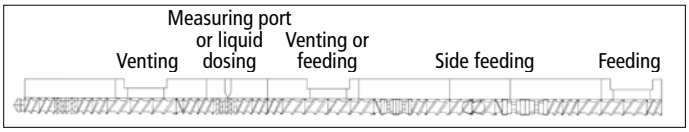
TSE 25/32
Glass reinforcement of polyamide 6.6



TSE 20/40
Blending of a polyphenylene oxide



TSE 25/42
Peroxide cross-linking of polyethylene



Twin Screw Extruder TSE 20/40

Designed to be a versatile solution for most of the compounding tasks – you can adapt the machine configuration easily and effectively to the different applications.

- Full barrel length 40 D with top openings at 10 D, 20 D, 30 D, 40 D – you can use multiple feeders, reduce the processing length or vary the place of venting
- Side openings at 12 D and 22 D to attach further dosing units
- Our dosing systems allow you to feed any consistency of the materials such as granules, powders, fibers and even fluids
- The complete barrel is split horizontally ("clamshell design") and allows quick opening and access to all parts in contact with the material, easy and effective cleaning and the analysis of the extrusion process
- Torsion-free, hardened, highly abrasion resistant barrel for a long lifetime
- Modular screw design – supported by our dedicated software – offers almost unlimited possibilities to optimize the configuration to your application
- Optional built-in vacuum pump
- Up to 1200 rpm screw speed is possible with the suitable drive units
- Available as a processing unit of our modular system, or as a compact stand-alone machine

TSE 20/40 / TwinLab-C 20/40

Screw diameter	20 mm
Screw length	40 D
OD/ID ratio	1.60
Drive power • TSE 20/40 • TwinLab-C 20/40	 9.5 kW
Screw speed max. • TSE 20/40 with Lab-Station drive: • TSE 20/40 with special gear (option): • TwinLab-C 20/40:	 350 min^{-1} 1200 min^{-1} 1200 min^{-1}
Screw torque	2 x 40 Nm
Operating temperature max. • TSE 20/40: • TwinLab-C 20/40:	 425 °C 400 °C
Pressure max.	300 bar
Throughputs(1)	0.5 – 20 kg/h
Dimensions L x W x H • TSE 20/40: • TwinLab-C 20/40:	 1350 x 730 x 1160 mm 1915 x 445 x 1565 mm
Weight • TSE 20/40: • TwinLab-C 20/40:	 323 kg 480 kg
Mains • TSE 20/40: • TwinLab-C 20/40:	 3 x 400 V, 50/60 Hz + N + PE, 32 A 3 x 230 V, 50/60 Hz + PE, 32 A 3 x 400 V, 50/60 Hz + N + PE, 63 A 3 x 230 V, 50/60 Hz + PE, 76 A

(1) depends on product properties and processing task

TSE 20/40 extruder, modular execution

1. Lab-Station drive unit
2. TSE 20/40 twin screw extruder
3. "Clamshell" barrel opening system



TwinLab-C 20/40 compounding line

1. TwinLab-C 20/40 (stand-alone execution)
2. Touchscreen control panel
3. Feeder
4. Round die
5. Water bath
6. Pelletizer



Twin Screw Extruder 20/40 model variants	
Modular	TSE 20/40
Stand-alone (compact)	Twinlab-C 20/40

Twin Screw Extruder TSE 25/16 - 54

Use it as a pilot plant, for recipe development, as an in-line compounder or for small-scale production – there are no limits.

- Segmented barrel design, you can have processing lengths of 16 - 54 D
- Using multiple feeders, more complex processing tasks are possible
- Massive, surface hardened barrel segments to ensure longer lifetime
- Our dosing systems allow you to feed any consistency of the materials such as granules, powders, fibers and even fluids
- The modular screw design – supported by our dedicated software – offers almost unlimited possibilities to optimize the configuration to your application
- Available as a processing unit of our modular system - for more details of the Lab-Station drive unit see our separate brochure



Twin Screw Extruder 25/16 - 54	
Screw diameter	24.7 mm
Screw length	16 - 54 D
OD/ID ratio	1.45
Screw speed max.	710 min^{-1}
Screw torque	2 x 90 Nm
Operating temperature max.	400 °C
Pressure max.	300 bar
Throughputs(1)	0.5 - 40 kg/h
Dimensions L x W x H	1160 - 860 x 730 x 1209 mm
Weight	approx. 350 - 600 kg
Mains	3 x 400 V, 50/60 Hz, 32 A

(1) depends on product properties and processing task

Mini-Compounder KETSE 12/36

With the Mini-Compounder KETSE 12/36, Brabender offers a miniature scale twin screw extruder with application to the chemical and pharmaceutical industry for product development.

- Full barrel length 36 D with top openings at 4.5 D, 10 D, 27 D – you can use multiple feeders, reduce the processing length or vary the place of venting
- Side feeding port at 12 D
- Our dosing systems allow you to feed any consistency of the materials such as granules, powders, fibers and even fluids
- The complete barrel is split horizontally ("clamshell design") and allows quick opening and access to all parts in contact with the material, easy and effective cleaning and the analysis of the extrusion process
- Torsion-free, hardened, highly abrasion resistant barrel for a long lifetime
- The modular screw design – supported by our dedicated software – offers almost unlimited possibilities to optimize the configuration to your application
- Throughputs down to 0.06 kg/h, small amounts of materials can be compounded
- Optional built-in vacuum pump
- Compact, stand-alone design



Mini-Compounder KETSE 12/36	
Screw diameter	12 mm
Barrel length	36 D
OD/ID ratio	1.43
Screw speed max.	600 min^{-1}
Screw torque	2 x 15 Nm
Operating temperature max.	425 °C
Pressure max.	150 bar
Throughputs max.(1)	0.06 - 5 kg/h
Dimensions L x W x H	1341 x 695 x 1198 mm
Weight	355 kg
Mains	3 x 400 V, 50/60 Hz + N + PE, 32 A 3 x 230 V, 50/60 Hz + PE, 32 A

(1) depends on product properties and processing task

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Conical Twin Screw Extruder (CTSE)

The counter-rotating conical twin screw extruder is ideally suited for quality control, product development and research applications.

- Gentle and effective mixing properties at shear sensitive materials such as PVC
- Nitrided barrel surface to ensure long lifetime even with abrasive materials
- Polished chrome plated screws – various special steel grades available as well
- Vent port

Conical Twin Screw Extruder (CTSE)	
Screw diameter	32 / 20 mm
Screw length	342 mm
Flight depth	2.2 mm
Screw speed max.	with Plastograph EC Plus: 150 min^{-1} with Lab-Station EC: 200 min^{-1} with Lab-Station: 350 min^{-1}
Screw torque	2 x 100 Nm
Operating temp. max.	400 °C
Pressure max.	700 bar
Throughputs max.(1)	0.5 - 10 kg/h
Dimensions L x W x H	on mobile frame: 1100 x 1600 x 670 mm on docking station: 1100 x 1600 x 600 mm
Weight	75 kg (w. frame) / 110 kg (w. docking station)

(1) depends on product properties and processing task

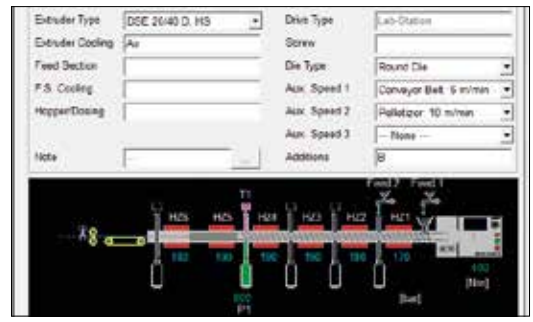


Screw pairs for CTSE (from left to right): venting, intensive mixing, mixing screws

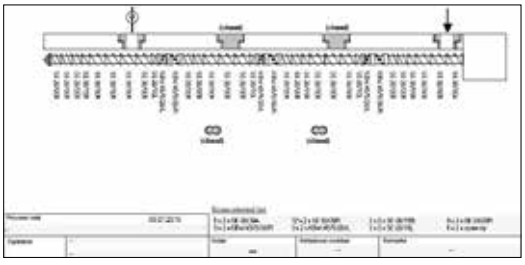
Screw Configuration Software

Brabender offers a software that can be used to create an application-specific screw configuration. The software offers the following features:

- List of all available screw elements
- Adjustment of the configured screw to the extruder process length
- Configuration of the screws under consideration of the liner opening
- Function description of the different liner openings
- Documentation and archiving
- List of all required screw elements



WinExt software: System configuration surface



Screw configuration software

The Brabender MetaBridge

MetaBridge® Brabender®



Brabender MetaBridge software running on tablet

Discover the Brabender MetaBridge

The new software is characterized by its easy and intuitive handling. After log-in, the user finds all information about the device and a choice of options for his purpose on the start screen.

The advantages

- User-friendly operation by touch – perfect for tablets and smart-phones
- Responsive web design: screen resolution adjusted automatically
- Ready to use, no installation necessary
- Security of tests and data through password protected user log-in
- Live test tracking by authorized users from multiple end devices all over the world at a time

Intelligent features

Benefit from new and optimized functions:

- Administration mode for user access rights
- Webbased solution – possibility of sharing information and data with other users worldwide
- Live tracking of tests with end time indication for logged-in users
- Optimized basic functions like data recording and evaluation, printing and export of test results – clearer, easier, faster
- Central test administration and data storage provides for quick and easy access of authorized users
- Easy definition, clear display and quick integration of reference curves
- Optimized functions for editing and adapting diagrams to your individual needs



Brabender application laboratory

The Brabender support

Our state of the art application laboratory is always made available to our customers.

You can choose to send material to us for testing or schedule a specific Lab Trial with our expert team. In our application laboratory, you will have access to our full product line to help come to a solution for your application.

Made in Germany since 1923

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Certified Quality DIN EN ISO 9001 Management System

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