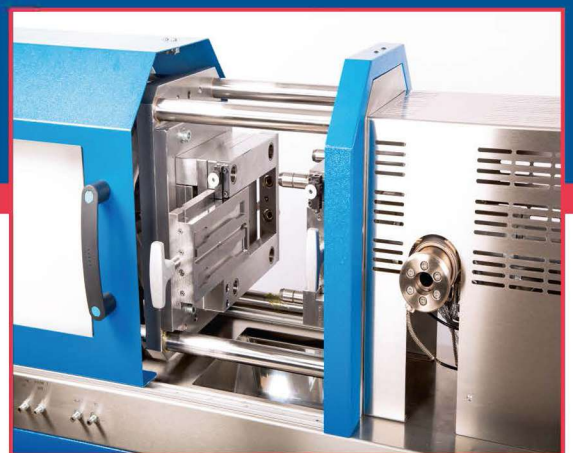




Original Brabender® Instruments for Material Research and Quality Control





C. W. Brabender® Instruments, Inc.; New Jersey, USA



Brabender® GmbH & Co. KG, Brabender Messtechnik® GmbH & Co. KG and Brabender Technologie GmbH & Co. KG; Duisburg, Germany



ООО Brabender®; Kazan, Russia

Company profile

The Brabender group

Founded in 1923 by Carl Wilhelm Brabender, Brabender GmbH & Co. KG has been the leading company for the development, manufacture, and distribution of instruments and equipment for testing material quality and physical characteristics in all fields of research, development, and industrial production in the chemical and food industries all over the world.

Today, the Brabender group comprises five companies, each of which is responsible for its special range of development, production, and service. This allows versatility in each of the special lines. To the benefit of our customers.

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.

Apart from that, numerous papers dealing with the application of the Brabender instrument systems for several tests have been published all over the world during the past decades. We would be happy to send you a bibliography comprising about 1,500 articles at present.



Brabender application laboratory



The Brabender 5-Star Service provides you with ongoing support for your Brabender equipment:

- On-site service – inspections, maintenance, repairs
- Spare parts service – spare parts, consumables, spare part logistics, upgrade kits
- Factory service – repairs, reconditioning
- Value added services – software update agreements, reference materials, inspection/maintenance agreements, emergency service, remote maintenance, mentoring, service-related training
- 24/7 service line – contacts, spare parts, technical answers, service appointments



Brabender® SpeciMold® - Produce specimen in-line

- Continuous production of specimen without impairing the extrusion process
- No second melting history - the specimen exactly represents the extrusion product
- High operating comfort by automated processes
- User-optimized software
- Universal application due to compatibility with third-party extruders and universal exchange of the injection mold

Patented procedure

The Brabender SpeciMold offers a unique and comfortable quick method for producing a specimen in a single step in-line with the ongoing extrusion process – fully automatically, without any bypass or additional process steps, directly from the ongoing production process.

Principle

The SpeciMold is subdivided into the heated SpeciMold block with the piston and the injection die, and an injection mold which can be opened and closed through a toggle mechanism.

The polymer is homogenized, molten and conveyed as usual in the

extruder. Then, the melt passes the SpeciMold block before it is shaped in the extruder die head.



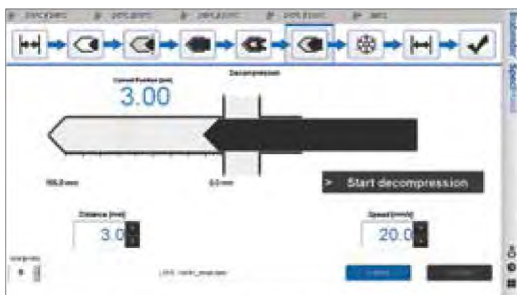
Different injection mold inserts

For testing the extruded product already during production, the SpeciMold goes into action.

A chamber beside the actual melt channel is slowly filled with the polymer melt. The melt from this chamber is then injected into a temperature-controlled injection mold where it is cooled down. During this process, the internal pressure of the injection mold is measured continuously. The actual compounding process continues during this process – no interruption required.

Advantages of the SpeciMold

- Matches a large variety of polymers and polymer compounds
- Saves time by continuously producing specimen in-line with the ongoing extrusion process
- No changes of the material characteristics caused by a second melting history
- High operating comfort by automated processes
- Quick and easy exchange of the injection mold
- Editable injection molding parameters



SpeciMold software: Process mapping



Specimen in the injection mold

Instrument description

The Brabender SpeciMold comprises the following main parts:

- 1 Control panel
- 2 SpeciMold block
- 3 Closing unit
- 4 Collector box
- 5 Height-adjustable castors



Applications

The SpeciMold suits a large variety of applications:

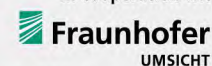
Material testing

- in research and development laboratories

Quality assurance

- in recipe development
- in additive production
- in compounding lines

Developed
in cooperation with



within the BMWi-ZIM project „Development of a modular inline specimen injection molding system for recipe optimization and quality assurance in polymer processing“ (KF2505201VT9; KF2084805VT9)

Meta-Torque Plasti-Corder® / Intelli-Torque Plasti-Corder® / ATR / Prep-Center

The heart of a flexible testing and simulation unit

- Modular configuration
- Multi-master system with self-intelligent modules
- Self-validation
- Real-time transmission of events and actual values
- Control and evaluation software for all current Windows® versions and for the new, web-based Brabender MetaBridge
- Real multitasking
- Easy connection of additional equipment such as mixers and extruders
- Automatic recognition of additional equipment

Fields of application

- Raw material and recipe development
- Material testing
- Quality control parallel to production
- Optimization of the production process
- Laboratory-scale production of samples for further investigations

Why go modular?

In laboratory applications, flexibility and versatility are paramount.

Users no longer need to have numerous stand-alone machines with many different controls. With just one drive unit, you can use several Brabender processing units:

- Measuring mixers
- Single screw measuring extruders
- Twin screw measuring extruders (compounders)

Using modular systems means a cost-effective solution to work flexibly with numerous laboratory machines.

Principle - the role of the drive units

The Brabender drive units

- provide the motion by the drive motor for the processing modules
- contain the direct torque measurement system
- control and/or read the parameters of the processing modules, feeders and processing data, like melt and zone temperatures, speed, pressure etc.



Clamshell design of twin screw extruder TSE 20/40 Attachment.



Meta-Torque Plasti-Corder

Advanced Torque Rheometer (ATR)



Prep Center



Intelli-Torque Plasti-Corder

Tailor-made system configurations for different applications

Batch Mixing



Extrusion



Meta-Torque/ Intelli-Torque

For applications which require higher torque and speed, we recommend these floor-standing models, where the modules are attached to the Drive Unit. The Meta-Torque model with its 16 kW drive power which provides 325 Nm torque and 350 RPM speed can handle all the processing modules of the Brabender modular system.

The Intelli-Torque model is a more economical version with 6.8 kW drive power with 400 Nm and 150 RPM. This unit can also handle all the processing modules of the Brabender modular system.

The compatibility of the different processing modules and Plasti-Corder drive units can be seen in the schematic on the left. (*Drive Units also compatible with processing models not pictured*)



Batch Mixing



Extrusion



Advanced Torque Rheometer (ATR)

The ATR Plasti-Corder is an extremely advanced Torque Rheometer with a sleek modular trim line design that provides flexibility for either mixing or extrusion applications.

The drive system is a 2.5 HP drive utilizing CAN (Controller Area-Network) Field Bus Communication. The drive speed is up to 120 RPM with a 0% speed deviation through digital feedback. The unit can accommodate any C.W. Brabender® mixer or extruder attachment up to 160 Nm. The ATR is provided with a single 5 zone temperature controller, 4 melt thermocouple inputs and multiple pressure inputs.



Measuring mixers

The efficient machines for quality control and recipe development

- Raw material and recipe development
- Material testing
- Quality control parallel to production
- Optimization of the production process
- Laboratory-scale production of samples for further investigations

Carl Wilhelm Brabender said:

"It is only testing, measuring, and recording as a function of time which efficiently helps to rise production quality; only this way, certain processes can be recognized which cannot be grasped with static measurements."

Principle

The internal or batch mixers - as their name suggests - are machines for non-continuous production of homogeneous polymer, elastomer, ceramic or other mixtures. The raw material is loaded through the top opening into the heated mixer bowl where it is homogenized by specially shaped mixing blades.

How can this equipment be used as a torque rheometer or measuring mixer?

The primary physical property measured in such mixers is torque. This torque mirrors the resistance the material opposes to the rotating blades during the mixing process. The torque moves a sensor out of its zero position. This path can be measured and visualized as a function of time. The resulting diagram illustrates the relationship between torque (viscosity) and temperature over the measuring time and also shows structural changes of the material.

Application areas

Brabender measuring mixers are perfectly suited for a large range of applications.

Use them as batch mixers for sample preparation if you only need small amounts of sample material. Several different batches can be produced in short time and with almost no waste of raw material.

Simulate on a laboratory scale all processes relevant for the production and processing of polymers and other plastic and plastifiable materials, such as compounding, mixing, masticating, etc. As an example, the fusion time of PVC and other materials can be determined precisely and related to the estimated residence time of the material in an extruder.

Test the processibility and material characteristics of thermoplastics, thermosets, elastomers, ceramic molding materials, pigments, and many other plastic and plastifiable substances.

Blade geometries

Select the optimum blade geometry for your application from a large program of mixer blades.

Decades of industrial experience have shown that roller, cam, Banbury and sigma blades have proven to be perfectly suited for most applications on thermoplastics and elastomers.

Evaluation

- Fusion behavior of PVC
- Heat and shear stability of polymers
- Flow and cure behavior of polymers
- Flow and cure behavior of elastomers
- Automatic evaluation of the black incorporation time (BIT) with selectable zero point
- Plasticizer absorption of PVC dry blends
- Liquid absorption of powders
- Semi-automatic universal evaluation
- Measuring mixer tests with temperature and speed programming
- Conductivity measurement
- Gas flow measurement
- Degree of property breakdown

Measuring mixers 10/30/60

Mixer Measuring Heads 10/30/60

- Sophisticated design for efficient mixing
- Easy handling, cleaning and manifold applications through quickly detachable and partially interchangeable mixer blades
- Precise and constant heating/cooling
- Operating temperatures of up to 450 °C
- Wide range of accessories



Half size mixer



Type 6 mixer



3 piece mixer



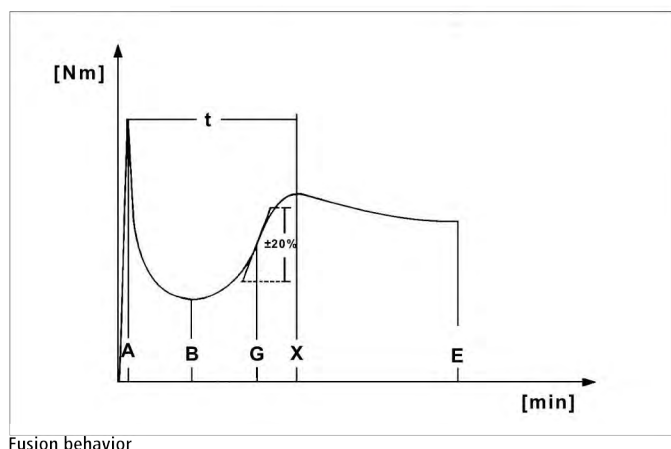
At most of the research and development sites, versatility of an instrument is a basic requirement due to steadily changing samples and materials.

The most general purpose mixers are the series 10/30/60 mixers. They can be supported as either electric or liquid heated mixers.

The electrically heated mixers are perfectly suited for materials like PAEK and PEEK with melting temperatures of more than 300 °C.

The liquid heated measuring mixers stand out for particularly precise heating/cooling and uniform temperature distribution. This makes these mixers the perfect tool for applications at lower temperatures (< 300 °C).

Another notable feature is the rotor speed ratio of 2 : 3 (driven to non driven, US type 5) which results in a high torque resolution and allows a better differentiation, especially when testing low viscosity polymers. Of course, all of the measuring mixers can be supplied with a 3 : 2 (US type 6) speed ratio either.



Application example: Fusion behavior

Use this evaluation method for testing the fusion behavior of thermoplastic polymers. Measure material-specific Plastograms which also permit to draw conclusions as to the history of the material.

The software analyzes the curve and determines, among others,

the extreme values in the torque curve (as a measure for viscosity), fusion time, gelation speed, and the mechanical energy input.

These material characteristics are valuable data for incoming and final inspection or for the configuration of production processes.



Prep Mixer

- Large mixer volumes
- Liquid or electric heating
- Precise and constant temperature conditioning up to 375°C

Prep Mixer Series mixers are available with liquid heating/cooling and with electric heating and air cooling. Due to the large mixer volumes of 370 to 440 cm³, these measuring mixers are frequently used for producing

sample compounds for subsequent tests. The material can easily be taken out and rolled out to sheets or pressed to plates.

Control and document the entire compounding process from your device or implement and benefit from an optional process-control of each individual mixing step.

These measuring mixers can also be applied for material testing (e.g. of rubber compounds).

These mixers can be equipped with Roller, Cam, Banbury and sigma blades.



Planetary mixer P 600

The Brabender planetary mixer P 600 is used for testing the properties of powders like the liquid sorption and the plasticizer sorption rate of PVC powders in compliance with international standards or the pourability of PVC dry blends, further for preparing PVC pastes for tests and testing them in compliance with DIN EN ISO 4612.

A special rotor runs in a planetary motion in the mixer bowl. A revolving scraper prevents the sample material from sticking to the mixer wall.

Applicable standards:

- DIN EN ISO 4612
- DIN 54802
- ASTM D 2396

Single Screw Extruders

Single Screw Extruders: 0.5", 0.75", 1.25"

Multipurpose machines for testing and processing

- Application in laboratories and small-scale production
- Development of new products
- Testing the processing behavior for recipe development or incoming and final material inspection
- Quality control during production in combination with measuring heads
- Production of small tubes and profiles
- Production of blown films, sheets and fibers



Application area

Laboratory scale machinery can easily simulate production processes in real time.

What kind of advantages are provided by a laboratory measuring extruder?

The design of this machine allows for small amounts of raw material samples. The mentioned research and sample preparation tasks do not require anymore to interrupt your production processes, which equates to direct savings to your bottom line.

The Brabender modular system 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.

These mentioned parameters can support you to find the optimum processing conditions on your production scale.

Advantages

The Brabender measuring extruders offer the following major technical features:

- Mechanical and electronic overload protection
- Nitrided barrel surface to ensure long lifetime even with abrasive materials
- Up to 4 ports for pressure transducers and 4 for melt temperature (Optional)
- The temperature of the individual extruder zones are controlled and displayed by self-tuning temperature controllers.
- Polished chrome plated screws – various special steel grades available as an option
- Single and multistage screws with various compression ratios, zone lengths and mixing elements are available for testing a large range of materials.
- Wide range of processing and measuring dies



Twin screw extruders and compounders

The ideal instruments for continuous compounding

- Development of new materials
- Recipe development
- Production simulation
- Application in laboratories and small-scale production

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 rate without pulsation or irregular thermal loads
- High quality of the extrudate
 - Narrow residence time spectrum
 - of the melt within the screw area
 - Well-defined plastification time
- and precise 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

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 instrument for plastics from synthesis up to recycling.

Users will benefit from the 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.

Users can 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 20 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 model 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.





Twin screw extruder TSE 20/40

(Stand Alone or Attachment Unit)

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 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

- Distorsion-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 600 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

Twin screw extruder TSE 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 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

- Distorsion-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



Conical twin screw extruder (CTSE)

The counter-rotating conical twin screw extruder is perfectly 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 a long lifetime even with abrasive materials
- Polished chrome plated screws – various special steel grades available as well
- Vent port

Software Support

- **WinMix**
For measuring mixers
- **WinExt**
For measuring extruders incl. capillary rheometry and for Filtratest according to DIN EN 13900-5 and ISO 23900-5
- **WinAbs**
For Absorptometer
- **Several correlation software packages**

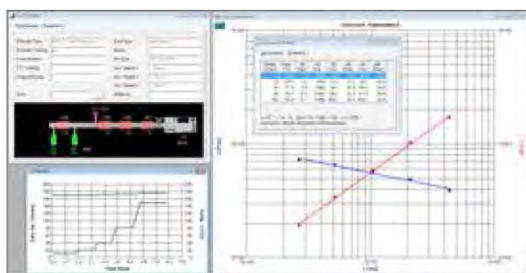
The user-optimized Windows® software allows recording of process data and evaluation of the test results in compliance with the relevant standards.

On-line diagrams give a quick overview of the test data already during the running test.

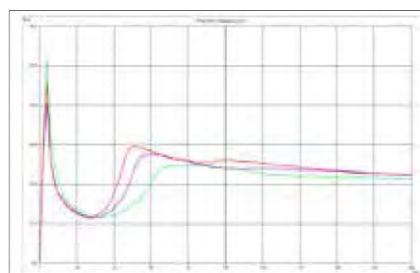
Special data correlation programs allow for a direct comparison of the results of different tests or test series with each other.

Furthermore, they offer automatic calculation of mean values and standard deviations and enable the definition of reference curves in order to show irregularities or compare against standards.

Storage of the measuring values in MS Access® database format makes further processing of the data in a LIMS possible without any problems.



WinExt software: Module for rheological evaluations



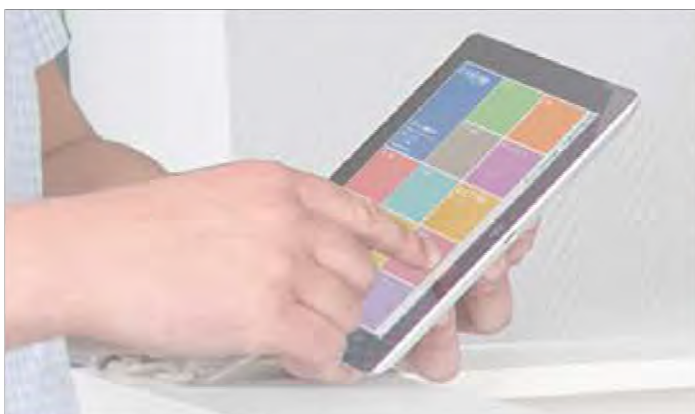
WinMix software: Correlation diagram (variation of speed)

The Brabender MetaBridge®



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.



Brabender MetaBridge software running on tablet

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 easy, 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

- Web-based 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

RheoLink Software Support

RheoLink

Key Features:

- Computerized interface with WiFi remote connectivity
- PLC Field Bus Technology controls and diagnostics
- Connectivity
 - Identification of sensors
 - Remote monitoring of process and control
 - Remote diagnostics

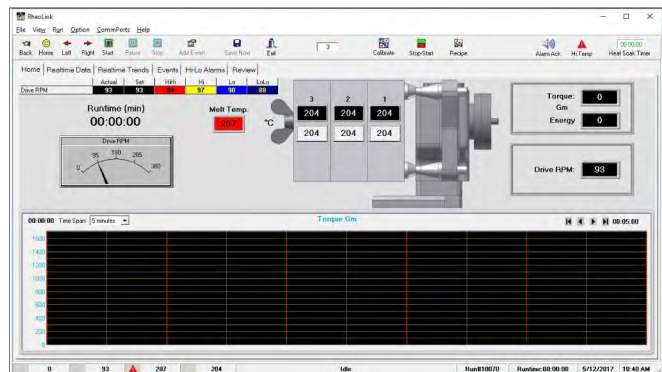
The Rheolink software is a universal software program for evaluating either extrusion or mixing applications.

By use of RFID (Radio Frequency Identification) Rheolink automatically detects the extruder or mixer attachment, the required heat zones, and all safety limits for the attachments.

The intuitive and user-friendly software provides detailed analysis of mixer and extrusion data, and is compatible with any CWB extruder or mixer.



RheoLink: Extrusion test screen



RheoLink: Mixer test screen

Measuring and processing die heads

Brabender measuring die heads are high-precision tools fitting all of the Brabender single and twin screw extruders.

Use the versatile Brabender measuring extruders and the extensive line program of measuring and processing die heads. Extrude all sorts of plastics and plastifiable materials such as thermoplastics, thermosets

and elastomers. Analyze your material on a laboratory scale in real conditions for various criteria, e.g.

- Uniform plastification, gels, surface gloss
- Color dispersion and color check
- Transparency and formation of streaks
- Swelling and contraction behavior

- Segregation of individual recipe components of a compound at the die and/or at the screw tip (e.g. titanium dioxide)
- Output per unit of time
- Rheological properties, etc.

Upon request, special constructions are available, such as liquid heating/cooling, non-standard sizes or special materials.



Round strand die heads

The single round strand die head is designed to accommodate nozzle inserts to allow for variation of the strand diameters without changing the entire die head. Multi-strand dies extrude several round strands at a time and can help enhancing your extrusion capacity.



Wire coating die head

With the wire coating die head, polymeric coatings can be extruded on wires of different diameters. This die head can perfectly be combined with the Brabender Wire Take-Off Unit to obtain a laboratory-scale wire production line.



Tubing die head

The tubing die head is designed to produce tubes or hoses of different dimensions. Various tooling diameters can be replaced to achieve different diameters and wall thicknesses without needing to change the entire die head.



Rheological die heads

You can extend the capabilities of your single-screw extruder to enable it performing rheological tests. The resulting flow curve or viscosity curve mirrors the rheological characteristics of your material in the occurring shear rate range.



Ribbon die head

Brabender supplies various designs:

- "Fishtail" with fixed gap
- "Fishtail" with adjustable gap
- "Coathanger" design with flex-lip

All of the ribbon die heads are available with different gap widths and openings to obtain a large variety of sheet dimensions.



Garvey die head

This die head was specially developed for the rubber and tire manufacturing industries. The special shape of the die outlet opening, combining relatively flat surfaces, sharp corners, and thin sections, reproduces typical geometries in tire building blocks and fully complies with ASTM 2230.



Blown Film die head

Mandrel designs are available. The mandrel type die heads are designed to accommodate die inserts of different sizes according to the desired bubble diameter.



Swelltest die head

Used in combination with the Brabender Swelltest, this die head allows for high-precision, non-contact measurement of the diameter of objects with a circular cross-section and any transparency by means of a visible parallel GaN green LED beam.

Post Extrusion

Pelletizer



- Adjustable pellet size
- Easy discharge
- Low-noise operation
- Constant pellet length even with deviating intake speed

Complete your strand extrusion line with the Brabender pelletizer which can handle up to 4 strands at a time with diameters of 1 to 6 mm. The pellet length can be adjusted at the control panel.

The pelletizer stands out for its two separate servo-drives which ensure a constant pellet length even if the intake speed varies. Further advantages are the low-noise operation and the thought-out and secure design, which offers easy-to-access control elements and various safety devices to ensure secure operation. Optional extras for this are an interchan-geable drawer or secure mounting option for sacks of various sizes.

The pelletizer can be controlled manually at the control panel.

Blown film take-off unit



The Brabender blown film take-off unit serves for simultaneous blowing, cooling, taking off and winding up of extruded blown films. The polymer bubble extruded through the film blowing die head by means of controlled supporting air supply which provides for precise control of the hose diameter. The hose is guided through the collapsing frame which is adjustable in height, taken by the nip rolls, guided through the roll assembly and wound up on the winder.



- Precise control of film diameter
- Adjustable height up to 2500 mm
- Also available with Film Quality Analyzer

Film Sheet Ribbon (FSR) Take Off



The Brabender FSR is a universal haul-off unit for taking off, cooling, and winding up flat films up to a max. film speed of 30 m/min. Liquid temperature conditioning of the nip rolls positively influences e.g. crystallization processes in the film. The winding roll is fixed with clamping cones for easy takeoff. The FRS can be controlled manually at the control panel or via CAN bus from the PC.

- Excellent film quality
- High haul-off speed
- Precise temperature conditioning
- Also available with Film Quality Analyzer



Filtratest



The Filtratest fully meets the demands of DIN EN 13900-5 and ISO 23900-5 for determining the dispersion and dispersibility of pigments and extenders in plastics by means of the filter pressure value (FPV) test. The main fields of application for this method are quality control of masterbatches, compounds, and polymers as well as color recipe development.

- Quick change of screen packs through drawer system
- Integrated preheating of the screen packs
- Short cycle times and continuous extrusion by by-pass operation
- Convenient process and evaluation software

Aqua Trough



The Brabender Aqua Trough is five feet (5') long and constructed with 304 stainless steel with drip trays and is equipped with strand/product roller guides and an air-wiping device.

It's versatile design allows it to be utilized during compounding and pelletizing applications.

With optional accessories it can be transformed to cool small tubing and profile applications.

- Precise control of hose diameter
- Infinitely adjustable height up to 2500 mm
- Expansible with Film Quality Analyzer

Conveyor Belt



The Brabender Conveyor Belt is ideal for take-off of extruded profiles of all types. The Conveyor Belt handles single or multiple strands, tubing, films, or any profiles 4.5" or less in width.

- Precise control of hose diameter
- Infinitely adjustable height up to 2500 mm
- Expansible with Film Quality Analyzer

Granugrinder



The design of the rotor configuration and the rotational speed of the rotor ensure excellent quality granulate, with consistent size without dust or fines.

- Equipped with a 1.8KW motor
- Stationary Cutters
- 150mm Rotary Cutters

Wire Coasting Take-off Unit



The wire take-off and winding unit takes off the coated wire and winds it up. The blank wire is straightened before it is coated in the wire coating die. After cooling in the water bath, the two nip rolls take off the wire at a constant tension. The coated wire is then wound up evenly via a traversing device on a winding roll. The wire take-off unit can be controlled manually or through the PC (via CAN bus).

Winder



Advantages:

Highlighted by the modular and compact design, the Brabender Winder can vary between roll or belt haul-off and providing supports for various types of coils..

- Flexible and easy retrofitting of roll to belt haul-off or vice versa
- Precise setting of the haul-off speed
- Adjustable distance between haul-off and oscillating unit
- Ergonomic control panel
- Easy integration in existing Brabender extruder software

Applications:

The Winder can be used as a downstream unit in any extrusion line for taking off and winding up round strands and hoses made of different materials such as elastomers, thermoplastic elastomers or thermoplastics. This opens up a wide range of applications:

- Production and simulation
- Quality analysis
- Recipe sampling for further analyses, e.g. for tensile strength
- Product development and filament production for 3D printing
- Wire sheathing
- Storage



Winder Control Screen

Auto-Grader®

- Objective
- Continuous
- Real-time testing
- Integration into process control system

Due to the frequently high material throughputs in continuous production, continuous in-line quality control is essential in industrial production lines. With the Brabender Auto-Grader, product specifications like constant of a rheological power law, MFR and MVR values at different loads, transparency and purity of a film can be surveyed directly at the production site.

All data can be shown and monitored in a control room of the production plant. Even the machine alarms or the film purity video line can be connected to the control room. Whenever inadmissible deviations are reached, a signal will be transmitted to the appropriate device.

The Auto-Grader adjusts itself automatically to different polymer grades. According to the needs, further in-line measuring systems can be integrated, e.g. a colorimeter or hazemeter. This combined system is suited for all main tasks of a production control.

The Brabender Auto-Grader continuously determines the quality characteristics (typically: MFI, MVR, optical properties) relevant to production practice. The complete machine control as well as the representation of the measured results are done fully automatically and continuously within seconds.

The Auto-Grader can be integrated in-line into a pellet conveying system or in bypass to a production extruder.



Absorptometer "C"

Precise and reproducible absorption test

- High-precision measuring mixer with special blades
- Automatic (sequencer controlled) buret with ready to use default settings
- Choice between local and remote operation for economic test procedure
- Separate location of the PC for clean operation and long lifetime



Application

The oil absorption number (OAN) is widely used for characterizing the structure of carbon blacks and other free flowing materials which has a strong effect on the processing and vulcanization parameters and the quality of the product as well.

Principle

The Brabender Absorptometer "C" is a tabletop instrument with a torque measurement system (dynamometer), which is used for the precise and reproducible determination of the oil absorption number (OAN) of powdery materials.

The test method is based on the changes of the consistency of powdery materials during oil absorption. How can such consistency changes be recorded and visualized?

The Absorptometer "C" consists of

two main parts: a drive unit with a torque measurement system and an attached mixer with special blades.

The torque is measured and recorded throughout a special mixing process: the oil is gradually added by an automated buret into the mixer. The free flowing, powdery material absorbs the liquid and starts agglomerating. During this transition, more and more torque is needed for the mixing and eventually a torque peak appears on the time-torque curve. The OAN itself is given in accordance with the standards and common practice in ml (of the absorbed oil) / 100 g (of sample material).

The Brabender Absorptometer "C" for running precise and reproducible absorption tests fully meets:

- ASTM D 2414 (carbon black)
- ASTM D 3493 (carbon black)
- ASTM D 6854 (silica)

Elatest®

Compact density measurement

- Excellent reproducibility of the measured values
- Easy handling
- Reliable, sturdy design



Application

The Elatest determines the density of polymers, in particular of rubber and non-vulcanized rubber compounds - a dimension which is of decisive importance for rubber processing both during recipe development and for continuous production control.

Principle

Density is determined by the measurement of the mass by a built-in electronic scale and measurement of the volume by an electronic position sensor.

Each measurement starts with weighing the sample, followed by the sample being placed into the measuring cylinder and compressed by the piston.



For the determination of the sample volume, the piston stroke is measured between empty and filled cylinder.

The sample density is calculated automatically from the sample weight and the determined sample volume.

Visco-Corder

Precise and reproducible absorption test



Best suited for applications/materials such as:

- Gypsum
- Cement
- Pastes and Slurries
- Adhesives
- Paints

The Visco-Corder® utilizes high precision torque cell technology to measure the viscosity of Newtonian and non-Newtonian materials. In the Chemical Industry the instrument is used to evaluate a wide range of materials for the laboratory, production and quality control. It can be used to measure apparent viscosity and perceived difference in the flow properties of fluids, pastes, slurries and semi-solids with particulates. The Visco-Corder® offers a wide measurement range, from a few centipoises up to 700,000 centipoises. The unit offers a menu driven electronic keypad and display for ease of operation and observation of data. The Visco-Corder® Model VC-E Software Program for controlling data collection consists of time, temperature and measured viscosity units. Data can be exported to EXCEL as a CSV file to a PC.

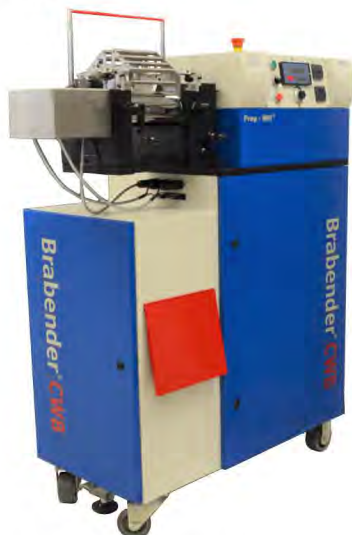
Principle Of Measurement

The Visco-Corder® uses reaction torque for dynamic measurement. Reaction torque is developed by submersing a sensor element in a rotating sample vessel containing the test material and measuring the resultant torque expended by the material on the sensing device. The torque is measured in units of either Centimeter-grams (cm-g) or Brabender Units (BU). The measured torque, time and speed data can then be utilized to calculate the apparent viscosity and characterize the flow behavior of the test material.



Prep Mill

Compact density measurement



- Standard friction ratio of 1.3:1
- Adjustable gap from .005" to .195"
- Safety trip bar and operator kick plates with coupled electrical interlock

The Brabender Laboratory Electrically Heated Prep-Mill is a universal, heavy-duty machine designed for small-scale milling of elastomer and thermoplastic materials.

The Two-Roll Mill combines the features of precision construction, reliability and serviceability into a mobile and compact milling station, ensuring uniform batch-to-batch mixing characteristics.

The Prep-Mill is designed to operate at temperatures up to 260° C, with an accuracy of up to 1°C. Various standard safety features provide the operator with exceptional protection.

A heavy-duty high torque system - The Prep-Mill drive is designed to provide output from a 2.5 HP, sensor-less vector drive with built-in torque overload protection with variable roll speed of 0-30 RPM.



Included safety guard over the rolls and dial gauge to determine roll gap setting. In addition to the operator trip bar over mill rolls, an operator kick plate will also stop the drive when actuated. The kick plates are mounted on both sides of the mill, along with an emergency stop on top of the unit.

Made
in Germany
since 1923

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... where quality is measured.