Brabender®
ViscoQuick

for fast and precise determination of the viscosity of a wide range of materials

Brabender®

… where quality is measured.

Brabender ViscoQuick

The Brabender ViscoQuick measures the viscosity of various Newtonian and non-Newtonian fluids under variable shear and temperature conditions. Additionally, the cooling behavior of different materials as well as the gelatinization behavior of different types of starch and starch-containing products can be measured.

The sophisticated architecture with its worldwide unique shear geometry and with the fully integrated temperature control allow for high compactness, quick temperature profiles and high measuring accuracy.

The typical areas of applications include quality assurance at incoming goods inspection and in the production. Moreover, the ViscoQuick is used for the development of new recipes and new characterization profiles in application and research laboratories.

Different measuring paddle geometries and the possibility of creating customer-specific shear and temperature profiles make the instrument suitable for a wide range of applications. In addition to pre-installed methods for quality analysis of starchy suspensions with the M-shaped standard paddle, measuring paddles with different gap geometries are available for different viscous materials with lower or higher shear. Optimize the efficiency in your quality and production processes, decrease development cycles and finally increase the quality of your final product.

Highlights

Accurate

- High measurement accuracy ± 0.5 %
- High temperature profile accuracy ± 1 °C

Compact

- Worldwide unique shear architecture
- Fully integrated electrical heating and cooling – no external thermostat necessary
- Built-in PC
- Pre-installed software with all benefits of the MetaBridge Concept

Quick

- Cooling and heating rates of – 15 °C / min | + 20 °C / min
- Short measuring time – e. g. < 10 min for starch gelatinization

Flexible

- Wide viscosity range 0.03 – 50 Pas
- Rotating speed of up to 500 min^{-1}
- Temperature 10* - 110 °C **
- Custom shear and temperature profiles
- Different measuring paddle geometries for different applications
- Dosing of additional ingredients during measurement

Ergonomic and efficient

- Integrated MetaBridge HMI with touch screen
- Interface to native or 3rd party LIMS or ERP systems

Sustainability

- One housing for three units (meter, computer, thermostat)
- Measuring pot and measuring paddle are designed for long durability
- No consumables

* depending on ambient temperature

**only for non- boiling applications

Applications

Measurement of gelatinization properties of starch and modified starch:

- Natural and modified starch and flour from e.g.:
  - Cereals (wheat, rye, corn, rice, millet etc.)
  - Pseudo cereals (buckwheat, amaranth, quinoa etc.)
  - Pulses (peas, lentils, chickpeas, fava beans etc.)
  - Tubers (potatoes, sweet potatoes, cassava etc.)

Analysis of viscosity of Newtonian and non-Newtonian fluids:

- Oils
- Honey
- Syrup
- Ketchup
- etc.

Measurement of the heating and cooling behavior in product development and quality control for starchbased formulations:

- Pudding
- Sauces
- vegan yoghurt alternatives
- etc.

Measurement of gelling agent performance:

- Algae – extraction of hydrocolloids and measurement of gelation
- Marmelade – analysis of pectine performance
- etc.

### Measurement of the degree of gelatinization of extruded products:

- Grinding of the products required as a pre-step

Other applications:

- Swelling curve (according to Drews)
- Consistency of cold swelling products (e.g. cold cream)
- Special stress test conditions by applying customer specific shear and temperature profiles
- Alkali treatment of starch
- Acid treatment of flour
- Dosing of reagents during the measuring process

Application - Corn Starch
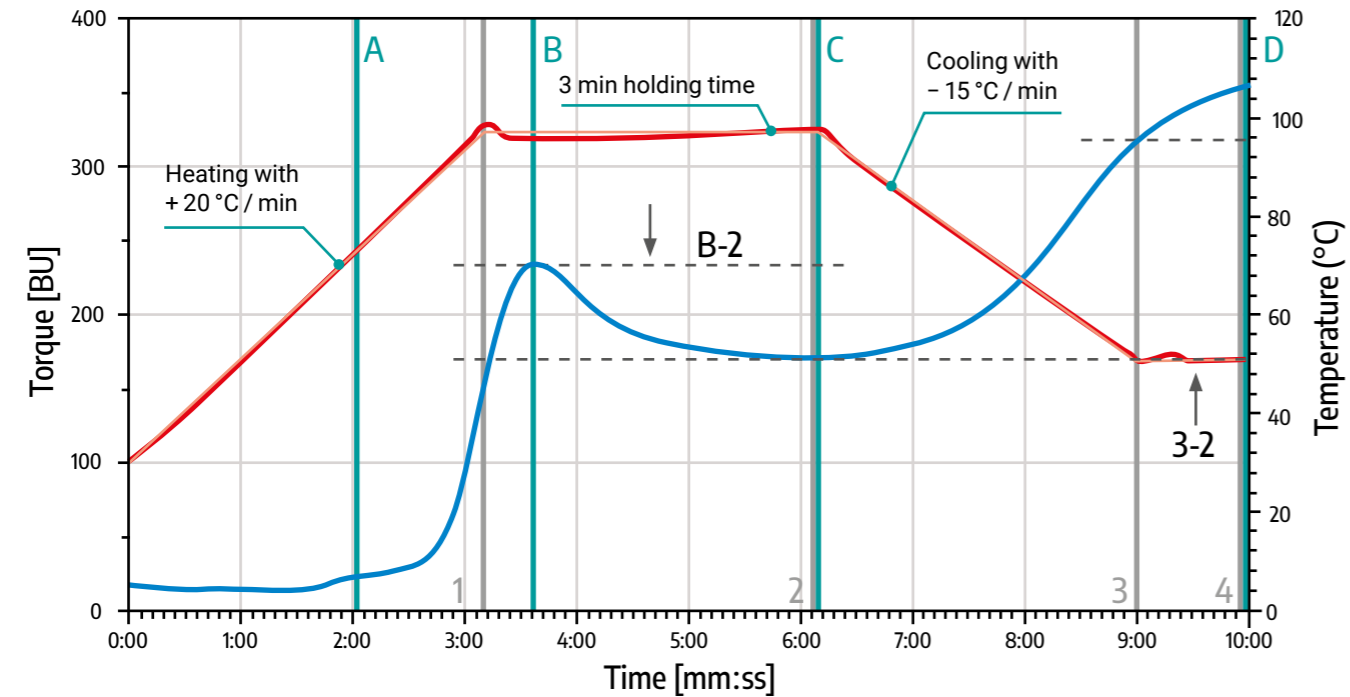
A – Beginning of gelatinization

Swelling of the starch granules caused by accumulating water leads to increasing viscosity.

B – Maximum hot viscosity

The water accumulation reaches its maximum and the starch granules begin to burst at the first maximum viscosity.

C – Minimum cold viscosity

The starch is gelatinized as a gel or paste and the amylose and amylopectin molecules are completely separated in the minimum viscosity.

D – Maximum cold viscosity

A 3-dimensional crystal structure is formed by the amylose and amylopectin molecules which leads to a second viscosity maximum in the cold phase.

The calculated breakdown (B-2) and the setback (3-2) values represent further starch quality parameters.
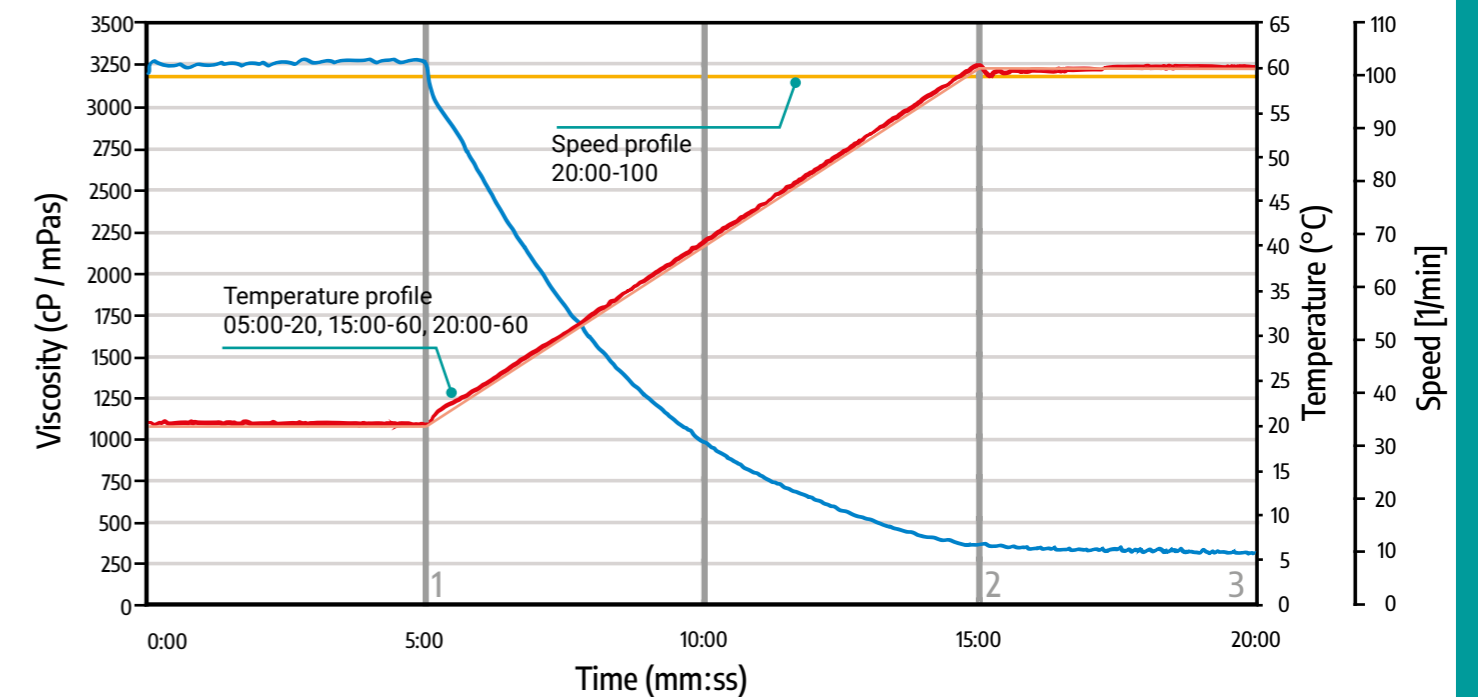
1 – Start of holding period

2 – Start of cooling period

3 – End of cooling period

4 – End of measurement

Application – Viscosity of toffee cream

1 – Start of heating period

After starting the measurement with an initial temperature of 20 °C, the temperature is increased to 60 °C after 5 minutes. Until the start of the heating process, the initial viscosity remains constant.

2 – End of heating period

After 15 minutes, referring to the entire measurement time, the heating process is finished. The viscosity of the sample material decreases significantly.

3 – End of measurement

The temperature is kept at 60 °C for the remaining 5 minutes. The viscosity decreases slightly to the final viscosity after 20 minutes measuring time.

Accessories

### Stainless steel universal beaker

for samples up to 115 ml (universal paddle) or
50 ml (tube paddle C 45)*.

M-shaped universal paddle

Universal stainless steel measuring paddle, for a wide
range of starch-based and other applications
(viscosity range: 0.03 - 50 Pas)

Static mixer insert

Stainless steel static mixer insert body for optimal flow
conditions and homogenization during measurement.
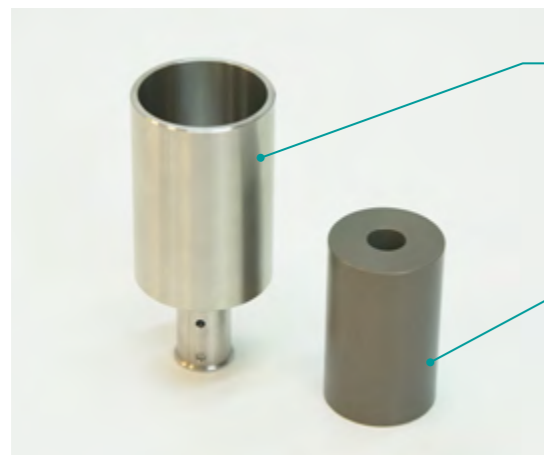
Tube paddle C 45 (Ø 45 mm)

2-gap system for measuring liquids with medium
viscosity, e.g. ketchup (30-20,000 cP/mPas, depending
on speed) , for universal measuring beaker (samples up
to 50 ml)*.

Flow body

minimizes the turbulence effect and ensures optimum
laminar shear at every any point of the beaker

Beaker 60 ml

Stainless steel beaker for samples up to 60 ml*,
without flow body

Tube paddle C 34 (Ø 34 mm)

1-gap system for measurement of products with high
viscosity, e.g. syrup, honey (200-50,000 cP/mPas,
depending on speed)

* depending on sample material

Technical Data

- Viscosity range: 0.03 – 50 Pas

- Speed: 0 – 500 min^{-1}

- Temperature range: 10* - 110 °C **

- Heating rate: up to 20.0 °C / min

- Cooling rate: up to 15.0 °C / min

- Sample volume: 15 g ***

- Touch screen: 10.4 Inches
  (1024 × 768 px), fixed

- Connectivity
  - MetaBridge Connect
  - WebAPI (general external data interface)
  - Labfolder (LIMS)

- Safety devices:
  - Emergency motor stop button
  - Non-contact magnetic safety switch
    on the cover of the measuring system

- Power supply: 100 – 230 V, 50 / 60 Hz

- Dimensions (W × H × D):
  approx. 350 mm × 640mm × 430 mm
  approx. 13.78 × 25.20 × 16.93 inch

- Weight (net): approx. 35 kg

- Ports:
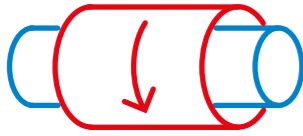 - 2 × USB
  - HDMI
  - Ethernet

* depending on ambient temperature

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*** depending on the analyzed material
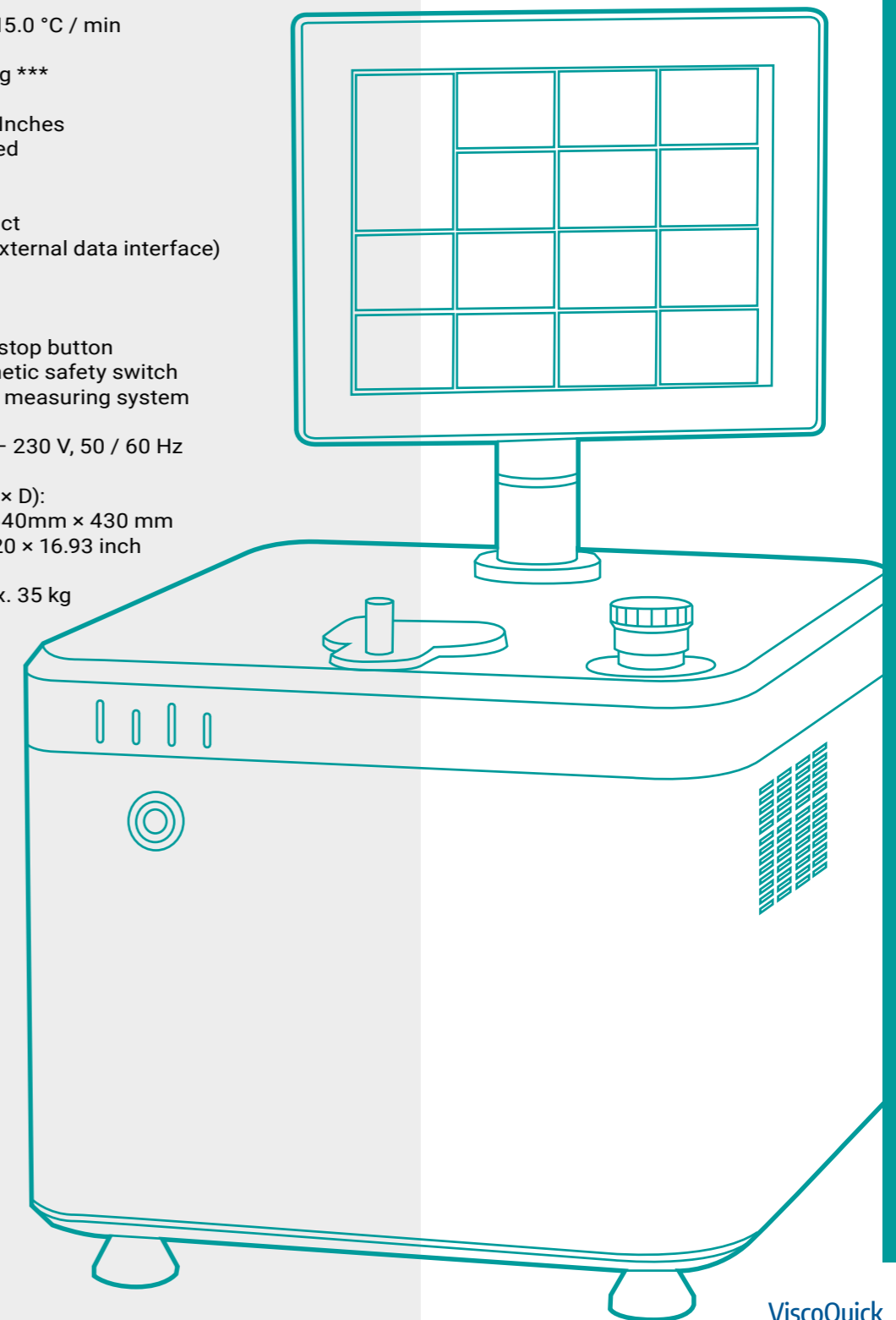
Technologies

DirectTorque

Brabender's DirectTorque technology directly measures the mechanical force on the drive axle. This enables a precise determination of the torque in a wide measuring range. Moreover, the measurement devices equipped with this technology support easy recalibration which can be carried out on-site without any component exchange.

DirectTemp

The DirectTemp technology is the key factor for precise temperature control. In order to achieve high accuracies and low latencies by measuring the temperature in the sample, Brabender uses specifically designed temperature probes with high thermal conductivity directly attached to the removable measuring container in the measuring mode or places temperature probes directly in the sample.
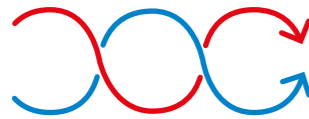
FlowOpt

The viscosity of a sample is heavily depending on the temperature. The accuracy of the viscosity measurement is therefore heavily depending on the temperature distribution in the measuring container. With Brabender's FlowOpt technology and specifically designed and flow optimized components, temperature gradients in the sample are avoided and a high degree of homogenization is achieved during the measurement.

EmbeddedHC

The Brabender's EmbeddedHC technology fully integrates a high performance heating and cooling architecture into the measurement device. Consequently, the need for additional external components like circulators is avoided allowing for high compactness of the complete measurement setup. Furthermore, it provides high heating and cooling rates which typically lead to short measurement times.

Ready2Use

Brabender devices with this function have a built-in computer and a touch display. This allows our customers to directly and easily start operating our devices without any IT experience. Combined with other Brabender technologies such as EmbeddedHC, this results in a very compact device setup.

MetaBridge

Brabender's cross-device software solution provides a consistent user experience between all Brabender units. The MetaBridge comes with various data evaluation functionality, pre-implemented standards and customizable measurement methods in order to meet application specific requirements. Regular updates improve and expand your device and let you automatically benefit from the latest trends and developments.

MetaBridge Connect

The MetaBridge Connect technology provides various data exchange interfaces and flexible connectivity features. Data sharing between all Brabender MetaBridge devices in one network allows for smart workflows and process efficiency. Moreover, the integrated web-based software interface (WebAPI) connects and automatically exchanges data with natively connected database systems and / or 3rd party laboratory information and management systems (LIMS) or ERP solutions.

MetaBridge Correlation

MetaBridge Correlation is an optional software package for performing correlation studies across multiple data sets. It allows for comparison of multiple measurements and parameters in a tabular and in an interactive graphical view. Particularly for quality control purposes, the compliance with a pre-defined tolerance is automatically evaluated and highlighted.

MetaBridge Database

The MetaBrigde Database represents a local data center in the customer network and a basic laboratory information and management systems (LIMS) for Brabender devices. Connected Brabender devices transfer measurement results automatically into the central MetaBridge database. Besides of the backup functionality, statistical analysis and crossdevice correlations between multiple data sets can be performed.

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… where quality is measured.