IKA

designed for scientists

Viscosity measurement for the monitoring of ceramic slurry

/// ROTAVISC for the chemical industry

The production of porcelain and various other ceramic products is dependent on a wide variety of raw materials. Viscosity measurements are required in order to achieve a homogeneous, smooth and bubble-free mass for further processing. The viscometers within the ROTAVISC series perform a precise measurement of the viscosity of the individual raw materials and the slurry - and this with easy handling.

Components used in ceramic production include clay, as water-containing aluminum silicate, and kaolin, as a weathering product of feldspar, as well as the non-plastic raw materials aluminum oxide, beryllium oxide, silicon carbide and zirconium oxide. Depending on the specific recipe, they are mixed together to achieve a fine-grain filter cake, which is then kneaded by machine. Here, it is important that the mixture has the correct consistency. And this can be determined using the ROTAVISC viscometer from IKA.

The ROTAVISC is ideal for examining a slurry under different shear loads. Thus, viscoelastic properties and the distribution of air pockets in the flow curve can be detected. This also makes it possible to determine the pumpability of the mixture into the desired molds.

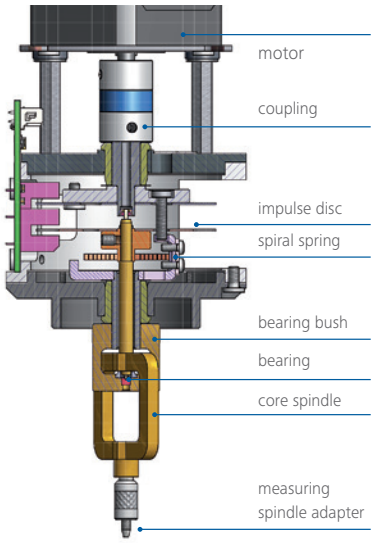
MEASURING VISCOSITY IN CERAMIC PRODUCTION

The ROTAVISC viscometer is suitable for quickly and reliably determining rheological parameters at different shear rates, both in the development lab and for purposes of quality control. ROTAVISC is able to measure the viscosity of preliminary ceramic stages and is easy to use as part of daily laboratory routine. The results are directly comparable with the measurement results produced by other devices. With an accuracy of ±1% of the measuring range and a reproducibility of ±0.2%, ROTAVISC meets all the requirements for reliable quality control and reliable production monitoring for the entire range of ceramic products.

STEPLESS MEASUREMENT ACCORDING TO THE SEARLE PRINCIPLE

Viscosity measurement with ROTAVISC is based on the SEARLE principle. A measuring spindle rotates in the substance to be examined. The viscosity of the sample is determined based on the torque required to achieve a given speed, taking into account the spindle used. All this happens automatically, without users having to make manual adjustments to the settings.

However, often the viscosity of a substance is not constant, but rather depends on the shear. Therefore, different viscosity values will be recorded for the same substance at different shear rates. Since exact measurements and perfect products require an entire series of measurements, the fact that ROTAVISC is infinitely adjustable is extremely helpful within the context of everyday lab work.



USABILITY

The rheological measurements with ROTAVISC ensure the constant quality and processability of the blanks. This minimizes breakage. The inclusion of a flow curve makes it possible, even in the slurry stage, to determine whether and in what way the raw materials or the manufacturing procedure must be changed. For example, thanks to viscoelasticity and flow behavior, it is possible to ascertain the optimal firing temperature and thus maintain and ensure the desired quality.

TECHNICAL FEATURES

Measurements according to DIN 53019 and relative measurements according to ISO 2555 are possible with ROTAVISC and the corresponding measuring spindles. ROTAVISC detects the sample temperature, which is important for the viscosity measurement, from a PT 100 sensor that can be immersed in the substance. You can store measurement methods and automate processes, even without connecting to a computer. This makes it possible to define both step and ramp programs, which can then be standardized over and over again.

TEMPERATURE CONTROL

The viscosity of a sample is always dependent on its temperature. Therefore, the sample should always be measured isothermally. The IKA tempering equipment meets this requirement by using immersion circulators as well as cryostats for temperatures ranging from -30°C to 250°C. This widens ROTAVISC's field of application, since the IKA laboratory software (see below) for controlling the thermostats can be used to specify rheological temperature ramps and record the change in viscosity.

VERIFICATION

The ISO 17025 standard requires that measuring instruments be verified. ROTAVISC offers users the option of carrying out this verification themselves. Thanks to the extensive range of appropriate standard fluids, users are fully independent, i.e. able to check their device without external maintenance costs. This allows them to check whether all specified readings are within the specified measurement accuracy range.

LABWORLDSOFT® 6 VISC

Labworldsoft® software opens up completely new possibilities for the user. Thanks to this, the measurement data taken by ROTAVISC can be transferred to a computer and stored there. The software is also ideal for controlling ROTAVISC. Labworldsoft® can also use ROTAVISC to carry out continuous measurements. The measured data is saved and is then available for evaluation.

It is particularly interesting that, while the viscosity is being measured, other parameters such as the pH value, the temperature and many others can be read in and processed by various measuring instruments via the software. As such, any correlation that exists between the parameters can be checked directly.

Do you have any usability questions, or would you like a quote? Our team is at your disposal at all times.

Phone: +49 7633 8310
eMail: sales@ika.de

IKA-Werke GmbH & Co. KG
Janke & Kunkel-Straße 10, 79219 Staufen, Germany
Tel.: +49 7633 831-0, Fax: +49 7633 831-98
eMail: sales@ika.de