



### Software RHEOTEST® RN MANAGER

Programm for performing, displaying and evaluating CR tests (shear rate), CS tests (shear stress) and OSC Oscillation tests. International standards and test specifications are stored in the software as standard tests. For special applications, predefined jobs for standard test methods are programmed for automatic test execution.

operating system	Windows 10 and higher
languages	English, Spanish, Russian, German – further languages on demand
user administration	definition of user rights
measuring data analysis according to the following models:	Newton, Ostwald de Waele, De Haven, Carreau, Cross, Golub, Reiner-Phillippoff, Meter, Bingham, Herschel Bulkley, Casson, Casson allg., Tscheuschner allgm.
import/export function	of the measurement data e.g. in Excel import and export of jobs for archiving or exchange with other users (GMP, GLP, GCP and FDA 21 CFR Part 11 compliant)
further functions	parallel temperature control of supporting temperature control technology definition of stop criteria definition of parameters calculation (e.g.: average viscosity, limits, thixotropy, yield point, correlation, scatter) configurable display of data in table and graph generation of reports freely programmable jobs

Manufacture and made in Germany  
**WHY WE ARE DIFFERENT**

Know-how and precision down to the smallest detail: At RHEOTEST®, ideas, high-tech and craftsmanship are converted to perfection. Near to Dresden creative engineers, experienced rheologists and practiced mechanics let arise rheological measuring instruments.

RHEOTEST® combines modern technology and manual work with the aim of producing a high quality product which is appreciated both by dealers and customers in our globalized world.

Viscometers and rheometers from Medingen have been a reliable constant in the test laboratory for decades: Precise test results, user-friendliness, robust design and cost effectiveness create real added value for our customers around the globe.

regionally manufactured – globally in demand  
**DISTRIBUTION WORLDWIDE**

Around the globe, our customers appreciate German workmanship: A large number of our viscometers and rheometers are exported and used worldwide. Please contact RHEOTEST® directly or contact our sales partners at: [www.rheotest.com](http://www.rheotest.com)



-  **RESEARCH & DEVELOPMENT**
-  **MANUFACTURING**
-  **INSTALLATION & TRAINING**
-  **ONLINE SUPPORT**
-  **CALIBRATION**
-  **SERVICE**

**PRECISION**  
MADE IN GERMANY



[www.rheotest.com](http://www.rheotest.com)

### CONTACT

**FON** +49 (0)35205 58182  
**FAX** +49 (0)35205 58297  
**MAIL** [info@rheotest.de](mailto:info@rheotest.de)  
**WEB** [www.rheotest.com](http://www.rheotest.com)

**RHEOTEST®** MEDINGEN GmbH

Roedertalstrasse 1 | D-01458 Ottendorf-Okrilla | Germany



Viscometer from Medingen.  
Since 1932.



### Construction Material Rheometer RHEOTEST® RN 5.1

modular rheometer  
for the construction industry





## RHEOLOGY OF CONSTRUCTION MATERIAL

### Plaster, mortar and other inhomogeneous products



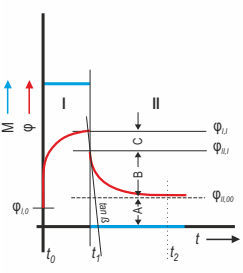
The **RHEOTEST® RN** with the specially developed mortar measuring cell enables an objective qualitative and quantitative evaluation and characterization of the material and processing properties of plaster and mortar as well as similarly structured mortars. Its field of application is based on the following tasks:

- Quality control, especially in connection with formulation variations.
- Quality complaints.
- Characterization of individual mixture components within the scope of synthesis and analysis.

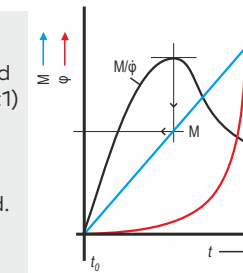
For the analysis of plaster and mortar, the mortar measuring cell of the **RHEOTEST® RN** consists of a flat plate carrying the sample, the plaster mortar, and the force-transmitting element, the crown sensor.

The plaster mortar must be applied to the sample material support in such a way that the sample does not mix, conveying and spraying. This constellation of forces results in a:

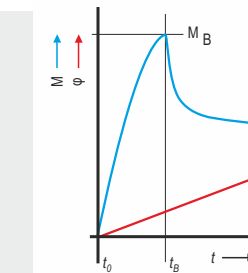
- **Practical variant of the sample material support:** The mortar is sprayed on a brick or other building material.
- **Abstracted variant:** After determining the spreading dimension, the mortar cake is placed on the ring-shaped sample holder.



In the **creep test**, the sample is stressed for a specified time ( $t_1$ ) with a constant moment  $M$  (I. Moment jump), then abruptly relieved. (II. Moment jump)



The **shear test** determines the yield moment  $M_{FL}$ . For this purpose a moment ramp;  $M(t)$  is specified and the torsion angle  $\varphi(t)$  of the specimen is measured.



During the **clamping test**, an angular ramp  $\varphi(t)$  is realized and the moment is measured. Through this type of test procedure the measurement of the moment  $M_B$  is feasible which finally indicates the destruction of the heap structure in the sample.

The displacement caused by the load is measured (area I). The subsequent unloading (area II) leads to a partial deformation. The three values for torsion angle  $\varphi$  and the curve in area II provide detailed information about the sample composition.

A quotient formation  $M/\varphi$  leads to a maximum, which allows the determination of the yield point.

Due to the destruction of the microstructure, the moment drops rapidly with further rotation. Certain material properties can now be assigned by the further course of the curve.

## RHEOLOGY OF CONSTRUCTION MATERIAL

### strongly sedimenting products



In the construction industry, the focus is on the assessment of the flow behaviour of fresh concrete without coarse aggregates (fresh concrete base mortar) and of cement paste.

- The essential processing property of fresh concrete is its flow behaviour.
- Of equal importance are long-termed tests to investigate reaction and setting processes.

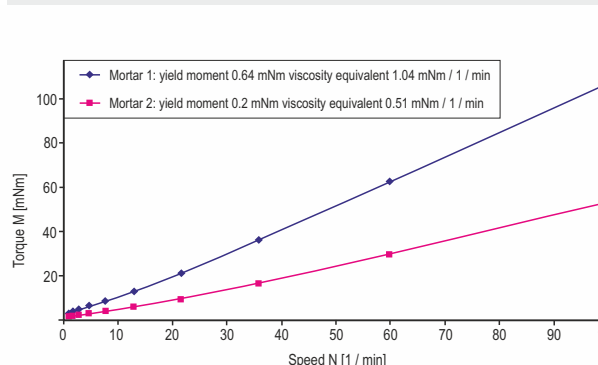
Because of the specific physical and chemical-mineralogical product structure of fresh concrete, the **RHEOTEST® RN 5.1** with a special measuring cell can be used. With the special measuring cell, the processing properties of materials with a high solids content and sedimentation (such as fresh concrete and cement paste) can be determined easily, quickly and accurately.

This special measuring cell consists of a special measuring pot and a claw stirrer and fulfills all the conditions required for the exact determination of tile properties such as:

- laminar flow conditions exist during the measurement;
- the settling of solids is prevented down to very low speeds.

The very wide torque and speed range and the precision of the **RHEOTEST® RN** enable the use of the special measuring system for sedimenting products in a wide viscosity measuring range, approx. 200 to 10<sup>5</sup> mPas, related to Newtonian liquids.

To investigate the flow behaviour, flow curves are measured with the help of the rheometer and the special measuring system. Flow curves are recorded in the form "torque as a function of speed" and compared with the Bingham model. Results of the evaluation are:



- the yield point  $M_{N=0}$  (torque at speed = 0) instead of  $N=0$  the yield point;
- the viscosity equivalent  $\eta_o = \Delta M / \Delta N$  instead of the plastic viscosity.

For long-term tests, the torque curve is determined as a function of time at constant speed.

With these test methods it is possible to determine the effects of the quality and quantity of the main ingredients cement, water and sand as well as admixtures on the flow behaviour of fresh concrete.

## Construction Material Rheometer RHEOTEST® RN 5.1

### TECHNICAL SPECIFICATION

torque	0,1 to 150 mNm
torque resolution	0,002 mNm
speed	0 bis 2000 rpm
speed resolution	0,015 rpm
viscosity range	1 ... 10 <sup>5</sup> mPas
angle range	unlimited, in both directions
angle resolution	0,001°
frequency	0,001 ... 100 Hz
temperature range, total	-60°C to + 350°C
temperature resolution	0,01°C

### EQUIPMENT

Rheometer according to application including:

- (profiled) cylinder measuring systems
- cone/plate and plate/plate measuring systems
- vane rotors
- special measuring systems for construction material

speed-controlled tests (CR-tests)  
torque-controlled tests (CS-tests)  
oscillation (OSC tests)

**modular construction**  
and flexible at any time optionally expandable  
with additional measuring systems and  
temperature control systems.

**user-friendly software**  
for performing, displaying and  
evaluating rheological tests

**Measuring precision made in Germany**  
Every rheometer of the series **RHEOTEST® RN**  
contains ball bearings from the world's  
best manufacturer. Thanks to powerful,  
high-precision and proven ball bearing drive,  
the **RHEOTEST® RN** is unbeatable in its  
robustness.

### APPLICATION & STANDARDS

Our RHEOMETER RHEOTEST RN 5.1 works according to DIN 53019 - all tests acc. to that standards are feasible.

The DIN cylinder measuring system according to DIN 53019 consists of a measuring cup and a rotor, whereby the geometrical ratios Ra/Ri and L/Ri are predefined.

The temperature can be set with the aid of a Peltier temperature control or by liquid thermostats in a large temperature range.

**RHEOMETER RHEOTEST® RN 5.1** is applicable for rheological analysis both in quality control as well as in research and development.

- **shotcrete, liquid concrete, fresh concrete base mortar**
- **screed, tile adhesive, ceramic slurries, plaster**
- **masonry mortar, special mortar, sprayed mortar, filling mortar, plaster mortar**
- **basic plaster, base plaster, fine plaster, special plaster, renovation plaster, plinth plaster, thermal insulation plaster**
- **alumina, cement, cement paste**
- **strongly sedimenting products**
- **waterproofings**
- **ceramic slurries**
- **products containing solids**



measuring system for fresh concrete and cement glue



measuring system for plaster mix



profiled measuring systems



vane measuring systems

## TAILOR-MADE FOR THE CONSTRUCTION INDUSTRY

Determination of the processing properties of products and sedimenting products in the construction industry.

Learn more about the qualitative and quantitative valuation and characterization as well as processing properties of building materials: benefit from rheological knowledge for further production processes.

