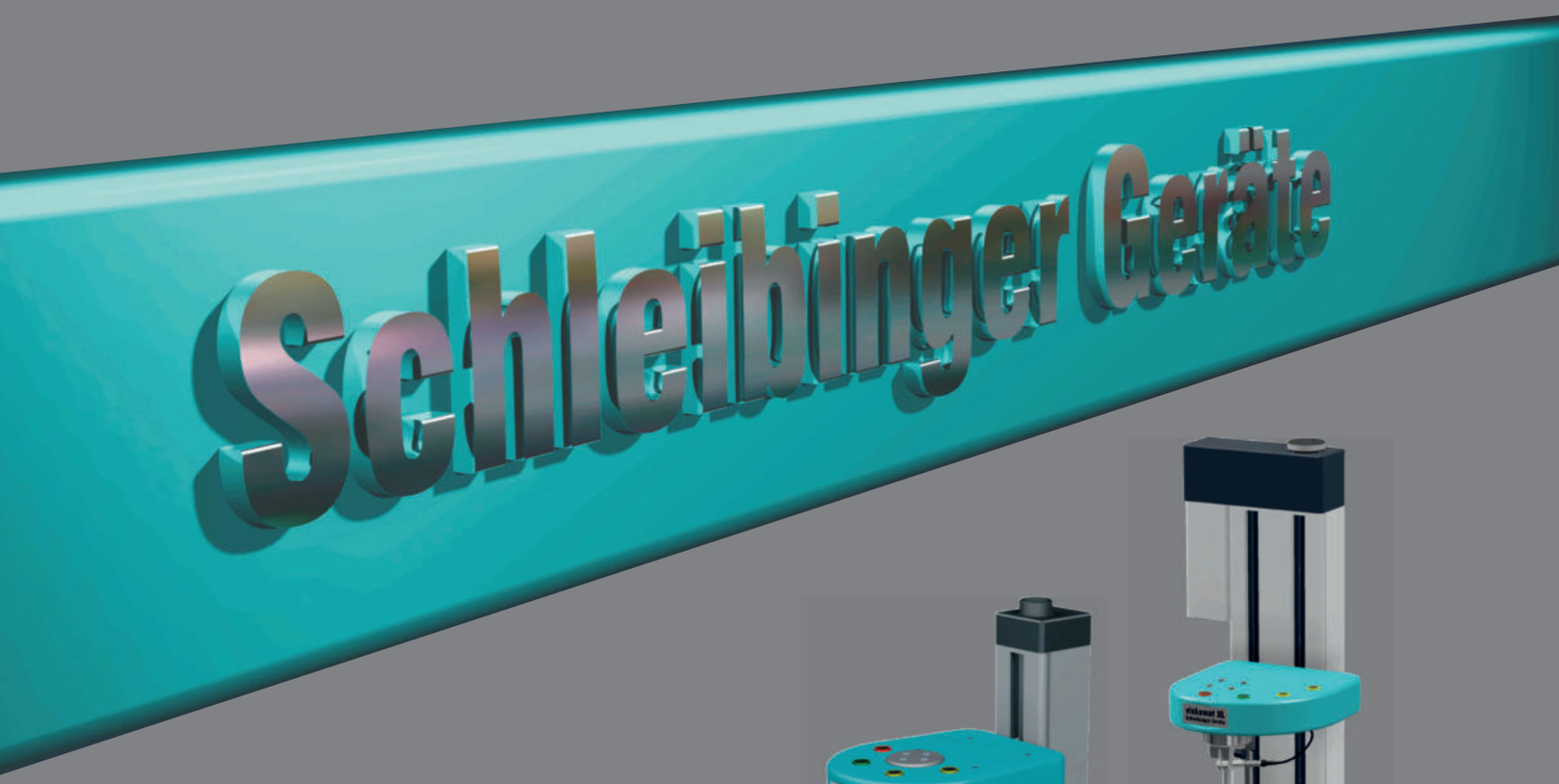
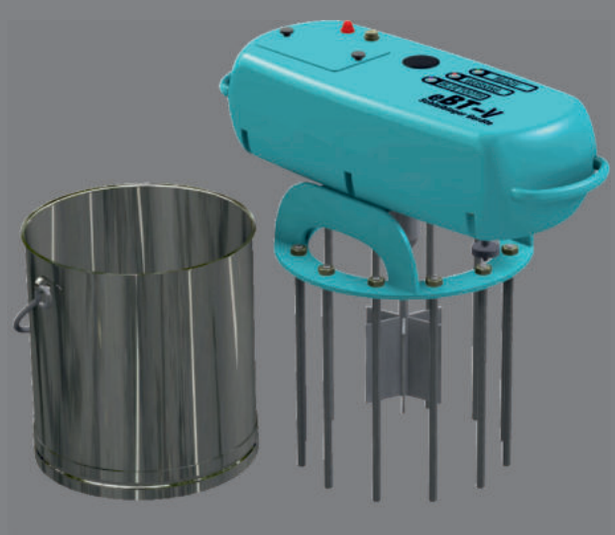
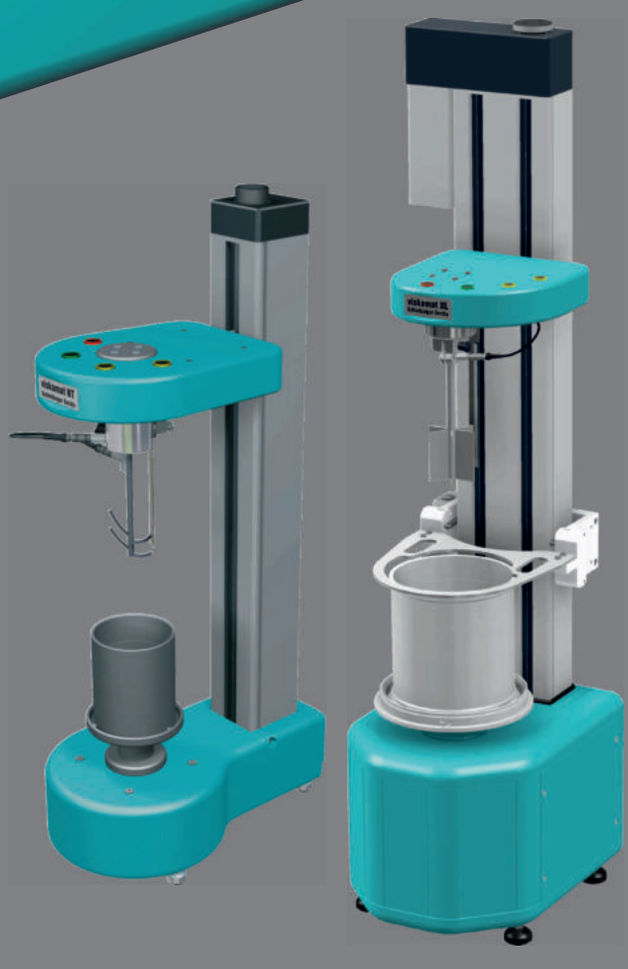
Building Materials Testing Systems



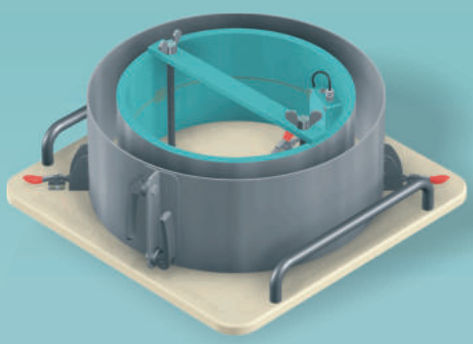


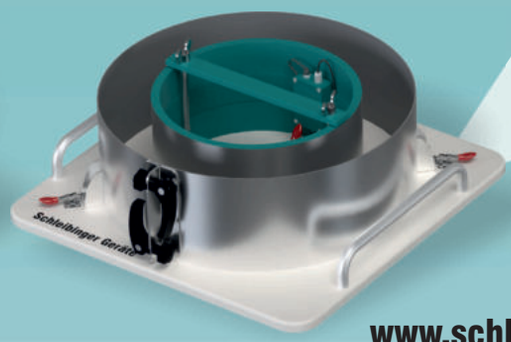


Shrinkage Ring

according to ASTM C1581
NEW: according to AASHTO T 334

for testing restrained shrinkage





NEW

www.schleibinger.com/shrinkage

AKROMAT

Alkali-Silica Reactor with Online Monitoring

for testing the specimen for alkali-silica reactivity.

www.schleibinger.com/durability

Water-Freeze-Thaw Equipment

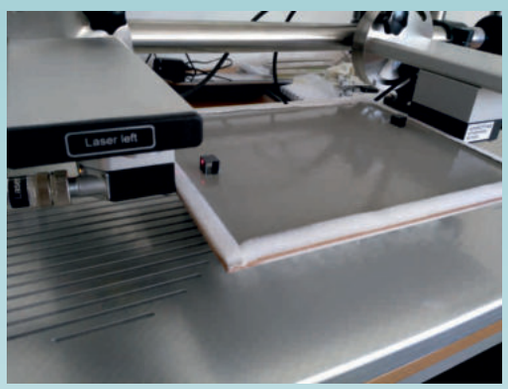
(WF equipment)

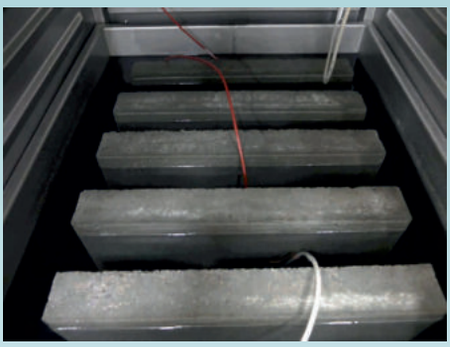
Water-Freeze-Thaw equipment for testing the freeze-thaw resistance of samples made of insulating materials and similar tests.

www.schleibinger.com

Testing Equipment for Building Materials - Solutions for Complex Tasks

- Rheological Properties
- Shrinkage and Expansion
- Durability





The company „Schleibinger Geräte Teubert u. Greim GmbH“ was founded 1995 by the engineers Markus Greim and Oliver Teubert and communications technician Anton Schleibinger. Our aim is to develop, build and sell innovative testing systems for building materials.

Most of our products are based on patents or licensing agreements with industrial partners and universities. Schleibinger Geräte focuses on special products for the building materials market which are developed and built in our own factory.

Schleibinger Geräte develops and produces building materials testing systems for testing workability, early strength, shrinkage and durability of paste, mortar, concrete and similar materials.

We are a company that ensures the satisfaction of our customers through high quality and innovative products. An intensive relationship with our customers and the continuous development of our products are the prerequisites for this. As a result of our work, we supply sophisticated measuring instruments that provide optimum performance. This applies to our services and the individual support service. Feel free to contact us for questions.

Your Schleibinger Team

Schleibinger Geräte
Teubert u. Greim GmbH
Gewerbestraße 4
84428 Buchbach, Germany
phone +49(0) 8086 9 47 31 10
fax +49(0) 8086 9 47 31 14
e-mail: info@schleibinger.com

www.schleibinger.com

Rheology of Building Materials

The rheology of building materials is more complex than classical rheological investigations of liquids. This is due, among other thing, to the time-dependent behavior of the building materials and the particle size used.

Rheological investigations are of fundamental importance for the development, manufacture and processing of building materials. In addition to investigating the setting behavior of mortar and concrete the influence of various additives and admixtures can be determined very precisely. The consistency and thus the processing properties of building materials can be adjusted more efficiently and precisely by rheological measurements. Thus, the quality of the products can be ensured and improved.

For more than 30 years now Schleibinger has been developing and manufacturing rheometers that are specially adapted to the measurement of paste, mortar and concrete. The measuring devices are equipped with robust measuring technology and allow measurements of suspensions with a particle size of up to 32 mm. The measuring profiles can be freely entered and the measuring procedure can be adapted to the real conditions in relation to the processing of building materials. We supply devices for continuous use in the laboratory and also mobile devices for quick and effective measurements on the construction site.

- robust measurement technology
- freely programmable measurement profiles
- for quality control and product development
- for laboratory and construction site

Mobile Rheometer:

⇨ robust
⇨ quick measurement
⇨ battery powered, no cables
⇨ operation and result display on smartphone
⇨ for laboratory and construction site

1. SLIPER

Sliding Pipe Rheometer - Putzmeister inside

portable rheometer for testing the pumpability of fresh mortar and fresh concrete.

Sliding PipE Rheometer (SLIPER), developed by Putzmeister and produced by Schleibinger, provides information on the sliding speed and pressure development of a flowable sample and thus allows statements to be made about the pumpability.
With a pipe diameter of 125 mm fine and coarse suspensions can be examined. With a consumption of approx. 7 liters of sample volume the measurement is very quick and economical.
The measurement results can be displayed graphically on a smartphone supplied with the device. With the help of the evaluation system the properties of the fresh concrete can be described and forecasts made about the pump pressure and the delivery rate.

2. eBT-V

Mobile Rheometer for Fresh Concrete

allows the measurement of the rheological properties of mortar and fresh concrete with a maximum particle size of up to 32 mm.

By measuring the flow resistance the yield stress and viscosity can be specified. The device is equipped with two measuring modes - vane cell (V mode) and spherical/cylindrical geometry (P mode) - and allows measurements of very flowable mixtures such as self-compacting concrete (SCC) as well as stiff mixtures such as road or vibrated concrete. The sample volume required depends on the measuring mode used and is 15 liters or 40 liters. An additional sample container with 20 liters for P mode is available on request.
The measurement data are transmitted to a smartphone supplied with the device in real time and can be displayed graphically there.

1

2

	Item	Item No.
1	Sliper - Sliding Pipe Rheometer	B0200
2	Mobile Rheometer eBT-V, incl. 15 l and 40 l containers	B0010
	Sample Container for eBT-V in P Mode, 20 liters	B0003

www.schleibinger.com/rheometers

Tabletop Rheometer:

⇨ developed for rheological measurements of suspensions
⇨ robust
⇨ for short measurements and long-term measurements
⇨ freely programmable testing profiles
⇨ for quality control and product development
⇨ oscillation measurement
⇨ shear stress controlled measurement

1. Viskomat NT

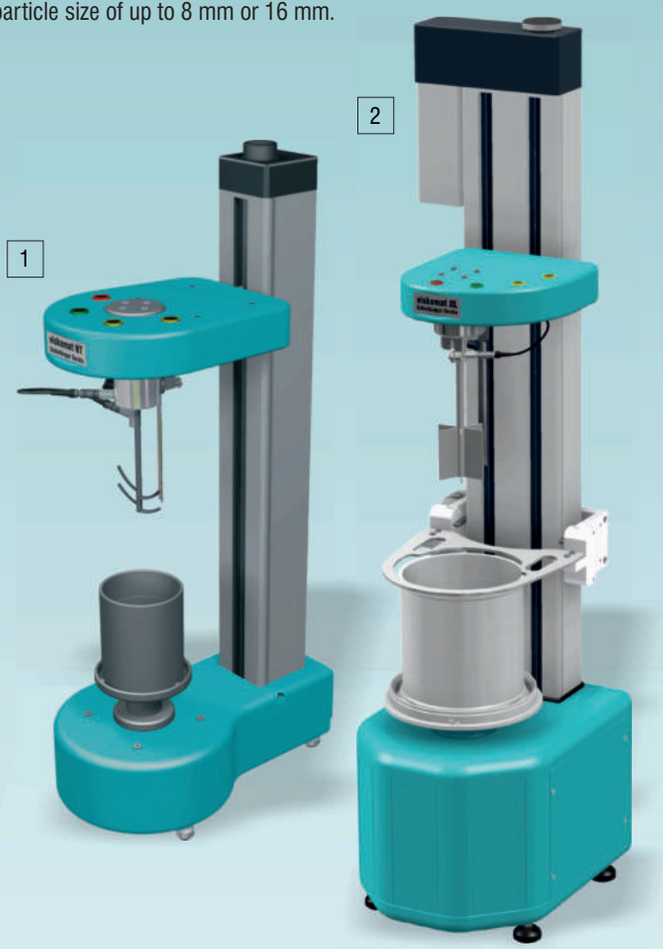
Rheometer for Mortar and Paste

Viskomat NT is a tabletop device for laboratory and can be used in a variety of ways. The rheometer was specially developed for measuring fine-grained building materials such as cement paste, mortar, gypsum and other suspensions with a maximum particle size of 2 mm and of 4 mm in combination with the Vane probe.

2. Viskomat XL

Rheometer for Mortar and Fresh Concrete

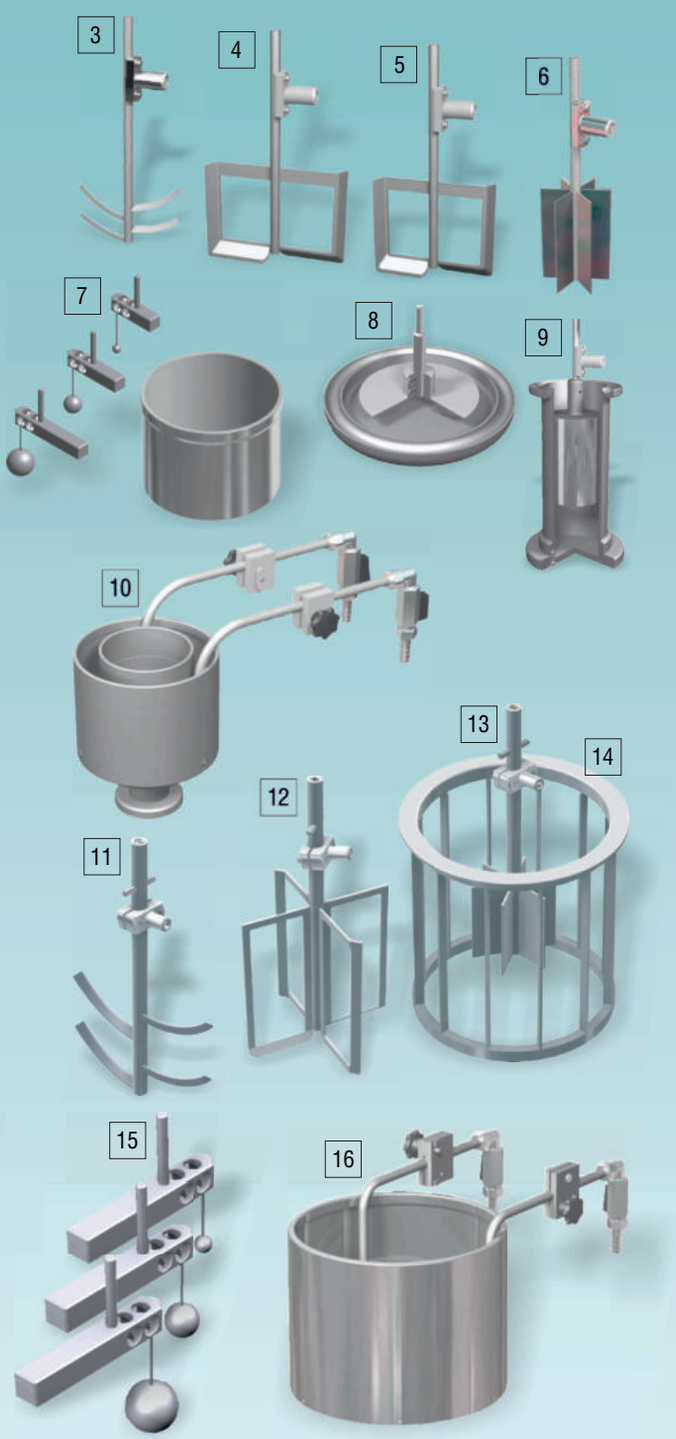
Rheometer for measuring rheological parameters of fine-grained to coarse-grained building materials and suspensions with a maximum particle size of up to 8 mm or 16 mm.



	Item	Item No.
1	Viskomat NT	V0001
2	Viskomat XL	VX0001
3	Mortar Probe for Viskomat NT	V0011
4	Cement Paste Probe for Viskomat NT	V0013
5	Modified Cement Paste Probe for Viskomat NT	V0003
6	Vane Probe for Viskomat NT	V0004
7	Sphere Probe with Sample Container for Viskomat NT	V0007
8	Plate-Cone Probe for Viskomat NT	V0002

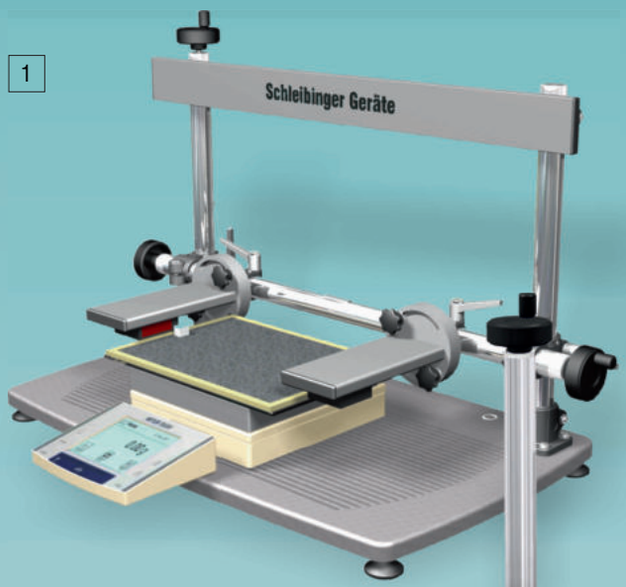
Viskomat Accessories

Depending on the requirements and consistency of the samples different measuring geometries can be used. Schleibinger Geräte offers various measuring geometries for the tabletop rheometers. Additional accessories are available on request.



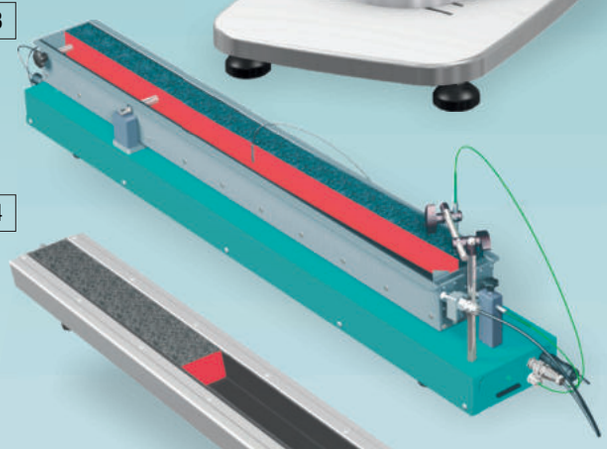
	Item	Item No.
9	Cylindrical Measurement System for Viskomat NT	V0070
10	Temperature Control for Sample Container, VNT	V0009
11	Concrete Probe for Viskomat XL	VX0011
12	Mortar Probe for Viskomat XL	VX0013
13	Vane Probe for Viskomat XL	VX0004
14	Basket for the Vane Probe for Viskomat XL	VX0005
15	Sphere Probe for Viskomat XL	VX0007
16	Temperature Control for Sample Container, VXL	VX0009

1

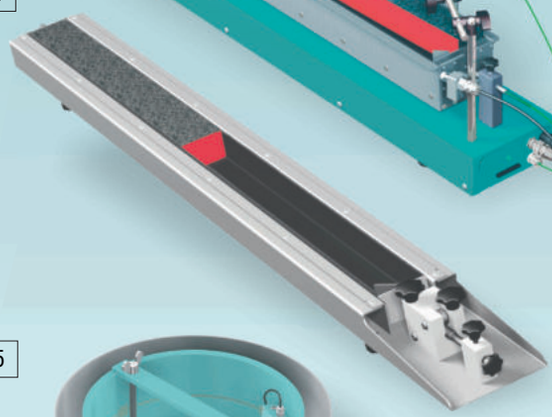


2

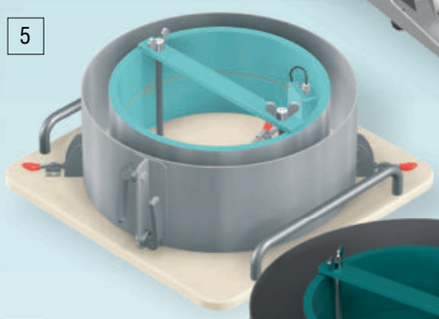
3



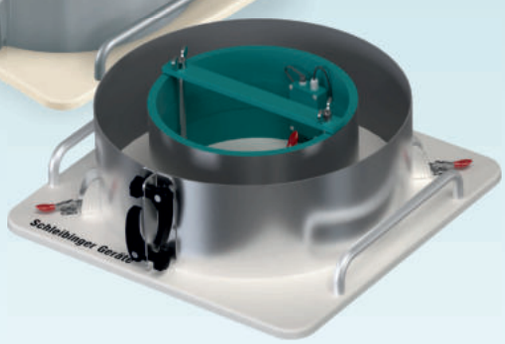
4



5



6



www.schleibinger.com/shrinkage

Shrinkage Measurements of Building Materials

The shrinkage of building materials can have several causes and occurs both in the plastic state and during hardening. The shape of the building materials and the environmental influences have a very large influence on the shrinkage behaviour. For example, the shrinkage behavior of building materials applied in thin layers is different from that of a solid component. A distinction is made between different types of shrinkage such as dry, plastic, autogenous or restricted shrinkage. Depending on the focus the measurement requires an adapted measuring arrangement.
Schleibinger Geräte offers suitable measuring systems for various tasks and requirements.

1. Thin-Layer-Shrinkage-System

for non-contact measurement of the shrinkage and expansion behavior of building materials applied in thin layers immediately after water is added. The laser sensors are rotatable and also allow the measurement of dimension change of the samples in vertical position.

2. Shrinkage Cone incl. Sample Container for Mortar

for non-contact measurement of the shrinkage and expansion behaviour of building materials in the first minutes and hours after mixing the materials with water. Incl. sample container for mortar with volume of 350 ml.
Additional available sample container for fresh concrete with a volume of approx. 680 ml.

3. Bending Drain accord. EN 13892-9

for measurement of curling and shrinkage behaviors of building materials according to:
EN 13892-9: Methods of test for screed materials. Dimensional stability.

4. Shrinkage Drain

for continuous measuring of shrinkage behaviors of building materials as described in ÖNORM B 3329.
Drains with different cross-sections and lengths available.

5. Shrinkage Ring accord. ASTM C1585

for testing the crack tendency and the stress distribution of building materials under restrained shrinkage.

6. Shrinkage Ring accord. AASHTO T 334

for testing the crack tendency and the stress distribution of building materials under restrained shrinkage.

7. Measuring Frame accord. EN 12390-16

for determining the change in length of concrete and mortar prisms or cylinders incl. dial gauge and reference bar.

7

	Items	Item No.
1	Thin-Layer-Shrinkage System	S0060
2	Shrinkage Cone incl. Sample Container for Mortar	S0050
	Shrinkage Cone Sample Container for Concrete	S0051
3	Bending Drain	S0018
4	Shrinkage Drain for Mortar, 1000 x 60 x 40 mm^3	S0103
	Shrinkage Drain for Concrete, 1000 x 100 x 60 mm^3	S0033
5	Shrinkage Ring ASTM C1581	S00031
6	Shrinkage Ring AASHTO T 334	S00131
7	Measuring Frame with Dial Gauge	S0111

Alkali-Silica Reaction (ASR)

The alkali-silica reaction is also known as concrete cancer and occurs as a result of a chemical reaction between alkalis in the cement stone and the aggregate with alkali-soluble silica. This reaction can cause serious damage to concrete infrastructure such as bridges and motorway surfaces, thus requiring very high repair work and costs.

To minimize the risk of ASR, it is necessary to test the building materials at an early stage. ASR tests and test methods are recorded and described in various standards and technical guidelines such as NF P18-454, RILEM TC101-APR AAR-4 or DAfStb Alkali Guideline.

1. ASR Climate Chamber

insulated temperature chamber for storing samples at temperatures from room temperature to +65 °C and almost 100 % humidity. Suitable for maximum of 24 ASR test containers and 72 samples in total.

Update of ASR Chamber with Fog System

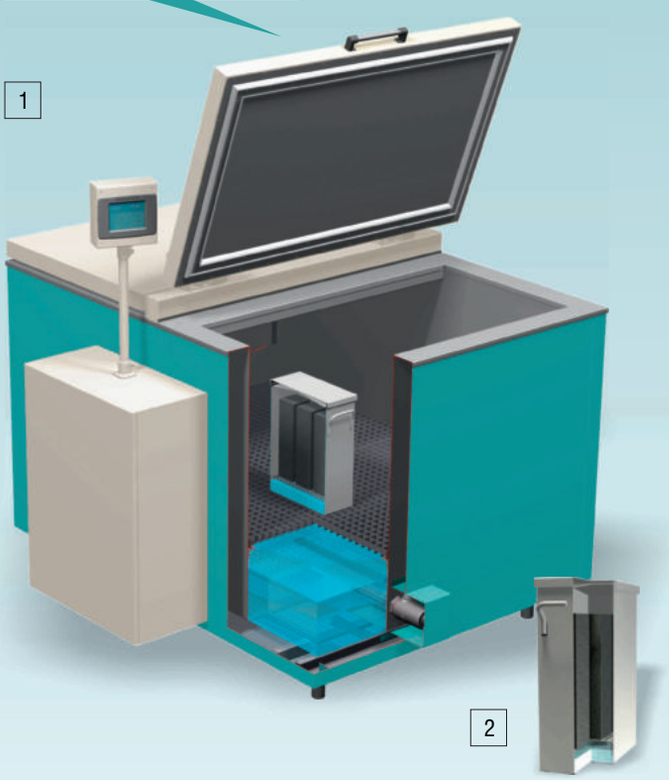
For ASR tests carried out at temperatures of +38 °C or +40 °C there is not enough humidity available through evaporation. The ASR fog system is recommended to increase the humidity during the storage tests.

2. ASR Testing Container

suitable for three samples with the size of 75 mm x 75 mm x 280 mm. A maximum of 24 containers fit into the ASR chamber.

NF P18-454
RILEM AAR-4
DAfStb Alkali Guideline

1

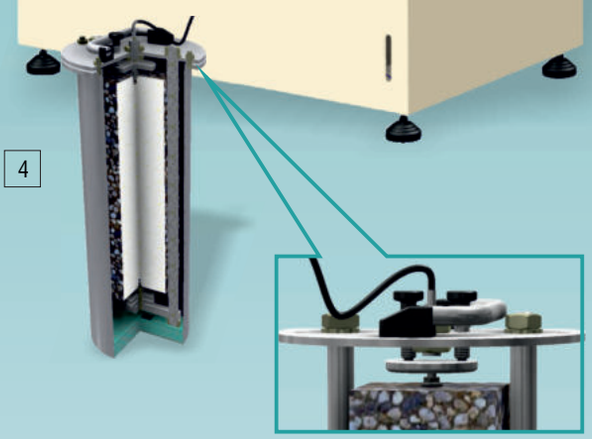


2

NEW

3

4



3. AKROMAT

Alkali-Silica Reactor with Online Monitoring

AKROMAT is a tabletop device for the laboratory.
While in conventional sample storage the samples have to be removed and cooled down for the length measurement, the measurement of the length change in the AKROMAT takes place automatically and continuously during the storage. This significantly reduces the amount of work and measurement deviations that arise due to handling and cooling and heating of the sample. The test gives an indication for an ASR reaction in weeks instead of months.

The samples are stored individually in the test containers. A maximum of 6 samples can be tested at the same time.

The temperature can be set in the range from room temperature to +65 °C. Data are recorded automatically using a data logger.

The measurement progress can be observed online and the measurement can be terminated earlier if the termination criteria are met.

	Item	Item No.
1	ASR Climate Chamber	K001
	ASR Fog System	K003
2	ASR Sample Container	K002
	Measuring Frame with Dial Gauge	S0111
	ASR Specimen Mould, 75mm x 75mm x 280mm	K0013

	Item	Item No.
3	AKROMAT - Alkali-Silica Reactor	K005
4	AKROMAT - Sample Container	K006
	AKROMAT - Sample Holder	K007
	AKROMAT - Data Logger	K008

Freeze-Thaw Resistance

The durability of building materials and thus of infrastructure also includes their resistance to freeze-thaw attacks. Frost stress is a dynamic process that is both a transport mechanism and a damage mechanism. The damage mechanism distinguishes between internal damage caused by microcracks that occur during freezing due to internal stresses in the building component and external damage caused by scaling of the surface. Both are related to the degree of water saturation of the samples and the expansion of the ice.

The freeze-thaw resistance tests of numerous building materials are expressed in a variety of standards and test specifications. These can involve tests for pure frost attack or in the presence of dissolved salts. In Germany test methods are generally used that are listed in the CEN/TS 12390-9 standard for determining external damage: slab test, cube test method and CF/CDF test. Outside Europe the ASTM C666 test is quite common.

With over 30 years of experience in the field of freeze-thaw testing, Schleibinger offers various designs of automated freeze-thaw testing systems.

1. CDF Equipment

The CDF test (Capillary suction, De-icing agent and Freeze-thaw test) is recommended for determining the frost-deicing salt resistance and the CIF test (Capillary suction, Internal damage and Freeze-thaw test) for determining the frost resistance. The tests are characterized by a one-dimensional heat and moisture transport within the test specimens.

The CDF/CIF test system offers the possibility of automatically subjecting test samples to a freeze-thaw cycle in a temperature range of -20 °C to +20 °C. The temperature profiles can be freely programmed within the specification. The temperature data are recorded automatically and can also be read out via a web browser. The equipment is also used for the ASTM C666 A test and for the German VDZ cube test method.

2. Slabtester Equipment

The Slabtester is used to perform various freeze-thaw tests on building materials. The Slabtester equipment allows automatic freezing and thawing of the samples in a temperature range of -30 °C to +45 °C in air. The temperature profiles are freely programmable. The temperature data is recorded continuously and can be read out and saved via a web browser.

Freeze-Thaw Test with Flooding

An update of the Slabtester equipment offers the option of „Freeze-Thaw test with Flooding for Slabtester“, which allows the samples to be frozen in the air and thawed in water. This means that samples such as natural stone, tile adhesive or aggregate can also be tested for their frost resistance.

During the test, tempered water is automatically pumped into the sample container at the entered cycle time and is also automatically drained after the flooding phase has ended.

Freeze-Thaw test with Flooding and Water Circulation

The additional option „Freeze-Thaw test with Flooding and Water Circulation“ allows to kept samples in water at a uniform temperature during the thawing process.
With this option, the water continuously circulated during the flooding phase and the temperature difference of the water caused by the thawing of the samples is kept low.

Freeze-Thaw Test with Spraying*

for testing masonry units according to CEN/TS 772-22 with automatic spraying for sample sizes of a maximum 58 cm x 58 cm.

***only available with the option „Freeze-Thaw test with Flooding“ (C0108).**

1

	Item	Item No.
1	CDF Equipment, Air Cooling only	C0001
	Combined Air and Water Cooling for CDF Equipment	C0005
	Upgrade for ASTM C666 A Test and Cube Test	C0124

2

	Item	Item No.
2	Slabtester Equipment	C0103
	Upgrade for Freeze-Thaw Test with Flooding	C0108
	Upgrade for Flooding with Water Circulation	C0108-S
	Upgrade for Freeze-Thaw Test with Spraying	C01085

Freeze-Thaw Test Accessories

Depending on the regulation, additional accessories are required for sample preparation and testing.
Schleibinger Geräte offers the complete range of accessories for performing the various tests. Additional accessories are available on request.

1. Ultrasonic Cleaning Device
for removing loose parts from the sample surface.

2. Refractometer, Anti-Freeze Density Tester
to check the antifreeze and the density of the heat transfer fluid.

3. Specimen Carrier for 150 mm Cubes
for collecting the scaling material during ultrasound transmission in the CIF test.

4. Spacers
to ensure the distance between the sample and the sample container. Three spacers are required for each specimen.

5. Fixation Clip for Spacers
for fixation of three spacers for easier positioning of the spacers under the sample.

6. Water Jet Pump
for adjusting the liquid level on the sample surface.
10 mm and 15 mm spacers included.

7. Vikasonic Ultrasonic Measuring Device
Ultrasonic measuring device including a pair of transducers with 80 kHz.

8. Ultrasonic Measuring Bath
for testing of samples with the size up to 150 mm x 150 mm and 110 mm x 150 mm with ultrasound.
Made of PMMA; including holder for the transducers.

9. Sample Container
Stainless steel sample container with handles.
A maximum of 10 standard GNB 1/2 containers fit into the CDF equipment.

10. Sample Container for Cube Test
for two samples with the size of 100 mm, including lid and spacers.
Made of 2 mm stainless steel.
A maximum of 15 sample containers fit into the CDF equipment.

11. Sample Container for ASTM Test (C666 part A)
container size (l x w x h): 320 mm x 105 mm x 105 mm
Made of stainless steel.
A maximum of 20 containers fit into the CDF equipment.

12. Can with Lid for Aggregates
for testing the thermal properties of aggregates.

	Item	Item No.
1	Ultrasonic Cleaning Device	C0014
2	Refractometer, Anti-Freeze Density Tester	C0061
3	Specimen Carrier for up to 150 mm Cubes	C0038
4	Spacers, 5 mm	C0040
5	Fixation Clip for Spacers	C0041
6	Water Jet Pump	C0030

	Item	Item No.
7	Vikasonic Ultrasonic Measuring Device	U0002
8	Ultrasonic Measuring Bath	C0026
9	Sample Container for 150 mm x 150 mm Samples	GN-B 1/2
10	Sample Container for Cube Test	C0114
11	Sample Container for ASTM Test	C0665B
12	Can with Lid for Aggregates	C0665S

1. Salt-Water-Freeze-Thaw Equipment
(SWF Test equipment)

If the samples are to be stored in saline solutions, conventional steel or stainless steel testing chambers can not guarantee this in the long term due to corrosion. This is particularly the case if the samples are subject to alternating storage in salt water and in water, as required by the EN 13687-1 standard for example.

To avoid the problem of corrosion, Schleibinger developed a test system that is specially designed for these requirements. The Salt-Water-Freeze-Thaw (SWF) test equipment has a large test room with dimensions (length x width x height) of approx. 85 cm x 200 cm x 50 cm, which can be automatically and alternately flooded with tempered water or saline solution.

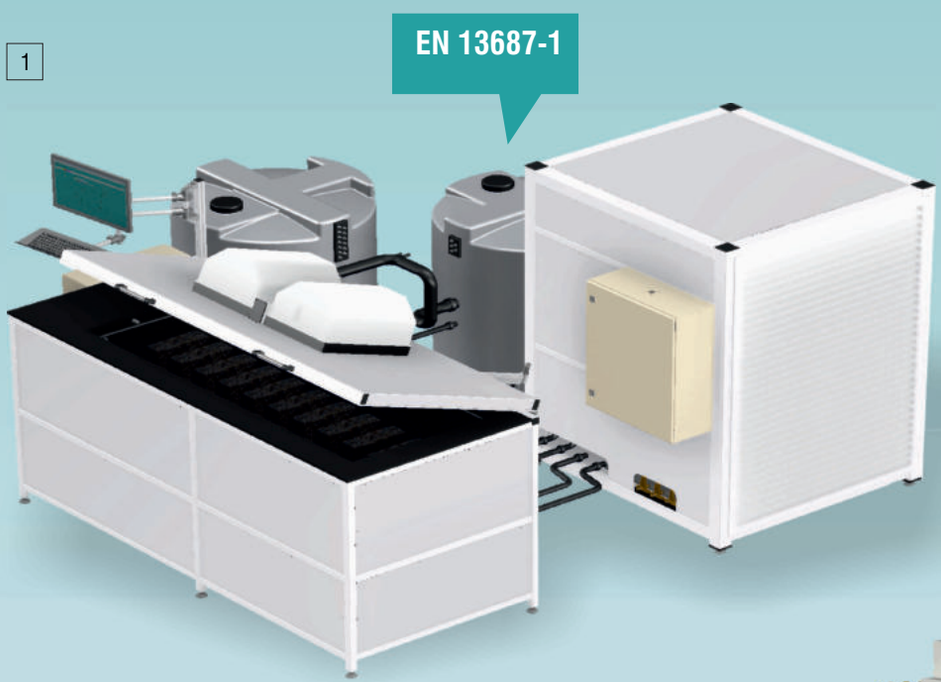
2. Water-Freeze-Thaw Equipment
(WF equipment)

Water-Freeze-Thaw equipment for testing the freeze-thaw resistance of samples made of insulating materials and similar tests.

The samples are stored alternately and automatically in water or on air in accordance with EN 12091 and similar standards. Thawing can take place both under water or in the air. The test chamber volume is approx. 600 mm (width) x 2200 mm (length) x 600 mm (height). The air in the test equipment can be tempered from -30 °C to +60 °C. The water for flooding can be tempered as well. As with all Schleibinger systems, the temperature and flooding profiles can be freely defined by the user within the specifications. Thus, the WF equipment allows a large number of freeze-thaw tests to be carried out automatically, which could previously only be carried out manually.

The WF equipment is equipped with heat recovery. This significantly reduces energy costs and the test can be carried out economically in the

1



2

	Item	Item No.
1	SWF Test Equipment	SF001
2	WF Equipment with Heat recovery	WF0001

Special Development

Many of the testing devices are the result of customer-specific developments. Schleibinger manufactures and sells testing and measuring systems and components that can also be used outside the construction industry. Do not hesitate to contact us for questions.

1. Vikasonic - Ultrasonic Measuring Device

for measuring the ultrasonic transit time and investigating the early strength development of mortar and cement paste. The sample is prepared in a measuring cell. Using a type K thermocouple, the temperature of the sample can be recorded.

The Vikasonic continuously measures the ultrasound transition time, the signal strength and the temperature of the sample. The data is saved on a USB stick. At the same time, the speed of sound and the Youngs modulus of elasticity are calculated and recorded as well.

2. RheoCT - Rheometer for Fresh Concrete in the Mixer

For measuring the rheological properties of fresh concrete or mortar in the mixer or similar process elements in the production.
Based on ball measuring system which is driven through the fresh mixture. The measurement is carried out within one revolution in less than one minute and is always made in non-sheared fresh mixture. The current speed and the resistance force on the ball are measured.

3. Schleibinger Filter Press

For determination the water retention capacity of mortar and concrete.
A fresh concrete sample with a volume of 4 liters is dewatered using mechanical pressure. The pressure is continuously increased within 2.5 minutes to 5 minutes and kept constant for up to 30 minutes. The amount of water escaping is continuously collected during the pressure build-up and the subsequent holding phase.

4. Soil Freeze-Thaw Chamber, CBR Equipment

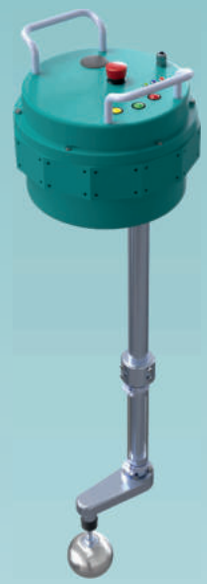
For a long service life of traffic routes, it is necessary that the road surface and substructure have a consistent load-bearing capacity. The base layers are exposed to large temperature fluctuations and also frost. The assessment of the building materials and soil samples used with a maximum particle size of up to 16 mm in terms of their frost properties can be carried out using the frost heave test in accordance with the Swiss standard SN 670 321a.

The heave is determined continuously and with micrometer precision using a displacement sensor. The height change and the temperature of the sample are recorded. The data can be accessed at any time via a web browser.

www.schleibinger.com/setting

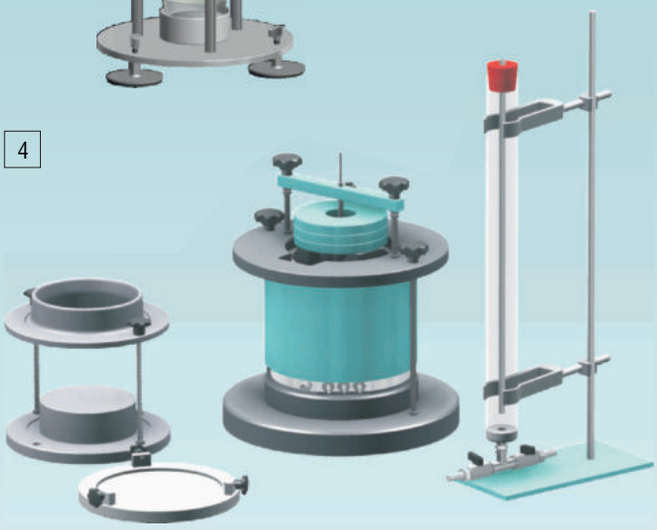
1

2



3

4



	Item	Item No.
1	Vikasonic	U0001
2	Rheometer RheoCT	B0300
3	Schleibinger Filter Press	FP001
4	Soil Freeze-Thaw chamber, CBR equipment	B0100

Schleibinger Geräte

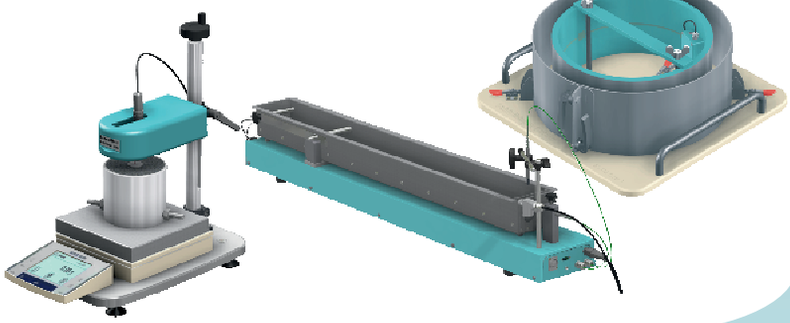
Testing Systems

workability

- rheological measurements on fresh mortar and concrete
- measurement pumpability of mortar and concrete

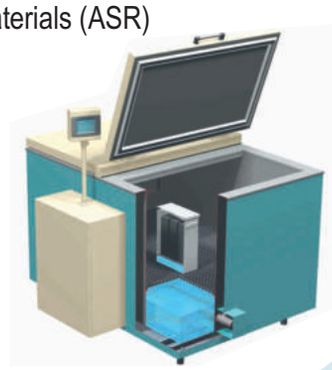
dimension stability

- determination of the shrinkage behavior of building materials in plastic and solid stage
- determination of bending behavior and restrained shrinkage



durability

- determination of the freeze-thaw resistance of building materials and soils
- Investigation of the alkali-silica reactivity potential of building materials (ASR)



Made in Germany

www.schleibinger.com

Stand 02/2025