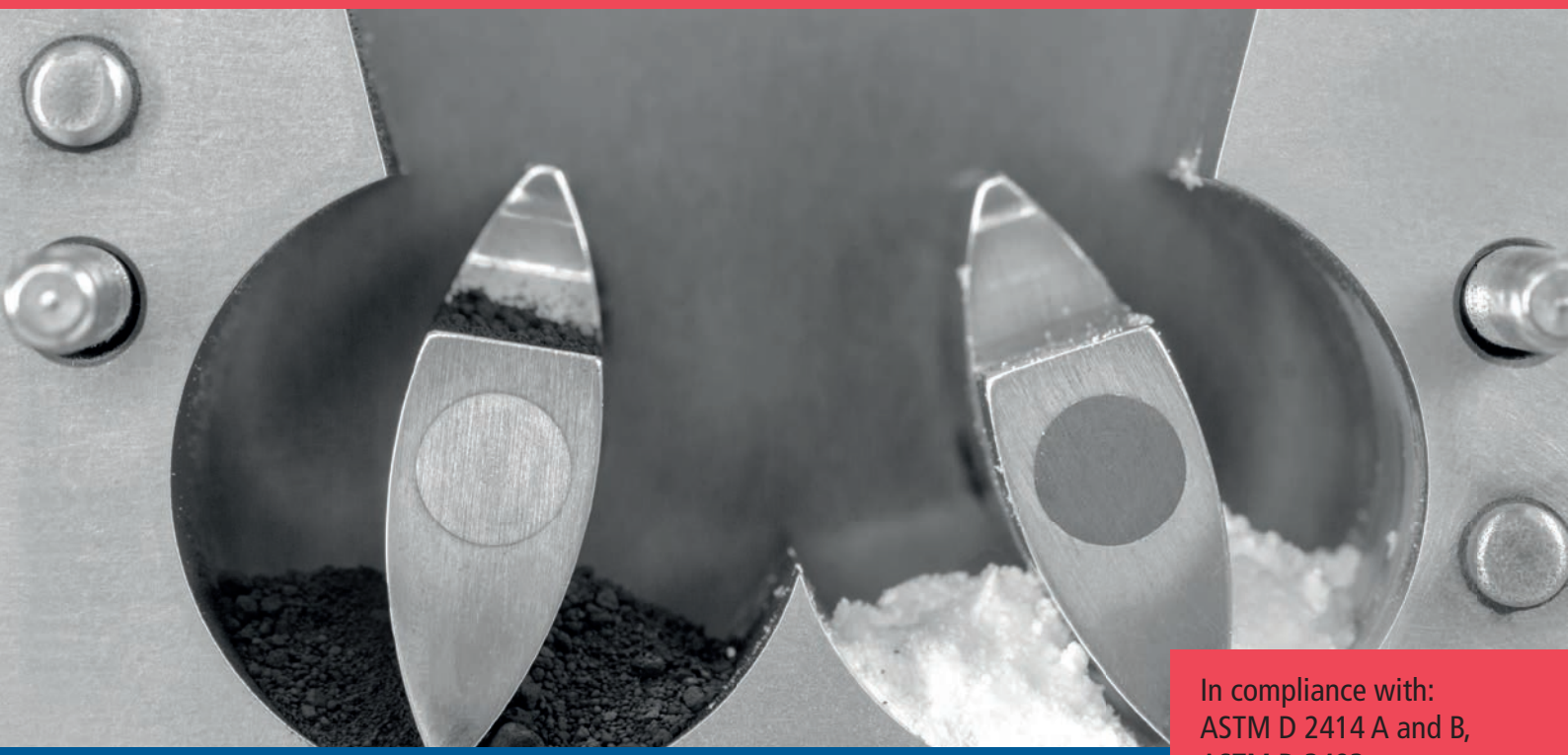
Brabender®



In compliance with:
ASTM D 2414 A and B,
ASTM D 3493
ASTM D 6854 (silica)

Brabender® Absorptometer "C"

Oil Absorption

… where quality is measured.

Absorptometer "C"

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)

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.

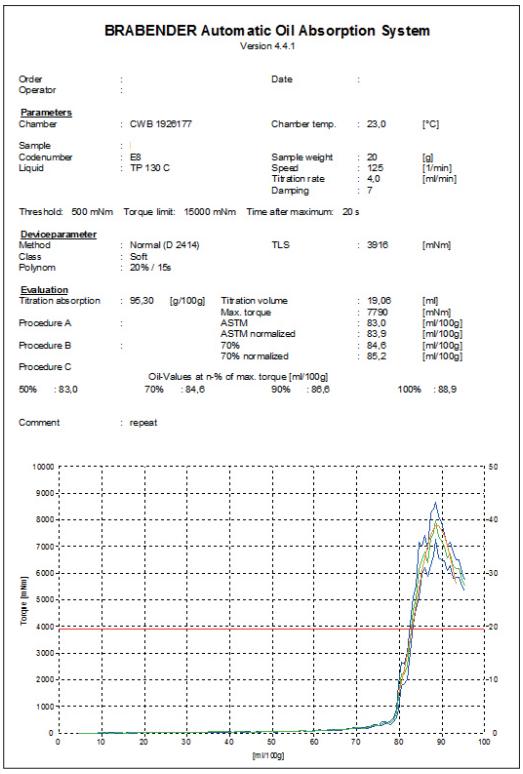
Principle

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).



BRABENDER Automatic Oil Absorption System
Version 4.4.1

Order :
Operator :
Date :

Parameters
Chamber : CWB 1926177
Chamber temp. : 23,0 [°C]
Sample :
Codenumber : E8
Liquid : TP 130 C
Sample weight : 20 [g]
Speed : 125 [1/min]
Titration rate : 4,0 [ml/min]
Damping : 7

Threshold: 500 mNm Torque limit: 15000 mNm Time after maximum: 20 s

Devicoparameter
Method : Normal (D 2414)
Class : Soft
Polynom : 20% / 15s
TLS : 3916 [mNm]

Evaluation
Titration absorption : 95,30 [g/100g]
Titration volume : 19,06 [ml]
Max. torque : 7790 [mNm]
Procedure A : ASTM : 83,0 [ml/100g]
ASTM normalized : 83,9 [ml/100g]
Procedure B : 70% : 84,6 [ml/100g]
70% normalized : 85,2 [ml/100g]
Procedure C

Oil-Values at n-% of max. torque [ml/100g]
50% : 83,0 70% : 84,6 90% : 86,6 100% : 88,9

Comment : repeat

Test report

Advantages

- Automatic (sequencer controlled) buret with ready to use default settings
- Easy to change mixing bowls reduce the dead time and ensure cost effective continuous operation
- Easy to access buttons and touchscreen at the front of the instrument
- The instrument is connected to the PC directly via USB – you don't need separate interfaces or adapters
- Separate location of the PC for clean operation and long lifetime
- Choice between local and remote operation for economic and clean test procedure
- Automatic saving of tests in remote operation - no need of working at the PC between the individual tests
- The torque is measured directly without any intermediate part to keep reliability high and service costs low
- Compact design for easy cleaning

Absorptometer "C" with mixer for testing carbon black

Instrument description

The Brabender Absorptometer "C" comprises the following major components:

1. Frequency inverter drive unit with torque measurement system
2. Control and evaluation software for all current Windows® versions
3. Precisely machined mixer with special blades
4. High-precision buret, sequencer controlled titration rate for optimum test procedure
5. Optional: Cooling jacket with temperature indication for the test data

Sophisticated software

Some fine details of the software and advanced control features offer a lot of advantages during your work with the Absorptometer "C":

Settings

- One PC can handle up to 4 instruments with 2 or more interchangeable mixers each.
- All test parameters required by ASTM D 2414 are preset as default values, though can be changed to meet individual requirements.
- Fully automated buret controlled from the PC incl. sequencer regulated titration rate for quick titration at the beginning and reduced rates during the significant test phase.

Operation

- Convenient continuous operation at low cost: one basic instrument can be run with several interchangeable mixers due to mixer specific determination of the TLS (= torque limit switch) values and all other important data.
- Choice between local and remote operation for economic and clean test procedure.
- Automatic saving of tests in remote operation.
- Lists with different test configurations can be defined and saved at the PC in local mode and then be worked off in remote operation from the Absorptometer "C" control panel.
- Creation of test patterns for running several tests with one and the same sample: create the test pattern at the PC (local mode), then work off all tests from this pattern at the Absorptometer "C" (remote operation).
- Normalization trends show mixer wear.
- System normalization as per ASTM with standard reference carbon blacks, including the possibility of normalization with other than standard carbon blacks (e.g. for laboratories working with their own reference carbon blacks).

Evaluation

- Evaluation by fitting of 3rd order polynomial on the significant part of the torque curve for optimum reproducibility.
- Evaluation includes the procedures A (endpoint at TLS), B (endpoint at 70 % of maximum torque) and also C (endpoint at fixed but reduced torque level).

Report

- Versatile graphic options to edit the test diagram and reports according to your individual needs.

Applications

Silica and carbon blacks

As additives, besides the carbon black, silica play a big role in the rubber industry. The same method is used commonly for their characterization.

For this kind of tests, a modified version of the Absorptometer "C" with the following features is available:

1. Stainless steel mixing bowl, silver-titanium nitride coating on the front and rear walls to prevent early wear.
2. Hopper on the mixer lid to facilitate filling.

This instrument design is suitable to characterize the structure of other minerals either like limestone, talcum, silicates, aluminum oxides, etc.: a good alternative of the manual oil absorption test in the mining industry and in pigment and additive manufacturing.

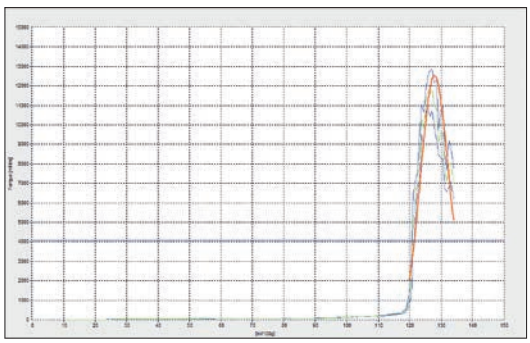
Cosmetics

The Absorptometer „C" is successfully used in the cosmetics industry to determine the oil absorption number of cosmetic powders, raw and conditioned pigments.

The test is carried out in the same way as for carbon black (ASTM D2414) or silica (ASTM D6854).

The application is a modern approach for the development of formulations in the versatile fields of the cosmetics industry.

In addition, the Absorptometer „C" meets all quality assurance requirements to determine the characteristic properties of the input substances and to measure as well as to recognize resource-intensive production disruptions at an early stage.



Absorptometer "C" evaluation

Absorptometer "C" with mixer for testing silica or other free flowing materials

… where quality is measured.

Absorptometer "C"

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.

Brabender application laboratory

Absorptometer "C"	
Drive unit	Digital AC inverter motor, carried in pendulum bearing
Torque measurement	electronical
Power	0.75 kW
Speed	Adjustable in range: 5 - 175 min^{-1} (default: 125 min^{-1} according to ASTM D 2414)
Torque	0 - 15 Nm
Titration system	Automatic buret (variable sequencer control), controlled directly via the PC (default titration rate: 4.0 ml/min according to ASTM D 2414)
Housing	Stainless steel, fully dust proof, DBP resistant
Mains	1 x 230 V, 50/60 Hz + N + PE, 2 A 1 x 115 V, 50/60 Hz + PE, 4 A
Dimensions (W x H x D)	510 x 600 x 740 mm (without buret)
Weight	Approx. 75 kg

Made in Germany since 1923

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