

Product Overview

Milling | Sieving | Assisting

**NEW
SIEVE SHAKERS**

Precise
sieve analysis
has never been
so easy!



RETSCH – More than 100 Years of Innovation

Global market leader in the preparation and characterization of solids – quality „made in Germany“.

The company was founded in 1915 by F. Kurt Retsch. A few years later he registered his first patent in grinding technology: a mortar grinder that became famous worldwide as the “RETSCH Mill”. This innovation replaced tiresome manual grinding with hand mortars which was the standard in laboratories at the time and earned RETSCH an excellent reputation in the international science and research community.

Today RETSCH is the leading solution provider for size reduction and particle sizing technology with subsidiaries in the US, China, Japan, India, France, Italy, Benelux, Russia, UK and Thailand and an export share of 80%.

RETSCH’s philosophy is based on customer orientation and leading edge technology. This is reflected in instruments whose high-quality components are designed for perfect interaction. RETSCH products not only guarantee representative and reproducible results for grinding and particle analysis but also allow for easy and comfortable operation.

With RETSCH you get:

- **First class product quality thanks to advanced manufacturing methods**
- **Comprehensive application support including free test grindings and product trainings**
- **Excellent sales and service network throughout the world**

www.retsch.com



PREMIUM QUALITY



MADE IN GERMANY



Integrated Solutions

We see ourselves as solution providers. In addition to our extensive product program we offer competent application support and technical assistance.

Application Consulting

For us professional customer service is about offering individual and specific advice, by phone or on-site in our application laboratories worldwide. Our application experts process and measure your samples free-of-charge and provide a recommendation for the most suitable method and instrument. Finally, we offer free application consultations at your doorstep with our fully equipped laboratory bus

Application Database

Our application specialists process and characterize a large number of customer samples every day. The most interesting results are collected in an online database which currently contains more than 2,000 test reports. The application database is an excellent tool for a first impression as to which instrument may be suitable for a particular application or sample material.

Test Grinding

The „Applications“ menu offers the possibility to download the questionnaires for „milling“ and „sieving“. These can be sent together with the sample material to our lab team for free test grinding or sieving. Use this direct link www.retsch.com/testgrinding.

Seminars and Workshops

Alone or with renowned partners in the laboratory industry we regularly offer seminars and workshops about different aspects of sample preparation, particle measurement and analytics. Dates and places are published on our website.



1915

The company is founded by F. Kurt Retsch in Duesseldorf.



1923

F. Kurt Retsch develops and patents a mortar grinder which becomes known as the RETSCH Mill and is synonymous with the concept of easier and better laboratory work.



1952

Engineer Dirk Sijssling assumes management responsibility for F. Kurt Retsch KG. The production of laboratory equipment gains more and more importance.



1959

RETSCH extends the product line with sieve shakers, sample dividers and magnetic stirrers. More space is required for production, leading to the move of the company into larger premises in Haan.



1963

RETSCH intensifies its cooperation with universities and institutes to ensure their equipment is always up to the latest technological standards. By the end of the sixties, the export share has increased to 35%.

1976

The company moves to a new expanded location in Haan.

1989

RETSCH becomes part of the Dutch VERDER group and gradually manages the transition from a family business to an international company.



as of 1993

Subsidiaries in the US, China, Japan, India, France, Italy, Benelux, Russia, UK and Thailand ensure RETSCH's direct presence in the major economies of the world.



1998

Foundation of RETSCH TECHNOLOGY.



2012

RETSCH moves to new premises in Haan (headquarter of the Verder Scientific division).



2014

Market launch of the revolutionary High Energy Ball Mill Emax.

2015

RETSCH celebrates its 100th anniversary.

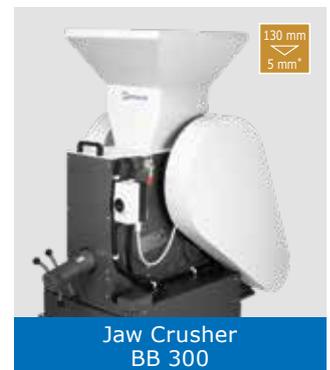
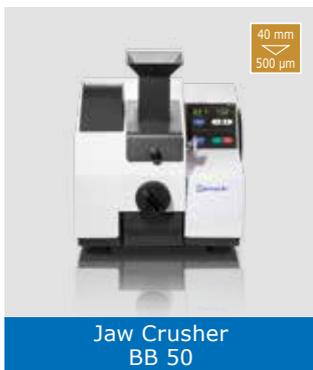


Reproducible Sample Preparation for Reliable Analysis Results

A reliable and accurate analysis can only be guaranteed by reproducible sample preparation. The “art of milling and homogenization” is turning a laboratory sample into a representative part sample with homogeneous analytical fineness. For these tasks RETSCH offers a comprehensive range of the most modern mills and crushers for coarse, fine and ultra-fine size reduction of almost any material. The choice of grinding tools and accessories not only ensures contamination-free preparation of a wide range of materials but also the adaptation to the individual requirements.

Jaw Crushers

RETSCH’s range of jaw crushers comprises four different models for coarse and primary size reduction of hard, brittle materials – from compact bench-top units to robust floor models with high throughput rates which can be integrated into automatic installations. Breaking jaws of different materials ensure neutral-to-analysis size reduction.



Rotor Mills

Four different types of rotor mills are available for the pulverization of granular, soft, medium-hard or fibrous sample materials. All mills can be equipped with a cyclone for improved sample discharge and cooling. Depending on the model, the mills are suitable for the preparation of very small amounts but also for use in pilot plants.



Cutting Mills

RETSCH offers a whole family of cutting mills – from the budget-priced basic model to the powerful high performance unit with high torque and RES technology – for primary size reduction of soft, medium-hard, elastic, tough and fibrous sample materials. The wide range of accessories allows for perfect adaptation to a variety of applications.



Knife Mills

The GRINDOMIX Knife Mills are perfectly suited for the quick and thorough homogenization of solid samples with high liquid, oil or fat content. Thanks to interval and reverse mode and a wide selection of accessories even difficult samples are completely homogenized in the GRINDOMIX mills.



Disc Mills and Mortar Grinders

The RETSCH portfolio comprises the ergonomic Vibratory Disc Mill RS 200 – the standard mill for sample preparation to spectral analysis within seconds – as well as two disc mill models for primary and fine size reduction of hard and abrasive materials up to 8 Mohs. All disc mills can be equipped with grinding tools made of different materials to ensure neutral-to-analysis sample preparation. The RETSCH mortar grinder mixes and homogenizes powders, suspensions and pastes, also with high viscosity.



6 Product Overview Milling

Ball Mills

RETSCH's ball mill range is the widest in the world, offering optimum solutions for the pulverization of medium-hard, hard, brittle and fibrous samples with high energy input. The High Energy Ball Mill Emax and the Planetary Ball Mills pulverize samples down to the nanometer range with impact and friction in dry and wet mode. These mills are also ideally suited for mechanical alloying.



The mixer mills are specially designed for quick grinding, mixing and homogenization of small sample volumes, as well as for cell disruption. The CryoMill is the perfect choice for efficient pulverization and homogenization of elastic and temperature-sensitive sample materials under continuous embrittlement with liquid nitrogen at -196 °C. The compact XRD-Mill McCrone is used for sample preparation to X-Ray diffraction.



Icons used in this catalogue

NEW **PRODUCT NEWS**
This icon marks products which appear in the RETSCH catalogue for the first time

MILLING

130 mm
↓
5 mm* Maximum feed size and final fineness

This mill is suitable for cryogenic grinding

Cyclone for improved material discharge and additional cooling

SIEVING

25 mm
| |
20 µm Measuring range of sieve shakers / particle analyzers

Suitable for wet sieving / for measuring suspensions

Suitable for dry sieving / for measuring dry samples

Selection Guide for Size Reduction Tools

The following selection guide gives an overview of the application areas of RETSCH mills and crushers. The selection of a suitable mill depends on the individual application. This table only serves as a first orientation.

Contact us to find the optimum solution for your application!

-  suitable
-  suitable to a limited extent
- not suitable

Applications														
Construction materials	Soil, sewage sludge	Chemical products	Electronic waste	Feed stuff	Glass, ceramics	Wood, bones, paper	Coal, coke	Plastics, cable, rubber	Food	Leather, textiles	Minerals, ores, rocks	Pharmaceutical products	Plants, hay, straw	Secondary fuels

Jaw Crushers	Model	Feed size* approx.	Final fineness* approx.
Jaw Crusher	BB 50	40 mm	500 µm
Jaw Crusher	BB 100	50 mm	4 mm
Jaw Crusher	BB 200	90 mm	2 mm
Jaw Crusher	BB 300	130 mm	5 mm

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Rotor Mills	Model	Feed size* approx.	Final fineness* approx.
Ultra Centrifugal Mill	ZM 200	10 mm	40 µm
Rotor Beater Mill	SR 300	25 mm	50 µm
Cross Beater Mill	SK 300	25 mm	100 µm
Cyclone Mill	TWISTER	10 mm	250 µm

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Knife Mills	Model	Feed size* approx.	Final fineness* approx.
Knife Mill	GRINDOMIX GM 200	40 mm	300 µm
Knife Mill	GRINDOMIX GM 300	130 mm	300 µm

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Cutting Mills	Model	Feed size* approx.	Final fineness* approx.
Cutting Mill	SM 100	80x60 mm	250 µm
Cutting Mill	SM 200	80x60 mm	250 µm
Cutting Mill	SM 300	80x60 mm	250 µm

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Mortar Grinders/Disc Mills	Model	Feed size* approx.	Final fineness* approx.
Mortar Grinder	RM 200	8 mm	10 µm
Disc Mill	DM 200	20 mm	100 µm
Disc Mill	DM 400	20 mm	50 µm
Vibratory Disc Mill	RS 200	15 mm	20 µm

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Ball Mills	Model	Feed size* approx.	Final fineness* approx.
XRD-Mill	McCrone	500 µm	1 µm
Mixer Mill	CryoMill	8 mm	5 µm
Mixer Mill	MM 200	6 mm	10 µm
Mixer Mill	MM 400	8 mm	5 µm
High Energy Ball Mill	E _{max}	5 mm	80 nm
Planetary Ball Mill	PM 100	10 mm	100 nm
Planetary Ball Mill	PM 100 CM	10 mm	100 nm
Planetary Ball Mill	PM 200	4 mm	100 nm
Planetary Ball Mill	PM 400	10 mm	100 nm

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 Please note:
The achieved final fineness depends on the sample material and instrument configurations which means that different results may be obtained with apparently similar samples.

Innovative Technology Sets Standards Worldwide

RETSCH's range of sieving machines not only covers a very wide measuring range, it also provides a suitable model for virtually any bulk material thanks to different sieving motions and sieve diameters. The instruments are used in research & development, quality control of raw materials, semi-finished and finished products as well as in production monitoring and comply with the requirements of DIN EN ISO 9000 ff.

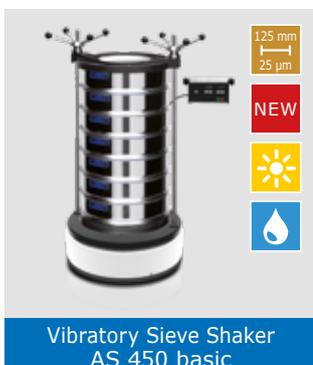
All "control" sieve shakers can be calibrated and provide reproducible, globally comparable results thanks to the possibility to set the sieve acceleration which is independent of the power frequency.

Vibratory Sieve Shakers

The patented electromagnetic drive of the vibratory sieve shakers produces a 3-D throwing motion which ensures optimum use of the open sieve area and lets the sample move equally over the whole sieving surface. The AS 200 series provides a suitable instrument for every requirement and budget. The AS 300 control is designed for large feed quantities up to 6 kg.



The two AS 450 models fractionate up to 15, respectively 25, kg of sample in one working run and achieve high separation efficiency.



Horizontal Sieve Shaker, Tap Sieve Shaker and Air Jet Sieving Machine

Horizontal sieving (AS 400), tap sieving (AS 200 tap) and air jet sieving (AS 200 jet) are used for the particle size determination of materials which are not suitable for vibratory sieving and whenever these separation methods are stipulated by certain standards.

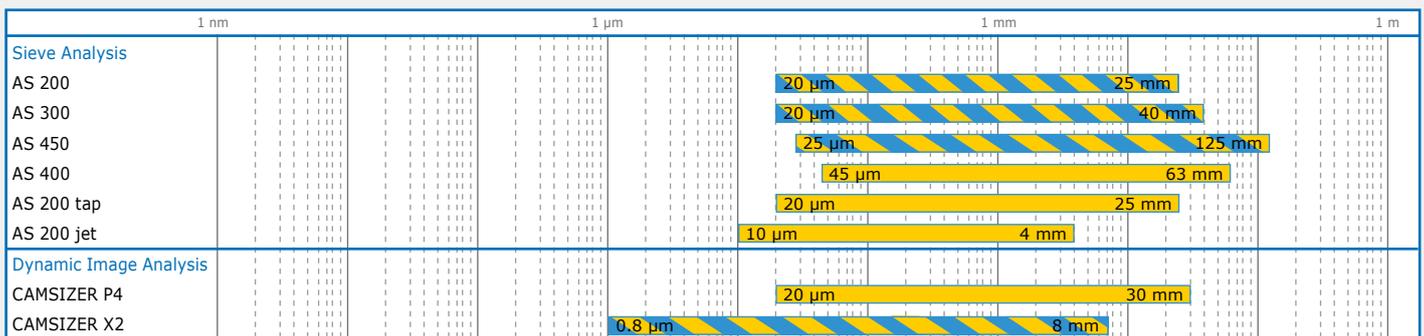


Particle Size and Particle Shape Analysis with Dynamic Image Analysis

Dynamic Image Analysis is one of the most accurate methods when it comes to measuring the particle size and particle shape. It is an established alternative to sieve analysis and laser diffraction and is greatly superior to these with regard to precision, reproducibility and information content in a size range from 0.8 µm to 30 mm. The particle analyzer CAMSIZER P4 measures pourable bulk goods and granulates with a maximum particle size of 30 mm. The CAMSIZER X2 is ideally suited for analyzing fine powders and suspensions up to 8 mm.



The perfect solution for each measuring range



■ Dry measurement ■ Wet measurement

Assisting – The Key to Greater Efficiency in the Laboratory

From representative, reproducible sampling and sample division to uniform, continuous material feed; from efficient preparation of solid pellets for XRF analysis to rapid cleaning of grinding tools and test sieves to gentle sample drying: RETSCH offers a comprehensive range of useful assistants which enhance the performance of our mills and sieve shakers even further and ensure reliable analysis results.



Sample Divider
PT 100



Sample Divider
PT 200



Sample Divider
RT 6.5-75



Vibratory Feeder
DR 100



Pellet Press
PP 25



Pellet Press
PP 35



Pellet Press
PP 40



Fluid Bed Dryer
TG 200



Ultrasonic Baths
UR 1/2/3

Expert Guides

Would you like to learn more about Milling and Sieving?
Please visit our website and download our expert guides:

- "The Art of Milling"
with comprehensive material overview
- "Sieve Analysis – Taking a close look at quality"
with sieve comparison table

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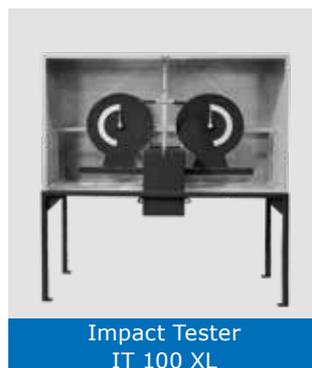
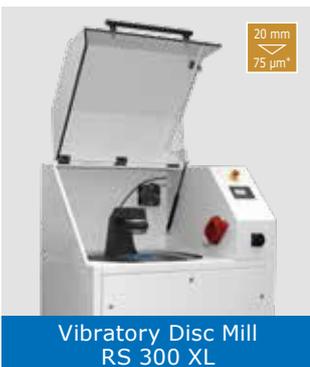
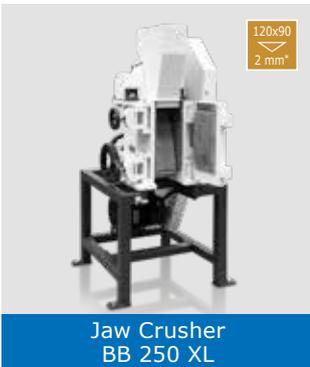
We are happy to send you a printed copy on request.



Product Range „X-Large“

In addition to the instruments for size reduction on a laboratory scale RETSCH now offers a complete range of products for applications with large feed sizes and high throughputs. The jaw crushers, vibratory disc mills and drum mills of the “X-Large” portfolio are mainly used in application areas such as construction materials, mining and energy in a pilot plant environment.

The line also comprises a number of testing instruments for the determination of the Bond Work Index as well as flotation and abrasion testers.





Science for Solids

Materialography
Hardness Testing
Heat Treatment
Elemental Analysis
Milling & Sieving
Particle Analysis

As part of the VERDER Group, the business division VERDER SCIENTIFIC sets standards in the development, manufacture and sales of laboratory and analytical equipment. The instruments are used in the areas of quality control, research and development for sample preparation and analysis of solids.

www.verder-scientific.com

Retsch[®]

MILLING SIEVING ASSISTING

part of **VERDER**
scientific

Retsch GmbH
Retsch-Allee 1-5
42781 Haan · Germany

Telephone +49(0)2104/2333-100
Telefax +49(0)2104/2333-199

E-Mail info@retsch.com
Internet www.retsch.com