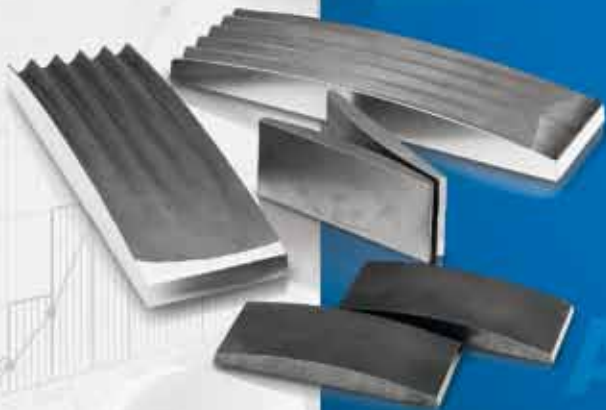


Primary size reduction with Jaw Crushers



Вспомогательное оборудование

Retsch[®]
Solutions in Milling & Sieving

Applications

RETSCH Jaw Crushers are used for the rapid, gentle **crushing and pre-crushing of medium-hard, hard, brittle and tough materials**. The variety of materials offered, their efficiency and safety make them ideal for sample preparation in laboratories and industrial plants.

The main areas of application for Jaw Crushers are:

Ceramics and glass
glass, oxide ceramics

Construction materials
basalt, bricks, cement clinker, chamotte

Environmental analysis
electronic components, soil, construction waste

Materials research

Mineralogy and metallurgy
alloys, coal, coke, feldspar, granite, ores, quartz, rocks, silicon, slag

and many more...

Free test grinding

The RETSCH application laboratories process and measure samples free-of-charge and provide a recommendation for the most suitable method and instrument.

Please visit our website www.retsch.com/testgrinding.

Jaw Crushers

Many unique details make the RETSCH Jaw Crushers the ideal choice when it comes to the rapid and gentle crushing and pre-crushing of hard and brittle materials.



Application examples

Application	Model	Breaking jaws	Gap width	Feed size	Sample amount	Grinding time	Final fineness
Asphalt	BB 300	Manganese steel	1 mm	130 mm	3,000 g	1 min	4 mm
Concrete	BB 200	Stainless steel	1 mm	70 mm	900 g	1 min	2 mm
Drilling cores	BB 300	Manganese steel	1 mm	Ø 120 mm x 250 mm	7,000 g	2 min	2 mm
Enamel	BB 200	Stainless steel	1 mm	90 mm	4,000 g	2 min	2 mm
Ferro Alloys	BB 300	Stainless steel	touching	70 mm	300 g	1 min	5 mm
Glass	BB 51	Zirconium oxide	0.1 mm	30 mm	250 g	2 min	0.5 mm
Shale	BB 200	Stainless steel	4 mm	Ø 50 mm x 200 mm	16,500 g	6 min	10 mm
Silicon	BB 200	Tungsten carbide	4 mm	90 mm	3,000 g	2 min	7 mm
Slag	BB 51	Tungsten carbide	1.5 mm	30 mm	280 g	20 sec	2 mm
Stones	BB 100	Stainless steel	2 mm	40 mm	500 g	2 min	4 mm

This chart serves only for orientation purposes.

RETSCH's application database contains more than 1,000 application reports. Please visit www.retsch.com/applicationdatabase.



Milling

– Jaw Crushers

- Rotor Mills
- Cutting Mills
- Knife Mills and Blenders
- Mortar Grinders
- Disc Mills
- Mixer Mills
- Planetary Ball Mills

Sieving

Assisting

Jaw Crushers

– Applications	2
– Benchtop model	
– Jaw Crusher BB 51	4
– Floor models	
– Jaw Crusher BB 100	5
– Jaw Crusher BB 200	5
– Jaw Crusher BB 300	5
– Selection guide / technical data	6
– Breaking jaws	7
– Order data	8



Apart from the four standard models, RETSCH Jaw Crushers are also available as special versions adapted to particular application requirements.

Heavy-metal-free grinding



All Jaw Crushers can be supplied in versions where all parts coming into contact with the sample are heavy-metal-free. The BB 200 is also available as a special version for **grinding of semi-conductor materials.**

Continuous pre- and fine grinding



The BB 200 can be combined with the Disc Mill DM 200 – the perfect solution for rapid, continuous pre- and fine grinding of large quantities of coarse material down to analytical fineness.

Process-line versions



The BB 200 and BB 300 Jaw Crushers are also available in versions which are suitable for continuous size reduction in on-line operation. These versions are supplied without the feed hopper and motor protection switch. The three-phase current version of the motor will be supplied as per customer's specifications.

Benchtop model

BB 51

Powerful and compact



BB 51

Laboratory scale pre-crushing

The BB 51 has been specially designed for sample preparation in the laboratory. The **space-saving, dust-tight instrument fits on any laboratory bench**. Small amounts of sample with large feed sizes are crushed gently and without loss.

The Jaw Crusher BB 51 rests on four rubber feet and has a closed housing that provides for ultimate operator safety. The on-off switch and gap width setting (0 – approx. 10 mm) with digital display are conveniently located on the front panel. Reproducible results are ensured by the zero-point adjustment of the gap width. This means that any breaking jaw wear can be compensated by simply pressing a button.

Benefits at a glance

- Compact, space-saving benchtop instrument
- Excellent performance and high final fineness ($d_{90} < 0.5 \text{ mm}$)
- Digital gap width display
- Zero-point adjustment for wear compensation
- Neutral-to-analysis size reduction thanks to breaking jaws made from 5 different materials
- Safe and user-friendly
- Escape-free hopper
- Dust-tight, maintenance-free
- Smooth and quiet operation
- CE-conforming

The feed hopper of the BB 51 can be easily dismantled for cleaning. Breaking jaws and wearing plates are available in five different materials to be selected depending on the sample and the analysis to be carried out. A version for heavy-metal-free size reduction is also available. The breaking jaws and wearing plates are easily exchanged. This means that the Jaw Crusher can be converted to suit different applications.

The BB 51 is driven by a powerful single-phase AC motor with 1100 W. A disc spring package and thermal overload protection device protect the Jaw Crusher against overloading. Due to permanently lubricated bearings and its solid design, the BB 51 is virtually maintenance-free.

Its compact size makes the BB 51 an ideal choice for use in mobile laboratories. Carrying handles for the Jaw Crusher are available on request.

Jaw Crusher technology

RETSCH Jaw Crushers are robust and powerful forced-feed crushers. The feed material passes through the no-rebound hopper and enters the crushing chamber. Size reduction takes place in the wedge-shaped area between the fixed crushing arm and one moved by an eccentric drive shaft. The elliptical motion crushes the sample which then falls under gravity.

As soon as the sample is smaller than the discharge gap width, it falls into a removable collector. The continuous gap width setting with scale resp. digital display ensure optimal size reduction in accordance with the set gap width value.



Floor models

BB 100, BB 200 and BB 300



BB 100



BB 200



BB 300

Benefits at a glance

- High throughput, high degree of size reduction
- High final fineness (down to $d_{90} < 2$ mm)
- Continuous gap width setting
- Scale for gap width display
- Zero point adjustment for wear compensation
- Central lubrication (BB 200, BB 300)
- Breaking jaws made of 4 different materials
- No-rebound feed hopper with quick-release clamp
- Brake motor with safety switch
- Easy-to-clean crushing chamber
- Process line versions of BB 200 and BB 300 available
- CE-conforming

Convenient and safe power packages

Robust design, simple handling and cleaning are the features of the BB 100, BB 200 and BB 300 models. For small amounts of sample the Jaw Crushers can be used batch-wise; for larger amounts they can be operated continuously.

The crushed sample is collected in a removable collector. For larger amounts or continuous crushing operations, the sample collector can be replaced by customer-specific solutions (e.g. a belt conveyor). Stainless steel and plastic sample collectors are available for the BB 300.

The grinding chamber is enclosed almost dust-tight. To remove any fine dust which could contaminate the

surroundings, each crusher is equipped with a connection for dust extraction.

A safety switch and the brake motor ensure an immediate stop if the unit is opened or switched on incorrectly. A Belleville spring washer integrated in the spindle adjustment provides additional overload protection. The eccentric spindle which moves the crushing arm is driven by a robust brake motor via V-belts. The largest belt pulley also acts as the flywheel to ensure uniform and smooth operation.

BB 200 and BB 300 feature central lubrication of the lower movable crushing arm roller bearings.

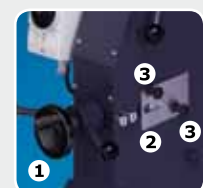
Wear compensation by zero-point adjustment

Depending on the material and the throughput, sooner or later the breaking jaws will start to show signs of wear. This means that the set breaking jaw distance or the crushing gap will increase with time. In order to still be able to obtain reproducible crushing results this wear must be compensated. With Jaw Crushers whose gap width can only be set in fixed steps, compensation for wear is not possible. This means that reproducibility can no

longer be assured. In comparison, RETSCH Jaw Crushers can be continuously adjusted and therefore breaking jaw wear can be compensated. This is done by slowly altering the gap width setting with the motor running until the breaking jaws are heard to come into contact. The new zero point thus obtained is saved by pressing the reset key (BB 51) or re-adjusting the scale (BB 100 to BB 300).



BB 51



BB 100 to BB 300

- (1) Gap width setting
- (2) Gap width display
- (3) Zero-point setting

Selection guide for Jaw Crushers

The choice of Jaw Crusher depends primarily on the feed material size and the amount to be crushed.

With its compact space-saving design, model **BB 51** is often used in laboratories for pre-crushing small amounts of sample with a large feed size.

Series **BB 100**, **BB 200** and **BB 300** Jaw Crushers are mainly used for pre-crushing hard, brittle products with a degree of hardness >3 on the Mohs' scale.

BB 100 and **BB 200** are particularly suitable for standard size reductions, e.g. of minerals, ores and fossil fuels.

Models **BB 200** and **BB 300** are also suitable for size reduction in process plant, e.g. when included in a sampling station.

Performance data	BB 51	BB 100	BB 200	BB 300
	www.retsch.com/bb51	www.retsch.com/bb100	www.retsch.com/bb200	www.retsch.com/bb300
Applications	coarse and pre-crushing			
Feed material	medium-hard, hard, brittle, tough			
Material feed size*	<35 mm	<50 mm	<90 mm	<130 mm
Final fineness*	d ₉₀ <0.5 mm	d ₉₀ <4 mm	d ₉₀ <2 mm	d ₉₀ <5 mm
Collector capacity	1 liter	2 liters	5 liters	27.5 liters / 35.4 liters
Throughput*	1 liter/batch	200 kg/h	300 kg/h	up to 600 kg/h
Jaw width	40 x 40 mm	60 x 60 mm	100 x 100 mm	150 x 200 mm
Gap width setting	0 - 10 mm	0 - 20 mm	0 - 30 mm	1 - 40 mm
Gap width display	digital	analog	analog	analog
Zero point adjustment	yes	yes	yes	yes
Hinged hopper	-	yes	yes	yes
Connection for dust extraction	dust-tight	yes	yes	yes
Central lubrication	-	-	yes	yes
Process line version	-	-	available	available
Technical data				
Power consumption	1100 W	750 W	1500 W	3000 W
W x H x D	360 x 510 x 580 mm	320 x 960 x 800 mm	450 x 1160 x 900 mm	670 x 1450 x 1600 mm
Net weight	approx. 79 kg	approx. 137 kg	approx. 300 kg	approx. 700 kg
Noise values (Noise measurement according to DIN 45635-31-01-KL3)				
Emission value with regard to workplace	L _{pAeq} 83.7 dB(A)	L _{pAeq} 90 dB(A)	L _{pAeq} 84 dB(A)	L _{pAeq} 81.5 dB(A)
Measuring conditions:				
Feed material	broken quartz gravel	quartz gravel	marble gravel	marble gravel
Feed size	approx. 25 mm	40 - 50 mm	40 - 80 mm	<90 mm
Set gap width	2 mm	<1 mm	<1 mm	<1 mm
Final particle size	<5 mm	<5 mm	<5 mm	<14 mm

*depending on feed material and instrument configuration/settings

Increased user convenience combined with maximum working safety

Safety is very important for RETSCH Jaw Crushers. The interior of the feed hopper cannot be accessed by hands and the baffles prevent the sample material from rebounding. Integral Belleville spring washer packages and a thermal overload protection switch protect the Jaw Crushers against overloading. The hopper is hinged for easy cleaning (BB 100 to BB 300) or can be easily

removed. The Jaw Crushers run very smoothly and quietly. Due to their solid design, RETSCH Jaw Crushers are virtually maintenance-free.



The BB 200's hinged cover permits easy access to the grinding chamber.

The suitable material for your requirements

5 different materials available

Selecting the breaking jaw material

Breaking jaws made from different materials are available for different applications:

- **Manganese steel**
is a material whose structure becomes compressed under pressure and becomes harder with time (cold hardening).
- **Stainless steel**
is recommended if the expected feed material is not too hard and could cause corrosion.



- **Tungsten carbide**
is the most abrasion-resistant and pure material. It provides an increased working life even with materials up to 7-8 on Mohs' scale.
- **Zirconium oxide,** partially yttrium-stabilized is used as a ceramic material for metal-free preparation, e.g. for dental or clinical ceramics, optical glasses. A further advantage is that no color changes as a result of abrasion are observed (only available for BB 51).

Surface structure of the breaking jaws				
Material	BB 51	BB 100	BB 200	BB 300
Manganese steel	smooth	smooth	grooved	grooved
Stainless steel	smooth	smooth	grooved	grooved
Tungsten carbide	smooth	smooth	smooth	on request
Zirconium oxide	smooth	-	-	-
Heavy-metal-free steel	smooth	smooth	grooved	grooved

- **Heavy-metal-free steel**
is optimal for the sample preparation of materials which will be submitted for analysis on heavy metals and which are not too abrasive, such as construction waste, soil samples and road surfacing.

Apart from giving guideline information about their analytical compositions, the table below provides an overview of which breaking jaw materials are available for which Jaw Crusher models.

Material composition guidelines						
Breaking jaws	Material reference	BB 51	BB 100	BB 200	BB 300	Hardness approx. / Analysis (%)
Manganese steel	1.3401	■	■	■	■	34-35 HRC C (1.3), Si (0.5), P (0.1), Mn (13), S (0.04), Cr (1.5), Fe (83.56)
Stainless steel	1.4027	■	-	-	-	37-40 HRC C (0.25), Si (1), P (0.05), Mn (1), S (0.05), Cr (14.5), Fe (83.17)
	1.4312	-	■	■	■	150-200 HB C (0.12), Si (2), P (0.045), Mn (1.5), S (0.03), Cr (19.5), Ni (10), Fe (66.805)
Tungsten carbide		■	■	■	■	1180-1280 HV 30 WC (92), Co (8)
Zirconium oxide*		■	-	-	-	8.5 Mohs ZrO ₂ (94.5), Y ₂ O ₃ (5.2), SiO ₂ / MgO / CaO / Fe ₂ O ₃ / Na ₂ O / K ₂ O (<0.3)
Heavy-metal-free steel	1.1750	■	■	■	■	58 HRC C (0.82), Si (0.4), P (0.035), S (0.035), Mn (0.8), Fe (97.91)
Wearing plates						
Stainless steel	1.4301	■	■	■	■	** C (0.07), Si (1), P (0.045), Mn (2), S (0.03), Cr (19.5), Ni (10.5), N (0.11), Fe (66.805)
Tungsten carbide		■	■	■	■	1180-1280 HV 30 WC (90), Co (10)
Zirconium oxide*		■	-	-	-	7.5 Mohs ZrO ₂ (94.5), Y ₂ O ₃ (5.2), SiO ₂ / MgO / CaO / Fe ₂ O ₃ / Na ₂ O / K ₂ O (<0.3)
Heavy-metal-free steel	St 1203	■	■	-	■	** C (0.1), Cu (0.35), P (0.05), S (0.05), N (0.008), Mn (0.45), Fe (98.992)
	1.0038	-	-	■	-	C (0.17), P (0.05), S (0.05), N (0.009), Mn (1.4), Fe (98.321)

The percentages given above for the analytical values are averages. We reserve the right to make alterations.

* partially yttrium-stabilized, ** no information available

Jaw Crushers order data

Jaw Crushers							Item No.
Breaking jaws	Wearing plates	Version ¹⁾	BB 51	BB 100	BB 200	BB 300 ²⁾	
Manganese steel	BB 51-BB 300: stainless steel	3/N- 400 V, 50 Hz	–	20.052.0001	20.053.0001	20.054.1001	
		230 V, 50 Hz	20.056.0006	20.052.0003	20.053.0007	–	
Stainless steel	BB 51-BB 300: stainless steel	3/N- 400 V, 50 Hz	–	20.052.0004	20.053.0002	20.054.1003	
		230 V, 50 Hz	20.056.0002	20.052.0006	20.053.0008	–	
Tungsten carbide	BB 51: tungsten carbide	3/N- 400 V, 50 Hz	–	20.052.0007	20.053.0003	20.054.1013	
	BB 100-BB 300: stainless steel ³⁾	230 V, 50 Hz	20.056.0003	20.052.0009	20.053.0009	–	
Zirconium oxide	BB 51: Zirconium oxide	230 V, 50 Hz	20.056.0004	–	–	–	
For grinding without heavy-metal contamination							
steel 1.1750	BB 51, BB 100: steel St 1203	3/N- 400 V, 50 Hz	–	20.052.0027	20.053.0018	20.054.1006	
	BB 200: steel 1.0038	230 V, 50 Hz	20.056.0013	20.052.0028	20.053.0019	–	
For grinding of semi-conductor materials (all parts coming into contact with the sample are heavy-metal-free)							
Tungsten carbide	BB 200: tungsten carbide	3- 400 V, 50 Hz	–	–	20.059.0001	–	
For integration into a system at the customer's location, with manufacturer's declaration according to EC machine directive, with three-phase motor (voltages on request) and central lubrication, without hopper and protective motor switch							
Manganese steel	BB 200, BB 300: stainless steel	on request	–	–	20.058.1001	20.057.1001	
Stainless steel	BB 200, BB 300: stainless steel	on request	–	–	20.058.1002	20.057.1002	
Tungsten carbide	BB 200, BB 300: stainless steel	on request	–	–	20.058.1003	–	
¹⁾ other electrical versions available on request ²⁾ please order receptacle separately ³⁾ versions with wearing plates of tungsten carbide available							
Spare breaking jaws and wearing plates							Item No.
Spare breaking jaws, 1 pair			BB 51	BB 100	BB 200	BB 300	
Spare breaking jaws, manganese steel			22.048.0014	22.048.0001	22.048.0004	22.048.0007	
Spare breaking jaws, stainless steel			22.048.0012	22.048.0002	22.048.0005	22.048.0008	
Spare breaking jaws, tungsten carbide			22.048.0010	22.048.0003	22.048.0006	on request	
Spare breaking jaws, zirconium oxide			22.048.0011	–	–	–	
Spare breaking jaws, steel 1.1750			22.048.0016	22.048.0017	22.048.0018	22.048.0019	
Spare wearing plates, 1 pair			BB 51	BB 100	BB 200	BB 300	
Spare wearing plates, stainless steel			22.711.0009	22.711.0002	22.711.0003	22.711.0004	
Spare wearing plates, tungsten carbide			22.711.0008	22.711.0005	22.711.0010	on request	
Spare wearing plates, zirconium oxide			22.711.0007	–	–	–	
Spare wearing plates, steel St 1203			22.711.0011	22.711.0012	–	22.711.0013	
Spare wearing plates, steel 1.0038			–	–	22.711.0006	–	
Other accessories / spare parts							Item No.
Carry handles, 1 pair			32.825.0001	–	–	–	
V-belt, 1 piece			05.242.0028	–	–	–	
V-belt, 1 set (3 pieces)			–	22.351.0002	22.351.0003	–	
V-belt, 1 set (4 pieces)			–	–	–	22.351.0004	
Set of wheels (4 pieces)			–	22.609.0002	–	–	
Lubricator			–	–	05.664.0001	05.664.0001	
Frame for combination with Disc Mill DM 200			–	–	02.824.0054	–	
Carriage for receptacle, capacity up to 150 kg			–	–	–	22.906.0001	
Receptacle, galvanized steel, 27.5 litres			–	–	–	05.045.0048	
Receptacle, plastic, 35.4 litres			–	–	–	05.045.0049	

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