



mrc



Mills



SM-450/SM-450TR/SM-450C, Sample Mills

Features:

- Compact size. The main body shell, container and lid are stainless
- The container unit and machine body are separated; users can take off the container unit for dry cleaning after using. (Users also can purchase a few container units for alternate using.)
- Useful to crush dried food, drugs, alumina, bones, grains, seeds, porcelain, mineral etc. (You can purchase the special processed blade for crushing harder materials like porcelain, mineral, etc.)
- Cooling-type mill is based on cooling the temperature by a water circulation system to reduce the temperature inside the container. (The increasing temperature inside of the container should be possible to destroy the samples.)
- Optional:
 - transparent lid to observe material inside cup.
 - Lid for small quantities.



Model	SM-450	SM-450L	SM-450C
Motor	1200W		
Speed (rpm)	0-30,000		
Body Size	Ø170 x 330H(mm)		
Cup Inner Size	Ø108 x 51H(mm)	Ø135 x 60H(mm)	Ø108 x 51H(mm)
Volume	300CC	400CC	300CC
Max. Capacity	150ml	200ml	150ml
Cooling jacket	No		Yes
Net weight	5.1kg		6kg
Power	AC110V/220V, 50/60Hz		



KM-Series, Knife Mills for hard dry materials

Features:

- Durable motor.
- Made of SS304.
- Fast & efficient grinding.
- Easy operation.
- No premixing.
- Low maintenance.

This model is equipped with special pressure hoods which makes it possible to mill leaf, branches, wood, bones, seeds, dry food, building materials and chemical, into flour like powder in large quantities and during short operation time. Shouldn't be used with wet or greasy samples.

- Easy replacement of blade knives.
- Applications: grain, seeds, spices, rice, wheat, salt, bonds, wood, leaves, tea leaves, tobacco, pigments, detergents, roots, stems, coal, coke, tablet, pills.
- Used in building materials in dust, Chemical industry, Medical industry, Paint and Varnish industry, Pharmacy industry.

Emptying of model KM-1500



Model	KM-700	KM-1500
Speed (rpm)		
Cap dimensions (mm)	Ø130 x 55H	Ø160 x 75H
Volume	700CC	1500CC
Max. capacity	200ml	375ml
Motor	1000W	1350W
Overall DIM. (mm)	Ø162 x 298	Ø270 x 300
Net Weight (kg)	4.6	10
Power		

Grinding Examples of KM-1500





FAM-100

FAM-100, Fast Mill

Versatility and suitable for the soft, brittle, fibrous and hard samples in fast, efficient, mild crushing processing. Is the food, feed, pharmaceutical, coating, agricultural test choice of NIR instrument.

Product application

Application field: dry grinding, fine grinding, cryogenic grinding

Sample: soft, medium-hard, brittle, fibrous sample

Application sample: agriculture, environment, soil, electron, RoHS, chemical, plastic, medicine, animal food, grain, dry plant and so on.

Sample comparison before and after grinding:

Sample picture		Parameter	
Before grinding	After grinding	Sample	Circuit board
		Speed setting	12 teeth rotor, stainless steel
		Sample characteristic	Tough
		Attention	Reject the metal part first, the feed size must be less than 8mm
		time	Real time
		Speed setting	12 teeth rotor, stainless steel
		Sample characteristic	Oil, hard
		Attention	feed size must be less than 8mm
		time	Real time
		Speed setting	12 teeth rotor, stainless steel
		Sample characteristic	Hard
		Attention	feed size must be less than 8mm
		time	Real time
		Speed setting	12 teeth rotor, stainless steel
		Sample characteristic	Hard
		Attention	Dry, feed size must be less than 8mm
		Grinding ball	Real time

Diversified application, efficient sample preparation:

The fast mill FAM-100 applies to a wide range of samples such as chemicals, drugs, seasoners, synthetic resin, coal, plastics, agricultural raw materials, finished drugs, fertilizers, foods and so on. Based on its efficient grinding technology and diversified accessories, FAM-100 can guarantee moderate sample preparation in instantaneous time.

Diversified application for example: Ecological environment protection: plants (root, stem and leaf, etc.) sample preparation, C.H.N determination of coal, coatings, such as sample preparation, ash content, thermal measurement. identify the nitrogen composition and protein composition of feed and food. Secondary fuel, rubbish, plastic, electronic elements, the determination of harmful substances.

The Fast mill FAM-100 is used for rapid fine grinding of soft, medium-hard and fibrous sample. Based on its efficient grinding technology and diversified accessories, the secondary grinding with the rotating rotor ring sieves system can guarantee moderate sample preparation in a very short time. The accessories in grinding operation such as rotor, ring sieves, collecting pan, cover can be removed and re-installed quickly without tool to efficiently meet the requirement of preparing a large number sample.



The grinding art for special samples:

- Plastic and rubber samples have embrittlement in liquid nitrogen conditions, and refining treatment is the ideal choice.
- The distance ring sieve and automatic vibratory Feeder can be used for grinding heat-sensitive samples such as paints, resin.
- The rotor and ring sieve with wear-resisting coatings can be used for grinding rigid and corrosive materials such as fertilizers, chemicals.

Work principle:

The fast mill can realize two-stage crushing for samples with the rotor and ring sieves. Samples are fed from the hopper with anti-splashing design. Under the effect of high speed centrifugal force, the falling samples and the high speed rotor generate a giant impact force to perform pretreatment for samples; then the samples



are sheared, extruded and rubbed again between the rotor and ring sieves. The sample sizes less than the aperture of ring sieves enter into the collecting pan. The two-stage crushing can form moderate and efficient crushing results. Due to the high crushing efficiency, the period of samples staying in the grinding chamber is quite short so as to avoid changes of sample natures.

Technical advantage:

- Provide all kinds of accessories to ensure the application of diversification.
- The final fineness less than 100um
- Speed is adjustable from 6000-18000rpm
- Two stage rotor-ring sieve system to realize quickly grinding.
- Low noise, reliable operation, easy clean.
- The rotor diameter is 95mm, peripheral speed up to 99.43m/s, can get efficient grinding results.
- Touch control panel, convenient and quick.
- The fineness depend on the ring sieve.

Technical highlights:

The specifically designed air passage can guarantee that the grinding chamber has constant airflow to cool rotors so as to form ventilation system to guarantee the cooling of samples. There is a double layer wear proof seal ring between the grinding chamber and the driving motor to prevent dust from entering the motor. The electronic lock and the mechanical lock form double protection for operators.

The double anti-blocking hopper can effectively prevent feedstock blocking and effectively reduce noises.

Special adapters can be equipped to perform large-capacity collections.

The motor is equipped with the function of overload protection, and it can keep running after restarting due to overload.

Diversified accessories:**Rotor**

The rotor have 3 kinds , 24 teeth, 12 teeth and 6 teeth, can be used respectively for fine sample, general sample, or particularly rough of the crushing of the sample.

Ring sieves:

Finally the sample fineness can be decided by different aperture ring sieve. reinforcement ring sieve can extend the service life of sieve.

All the rotor and the ring sieve material have stainless steel and the heavy-metal-free titan sets to be chosen. The rotor and the ring sieve should be chosen reasonable according to the properties of the samples, the required final fineness and subsequent analysis requires. We offer a special ring sieve with shear function, for most materials, about 80% of the samples can reach less than of the half fineness .of sieve aperture used.

**Automatic feed device and large sample receiver:**

The fast mill FAM-100 can be equipped with an automatic feed device . The automatic sample feed operation can guarantee especially homogeneous grinding results and avoid the risk of sample feed overload.

The grinded samples are collected in a collecting pan, which is convenient for collection without sample loss and prevents cross contamination of samples.

When using a cyclone or a paper bag, the grinded samples can be cooled via airflow and leave the grinding chamber quickly via the collecting pan with an exit. f a vacuum cleaner is connected, the process can be faster and efficient. The cyclone can be used in conjunction with 250ml or 500ml sample bottles; in case large samples are grinded, the cyclone with the capacity of 3L or 5L can be selected. All parts contacting samples can be removed manu without any tools, and it is quite convenient to clean and install such parts.



Optional: Vibratory Feeder



Optional: Cyclone

Model	FAM-100
Speciality	
Application filed	Fine grinding
Sample characteristic	Soft, medium-hard, brittle, fibrous
Transport data	
Package size	62x60x60cm
Instrument size	48x40x48cm
Gross weight	40kg
Net weight	34kg
Technical data	
Feed size	Less than 10mm
Final fineness	Less than 100um
Option ring sieve	0.20, 0.50, 1.00, 2.00 mm
Collecting pan volume	Standard pan: less than 500ml (1000ml)
Motor speed	6000 - 18000 rpm, constant adjustable
Peripheral speed	29.83-99.43m/s
Rotor diameter	95mm

*depending on feed material and instrument configuration



PMG-100

PMG-100, Power Mortar Grinder

Mortar grinder PMG-100 is use to grindw homogenize & mix a wide range of solid material in dry/wet or cryogenic condition. For the modern laboratory applications, have extraordinary performance on the processing capacity, the comfort & safety of operation.









Application Example:

Universal, High performance Mortar Grinder is used to process high repeatable the solid material in dry, wet or cryogenic condition. (eg. Soil, corn, grain ,glass, pill,rice)

The method of operation:

The material to be processed falls into the Pulverizing area between mortar and pestle by top feeding via the opening which is at the inlet cover. The material is then pulverized and mixed between the mortar inner surface area and the bottom of the pestle. n order to match the necessary top pressure with the requested end fineness and the breaking behaviour of the sample to be prepared the PMG-100 is equipped with and adjustable. Top pressure mechanism with scale & a variable speed setting 50- 130rpm and a flexible scraper setting.



Sample picture		Parameter	
Before grinding	After grinding	Sample	Corn
		Grinding set	The mortar & pestle of S.S
		Sample characteristic	Hard, oiliness
		Attention	The feed size must be less than 8mm
		time	12 min.
Before grinding	After grinding	Sample	Pill
		Grinding set	The mortar & pestle of S.S
		Sample characteristic	Brittle
		Attention	feed size must be less than 8mm
		time	3 min.
Before grinding	After grinding	Sample	Soil
		Grinding set	the mortar and pestle of agate
		Sample characteristic	Soft, powder
		Attention	Remove the stone,metal from the sample first,the feed size must be less than 8mm,
		time	5min.
Before grinding	After grinding	Sample	Glass
		Grinding set	The mortar & pestle of S.S
		Sample characteristic	Hard, Brittle
		Attention	The feed size must be less than 8mm
		time	10min.

Grinding Homogenizing Hriturating:

The Mortar Grinder is the central machine in a sample preparation Laboratory of today. This system is suitable for the fine grinding of any dry substance,as well as for suspensions with different viscosities for analysis, quality control and material testing.It is perfectly suitable for the homogenization of cremes and pastes,Typically samples with a feed size of up to 8-10mm and a total batch of up to 200 ml (volume depending on the



characteristic of the samples) can be ground down to 10-20µm.

No other grinding system is more easy to clean than the PMG-100 Mortar Grinder. When the grinding process is finished the mortar and pestle can be removed by a bayonet lock in order to perform a quick cleaning of the grinding tools.

Technical features:

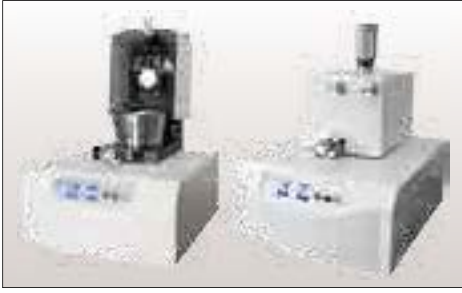
- 3 kinds of material scraper to be choose
- Humanization design, easy clean
- The speed is adjustable between 50-130rpm
- Digital time setting, speed adjustment
- Remove the mortar & pestle without tool
- Suitable for the yeast cell disruption.



Technical Data	
Power supply	200-240V, 50/60Hz
Motor speed	50-130 rpm adjustable
Nominal rating	180 Watt

Transport Data	
Gross dimensions w x d x h	App. 580x580x600mm
Net dimensions w x d x h	App. 400x460x480mm
Gross weight	39kg
Net weight	34kg

Features/Performance	
Working principle	Friction, Pressure
Feed size maximum	8-10mm
Final fineness	10-20µm
Batch quantity	10-200ml
Grinding time setting	1-99min, continuous adjustment, digital
The pestle pressure adjustment	Yes. by adjusting scale
The scraper pressure adjustment	Yes. by adjusting rotary knob



High operator convenience and maximum safety

Maximum grinding performance and maximum safety is important for our mills. Due to an integrated safety switch the machine can only be started when the "Easy Lock Cover" is closed. The "Adjustment mechanism" allows the simple & fast settings & fine adjustment. The cover as well as the housing of the PMG-100 is made from solid steel. The ergonomic design of the machine and the front panel ensures the easy and simple setting of all working parameters.

Achieve the best grinding result of grinding technique

- Before prepare the paste samples, first you can put the mortar and samples (cocoa) into the drying oven heated to 40°C.
- In the preparation of chemicals and pharmaceuticals, adding grinding aid can help prevent caking phenomenon.
- For some sample difficult to process such as yeast cells, you can add the liquid nitrogen to make the sample brittle and easier to grinding.

Product Advantage:

- Suitable for dry, wet & cryogenic grinding
- Option of pre-crushing for coarse materials
- Possible to add sample material during the milling process via cover Inlet
- Positioning and removal of mortar and pestle without tool
- Touch human-machine Interface, high sensitivity sensor
- Representative results due to digital time and speed setting
- Precise and optimized result due to variable speed 50-130rpm
- Meet all application tasks due to a wide selection of grinding tools for the mortar and the pestle
- Meet all application tasks due to a wide selection of scraper materials (Vulkollan, Teflon, Besch, Wood)
- Precise and reproducible pestle setting due to scale adjustment.



The pestle is adjustable horizontal

Using rotational structure to make the pestle slight adjustment in the horizontal position, by rotating the handle can adjust pestle position, the operation is simple, the clearance between the mortar and pestle is adjustable, guarantee the quality of the sample preparation.

The pestle is adjustable Longitudinal

Considering the requirement that the fineness depending by the pestle pressure, and suspend the sample preparation at any time, so the device adjustable pressure at the top of the machinery can to ensure the pestle slightly on the longitudinal mobile, to adjust the pestle and mortar in the clearance between the longitudinal distance.

Adjustable scraper

The position of scraper between mortar and pestles adjustable to ensure that the sample in the grinding process can fully mixing evenly, and then to improve the quality of the sample preparation. The adjustment is Simple operation.

Adjustable scraper

Adjustable pestle

Above product has applied for national patent, counterfeit will investigate



KM-100

KM-100, Tablet Grinder for Pharmaceutical Laboratories

- Made of cast steel and aluminum
- Separated Grind container
- Powerful disintegration device
- Grinding time: 1~60sec
- Power cut off automatically
- Fast & efficient grinding
- Easy Operation
- Adjusted speed and timer.



Cup made of PC with transparent cover to observe material inside the cup.

- Quiet operation
- Transparent chamber to observe the inside powder
- Safety - sealed housing to protect user
- Perfect milling results
- Large applications range: Pharmaceutical tablets, vitamin pills, grains, seeds, leaves, salt, detergents, coal, coke, rice.

Model	KM-100
Speed	2,000~10,000rpm
Timer	1~60 seconds
Power	AC110V/220V, 50/60Hz
Outline Size (mm)	220x160x260
Net Weight (kg)	4.7



MBM-100, Vibration Ball Mill

The Vibration ball mill MBM-100 is designed for modern laboratory applications. It can process small amount and large batch sample, for example plant, animal tissue and small quantity sample in dry, wet or cryogenic condition.

Product application

Application: Grinding, mix and cell disruption for DNA/RNA Sample: hard, medium-hard, soft, elastic and fiber sample.

Application field: plant root, stem, leaf, grain, seed; human and animal tissue, viscera, bone, hair; mineral, soil, glass, ceramic, rubber, plastic, solid waste, electronic waste, paper, textile, chemical, medicine, food the special application field recommend:

Plant tissue nucleic acid extraction, rapid extraction of genomic DNA from cultured cell preparation for PCR analysis, 96 hole high throughput of yeast cell, bacterial cell disruption (halophilic bacteria & bacillus) (See the website).



Sample comparison before and after grinding:

High operation convenience & maximum safety

Maximum grinding performance and maximum safety is important for MRC mills. Due to an integrated motor break the machine can only be started when the "easy covers closed". The unique "Easy clamp system" allows the simple and safe clamping of all grinding jars up to 50ml. The grinding chamber, easy clamp system as well as the swinging arm is made from high precision stainless steel to meet all food and pharmaceutical requirements. Due to the new motor concept and direct motor drive, the MRC MBM-100 is maintenance free.

Advanced touch screen design, can easily control instrument program, setting up the grinding parameters.

The grinding time setting from 1 second to 99 min 59 second, continuously adjustable, digital display.

The vibration frequency setting from 200rpm to 2000rpm, continuously adjustable, digital display.



Grinding, mix & cell disruption

The MRC MBM-100 typical processing time are at 30 seconds. The MBM-100 can prepare 2 or more samples from 0.2ml of up to 50 ml. It is designed as well for high-sample-throughput.

Grinding accessories options

The clamping device of MBM-100 is not designed only for the standard deep well plate, it is also suitable for anything which has the same size, include the different hole adapters and other possible accessories.

Sample picture		Parameter	
Before grinding	After grinding	Sample	SoyBean
		Grinding ball	7mm stainless steel
		tube	5 MLPC tube
		Sample	Medium-hard, Large amount of fat
		Attention	Must choose suitable ball
		time	1min
Before grinding	After grinding	Sample	Maize
		Grinding ball	10mm stainless steel
		tube	5 MLPC tube
		Sample	brittle, hard
		Attention	The position of the ball & the sample
		time	2min
Before grinding	After grinding	Sample	Ore
		Grinding ball	25mm stainless steel
		tube	50ml stainless steel
		Sample	brittle, hard
		Attention	The filling volume of the sample
		time	3min
Before grinding	After grinding	Sample	Small mouse tail
		Grinding ball	7mm stainless steel
		tube	2ml tube
		Sample	hard, tough
		Attention	The feed size
		Grinding ball	3-5min
Before grinding	After grinding	Sample	Leaf
		Grinding ball	5mm stainless steel
		tube	2ml tube
		Sample	Soft, brittle
		Attention	Sample size and the ball size
		Grinding ball	1min

Many kinds of materials grinding jar, the volume up to 50ml. Be suitable for processing the soil, mineral, plant, Dental Materials and so on.



adapters for reaction vials Avoid the cross contamination between samples, achieve the high-throughput, the adapter can place into the liquid nitrogen directly.



Special use for detection of pesticide residue samples, 50ml. Adapters, can process 8pcs sample simultaneously.



The MRC specially design the aluminium-magnesium alloy clamping device , comfortable operation, strong and durable.Inside clamping device is equipped with a mobile positioning catch, greatly improve the grinding parts and service life of the clamping device; The catch is removable, easy to change, reduces the equipment maintenance cost.

Grinding auxiliary accessories:

Cryo kit for cooling the grinding jars or adapter with liquid nitrogen Insulation heat preservation box, the clamping device for jar, eyes protector For heat sensitive materials such as plastics and rubber, it is possible to embrittle the material with liquid nitrogen and perform an additional external freezing of the fast clamping jars. Those jars are either made from teflon or from stainless safely disrupts samples of spores, microorganisms, plant and animal tissue or soll samples at a time. The samples along with extraction and small or ceramic balls are placed in micro vials. After 2 minutes of preparation in the MBM-100 more than 95% of the cells are disrupted.Because balls and vials plates are disposable the method is Ideal for PCR, PAGE, and Probe applications where cross contamination between samples cannot be tolerated. steeland are suitable for cryogenic grinding applications.



Performance and advantage:

- Extremely short processing times
- Designed for high sample throughput
- Universal and highly efficient grinding, blending and disruption
- Large range of grinding jars and accessories
- Pre-setting of all working parameters, the result is repeatable
- Ransparent cover can let the operator view the grinding condition during the milling
- Cover with a safety Interlock device, once the cover open during the milling, the motor will stop running in.

bead dispensers

Be suitable for 96 hole deep well plate, have 3mm and 5mm to choose.



Fast clamping jars for:

- Dry grinding
- Wet grinding
- Ultra fine grinding
- Mechanical alloying.

Reaction vial of many kinds:

The PTFE and stainless steel reaction vial, the steel and tungsten carbide balls, can be used to process small amount sample in cryogenic mill.



Adapters for reaction vials:

Designed for high analytical screening, the MBM-100 efficiently and

safely disrupts samples of spores, microorganisms, plant and animal tissue or soll samples at a time.n The samples along with extraction & small or ceramic balls are placed in micro vials. After 2 minutes of preparation in the MBM-100 more than 95% of the cells are disrupted. Because balls and vials plates are disposable the method is Ideal for PCR, PAGE, & Probe applications where cross contamination between samples cannot be tolerated.

Selection guide jar filling:

Model	MBM-100
Transport data	
Package size	600X600X500mm
Instrument size	510X380X275mm
Net weight	34kg
Technical data	
Power supply	220 - 240V , 50 - 60Hz
Nominal rating	200W
Performance data	
Work principle	vibration Impact
Feed size	Less than 8mm
Final fineness	approx. 5µm
vibration frequency	200-2000rpm. continuous adjustment, digital
Batch quantity	0.2-50ml
Reaction vial quantity	4x2, 5x2, 6x2. 10x2. 12x2. 24x2. 96x2

Recommend balls fillings for grinding 1ars and for static mixer										
Grinding jar volume	Feed size	Smple filling quantity	Recommend ball filling							
			2mm	3mm	5mm	7mm	10mm	15mm	20mm	25mm
1.2ml			1-2pcs.	1pcs.						
2ml	≤1mm			1-2pcs.	1-2pcs.	1pcs.				
5ml	≤2mm					1-2pcs.	1pcs.			
10ml	≤3mm	2ml					1pcs.			
25ml	≤6mm	4-10ml						1pcs.		
35ml	≤6mm	6-15ml							1pcs.	1pcs.
50ml	≤8mm	8-20ml								1pcs.



PBM-4/6, Planetary Ball Mill

For rapid fine crushing of so hard, brittle and fibrous material to end fineness $\lt; 1\mu\text{m}$. The Grinding result is repeatable. The planetary ball mill can reach high fineness of grind. It can not only perform mixing and grinding, but also meet the requirements of colloid grinding. In addition, its giant energy input can meet the technical requirements of preparing alloy with mechanical methods.

Product application

Application field:
 engineering/electronics, building materials, agriculture, pharmaceuticals, chemical synthetic materials, geological/metallurgy, environment/resources recycling, glass/ceramics, biological
 Sample characteristic: soft, hard, brittle, fibrous, dry or wet sample



Applications:

plant material, cement clinker, concrete, compost, coatings and paint, charcoal, hair, catalyst, chemicals, metal, carbon fiber, paper, fiber products, cellulose, seeds, clay minerals, coke, coal, glass, waste electronic products, mineral, ore, limestone, gypsum, quartz, kaolin, bones, metal oxide, Iron ore, ceramics, polymers, bentonite/bentonite, pigment.

Work principle:

MRC Planetary Ball Mill have two superimposed movement move the grinding jars, Like in a planetary system the grinding jar rotates on a orbit around the center, This rotational movements is the self-rotation of the grinding container superimposed. The result centrifugal and acting acceleration forces lead to strong grinding effects . Furthermore there are forces working according to the Coriolis acceleration. The result is an intensive grinding effect between the grinding balls and the sample. There are different rotational ratios, with a rotation ratio of 1:-2 the grinding jar rotates twice during a sun wheel turn. The minus of this case indicate the opposite rotation direction.



The design of single-button control is used for PBM-6 control panel.

The LCD can clearly display parameter settings, which makes It easy to operate.

Sample comparison before and after grinding:

Sample picture		Parameter	
Before grinding	After grinding	Sample	Glass
		Grinding ball	10mm & 3mm grinding ball ZrO2
		Sample characteristic	Brittle & hard
		Attention	Grinding jars should be symmetrical placed, the sample should not be more than a quarter of the total grinding jar
		time	30min
Before grinding	After grinding	Sample	Granite
		Grinding ball	10mm ball stainless steel
		Sample characteristic	Hard
		Attention	Grinding jars should be symmetrical placed, the sample should not be more than a quarter of the total grinding jar
		time	15min
Before grinding	After grinding	Sample	Pearl Powder
		Grinding ball	3mm ball ZrO2
		Sample characteristic	Brittle
		Attention	Add suitable liquid, ball, sample, the liquid do not more than 3/4 of the grinding jar
		time	6H
Before grinding	After grinding	Sample	Sludge
		Grinding ball	10mm ball stainless steel
		Sample characteristic	Hard
		Attention	The sample must be dry
		Grinding ball	35min

Technical highlights:

The planetary ball mill can reach high fineness of grind. It can not only perform mixing and grinding, but also meet the requirements of colloid grinding. In addition, its giant energy input can meet the technical requirements of preparing alloy with mechanical methods.

The planetary ball mill series have one, two or four grinding platforms for you to choose from. The grinding parameters can be set depend the characters of samples. The grinding jars are made of high-quality materials, and the materials are various. various filling combinations can be selected for the number and size of grinding balls to make planetary ball mill perform personalized setting and adjustment as per specific smashing and grinding requirements as well as realize repeatability for grinding results.

Speed ratio

The work principle of planetary ball mills is based on the relative rotational motion of a sun wheel and grinding jar. Speed ratios have direct impacts on the size of energy inputs and grinding effects. We can perform customized design and production from 1:1to 1:-3.5 depend on the requirements of our customers.

Performance and advantage:

- High efficient fine grinding up to end fineness <1 μ m
- With 4 grinding platforms can process 2,4,8 samples simultaneously (PBM-4)
- Grinding jars have 6 kinds of material, the volume various from 12ml-500ml
- Suitable for long-term trials and continuous use
- Reproducible results due to program grinding parameters
- Automatic direction reversal to avoid agglomerations
- Grinding chamber automatic ventilation system for grinding jar of cooling.

Efficient, safe and easy operation:

Efficient, maintenance-free drive is used for planetary grinders so as to guarantee the machine can maintain constant speed in continuous operation for a long time or under maximum load. During the milling, built-in high-power fans can automatically provide effective cooling for motors. Ergonomics design and it is quite comfortable and safe to operator. The intelligent safety lock not only provides various applications but also guarantee operator security. The user-friendly programming facilitates the setting of grinding start time; therefore, tests can be operated automatically without the monitoring of operators.

MRC has specially designed jar-opening tools for the grinding jars of planetary ball mill series.

The user-friendly design makes the jar open easy and safe.

**Grinding jars filling guide:**

Grinding jar		PBM-4/6	The recommend grinding ball and quantity			
Volume	Sample quantity		Feed Size	10mm	20mm	30mm
50ml	5-20ml	<3mm	10pcs	2pcs	-	-
80ml	10-35ml	<4mm	25pcs	4pcs	-	-
125ml	15-50ml	<4mm	30pcs	6pcs	-	-
250ml	25-120ml	<6mm	60pcs	13pcs	6pcs	-
500ml	75-225ml	<10mm	100pcs	22pcs	9pcs	5pcs

Grinding jars performance:

- Safe and easy operation
- The grinding jar have various kinds of materials to meet different requirement
- The base have safety positioning system, center position, ensure the grinding jar no sliding during the milling
- The O-ring can guarantee the dust-prevention
- Agate, sintered aluminum oxide, zirconium oxide, tungsten carbide grinding jar have stainless steel jacket
- There is mark on the grinding jar with the material and the rated capacity, easy to distinguish.



Model	PBM-4	PBM-6
Transport data		
Package size	1011x897x811mm	898x784x700mm
Instrument size	759x645x550mm	650x470x435mm
Gross weight	206kg	120kg
Net weight	158kg	75kg
Technical data		
Power supply	220V , 50-60HZ	
Nominal rating	1500W	750W
Performance data		
Work principle	Impact, friction	
Feed size	Less than 10mm	
Final fineness	approx. 1 μ m (0.1 μ m for colloidal grinding)	
Grinding time setting	hour : 0~99 , minute: 0~59 , repeat: 0~99	
Speed ratio	1:-2.3	1:-2
Sun wheel speed	30~400rpm	100~650rpm
Effective sun wheel diameter	360mm	260mm
Grinding jar volume option	12m , 25ml, 50ml, 125ml, 250ml, 500ml	

The planetary ball mill series not only apply to dry grinding, but also wet grinding such as colloid grinding. The grinding jars are equipped with safe closure device for gas-tight handling inside and outside of glove boxes.

Ventilation lid are mainly used for protecting the inert gases generated inside grinding jars; the safe airtight devices can guarantee the high-level gas tightness inside grinding jars so as to ensure that the grinding result is not affected.



Temperature and pressure measuring system

In order to better grinding and analyze the conditions inside the grinding jars (e.g. chemical reactions, phase changes, etc.), it is necessary to acquire two major thermodynamic parameters: temperature and pressure for records.



DMP-100, Disc Mill

It is robust design, and suite for for batch or continuous fine grinding of very hard, hard-abrasive'l hard-brittle, medium-hard solids and for metal-free grinding.

Work principle:

The feed material is milled by a rotated grinding disc and the other fixed disc. The moving grinding disc rotates against a fixed one and draws in the feed material. The necessary comminution effects are generated by pressure and frictional forces. The progressively arranged grinding disc meshing first subjects the sample to preliminary crushing; centrifugal force then moves it to the outer regions of the grinding discs where fine comminution takes place. The processed sample exits through the grinding gap and is collected in a receiver.

Application:

Mining and metallurgy, ceramics industry, rocks and soils, glass industry, soil research...

Advantages:

- The operation is simple, easy to clean
- The grinding disk has long service life
- A variety of material selection of grinding disc
- Continuous adjustable clearance of grinding disc
- Large amount of sample processing
- Large size of sample feed, up to 20 mm
- High efficient in sample processing, can achieve small discharging granularity
- Within short period of time.

Model	DMP-100
Material feed size	<20mm
Final fineness	<100 μ m
Gap width setting	continuous, 0.1 – 5 mm
Drive	3-phase 380V geared motor 50-60Hz
Speed	470rpm
Drive power	1.5kW



HOM-100

HOM-100, Knife Mill

The knife mill HOM-100 is used for process the soft, medium-hard, brittle and fibrous sample. Special for high water, oil or fat content sample.

Product application

Application field: milling ,homogenizing & mixing.

Sample: soft, medium-hard, elastic, fibrous, high water, oil or fat content sample and dry sample.

Application sample:

agriculture: grain, animal food and so on
Biology: mouse tissues. plant leaf, seed, embryo and so on

Food: vegetable, pork, Quick-frozen food, cocoa, candy, preserved fruit, candled fruit, cooked meat products, etc.



Sample comparison before and after grinding:

Sample picture		Parameter	
Before grinding	After grinding	Sample	Pork
		Speed setting	6000rpm
		Sample characteristic	High oil & fat
		Attention	The feed size must be less than 2- 3cm
		time	30s
Before grinding	After grinding	Sample	Chives
		Speed setting	5000rpm
		Sample characteristic	tough, fibrous
		Attention	The feed size must be less than 4-5cm, use the Gravity lid
		time	1min
Before grinding	After grinding	Sample	Cabbage
		Speed setting	4000rpm
		Sample characteristic	Brittle
		Attention	The feed size must be less than 5-6cm, use the Gravity lid
		time	1min 30s
Before grinding	After grinding	Sample	Coffee bean
		Speed setting	7000rpm
		Sample characteristic	hard, high fat
		Attention	Reverse first & then forward direction grinding, use the gravity
		Grinding ball	3min

Work principle:

The HOM-100 has two-blade knives at the center of the bottom of a grinding cup. A certain height gap is kept between such knives. Driven by a motor of 1,100W, the knife start rotating. Reliable crushing and homogeneous phase effects are generated via the cutting of the sharp steel knife edges. As per the rotating directions, the blunt side can be selected for coarse grinding of bulk samples or the tough side can be selected for fine grinding of samples. The motor speed is electronically controlled and can be preset. The constant speed guarantees efficient and high-quality grinding homogenization. You Just need 10 to 30 seconds to process samples that are usually hard to crush and get homogenized samples for analysis.

Major accessories:

- 1. Grinding container autoclavable plastic.** High temperature and high pressure sterilization. containers, meet strict hygiene standards of food and drugs under test conditions. Suitable for process soft, oil, water, fat and fibrous sample.
- 2. Grinding container stainless steel.** Applied for granules, shell grainsample Suitable for process medium-hard, brittle, tough sample.
- 3. Gravity lid.** The gravity lid is suitable for process small quantity sample: include the oil, fat ,low-water, dry sample. Put the gravity lid on the grinding container, before the milling,the sample volume ls bigger, but the volume will be smaller during the milling. The gravity lid can decline depend its own weight gradually to press the grinding chamber, so that the sample will be processed in a more smaller space to increase the grinding effect.



- 4. Gravity lid PP with overflow channels.** Gravity lid PP with overflow channels suitable for grinding high-water fresh fruits, vegetables and other samples. In the process of grinding, the water in grinding container is gradually increased, when the water reaches the overflow hole position, the stream along the hole back into the ground at the bottom of the cup inside, thus avoid the water overflow and Improves the grinding homogenization effect of the sample.
- 5. knife of titanium** —for grinding without heavy-metal contamination.
- 6. Knife--2 blade,** stainless steel, turn serrated knife.

Performance advantage:

- Strong motor power, 100w, adjustable speed
- The sample volume up to 700ml
- The accessories is autoclavable
- Option interval mode, regular mode, impact in reverse mode
- Coarse grinding and fine grinding be realized one pace
- Various material of the grinding container
- Simply operation, quickly start.

Professional grinding equipment, superior to the ordinary:

Ordinary laboratories use household agitators. However, it is hard for such agitators to process many samples such as meat with skin, chewing gums, zongzi, cured meat, soft sweets and soybean, and homogenized samples cannot be made by using such agitators.

It is quite easy for a HOM-100 crusher to grind such samples; in addition, good repeatability and reproducibility can be acquired.

Using HOM-100, the homogenization of the sample within 30 seconds is quite high, and the standard deviation of the analysis result for the sample is much lower than that use the household agitator. Multiple available containers and lids make it be must-have in professional laboratories.

Recommend grinding parameters:

Sample	Quantity (g)	The feed size	Speed (rpm)	Time (s)	Remark
Cabbage	100	30~40	4000/8000	60	First use the manual mode, then the constant mode
Chives	80	20~30	5000	60	
Candied date	50	5	5000	40	Use dry ice
Fruit cake	50	5	5000	45	Use dry ice
Sweetend roll	60	5	5000	30	Use dry ice
Casing	50	10~20	8000	20	
Pork	100	20	8000	30	
Fish	100	10~20	8000	30	
Peanut	100		8000	30	
Sesame	80		7000	30	
Mung bean	120		8000	45	
Coffee bean	120	10~20	7000	30	
Chili	60	20~30	7000	20	
Corn	100		8000	30	
Pepper corn	120		7000	45	
Cacao beans	100		6000	30	
Potato	180	20~30	7000	30	
Tomato	200	20~30	7000	15	
Apple	150	30	6000	20	
Mushroom	180	20~30	8000	25	
Carrot	200	20	8000	20	
Cheese	150	20~30	6000	30	
Fig	120	20~30	8500	20	

Technical data:

Model	HOM-100
Speciality	
Work principle	milling, homogenizing and mixed
Application field	Agriculture, biology, food, medicine/drug
Sample characteristic	Soft, medium-hard, elastic, fibrous, water, oil, fat & dry sample
Technical data	
Feed size	Approx. 10~40mm
Final fineness	< 300µm
Number of blades	2
Time setting	digital, 1s - 3 min
Batch quantity	50-700ml
Interval mode	Yes
Drive power	~900w
Power supply	200-240V, 50-60Hz
Motor speed	2000-10000rpm
Motor power	1100W
Transport data	
Package size	52x50x64cm
Instrument size	34x25x52cm
Gross weight	22kg
Net weight	18kg

CM-5000/CM-20,000, Cutting Mills

The CM-5000 & CM-20,000 are economically powerful cutting mills that are particularly suitable for size reduction of soft, medium-hard, elastic or fibrous materials, whose size can be reduced without requiring the use of extremely high forces.

Function Principle:

Size reduction in the cutting mill CM-5000 takes place by cutting and shearing forces. The sample passes through the hopper and into the grinding chamber where it comes into contact with a rotor equipped with 4 cutting blades; it is comminuted between the blades and the four stationary cutting bars inserted in the housing. The chamber dwell time is short; as soon as the sample can pass through the openings of the bottom sieve it is discharged and collected in the receiver. It ensures gentle, rapid and nearly dust-free size reduction. Ground product is quickly discharged by using a filter bag or a ring filter.

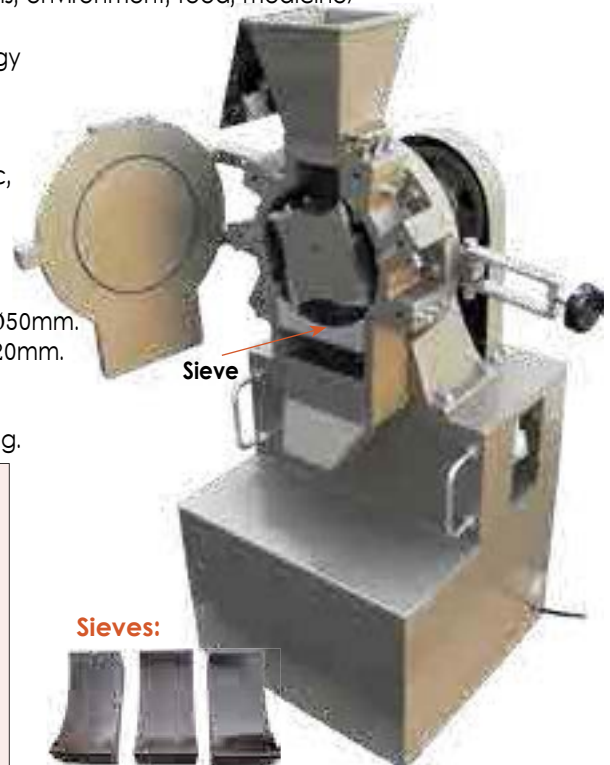


Optional Knives



Features:

- Rapid and gentle size reduction of dry materials.
- Defined final fineness by using of bottom sieves.
- The samples subjected to low thermal stress.
- Nearly dust-free comminution.
- Applications - size reduction by cutting.
- Field of application - agriculture, biology, chemistry/plastics, construction materials, environment, food, medicine/ pharmaceuticals, mineralogy/metallurgy
- soft, medium-hard, elastic, fibrous.
- Feed material - soft, medium-hard, elastic, fibrous.
- Size reduction principle - shearing, cutting.
- Material feed size - Ø50mm.
- Final fineness - 0.25-20mm.
- Sieve sizes - 0.25mm, 0.42mm, 0.84mm.
- Quick & easy cleaning.



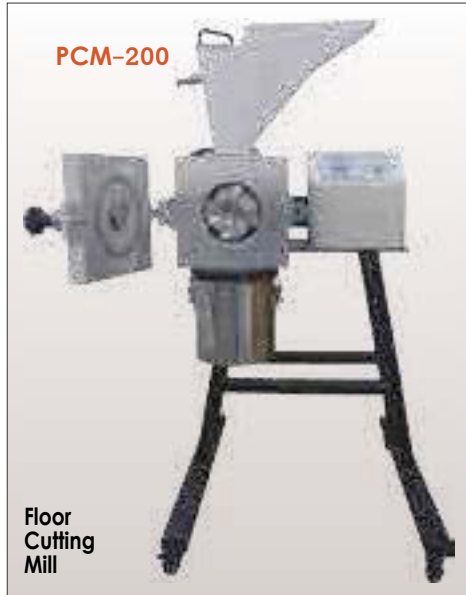
Main areas of Applications:

Electronic cards, cables, computer & electronic waste, plant materials, plastics, rubber, spices, wood, drugs, feeds, foils, leather, light metal scrap, lignite, non-ferrous metals, organic & inorganic waste, paper, straw, secondary fuels, grain, seeds, resins, textiles and bones.

Model	CM-5000	CM-20,000
Mesh(m/m)	20,40,60 (option: 10,14)	≤0.5,1,2
Inner cutting put	Ø5cm	Ø20cm
Cap.	5kg/H	20kg/H
Motor	200W	750W
Size(mm)	W210xD290xH240	W350xD580xH1100
Power	AC110V/220V, 50/60Hz	

PCM-100, PCM-200, Power Cutting Mills

- Rapid reduction of large particles from 80 mm to 0.25 mm
- Quick and easy cleaning
- Full range of bottom sieves
- Collector volume 5,000 ml
- Digital speed setting.



Method of operation: The Models PCM-100/200 Cutting Mills is used by Laboratories & Processing Companies to granulate solid materials such as waste of wood and thermoplastics. The material to be processed falls into the cutting chamber of the mills via an upper chute and is shredded by cutting between rotating and fixed knives until it passes an attached sieve as ground product. The sieve extends over the lower half of the grinding chamber and is easily exchanged. Final particle size is determined by the selected sieve perforation aperture. No other Cutting Mill is easier to clean then the PCM-100/200 Cutting Mills. When the grinding process is finished the front door can be opened sidewise and the rotor / infeed hopper can be taken out in order to perform a fast and systematic cleaning of the grinding tools.

Acoustic Noise Reduction Infeed Hopper made from Bondal. Bondal is a vibration damping composite material with a sandwich structure consisting of a viscoelastic core between two outer steel sheets. Various in-feed hopper types are available with wood- en / teflon plunger.

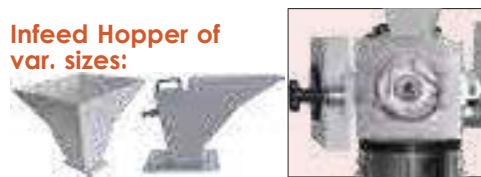
Massive grinding chamber made from vibration reducing components

Solid door with safety switch for easy access and cleaning

Solid 5 Liters sample collector

High precision solid steel under frame with industrial caster wheels (lockable)

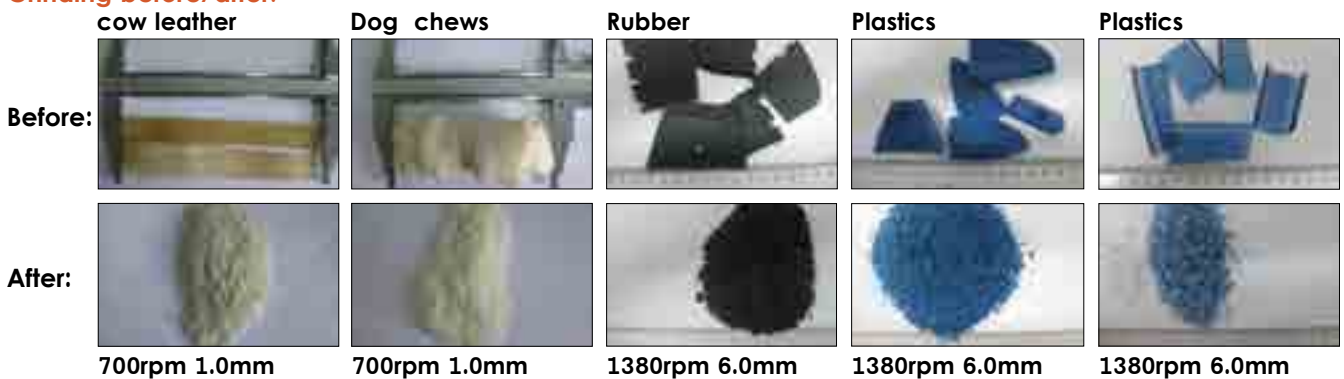
Infeed Hopper of var. sizes:



Applications:

- Linoleum, Carpets, Cloth
- Secondary fuels and Bio Mass
- Food & Animal food
- Wood, Paper, Carton, Cellulose
- Rubber, Shredder Light Fractions
- House Waste, Industrial Waste
- Computer Scrap and Electronic Scrap
- Plants, Twigs, Roots etc.
- Herbs, Spices, Gras, Straw
- Bones
- Technical Plastics such as ABS, PA, POM, PE etc.

Grinding before/after:



Rotor and Stator knives:



Technical Data	PCM-100	PCM-200
Electrical details	230V/50 Hz	
Speed	150-3000 rpm	500-3000 rpm
Motor Power	1500watt	3000watt
Features/Performance	PCM-100	PCM-200
Working principle	Cutting	
Feed size maximum	Up to 80mm depending on sample	
Quantity max. / min.	5000ml/50gr.	
Final product size	250µm	
Number of rotor knives	3	
Number of stator knives	4	
Start/stop function	by on/off button	
End fineness adjustment	by interchangeable bottom sieves	
Weight	68 kg without under frame 90 kg with under frame	

Ball mill is a grinder for reducing hard materials to powder. A ball mill grinds material by rotating a cylinder with balls causing the balls to fall back into the cylinder and onto the material to be ground. The cylinder rotates at a relatively slow speed, allowing the balls to cascade through the mill base, thus grinding or dispersing the materials. Ball mills are generally used to grind material 7mm and finer, down to the particle size of 20 to 75 microns.



RJM-30D
BenchTop Small Ball Mill

RJM-30D, Small Ball Mill

Features:

- Fixed speed & stepless speed change.
- Digital speed meter is available.
- Suitable for different size mill pots.
- Roller distance can be adjusted.
- Timer can be added separately.

Model	RJM-30D
Speed	0~480rpm
Timer	99hours: 59min
Pot size	6.5cm~8.5cm
Roller	Ø50mm
Motor	60W
Outline Size (mm)	550x310x220
Power	220V/50Hz

The unique operating characteristics of our Jar mill satisfy the most requirements of the chemical, ink, paint, plastics, food and pharmaceutical industries. Our jar mills are ideal for R&D, small production runs, for grinding laboratory or high-purity samples. These mills provide quiet and smooth operation.

- Single or multi-tier design, two or three jars per tier
- No cross-contamination between samples
- Easily adjustable rollers and brackets to accommodate different jars of various diameter
- The speed can be varied
- Position adjustment for roller for different diameters of jars.

Rollers easily adjust to accommodate a variety of jar diameters—no clamping or fastening required.



RJM-102
Floor Ball Mill

RJM-102, Large Ball Mill

Features:

- Digital Large Ball mill, 2 rollers.
- Speed range: up to 600 rpm.
- Pot diameter:120~300mm.
- Roller length: 650mm, Max. load: 40kg accept couple of mill jars together.
- Timer: up to 99 hours:59 seconds.
- Dimensions: W97xD36xH41cm.
- Power 400watt.

Model	RJM-102
Speed	0~600rpm
Timer	99hours: 59min
Pot size	12cm~30cm
Motor	300W
Outline Size (mm)	W100xD410xH380
Power	AC110/4A AC220V/2A

A horizontal cylinder is rotated at a predetermined speed that sets the balls into a tumbling and cascading motion which impact the solids in a very predictable and controllable fashion. Because the process takes several hours, the particles will not only be finely milled, but will exhibit a narrow particle size distribution. They are used widely in the chemical, paint, coatings, and ceramics industries.



RJM-103
Floor Ball Mill

RJM-103, Large Ball Mill-3 Adjustable Roller

Features:

- Digital Large Ball mill, 3 rollers.
- Speed range: up to 600 rpm.
- Pot diameter:70~130mm.
- Roller length: 650mm, Max. load: 40kg accept couple of mill jars together.
- Timer: up to 99 hours:59 seconds.
- Dimensions: W97xD36xH41cm.
- Power 400watt.

Model	RJM-103
Speed	0~600rpm
Timer	99hours: 59min
Pot size	Ø7~13cm
Motor	400W
Outline Size (mm)	W970xD410xH360
Power	AC110/4A AC220V/2A

- **High efficiency** – Due to the relatively slow rotational speed but large mass of media, more of the energy goes into milling and less wasted as heat.
- **Narrow particle distribution** – Solids milled in tumble mills are normally so fine and consistent in size that it's rare to require classification.
- **Repeatable results** – Mill operating parameters including rotational speed, media size and milling duration can be independently controlled with known effect on the final results.
- **Low temperature** – Because of the high efficiency of milling and low heat generation, the solids will not be exposed to high temperatures. For extremely heat sensitive products, cooling jackets can be provided on the mill cylinder.
- **Chemical containment** – Solids are sealed and contained inside the mill, protecting the environment and operators.



RJM-304

RJM-304, Large Ball Mill, 3 Stages

Model	RJM-304
Speed (RPM)	0~420
Pot size (cm)/DIM	Ø9~Ø24
Roller Ψ (cm)	Ø5
Motor	400W
Timer (hrs)	0.1~99.9
Outline size (cm)	W142xD68xH182
Power	AC220V, 50/60Hz

Mill Pots

	Model	Speed rpm	Useful Cap.	Total Cap.	Size (mm)
	Mill pot 4	130	500	800	Ø120x150
	Mill pot 5	110	1,000	1,600	Ø150x180
	Mill pot 6	90	2,000	2,800	Ø180x210
	Mill pot 7	85	3,000	4,500	Ø210x240
	Mill pot 8	75	5,000	7,500	Ø240x300
	Mill pot 10	60	10,000	15,500	Ø300x360

Balls for Mill Pot

	Mill pot no.	Capacity approx. ml.	Ball Ø			
			42K-9 9mm	42K-15 15mm	42K-20 20mm	42K-30 30mm
Recommendations for ball fillings	4	500	0.05kg	0.1kg	0.1kg	
	5	1000	0.1kg	0.2kg	0.2kg	
	6	2000	0.2kg	0.4kg	0.4kg	
	7	3000	0.3kg	0.6kg	0.6kg	
	8	5000	0.5kg	1.0kg	1.0kg	
	10	10000	0.5kg	1.5kg	1.5kg	1.5kg
No. of balls per kg approx.			425 pcs.	130 pcs.	90 pcs.	16 pcs.
Bulk density of balls per Liter approx.			1885g	1930g	2000g	1800g



CCM-10/15/20, Vertical Crushing Machine

Features:

The vertical crushing machine uses the traditional grinding method to break the sample. It's designed to use the centrifugal force of the motors tungsten carbide blade to achieve high crushing efficiency. Input volume is adjustable. It is suitable for laboratory purpose.

- Suitable for fine grinding and coarse crushing. Not to be used with wet, greasy, sticky, fibre rich materials.
- Continuous operation.
- Easy replacing mesh sieves.
- Up to 6 different mesh sieves
- Grinding particle size. Not bigger than 30mm.
- Size after grinding 0.3 - 13mm.
- Capacity 3-5kg/hour.
- Power supply, NH-34-34S: AC100V 50/60Hz NH-20/3 phase 200V.
- The processing hammer is made of Tungsten.
- Stainless steel tank, inner funnel aluminium, outer funnel stainless.
- Blades speed 3600 RPM.

Sieves included

0.3mm	2pcs.
0.4mm	1pcs.
0.5mm	1pcs.
3mm	1pcs.
8mm	1pcs.
13mm	1pcs.

Sieves:

Interchangeable sieves for insertion into the grinding heads ensure maximum particle size filtering.



Model	CCM-20	CCM-15	CCM-10
Speed (rpm)	3600		
Type	Floor cut mill		Table cut mill
Motor	2HP	1.5HP	1HP
Weight (kg)	85	70	25
Cap size (mm)	W240xL120	W180xL100	W70xL110
Power	220V, 50/60Hz		110V/220V 50/60Hz



CGM-20, Leading-Coming-Air Grinder

Features:

- Mineral substances, fiber and adhesive substances.
- Wind is used to cool the grinder for continuous operation.
- Size of particles: 150 mesh & above.
- Ordinary herbal medicine: 0.6kg per 10 minutes.
- Adhesive substances: 0.6kg per 15-20 minutes.



Model	CGM-20
Speed	30,000 RPM
Weight	14kg
Dimensions(mm)	W320xD300xH530
Power	AC110V/220V, 50/60Hz, 2HP

Knives included	12-4, Center
12-1, Straight blade	Use for the materials in general, fiber, & tough quality such as pearl, gentian & liquorice
12-3 Big curve blade	Use for the materials in powder, fiber, & viscosity quality such as gentian & medlar
12-2 Medium curve blade	Use for the materials that straight blade can not pulverize. Or when use the big curve blade but can not achieve the tiny powder, use this blade