

### **planetary ball mill with grinding jars rotating 360 degrees**

Planetary grinding jar 360 degree rotation planetary ball mill, no belt, using the motor directly connected to the way, this beltless planetary ball mill, maintenance is easier, more stable, longer service life.

#### **Planetary Ball Mill**

This planetary ball mill is different from the traditional vertical planetary ball mill, when the planetary grinding jars work, the planetary main disk rotates 360 degrees or any angle at the same time uninterruptedly, which makes the material can fully participate in the grinding, mixing, and reduces the phenomenon of the material sinking to the bottom, so the material requires shorter and fuller grinding time.

Planetary ball mill is characterized by full function, high efficiency, low noise, etc. It can place 4 grinding jars at the same time, and can produce 4 kinds of sample materials at one time. This series of ball mill can be equipped with vacuum tank to grind samples under vacuum. It is very suitable for research tasks such as in research institutes, universities and corporate laboratories, from the experimental end to the production end to verify the feasibility of mass production, as well as for routine tasks such as mixing and homogenization of soft, hard, brittle or fibrous materials.



Wet milling is used to obtain particles of up to 5 micrometers, as the surface of small particles tends to become charged and agglomerate, which makes dry milling difficult. The particles can be kept separate by adding liquids or dispersants.

To produce ultrafine particles of 100 nanometers or less by wet milling, nanoscale milling, requires friction rather than impact. This can be achieved by using a large number of small grinding balls that have large surfaces and many friction points. It is recommended that the proportion of small grinding balls should be 60% in the grinding jar.

### **Features**

1. 360 degree rotation of the grinding jar, effectively reduce the sinking phenomenon, grinding materials more evenly.
2. Oil seal mute technology: all the planetary gears and bearings are sealed in an airtight box, filled with a certain amount of lubricant before use, the planetary ball mill in the running state of operation, the gears are immersed in lubricant. Reduce the noise of gear transmission, more than 50% lower than the noise of ordinary planetary ball mill, extend the service life of more than 2 times.
3. PLC frequency conversion control, can set the time, speed and forward and reverse.
4. Adopting V type card holder to fix the grinding jar, which protects the safety of the operator.
5. Precision gear transmission is adopted.
6. Can place 2 or 4 grinding jars at the same time.

7. Can be dry grinding, wet grinding, vacuum grinding and vacuum atmosphere protection grinding.
8. Universal support feet are solid, universal wheels push running, fixing and moving are convenient and labor-saving.
9. Intelligent control safety switch, the door can be opened only when the ball mill is not rotating. Thus avoiding the risk of opening the door when the ball mill is not stopped and the grinding jar is thrown out, protecting personal safety.
10. The grinding effect can reach 0.1 micron.
11. With CE certificate.
12. Total timing range: 1 to 9999 minutes.
13. Intermittent Timing Range: 1 to 9999 minutes.
14. Time that can run continuously: 72 hours.

## **Working Principle**

The grinding jar is eccentrically mounted on the sun wheel of the planetary ball mill. The sun wheel and the grinding jar move in opposite directions in the ratio of 1:2, and the grinding balls in the grinding jar are subjected to superimposed rotational motion, the so-called Coriolis force. The speed difference between the grinding balls and the grinding jar creates an interaction between friction and impact forces, which releases high kinetic energy. The interaction between these forces results in a high and very efficient material size reduction in planetary ball mills.

## **Application Areas**

Widely used in geology, mining, metallurgy, electronics, building materials, ceramics, chemical industry, light industry, beauty, environmental protection and other fields.

1. Agriculture: plant materials, seeds, soil, tobacco, wood fiber
2. Biological: bones, hair, tissue paper ceramics and glass ceramic oxides, clay minerals, glass, hydroxyapatite, china clay, quartz sand, electronic ceramics, structural ceramics, piezoelectric ceramics, nano-materials, round ceramic capacitors, MLCC, thermistors (PTC, NTC), ZnO varistors, dielectric ceramics, alumina ceramics, zirconia ceramics, phosphor, zinc oxide powder, cobalt oxide powder, Ni-Zn ferrite, Mn-Zn ferrite chemicals and plastics carbon fiber, catalysts, cellulose, pigments, paints, plastics, polymers.
3. Building materials: soap clay, cement slag, polymers, gypsum, sand, stone.
4. Environmental research: mixtures, electronic debris, sludge, waste.

5. Minerals and metallurgy and metal electronics: alloys, coal, coke, iron ore, metal oxides, quartz, sub-precious stones, slag, magnetic materials, lithium cobaltate, lithium manganese, catalysts, phosphor, long afterglow luminescent powders, rare-earth polishing powders, electronic glass powders, fuel cells, zinc oxide piezoelectric resistors and so on.

### **Grinding Jars and Grinding Balls**

1. The grinding jar adopts refined mold or high-precision polishing, the inner and outer walls are extremely smooth, and the bottom adopts the difficult large R angle design, which can effectively reduce the phenomenon of material sinking in the grinding process. The mouth of the grinding jar adopts a more ergonomic gripping step to prevent the hand from slipping and make it more convenient to pick up and put down the grinding jar.
2. Grinding jar material: zirconia, silicon oxide, agate, carbide, stainless steel, high chrome steel, nylon, polyurethane, polypropylene pp, PTFE, aluminum oxide, etc.
3. Grinding jar volume: 0.1L, 0.25L, 0.5L, 1L, 1.5L, 2L, 2.5L, 3L, 4L, 5L, 10L, 15L, 20L, 25L and so on.
4. Grinding ball material: zirconia ball, high chrome steel ball, stainless steel ball, corundum ball, polyurethane ball, alumina ball as well as onyx ball and tungsten carbide ball.
5. Grinding generally choose the same material with the grinding jar grinding ball, can also be mixed and matched. The size of the grinding ball is generally 2mm to 50mm, generally recommended to use 3 to 4 different sizes of the grinding ball in accordance with a certain proportion of mixed use.

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<b>Model</b>	<b>PMT1L</b>	<b>PMT2L</b>	<b>PMT4L</b>	<b>PMT8L</b>	<b>PMT12L</b>
Grinding jar capacity	50 to 250ml	50 to 500ml	50 to 1000ml	500 to 2000ml	1000 to 3000ml
Vacuum jar capacity	50 to 100ml	50 to 250ml	50 to 500ml	500 to 2000ml	1000 to 3000ml
Revolution speed	5 to 450rpm	5 to 400rpm	5 to 400rpm	5 to 320rpm	5 to 320rpm
Rotation speed	10 to 900rpm	10 to 800rpm	10 to 800rpm	10 to 640rpm	10 to 640rpm
Temperature range	1°C to 15 °C			3°C to 15 °C	
Air cooler	2P	2P	2P	2P to 3P	2P to 3P
Power	0.55kw	0.75kw	0.75kw	1.5kw	1.5kw
Power supply	220Vac, 50Hz	220Vac, 50Hz	220Vac, 50Hz	220Vac,380Vac, 50Hz	380Vac, 50Hz
Weight	70kg	96kg	191kg	191kg	193kg
Dimensions	630x435x500mm	710x495x610mm	710x495x610mm	820x560x780mm	820x560x780mm

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Model	PMT20L	PMT40L	PMT60L	PMT80L	PMT100L
Grinding jar capacity	1 to 5L	5 to 10L	10 to 15L	10 to 20L	10 to 25L
Vacuum jar capacity	1 to 5L	5 to 10L	10 to 15L	10 to 20L	10 to 25L
Revolution speed	5 to 230rpm	5 to 220rpm	5 to 220rpm	5 to 180rpm	5 to 180rpm
Rotation speed	10 to 460rpm	10 to 440rpm	10 to 440rpm	10 to 360rpm	10 to 360rpm
Air cooler	3P	3P	2P to 3P	3P to 5P	5P
Power	3kw	7.5kw	7.5kw	11kw	11kw
Power supply	380Vac, 50Hz	380Vac, 50Hz	380Vac, 50Hz	380Vac, 50Hz	380Vac, 50Hz

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<b>Model</b>	<b>PMT1L</b>	<b>PMT2L</b>	<b>PMT4L</b>	<b>PMT8L</b>	<b>PMT12L</b>
Weight	288kg	400kg	610kg	870kg	1060kg
Dimensions	990x660x870mm	1160x945x1450mm	1160x945x1450mm	990x730x860mm	1620x1110x1670mm