

## Planetary Ball Mill PM 400

### General Information

Planetary Ball Mills are used wherever the highest degree of fineness is required. Apart from the classical mixing and size reduction processes, the mills also meet all the technical requirements for colloidal grinding and have the energy input necessary for mechanical alloying processes. The extremely high centrifugal forces of the Planetary Ball Mills result in very high pulverization energy and therefore short grinding times.

The PM 400 is a robust floor model with 4 grinding stations.

### Application Examples

alloys, bones, ceramics, charcoal, chemical products, coal, coke, electronic scrap, fibres, glass, limestone, minerals, ores, paper, plant materials, quartz, seeds, sewage sludge, soils, waste samples, wood, ...

### Product Advantages

- powerful and quick grinding down to nano range
- comfortable parameter setting via display and ergonomic 1-button operation
- automatic grinding chamber ventilation
- 10 SOPs can be stored
- programmable starting time
- power failure backup ensures storage of remaining grinding time
- grinding with up to 26.8 x acceleration of gravity
- reproducible results due to energy and speed control
- suitable for long-term trials and continuous use
- 2 different grinding modes (dry and wet)
- optional pressure and temperature measuring system PM GrindControl
- measurement of energy input
- wide range of materials for contamination free grinding
- Safety Slider for safe operation



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### Features

Applications	pulverizing, mixing, homogenizing, colloidal milling, mechanical alloying
Field of application	agriculture, biology, chemistry / plastics, construction materials, engineering / electronics, environment, geology / metallurgy, glass / ceramics, medicine / pharmaceuticals
Feed material	soft, hard, brittle, fibrous - dry or wet
Size reduction principle	impact, friction
Material feed size*	< 10 mm
Final fineness*	< 1 µm, for colloidal grinding < 0.1 µm
Batch size / feed quantity*	max. 4 x 220 ml, max. 8 x 20ml with stacked grinding jars
No. of grinding stations	4 / 2
Speed ratio	1:-2 / 1:-2.5 / 1:-3
Sun wheel speed	30 - 400 min <sup>-1</sup>
Effective sun wheel diameter	300 mm
Type of grinding jars	"comfort", optional aeration covers, safety closure devices
Material of grinding tools	hardened steel, stainless steel, tungsten carbide, agate, sintered aluminium oxide, zirconium oxide
Grinding jar sizes	12 ml / 25 ml / 50 ml / 80 ml / 125 ml / 250 ml / 500 ml
Setting of grinding time	digital, 00:00:01 to 99:59:59
Interval operation	yes, with direction reversal
Interval time	00:00:01 to 99:59:59
Pause time	00:00:01 to 99:59:59
Storable SOPs	10
Measurement of input energy possible	yes
Interface	RS 232 / RS 485
Drive	asynchron motor with frequency converter
Drive power	1.5 kW
Protection code	IP 30
Power consumption	~ 2100 W (VA)
W x H x D closed	836 x 1220 (1900) x 780 mm
Net weight	~ 290 kg
Workplace related emission value	LpAeq < 85 dB(A)
Documentation	Operation & Application Video
Standards	CE

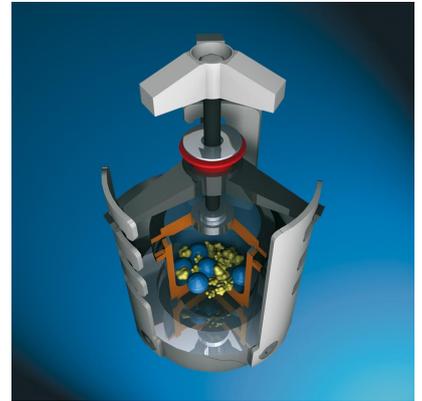
\*depending on feed material and instrument configuration/settings

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### Function Principle

The grinding jars are arranged eccentrically on the sun wheel of the planetary ball mill. The direction of movement of the sun wheel is opposite to that of the grinding jars in the ratio 1:-2 (or 1:-2.5 or 1:-3).

The grinding balls in the grinding jars are subjected to superimposed rotational movements, the so-called Coriolis forces. The difference in speeds between the balls and grinding jars produces an interaction between frictional and impact forces, which releases high dynamic energies. The interplay between these forces produces the high and very effective degree of size reduction of the planetary ball mill.





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