



Innovation Empowers Sample Preparation,
Intelligence Achieves Simplicity



AM400S/AM410/AM420 Planetary Ball Mill



蚂蚁源科学仪器（北京）有限公司
ANTS SCIENTIFIC INSTRUMENTS (BEIJING) CO., LTD.



AM410/AM420/AM400S Planetary Ball Mill

Planetary ball mill is suitable for soft, medium-hard, hard, brittle, fibrous and tough. Dry and wet grinding possible, wet grinding is more suitable for sample preparation at higher finenesses. Planetary ball milling also meets the requirements of colloidal grinding and even mechanical alloying.

The internal design of the planetary ball mill can meet long time running , which can be used in the preparation of nanomaterials. The instrument can be set with forward and backward, intermittent and so on. It can be set with two grinding times. Each grinding time can be set with different speeds, which optimizes the product.



AM410

AM400S



AM420

Working Principle



The grinding jar of the Planetary Ball Mill is of an eccentric design with respect to the sun wheel at the bottom. The grinding jar rotates around the shaft in the opposite direction to the sun wheel. The speed ratio between the sun wheel and the grinding jar is selectable. The grinding balls and the grinding jars are subjected to the superimposed effect of the rotational deflection force as they move together, and the high energy thus generated pulverizes the sample. The centrifugal force acting on the jar drives the grinding balls in the direction of rotation. Due to the different velocities of the inner wall of the grinding jars and the balls, friction and impact are generated between the sample and the grinding wall, releasing a huge amount of energy.

Performance Advantages

- ◎ It can be run continuously for a long time.
- ◎ Extremely high speed to grind samples to submicron or even nanometer fineness.
- ◎ Forward and backward operation, interval time and pause time can be set, to prevent sample aggregation and better heat dissipation.
- ◎ Automatic setting of different speeds for two grinding times to meet the special requirements of different samples.
- ◎ Grinding jars volume 50 ~ 500ml , made of 6 different materials , expanding the application range of the product.
- ◎ Grinding jars can be stacked with adapters to double the grinding volume in a single operation.
- ◎ Automatic ventilation in grinding chamber.
- ◎ 10 sets of grinding parameters can be stored and the number of parameter cycles can be set.
- ◎ LCD touch screen, reversible to the optimal operating position.
- ◎ The instrument is easy to operate, in line with the principle of artificial science, with casters, easy to move.
- ◎ The instrument is equipped with a safety lock device to ensure the safety of the operator.

Technical Information

Technical parameter	AM400S planetary ball mill	AM410 planetary ball mill	AM420 planetary ball mill
Feed material	soft, medium-hard, hard, brittle, fibrous and tough		
Material feed size	≤15mm (Depends on the nature of the sample and the grinding environment)		
Final fineness	approx. ≤ 0.1μm (for colloidal grinding) / ≤ 1μm (for general grinding) (Depends on the nature of the sample and the grinding environment)		
Batch size / feed quantity	≤ 4 × 225 ~ 250ml or ≤ 8 × 20 ~ 60ml (with stacked grinding jars)	≤ 1 × 225 ~ 250ml or ≤ 2 × 20 ~ 60ml (with stacked grinding jars)	≤ 2 × 225 ~ 250ml or ≤ 4 × 20 ~ 60ml (with stacked grinding jars)
Setting of grinding time	1s ~ 99h59min59s, continuously adjustable		
Operating mode	forward and backward. interval time, pause time, and two grinding times can be set		
Sun wheel speed	30rpm ~ 450rpm	100rpm ~ 650rpm	
Effective sun wheel diameter	≥360mm	≥305mm	
G-force	28.9g	42.5g	
Speed ratio	1 : -2.5 (Customizable on demand)	1 : -2 (Customizable on demand)	
Grinding way	dry, wet		
No. of grinding stations	2/4	1	2
Grinding jars volume	12ml、50ml、80ml、115ml、125ml、250ml、500ml		
Material of grinding jars	hardened steel, stainless steel, tungsten carbide, agate, sintered aluminum oxide, zirconium oxide		
Number of grinding jars placed	2/4/8	1/2	2/4
Stackable grinding jars	50ml/80ml/115ml, placed 8		
Grinding balls diameter	0.1mm ~ 30mm (Customizable on demand)		
Storable SOPs	10 groups		
Number of cycles	1 ~ 20 times		
W × H × D	810mm × 1220mm × 815mm	656mm × 517mm × 396mm	
Net weight	Approx. 330Kg	Approx. 100Kg	
Electrical supply data	AC220V, 50Hz/60Hz, 1500W	AC220V, 50Hz/60Hz, 750W	



Application



Agriculture



Plastic



Ceramics



Environment



Nanomaterials



Stone



Soil



Glass



Biological



Chemicals



Building materials



Mineral metallurgy



Hair



Sludge



Polymer

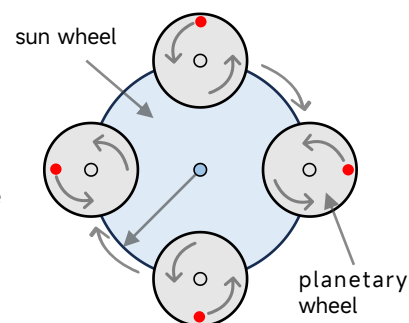


Coke

Ball Mill Tips:

①The speed ratio determines the size of the energy input. Ball milling efficiency factor = square of sun wheel diameter × speed ratio.

②Therefore, the larger the diameter of the sun wheel, the higher the speed ratio, the higher the input energy, the higher the ball milling efficiency.



Grinding jars volume-Sample volume-Number of grinding balls

Grinding jars volume (ml)	Sample volume (ml)	Feed Size (mm)	Number of grinding balls (PCS)					
			Φ5mm	Φ10mm	Φ15mm	Φ20mm	Φ30mm	Φ40mm
50ml	5 ~ 20 ml	<3 mm	200	10	7	3	-	-
80ml	10 ~ 35 ml	<4 mm	250	25	10	5	-	-
125ml	15 ~ 50 ml	<4 mm	500	30	18	7	-	-
250ml	25 ~ 120 ml	<6 mm	1200	50	45	15	6	-
500ml	75 ~ 220 ml	<10 mm	2000	100	70	25	8	4

Optional Guide

A wide range of grinding jars are available for customers to choose from. Common grinding jars volumes include: 50ml, 80ml, 125ml, 250ml, 500ml, special volumes are 12ml, 115ml, etc. The materials includes: hardened steel, stainless steel, tungsten carbide, agate, sintered aluminum oxide, zirconium oxide and so on.



The Planetary Ball Mill is equipped with adapters to stack 50ml, 80ml, and 115ml grinding jars, doubling the number of sample batches for a single grinding, and realizing simultaneous grinding of 2, 4 and 8 jars, increasing the diversity of samples to be ground.

Material of grinding jars (recommended for routine samples) :

Stainless steel: Suitable for pulverizing routine samples;

Agate, Sintered aluminum oxide, Zirconium oxide: For pulverization of samples requiring protection against heavy metal contamination;

Tungsten carbide: Pulverization of hard samples, such as ores, etc.

- ① The bottom of the grinding jars has a central location to ensure that the grinding jar is not sliding;
- ② O sealing ring, dust-free design;
- ③ The grinding jar and lid are designed with grasping edges to facilitate operation;
- ④ Jar and lid have opening gap;
- ⑤ Stainless steel protective jacket (for agate, sintered aluminum oxide, zirconium oxide and tungsten carbide grinding jars);
- ⑥ The label area is labeled with the material and volume.

Grinding kit for special applications—Wet grinding and grinding under inert atmosphere



Grinding jars for special applications are equipped with safety sealing devices, which have excellent air tightness and dust resistance, so that excessive pressure generated during and after grinding will not be easily removed. In addition, the grinding jar is equipped with temperature and pressure monitoring device, which can monitor the process and reaction in the grinding jar. This device is mainly used in the preparation of alloy materials.



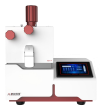
Application Examples



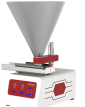


Innovation Empowers Sample Preparation, Intelligence Achieves Simplicity

Milling Series

 AM100S Vibratory Ball Mill	 AM200S Mortar Grinder	 AM300 Cutting Mill	 AM300S Cutting Mill	 AM350 Beater Mill	 AM360 Turbo Mill	 AM400S Planetary Ball Mill
 AM410 Planetary Ball Mill	 AM420 Planetary Ball Mill	 AM500S High Speed Rotary Mill	 AM600S Knife Mill	 AM700 Jaw Crusher	 AM710 Extrusion Crusher	 AM750S Bench Jaw Crusher
 AM800 Disc Mill	 AM800CC Disc Mill	 AM810 Disc Mill	 AM900 Vibratory Disc Mill	 AM950 Vibratory Disc Mill		

Assisting Series

 AF100S 3D Vibratory Sieve Shaker	 AF150 Horizontal Sieve Shaker	 AF200S Sample Automatic Divider	 AF300 Vibratory Feeder
 AF400 Rotating Tube Divider	 AF450 Rotating Sample Divider	 AF500 3D Sample Mixer	 AF510 3D Sample Mixer

Intelligent Series

 AISP1678 / AISP1700 Intelligence Soil Preparation System	
 ADV1001 / ADV1001CS Vacuum Microwave Drying Series	

蚂蚁源科学仪器（北京）有限公司

ANTS SCIENTIFIC INSTRUMENTS (BEIJING) CO.,LTD.

地址：北京市经济开发区经海二路29号院1号楼1单元4层

Add: Room 401, Floor 4, Unit 1, Building 1, No. 29, Jinghai 2nd Road, Kechuang
5th Street, Beijing Economic-Technological Development Area

德州生产基地：山东省德州市德城区袁桥镇中元科技创新创业园1#厂房

电话 (Tel) : 010-57791811

传真 (Fax) : 010-67656036

邮箱 (E-mail) : ex-trade1@my-ant.com; ex-trade2@my-ant.com

网址 (Web) : www.my-ant.com



M400.1.2024.7