

pulverisette 7

classic line



Planetary Micro Mill

- High speed grinding of laboratory samples down to $< 1 \mu\text{m}$
- Suitable for hard to soft grinding materials
- Also suitable for grinding in suspension

milling sample
 preparation
planetary ball mill
 for your lab

FRITSCH

Application

Field of application

For very fine comminution down to colloidal fineness of dry laboratory sample or solids in suspension. For mixing and perfect homogenisation of emulsions and pastes.

Feed size < 5 mm; feed quantity up to 2 x 20 ml; capable of fineness down to 1 µm

Examples of application

Geology and mineralogy

stones, pebbles, sand, minerals

Ceramics

porcelain, sintered ceramic, clay, fireclay

Chemistry

plant protectives, fertilisers, slats, inorganic and organic materials

Biology

plants, leaves, freeze-dried samples

Medicine, pharmacology and galenite research

eye therapeutics, jellies, crèmes, extracts, drugs, pastes, dragées, tablets

Nuclear research

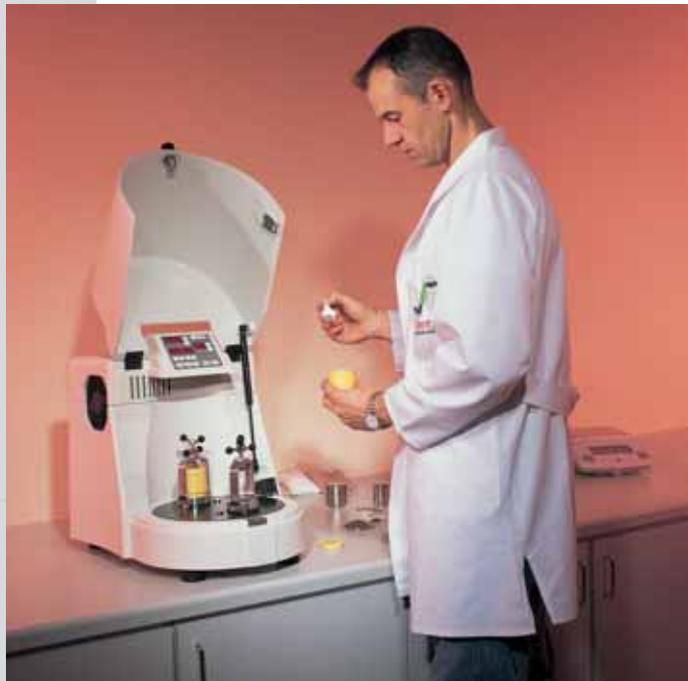
radioactive samples

Material technology

pigments, precious materials, new materials, alloys, mechanical activation

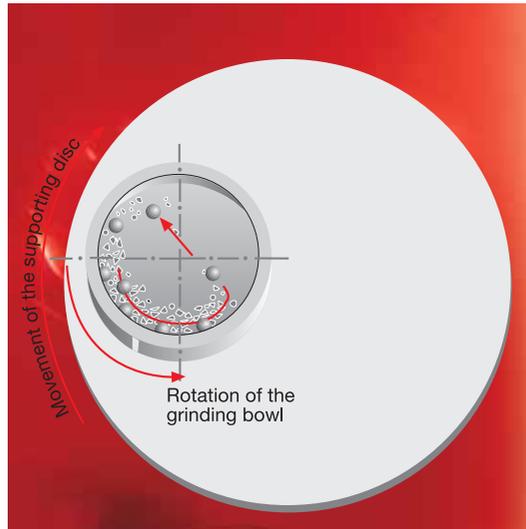
Analytic preparation

spectroscopy, X-ray fluorescence, X-ray structure analysis, chromatography



quality control
fine grinding

Planetary Micro Mill



working principle



pulverisette 7

Method of operation

In the planetary micro mill pulverisette 7, grinding bowls rotate on their own axis while simultaneously rotating through an arc around the central axis. The grinding bowls and material are thus subjected to centrifugal forces which constantly change in direction and intensity resulting in efficient, fast grinding processes.

The geometries and speed ratios allow optimum movement of the grinding balls. The grinding balls rotate against the inside wall of the bowl until under specific conditions they break away from this. After being thrown across the grinding bowl, the grinding material and the balls are impacted against the opposite wall. The energy thus created by impact is many times higher than for traditional ball mills. This results in excellent grinding performance and considerably shorter grinding times.



membrane keyboard

Features

Advantages

- Very high grinding output with low space requirement
- High final fineness down to $< 1\ \mu\text{m}$
- Very fast, uniform comminution
- Loss-free grinding – also for suspensions
- Reproducible grinding results
- Quick and safe bowl retention
- Easy to clean
- Cooling of the grinding chamber by an integrated fan to allow extended for grinding times
- Analytically pure grinding materials; choice of 8 different materials
- Simple cleaning of the grinding components
- Exact display of rotational speed
- Microprocessor electronic controls
- Wide speed range
- Easy to use, ergonomic design
- Safety tested and CE mark
- 2 year guarantee

Design Characteristics

- Speeds up to 800 rpm
- Enclosed, easy-to-open working chamber
- Microprocessor control system
- Speed control with setpoint/actual value displayed
- Programme timer for grinding operation and cooling phases
- Grinding cycle can be programmed to repeat up to 99 times
- Forward and reverse operation
- Power safe function
- RS232 interface for output of process data and programming of grinding cycles (validation)
- Ergonomic membrane keyboard (IP64)
- Maintenance-free drive (asynchronous motor and frequency converter)
- Built in selection of mains voltage available (100-120/200-240 V)
- Grinding bowl with sealing ring
- Simultaneous grinding of two samples
- Recyclable plastic housing

wet / dry

analytical

fineness

grinding



grinding bowls and balls

Accessories

Grinding bowls and balls

Grinding bowls and balls are available in 8 different materials to avoid contamination of samples due to unwanted abrasion of grinding elements.

Material	Density g/cm ³	Abrasion resistance	Material to be ground
Agate 99.9 % SiO ₂	2.65	good	soft to medium-hard samples
Silicon nitride 91 % Si ₃ N ₄	3.1	extremely good	abrasive samples, iron-free grinding
Sintered corundum 99.7 % Al ₂ O ₃	> 3.8	fairly good	medium-hard, fibrous samples
Zirconium oxide 94.2 % ZrO ₂	5.7	very good	fibrous, abrasive samples
Stainless steel bowls: 17-19 % Cr + 8-10 % Ni balls: 12.5-14.5 % Cr + 1 % Ni	7.8	fairly good	medium-hard, brittle samples
Tempered steel bowls: 11-12 % Cr balls: 1-1.65 % Cr	7.9	good	medium-hard, brittle samples
Hard metal tungsten carbide 93.8 % WC + 6 % Co	14.95	very good	hard, abrasive samples
Polypropylene bowls	0.9	adequate	soft, brittle samples

Recommended number of balls per grinding bowl

Grinding bowl/ useful capacity	12 ml 0.5-5 ml	45 ml 3-20 ml
Balls		
5 mm	50	180
10 mm	6	18
15 mm		7

The quoted number of balls per bowl is the minimum quantity; depending on the material behaviour it shall be possibly increased.

Normally grinding bowls and balls of the same material are used. To shorten the grinding time, larger or heavier balls (higher density) can be used (high grinding energy): e.g. tungsten carbide balls in the steel grinding bowl or zirconium oxide balls in the silicon nitride bowl.

Grinding bowls should always be used in pairs (if applicable, empty bowl without balls).

Smaller grinding balls (0.5 - 4 mm dia.) to achieve a fineness down to the Nanometer-range are available on request!

product
search

Data

Technical data

working principle	impact force
max. feed size (depending on the material)	5 mm
min. sample quantity	0.5 ml
max. sample quantity	40 ml
final fineness	< 1 µm
typical grinding time (e. g. for quartz sand up to < 40 µm)	8 min
grinding process	dry / wet
speed of the main disc	100 - 800 rpm
transmission ratio	$i_{\text{relative}} = 1 : -2$
electrical details	100-120/200-240 V/1~, 50-60 Hz, 880 watt
motor-shaft-power according to VDE 0530, EN 60034	0.37 kW
weight	net: 35 kg, gross: 55 kg
dimensions w x d x h	table top instrument: 37 x 53 x 50 cm
packing details	wooden case: 68 x 54 x 72 cm

Ordering data

Order no.	Description
07.4000.00	Planetary Micro Mill pulverisette 7 without grinding bowls and balls for 100-120/200-240 V/1~, 50-60 Hz, 880 watt The voltage specified on the order form will be set by the factory.
	Grinding bowls
	Grinding bowls 45 ml volume with lid and seal ring
50.7050.00	agate
50.7060.00	sintered corundum (99.7 % Al ₂ O ₃)
50.7310.00	silicon nitride
50.7110.00	zirconium oxide
50.7100.00	stainless steel
50.7090.00	tempered steel
50.7080.00	hardmetal tungsten carbide
50.7200.00	polypropylene (disposable bowl)
07.3280.13	bowl adapter for disposable bowl
50.7250.20	replacement seal ring PTFE 50/40 mm dia. for all bowls of 45 ml volume
	Grinding bowls 12 ml volume with lid and seal ring
50.5050.00	agate
50.5060.00	sintered corundum (99.7 % Al ₂ O ₃)
50.5310.00	silicon nitride
50.5110.00	zirconium oxide
50.5100.00	stainless steel
50.5090.00	tempered steel
50.5080.00	hardmetal tungsten carbide
50.5250.20	replacement seal ring PTFE 37/26 mm dia. for all bowls of 12 ml volume
	Grinding balls
	Grinding balls 15 mm dia. for grinding bowls 45 ml
55.0150.05	agate, polished
55.0150.06	sintered corundum (99.7 % Al ₂ O ₃)
55.0150.31	silicon nitride
55.0150.27	zirconium oxide
55.0150.10	stainless steel
55.0150.09	tempered steel
55.0150.08	hardmetal tungsten carbide
	Grinding balls 10 mm dia. for grinding bowls 45 ml, 12 ml
55.0100.05	agate, polished
55.0100.06	sintered corundum (99.7 % Al ₂ O ₃)
55.0100.31	silicon nitride
55.0100.27	zirconium oxide
55.0100.10	stainless steel
55.0100.09	tempered steel
55.0100.08	hardmetal tungsten carbide
	Grinding balls 5 mm dia. for grinding bowls 45 ml, 12 ml
55.0050.05	agate, polished (100 pieces weigh approx. 17 g)*
55.0050.27	zirconium oxide (100 pieces weigh approx. 38 g)*
55.0050.10	stainless steel (100 pieces weigh approx. 51 g)*
55.0050.09	tempered steel (100 pieces weigh approx. 52 g)*
55.0050.08	hardmetal tungsten carbide (100 pieces weigh approx. 97 g)*
	* due to the indication of weight, the high number of balls per grinding bowl can be weight.

