FRITSCH

FRITSCH · MORTAR GRINDER

IDEAL FOR

PHARMACY
FOODSTUFFS
CHEMISTRY
MINING AND METALLURGY
GEOLOGY AND MINERALOGY
GLASS AND CERAMICS INDUSTRY
AGRICULTURE AND FORESTRY

MORTAR GRINDER

PULVERISETTE 2

THE UNIVERSAL GRINDER FOR EVERY APPLICATION

- **Ideal for wet and dry grinding, mixing and homogenisation**
- **For hard, medium-hard, soft, brittle, fibrous and abrasive materials**
- **Particularly gentle grinding with no thermal load**
- **Precisely adjustable pestle pressure and optimum scraper kinematics**
- **Loss-free grinding thanks to closed grinding chamber**
- **Illuminated grinding chamber for optimum control**
- **Simple filling even during grinding**
- **Easy cleaning through simple removal of pestle and mortar bowl**

VERSATILE USE

Thanks to its special mode of operation, the FRITSCH Mortar Grinder PULVERISETTE 2 is the ideal universal grinder in the laboratory – for analysis, quality control and materials testing as well as for the mixing and homogenisation of pastes and creams on a laboratory scale. Its particularly gentle grinding by friction with almost no thermal load is ideal for the preparation of tablets in galenics. Using liquid nitrogen it also grinds difficult-to-mill samples with moist, fibrous or elastic structures. And the PULVERISETTE 2 is also ideally suited for mixing of solids or liquids and solids. With brief, reliably reproducible grinding and mixing times, it is loss and dust free. For final finenesses of between 10 and 20 µm, with a feed size of 6–8 mm and a max. sample quantity of up to 190 ml.

GENTLE FINE GRINDING

The principle of the Mortar Grinder is the oldest grinding principle in the world: using pressure and friction, the pestle, with its large grinding surface, grinds the material against the walls and bottom of the mortar bowl. Your advantage: a particularly uniform and gentle grinding through friction, mixing or homogenisation of organic and inorganic samples with no thermal load – dry or in suspension at 70 to 80 rpm.

FRITSCH Advantage Sturdy coating of the mortar bowl with high-quality plastic frame – particularly robust, light and with a good grip.

FRITSCH Advantage Easy setting and re-adjustment of the **pestle pressure on the mortar wall** – for perfect grinding.

FRITSCH Advantage The essential **downward pestle pressure** on the mortar bowl can quickly and easily be exactly adjusted and read off on a scale – for reliable reproducibility.

FRITSCH Advantage Simple addition of sample materials, liquids and additives during the grinding process.

FRITSCH Advantage The optimised **FRITSCH scraper kinematics**, which are infinitely adjustable on three axes, ensure that the scraper is always perfectly fitted against the inner wall of the mortar bowl and to guide rising material toward the pestle – with manual re-adjustment also during grinding.

FRITSCH Advantage The large acrylic window and grinding chamber illuminated with long life LEDs to check the grinding process.

PULVERISETTE 2

Easy to handle and extremely safe: quick-fastening bayonet clamping of the mortar bowl

Practical inserting of the pestle without tools – for quick work and easy cleaning

Automatic safety switch-off when opened

SIMPLE WORKING

Well-conceived details for efficient working and quick cleaning: the mortar bowl and pestle of the PULVERISETTE 2 lock in place securely thanks to their bayonet clamping with just one motion and are just as quickly removed for cleaning. The pestle pressure can also be easily adjusted during grinding. And the special FRITSCH scraper kinematics ensure that the scraper can be fine-tuned in height and depth and that the setting angle to the mortar bowl can be adjusted according to your material and application – all conveniently from the outside. For perfect material feeding.

For special applications: practical cryogenic grinding

FRITSCH Advantage The PULVERISETTE 2 is ideally suited for cryogenic grinding, where the material to be ground is embrittled with the addition of liquid nitrogen. In this manner moist, fibrous or elastic samples such as tomatoes, rubber, synthetic resins or plants can be ground without problem in the stainless steel grinding set.

Fine homogeneous powder – ready in 2 minutes

TECHNICAL DATA

Electrical details
100-120/200-240 V/1~, 50-60 Hz, 250 watt

Motor shaft power in accordance with VDE 0530, EN 60034
180 W

Weight

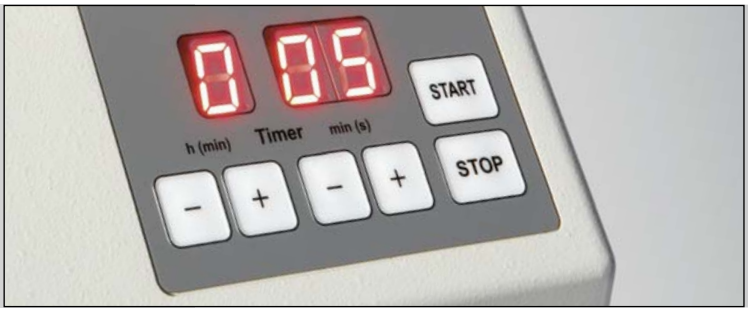
Net	24 kg
Gross	26 kg

Dimensions w x d x h
Bench top instrument 31 x 46 x 41 cm

Packaging w x d x h
Cardboard box 63 x 46 x 55 cm

Emissions value of workplace according to IEC 61672-1
Approx. 71 dB(A)
(depending on the material to be ground and grinding set)

Order no.
02.2000.00



The automatic timer integrated in the splash proof membrane keyboard ensures an exactly reproducible grinding time.

APPLICATION EXAMPLES

Pharmacy	Dragées, drugs, tablets, pastes
Foodstuffs	Sweets, gelatine, spices, yeast, pasta, sugar
Chemistry	Fertilisers, dyes, pesticides, salts, detergents, synthetic resins
Mining and metallurgy	Ores, coal, coke, ashes, bauxite, slags, additives
Geology and mineralogy	Minerals (up to and including a Moh's hardness of 9), calcites, quartz, silicates, gypsum, lime, clinker, sand, cement
Glass and ceramics industry	Sand, frits, glass, raw materials, porcelain, fire-clay, sintered ceramics, clay
Agriculture and forestry	Soil samples, fertilisers, leaves, plants

For pharmaceutical samples in analysis, you will receive a detailed IQ/OQ documentation to support equipment qualification.

FACTS AND ADVANTAGES

Working principle	Friction
Max. feed size (depending on material)	8 mm
Min. sample quantity	10 ml
Max. sample quantity	Up to 190 ml
Final fineness	10 – 20 µm
Grinding process	Dry / wet
Mortar bowl speed	50 Hz – ~70 rpm, 60 Hz – ~80 rpm
Grinding bowl diameter	Inner: 130 mm, outer: 200 mm
Conformity	CE mark
Guarantee	2 years

GRINDING SETS

Only available from FRITSCH: the mortar bowls of the PULVERISETTE 2 are rimmed regardless of the material, in a robust shell of shock-resistant plastic, which protects the actual bowl. This makes it particularly durable and the integrated all around grip ensures optimum working conditions. All FRITSCH mortar bowls have an extra high rim and are sealed by a sealing lip in the lid.

For contamination-free sample grinding, select the grinding set of your PULVERISETTE 2 from seven different materials – the appropriate pestle and scraper are also supplied. A grinding set made of stainless steel without a plastic frame is available, especially for cryogenic grinding using liquid nitrogen to embrittle the material to be ground. It is also heat-resistant and can be cleaned with solvents.

MATERIAL DATA FOR GRINDING SETS

Grinding sets in plastic frame

Material	Main component of the material*	Density g/cm³	Abrasion resistance	Use for material to be ground
Agate	SiO_2	2.65	Good	Soft to medium-hard samples, iron-free grinding
Sintered corundum	Al_2O_3	3.8	Fairly good	Medium-hard, soft, brittle samples
Hard porcelain	SiO_2–Al_2O_3	2.4–2.5	Sufficient	Soft, fibrous samples
Zirconium oxide	ZrO_2	5.9	Very good	Fibrous, abrasive samples
Hardened steel	Fe–Cr	7.9	Good	Hard, medium-hard, brittle samples
Hardmetal tungsten carbide	WC	14.95	Very good	Hard, medium-hard, abrasive samples

Grinding set made of stainless steel

Material	Main component of the material*	Density g/cm³	Abrasion resistance	Use for material to be ground
Stainless steel	Fe–Cr–Ni	7.8	Good	Medium-hard, brittle samples; cryogenic grinding of moist, fibrous and elastic samples

* At www.fritsch.de, you can find the corresponding element analyses with detailed information about the materials.

ORDERING DATA

Order no.	Article
MORTAR GRINDER	
	PULVERISETTE 2
	
	Instrument without grinding set
02.2000.00	For 100-120/200-240 V/1~, 50-60 Hz, 250 watt The voltage specified in the order is set.
	Grinding sets
46.2050.00	Agate
46.2060.00	Sintered corundum (99.7 % Al_2O_3)
46.2110.00	Hard porcelain
46.2120.00	Zirconium oxide
46.2140.00	Stainless steel
46.2090.00	Hardened steel
46.2080.00	Hardmetal tungsten carbide
	Certification
96.0210.00	IQ/OQ documentation (questionnaire format – implementation by customer)
	Spare parts
02.1340.16	Spare scraper vulkollan (Polyurethane)

Excellent grinding results with the FRITSCH Mortar Grinder PULVERISETTE 2

PRODUCTION OF MIXTURES ON A LABORATORY SCALE

The PULVERISETTE 2 creates even the most difficult mixtures such as the fine dispersion of pure liquid mercury in a mixture of fine metal powders. It can introduce the greatest possible amount of solids in the high-viscosity organic phase for the production of filled pastes. Also the doting of ceramic powder with small amounts of in liquids dissolved substances is no problem.

EVALUATION OF MINERAL ANIMAL FEED

In order to perform the chemical evaluation of animal feed for chemicals and trace elements, for the sample preparation the production of a homogeneous and fine sample with a particle size under 0.5 mm/0.25 mm is stipulated. In a grinding set made of agate the PULVERISETTE 2 achieves this final fineness after just 5 – 10 minutes, without the occurrence of heating.

ANALYSIS OF ACTIVE INGREDIENTS OF MEDICINES

To prove the exact quantity of active ingredients in tablets, dragées or pastilles, the PULVERISETTE 2 provides a homogeneous powder of approximately < 100 µm particle size after a grinding time of 1 – 5 minutes, ideally in a grinding set made of agate or hard porcelain. The Mortar Grinder ensures gentle grinding with no thermal load so no active ingredient is lost.

PESTICIDE AND ANTIBIOTIC RESIDUES IN FOOD

In order to inspect food in regards to possible residues, particularly for temperature sensitive pesticides or fertilisers, it must be prepared in a temperature-conserving manner. This is not simple, especially with elastic-fibrous samples such as tomatoes. Here the PULVERISETTE 2 offers ideal prerequisites with its gentle grinding with no thermal load and the possibility for cryogenic preparation.

Free sample grinding

We would be pleased to assist you in finding exactly the right laboratory mill for your specific applications. Simply send us your sample for a free-of-charge sample grinding. We will then submit a fully documented grinding report showing you which mill from the extensive FRITSCH range is the right one for you.

A comprehensive collection of grinding reports can be found in the extensive grinding report database at www.fritsch.de, in the menu item Sample Preparation/Solution.

Scheduling and information

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