

*Knife Mill*



**IDEAL FOR**

- FOODSTUFFS
- ANIMAL FEED
- AGRICULTURE AND FORESTRY
- BIOLOGY
- PHARMACEUTICALS
- CHEMISTRY

**KNIFE MILL**

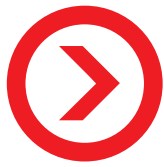


# QUALITY MADE IN GERMANY

FRITSCH is more than just a brand: It is backed by a strong, medium-sized, family business in its fourth generation, which has been firmly embedded in the region since 1920 and globally active for decades. All FRITSCH-products are produced according to strict quality criteria, and our entire production is in-house. The innovative ideas of our development department are inspired by the close relationship with our customers and their practical work in the lab. Satisfied customers worldwide count on our quality, our experience and our service. This makes us proud and motivates us.

**FRITSCH. ONE STEP AHEAD.**





# PULVERISETTE 11

## MULTIFUNCTIONAL, INDUSTRIAL-GRADE MILL

- **Extremely fast comminution, homogenisation and mixing**
- **Extra strong motor power up to 1250 watt**
- **Knife blades with up to 4 cutting edges – up to 56,000 cutting processes per minute**
- **Up to 1,400 ml useful capacity of the grinding vessel plus Vario-Lid system for variable volume**
- **Variable speed settings 2,000 – 10,000 rpm, turbo function with 14,000 rpm**
- **20 SOPs can be saved and USB interface for SOP management**
- **Continuous, reverse and interval mode**

Transparent grinding vessel made of scratch-resistant, autoclavable plastic PC for optimal observation of the comminution process.

**The quietly operating Knife Mill PULVERISETTE 11 is the ideal laboratory mixer for very fast and gentle comminution and homogenisation of moist, oily and fatty as well as of dry, soft, medium-hard and fibrous samples.**

### **Reproducible comminution for a wide range of samples**

The up to 1250 watt strong motor of the PULVERISETTE 11 and its special knife, fitted with up to four blades, grinds fast and gentle problematic samples with high fat or water content such as meat, gummi bears, chocolate or also hard samples such as dishwasher tabs or toys. This makes it a perfect all-rounder with many advantages for sample preparation in the fields of foodstuffs or animal feed testing, pharmaceuticals and chemistry and many other applications.

### **Intuitive and easy operation with practical functions**

Due to its modern touchscreen with colour display, the PULVERISETTE 11 enables fast access to all functions and the SOPs. The grinding time of the integrated stopwatch can be set in 0.5 second steps using a practical multifunctional dial. By the push of a button you simply change from continuous operation to interval operation for pre-crushing of harder samples resp. for better homogenisation or to the reverse mode for better mixing of the sample without having to open the mill. The parameters for interval mode can be set freely in the sub-menu.

### **Your decision for professional quality**

The PULVERISETTE 11 was developed specifically for utilisation under laboratory conditions and exceeds by far the performance of conventional instruments for household requirements. A safe investment in efficient working, reproducible results for reliable analyses and highest safety at the workplace.

## OUR SUGGESTION

All parts which come into contact with the sample material such as grinding vessel, lid and knife of the PULVERISETTE 11 are autoclavable for sterile comminution.



### Safe operation

The PULVERISETTE 11 does not start until the grinding vessel and knife are inserted and the safety lock in the protective hood has been closed properly. The protective hood cannot be opened whilst the knife is rotating. The control system detects the vessel and prevents the setting of a too high rotational speed. The knife is securely mounted by a bayonet lock and cannot come loose even if the sample material is very hard or the start-up speed is too high.

### Variable speed settings and turbo function

The motor speed can be set digitally – in increments of a hundred between 2,000 and 10,000 rpm – making it possible to adapt the mill to the specific comminution behaviour of each sample. The additional turbo function with 14,000 rpm for up to 6 seconds facilitates the grinding of sticky and fibrous samples.

### Easy cleaning

Grinding vessel, lid and knife of the PULVERISETTE 11 can be cleaned without a problem in a dishwasher. The knife, which is securely mounted by a bayonet lock, can be removed for cleaning with just a simple motion.



The standard knife with four blades of the PULVERISETTE 11 can be used for comminution of nearly all materials. A knife with serrated blades is also available as an additional accessory.



## Reliable representative samples

The PULVERISETTE 11 Knife Mill provides you a homogeneous sample in a very short time due to its special design. Each subsample which you take from any location in the grinding vessel is representative for the original sample and thus ensures an exact, significant analysis. And that for a wide range of different materials.

### Well-conceived down to the smallest detail

Interfering contours on the inner wall of the grinding vessel force the sample material towards the middle of the vessel and thus ensuring an efficient thorough mixing during grinding. The result: a homogeneous sample within a narrow particle size range.

### FRITSCH Advantage

#### Well-conceived knife geometry

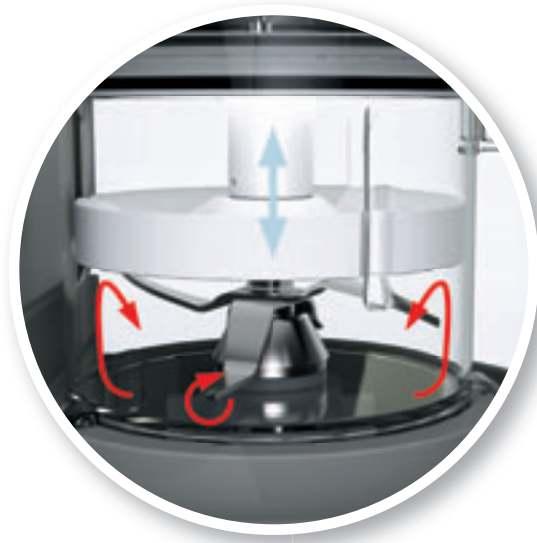
The specially curved knife blades of the PULVERISETTE 11 achieve with up to 56,000 cutting processes per minute, significantly faster a homogeneous sample than comparable instruments at the same grinding time and rotational speed. And in the reverse mode, the PULVERISETTE 11 enables a better thorough mixing if necessary.

### FRITSCH Advantage

#### Fast cryogenic comminution in a single step

Samples which are difficult to grind such as gummi bears, chocolate or plastic toys can be embrittled with liquid nitrogen for comminution directly in the grinding vessel made of stainless steel 316L. The sample material remains 100% cold. Just select the special lid with the easily exchangeable single-use sieve insert – the reliable protection against contamination.





### Autoclavable Vario-Lid system

The freely adjustable Vario-Lid system made of plastic PP fulfils two important requirements at the same time: It can be used to reduce the grinding chamber volume down to 0.54 litres and to manually compress and loosen up the sample material at the beginning and at any time during comminution. Thus you always achieve a homogeneous sample in a narrow particle size range even for smaller sample quantities and for difficult-to-grind materials. The Vario-Lid system is delivered as a standard with a reduction sample pusher for moist, liquid and viscous sample materials such as tomatoes, cucumbers or yoghurt. It automatically returns rising liquids during the comminution and can be used for most sample materials. A reduction sample pusher can be ordered as an option for dry, solid samples.



Vario-Lid system with plunger made of plastic PP and reduction sample pusher for moist, liquid and viscous sample materials.

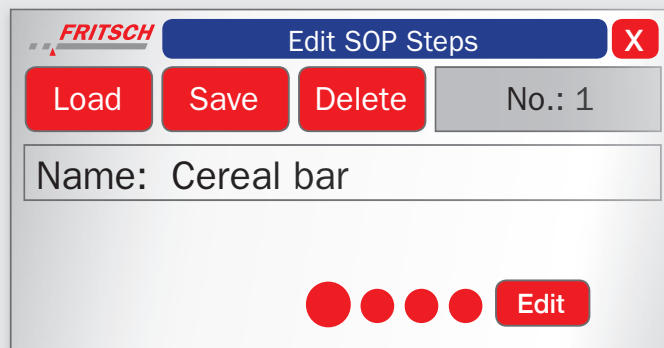


## Clear operation advantage: Save up to 20 SOPs

### YOUR ADVANTAGES

- 20 Standard Operating Procedures can be saved and edited
- Up to 15 grinding sequences can be programmed
- Practical clear text labelling
- Simple operation even for changing users
- Integrated USB interface for SOP management

A clear advantage of the PULVERISETTE 11 over comparable instruments is the possibility to program and save up to 20 Standard Operating Procedures (SOPs) and to label them with a clear text. Instead of SOP 1, 2 or 3, every user directly finds the saved program on the touchscreen for example for hazelnuts, bananas or meat. Up to 15 grinding sequences can be programmed in each individual SOP. The setting up of the SOPs is done very easily via the touchscreen and the multifunctional dial of the control panel. All saved SOPs can be controlled, uploaded and exchanged by laptop via the integrated USB interface. And upon consultation, we also deliver the SOPs, which were determined for certain sample materials during an individual sample grinding (see page 11).



Even hard materials with sticky components can be easily comminuted after embrittlement within seconds.





## TECHNICAL DATA

### Electrical details

200–240 V/1~, 50/60 Hz, 1250 watt  
100–120 V/1~, 50/60 Hz, 1000 watt

### Weight

Net 17.6 kg  
Gross 39.6 kg

### Dimensions w x d x h

Bench top instrument 32 x 43 x 48 cm

### Packaging w x d x h

Case 80 x 55 x 65 cm

### Emission sound pressure level at the workplace according to DIN EN ISO 3746

$L_{pA}$  = 71 dB

(depending on the material to be ground, selected rotational speed and instrument configuration)

<b>Order No.</b>	<b>200–240 V/1~</b>	<b>100–120 V/1~</b>
	11.3020.00	11.3010.00



### Optimal size-reduction of rubber hoses in shorter times

The rubber hoses were embrittled with liquid nitrogen and then comminuted in the grinding vessel with Vario-Lid system with plunger.



Cookies and vitamin tablets before and after comminution in the Knife Mill PULVERISETTE 11

## APPLICATION EXAMPLES

<b>Foodstuffs</b>	Cereal bars, dried fruit, fish, meat, ham, sausages, frozen foods, vegetables, potatoes, spices, cheese, cacao nibs, nuts, dietary supplements, confectionery, salad, convenience foods, bread
<b>Animal feed</b>	Feed pellets, dog food
<b>Agriculture and forestry</b>	Grain, oilseed, seeds, hops
<b>Biology</b>	Plants, parts of plants, leaves, freeze-dried samples, straw, hay, tissue disruption
<b>Pharmaceuticals</b>	Tablets, dragées, pharmaceutical products, soaps, herbs, teas
<b>Chemistry</b>	Dishwasher tabs, detergent tabs

IQ/OQ documentation available to support equipment qualification.

## FACTS AND ADVANTAGES

- Max. feed size\* 40 mm, final fineness\* < 300 µm
- Sample quantity\* < 1,400 ml, with the Vario-Lid system < 540 ml
- Complete comminution and homogenisation in seconds
- Digital setting of the grinding time as continuous mode or between 0–360 seconds in 0.5 second steps, average grinding time\* 30 seconds
- Knife diameter 128 mm, knife peripheral speed ~ 67 m/s
- Manual and programmable interval and reverse mode
- Rotational speed regulated by microprocessor
- USB interface for SOP management
- Safety lock of grinding vessel, knife and protective hood with stoppage monitoring
- Gas pressure springs for easy opening of the protective hood
- If the motor temperature is too high, power is reduced automatically
- Intuitive operation via colour 4.3" touchscreen and practical multifunctional dial
- Easy cleaning
- 2-year guarantee

\* depends on material



## Standard configuration and accessories

As a standard, you receive the PULVERISETTE 11 Knife Mill equipped with a 1.4 l grinding vessel made of autoclavable, transparent and scratch-resistant plastic, with a standard lid made of silicone and the standard knife made of stainless steel.



Grinding vessels 1.4 litres



Lids for grinding vessels



Standard knife with 4 blades

### ➤ Grinding vessels 1.4 litres

In addition to the grinding vessel made of autoclavable, transparent and scratch-resistant plastic PC, we also offer a grinding vessel made of stainless steel 316L for cryogenic comminution and for grinding harder sample materials.

### ➤ Lids for grinding vessels

The included standard lid made of silicone is ideal for comminution of soft, medium-hard sample materials, which don't need to be compressed. The Vario-Lid system with plunger made of plastic PP and reduction sample pusher for moist, liquid and viscous sample materials minimises the grinding chamber volume to 0.54 litres and allows for a manual compression of the sample material. A reduction sample pusher can be ordered as an option for dry, solid samples. For cryogenic comminution, we offer a special lid with sieve insert.

### ➤ Knives with up to 4 blades

The standard knife made of stainless steel can be used for comminution of nearly all materials due to its four blades and a well-conceived geometry. For comminution of especially fibrous, tough or sinewy samples, we recommend the knife with serrated blades made of stainless steel.

### **FASTER WORKING**

Since the grinding times of the PULVERISETTE 11 are so short so that your samples can be processed very fast, it is worthwhile to order several grinding vessels right away for parallel use.

## ORDERING DATA

Order no. Article

### KNIFE MILL

#### PULVERISETTE 11



**Instrument incl. 1.4 litres grinding vessel made of autoclavable plastic, standard lid and standard knife made of stainless steel**

11.3020.00 For 200–240 V/1~, 50/60 Hz, 1250 watt  
11.3010.00 For 100–120 V/1~, 50/60 Hz, 1000 watt

#### Grinding vessels, 1.4 litres

11.3151.16\* Grinding vessel made of autoclavable, transparent and scratch-resistant plastic PC  
11.3160.00 Grinding vessel made of stainless steel 316L

#### Lids for grinding vessels

11.3203.15\* Standard lid made of silicone  
11.3180.00 Vario-Lid system with plunger made of plastic PP and reduction sample pusher for moist, liquid and viscous sample materials  
11.3189.16 Reduction sample pusher for dry, solid samples for Vario-Lid system with plunger  
11.3220.00 Special lid for cryogenic comminution with single-use sieve insert  
11.3224.00 Set of single-use sieve inserts (set = 10 inserts)

#### Knives

11.3204.00\* Standard knife made of stainless steel  
11.3210.00 Knife with serrated blades made of stainless steel

#### Further accessories

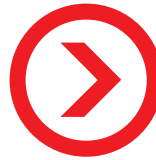
11.3190.00\* Bayonet lock for mounting the knife to the grinding vessel  
83.4075.00 Scraper

#### Certification

96.0350.00 IQ/OQ documentation (questionnaire format – for implementation by customer)

Further grinding vessels and knives on request!

\* Included in the basic price of the instrument; when ordering a deviating specification of the standard accessories, please specify the exact article number of the part to be replaced.



**Worldwide at  
your service  
in 116 countries**

### Always nearby

Wherever you use your FRITSCH instruments: we are nearby. With direct contact persons for application consulting and technical service – and in Europe with the FRITSCH mobile laboratory for practical demonstrations on-site.

### Grinding reports online

An extensive database of grinding reports for various materials and industries is available online at [www.fritsch-international.com/grinding-reports](http://www.fritsch-international.com/grinding-reports).

It's worth taking a look!

### Showing you how it's done!

Our applications laboratory will be more than glad to help you find the right Mill for your specific task. If desired, within the scope of a product recommendation, we will conduct a comminution of your material. Simply request at [www.fritsch-international.com/service/sample-analysis](http://www.fritsch-international.com/service/sample-analysis). The result will convince you.

**Or simply give us a call –  
our experts will be happy  
to assist you.**

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