

*Planetary Mills - premium line*



**IDEAL FOR**

**GEOLOGY AND MINERALOGY  
METALLURGY  
CERAMICS  
MATERIAL RESEARCH/  
MECHANICAL ALLOYING  
NANOTECHNOLOGY  
PHARMACEUTICALS  
CHEMISTRY  
BIOLOGY  
SAMPLE PREPARATION FOR ANALYSIS**

*premium line*

**PLANETARY MILLS**



# 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.**



## FRITSCH Planetary Mills *premium line* – faster, simpler, safer

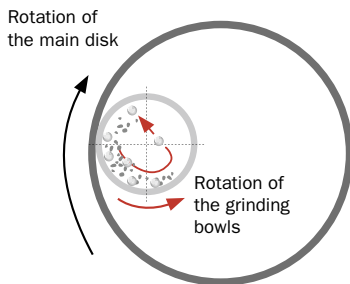
FRITSCH Planetary Mills *premium line* are extremely strong all-purpose mills that offer *premium* performance, usability and safety. Due to revolutionary rotational speeds of up to 1100 rpm, ultra-fine results are achieved by powerful wet and dry comminution of hard, medium-hard, soft, brittle and moist samples by the high-energy impact of grinding balls in rotating grinding bowls. Your advantage: extremely short grinding times and reliably reproducible results down into the nano range. FRITSCH Planetary Mills *premium line* are also a perfect choice for highly efficient mixing and homogenising or for mechanical activation and alloying in materials research. Convince yourself!

### **The FRITSCH *premium line* principle**

Making the best even better: According to this principle we develop and produce the high-tech laboratory mills of the FRITSCH *premium line*. Additional power gives them an edge over comparable instruments. And even more practice-oriented equipment elements make working with them even easier, more comfortable, faster and safer. Inspired by ideas, which make your work easier – for *premium* results with absolute reliability.

**FRITSCH *premium line* – the high-tech standard for the modern laboratory.**





**Planetary Mills:** The comminution of the sample material takes place primarily through the high-energy impact of grinding balls. To achieve this, the grinding bowls, containing the material to be ground and grinding balls, rotate around their own axis on a main disk rotating in the opposite direction. The overlapping of the centrifugal forces cause the sample material and grinding balls to bounce off the inner wall of the grinding bowl. The grinding balls cross the bowl diagonally at an extremely high speed and grind the sample material on the opposite wall of the bowl. The grinding bowls reach twice the speed of the main disk during this process.



	Planetary Mill <b>PULVERISETTE 6</b> <i>premium line</i>	Planetary Micro Mill <b>PULVERISETTE 7</b> <i>premium line</i>
	<b>Ideal for large quantities</b>	<b>Ideal for small quantities</b>
Max. feed size (depending on the material)	10 mm	5 mm
Sample quantity	40–450 ml	2–70 ml
Final fineness (depending on the material)	< 0.1 µm	< 0.1 µm
Typical grinding time down to analytical fineness	3 min	3 min
Grinding process	Dry/wet	Dry/wet
Rotational speed of main disk	100–800 rpm	100–1100 rpm
Centrifugal acceleration	64 g	95 g

**Our suggestion:** Specific application examples and a table of grinding results, can be found at [www.fritsch.de/solution](http://www.fritsch.de/solution).



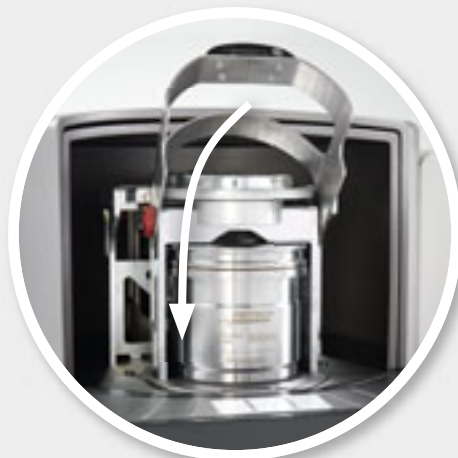
# PULVERISETTE 6

*premium line*

## High-performance grinding down into the nano range

- Extra strong 2.2 kW drive power and extremely high centrifugal acceleration up to 64 g and up to 800 rpm\* (rotational speed of the bowl 1600 rpm)
- Motor-driven ServoLOCK clamping of the grinding bowls
- Safe and user-independent reproducible clamping
- 2 grinding stations for grinding bowls 160 ml, 250 ml and 500 ml volume
- Intuitive touchscreen operation with colour display

With two grinding stations, we have developed the FRITSCH Planetary Mill PULVERISETTE 6 *premium line* as the 'big sister' to the PULVERISETTE 7 *premium line*: Your ideal mill for fast wet and dry grinding, mechanical alloying, mixing and homogenising of larger sample quantities with reliable results down into the nano range – and an absolutely secure automatic clamping of bowls.



### **FRITSCH premium advantage: Maximum operational safety**

In the completely newly developed bearing of the grinding bowl holder, the grinding bowls of the PULVERISETTE 6 *premium line* are housed in a completely enclosed frame. It is automatically locked by the machine via ServoLOCK instead of manually. Your advantage: extremely safe and easy operation with reproducible, user-independent clamping at any time.

\* The maximum rotational speed reached depends on the machine load.



**FRITSCH premium advantage: Intuitive user navigation**

Fast and easy operation due to a high-resolution touchscreen, logical menu structure in multiple languages and practical plain-text user navigation.



**FRITSCH premium advantage: Extra strong motor**  
for superior drive power.



## More safety due to ServoLOCK

**Grinding has never been safer: With the completely brand new ServoLOCK clamping of the grinding bowls and the automatic check of the fastening of the bowls inside the mill, man and machine are optimally protected. In the event of impermissible operating states, the machine blocks the start of a grinding – and if an imbalance occurs it automatically shuts off. It doesn't get any safer than this.**



### **FRITSCH premium advantage: Safely guided insertion**

The grinding bowl is simply inserted in the PULVERISETTE 6 premium line from the front into the holder. Correct positioning is automatically ensured by a practical guide.

### **FRITSCH premium advantage: Motor-driven grinding bowl clamping**

The revolutionary ServoLOCK is activated with a single hand motion by pressing down the clamp. The actual clamping is motor-driven by the mill. Your advantage: each grinding with always same conditions without screwing or other manual fastening.

### **FRITSCH premium advantage: Safe opening in the event of overpressure**

Any overpressure is released by the specially designed ServoLOCK in the PULVERISETTE 6 premium line. In this way, the grinding bowl can always be easily and safely opened.

### **FRITSCH premium advantage: Reliable bowl detection via RFID chip**

The PULVERISETTE 6 premium line does not start until both bowls are correctly inserted and prevents the setting of too high speeds depending on the bowl material used\*. Your advantage: guaranteed constant, reliable results – incorrect operation impossible.

\* At [www.fritsch.de](http://www.fritsch.de), you find the maximum speed limits for different grinding ball diameters and grinding bowls made of agate.



## ONLY AVAILABLE FROM FRITSCH

Turn your Planetary Mill into an analytical measuring system with the EASY GTM system.

### Adjustable touchscreen

The PULVERISETTE 6 *premium line* is operated via the ergonomically arranged touchscreen that can be easily adjusted with just a single hand motion. Here you enter the variable rotational speed and define the grinding time. You can programme interval and pause times using the minutes and seconds timer and can save up to 10 programmes.



### Easy recording

due to perfect integration into the IT structure of your laboratory and the MillControl software. All data can be easily exported via USB.



## Insert – start – done!



### **FRITSCH premium advantage: Easy insertion**

The grinding bowl is inserted in the PULVERISETTE 6 *premium line* from the front into the holder. To insert the second bowl, the second grinding station moves forward at the press of a button.



### **FRITSCH premium advantage: ServoLOCK**

Once the grinding bowl is inserted, the clamp is closed with a single hand motion. Motor-driven by the mill, the grinding bowls are clamped in. In this way, clamping is always identical, regardless of who operates the device. A clear advantage that ensures reproducibility.



### **FRITSCH premium advantage: Clamping release**

The LED light shows that the bowl is correctly inserted and clamped. Now the second bowl can be inserted and clamped.



### **FRITSCH premium advantage: Automatic closing**

Once both grinding bowls are correctly inserted and clamped, you choose the “Close” command on the touchscreen and the grinding chamber will close automatically. Simply enter the grinding parameters and start the grinding process.

# FRITSCH-COMPETENCE

## PATENTS (pending)

DE 10 2012 009 982 A1  
 DE 10 2012 009 984 A1  
 DE 10 2012 009 985 A1  
 DE 10 2012 009 987 A1

## TECHNICAL DATA

### Electrical details

200-240 V/1~, 50-60 Hz, 2950 watt  
 200-230 V/3~, 50-60 Hz, 2950 watt

**Motor shaft power in accordance with VDE 0530, EN 60034**

2.2 kW

### Weight

Net 110 kg

Gross 145 kg

### Dimensions w x d x h

Bench top instrument 82 x 52 x 48 cm

### Packaging w x d x h

Case 100 x 72 x 83 cm

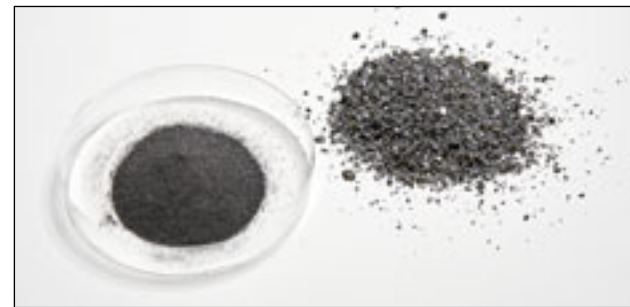
### Emissions value of workplace

**according to DIN EN ISO 3746:2005**

approx. 84 dB(A)

*(depending on the material to be ground, grinding bowls/balls used, selected rotational speed)*

<b>Order no.</b>	<b>200-240 V/1~</b>	<b>200-230 V/3~</b>
	06.3020.00	06.3030.00



Ferrovanadium before and after grinding with the Planetary Mill PULVERISETTE 6 *premium line*



Optimal preparation of a soil sample using the Planetary Mill PULVERISETTE 6 *premium line*

## APPLICATION EXAMPLES

<b>Geology/Mineralogy</b>	Rocks, gravel, sand, minerals
<b>Metallurgy</b>	Ores, slags
<b>Ceramics</b>	Porcelain, sintered ceramics, clay, fireclay
<b>Material research/ Mechanical alloying</b>	Pigments, precious materials, new materials, alloys, mechanical alloying and activation
<b>Nanotechnology</b>	Graphite, titanium dioxide, silicon dioxide, aluminium oxide, diazepines
<b>Pharmaceuticals</b>	Ophthalmological agents, gels, creams, extracts, drugs, pastes, dragées, tablets
<b>Chemistry</b>	Pesticides, fertilisers, salts, inorganic and organic materials
<b>Biology</b>	Plants, leaves, freeze-dried samples
<b>Sample preparation for analysis</b>	Spectroscopy, x-ray fluorescence, x-ray structure analysis, chromatography

IQ/OQ documentation available to support equipment qualification.

## FACTS AND ADVANTAGES

- Absolutely safe operation – motor-driven, user-independent reproducible clamping
- 2 grinding stations for grinding bowls 160 ml, 250 ml and 500 ml volume
- Min. sample quantity 40 ml, max. sample quantity 450 ml
- Simultaneous processing of up to 4 samples
- Grinding ball diameters 0.1–40 mm
- Easy-to-clean grinding elements
- Rotational speed of main disk 100–800 rpm, relative rotational speed of grinding bowls up to 1600 rpm
- Transmission ratio planetary disk / grinding bowl  $i_{\text{relative}} = 1 : -2$
- Effective diameter of main disk 190 mm
- Centrifugal acceleration ( $g = 9.81 \text{ m/s}^2$ ) 64 g
- Up to 10 programmes can be saved, software MillControl (optional), USB interface for transmission of process parameters
- 2-year guarantee



# PULVERISETTE 7

*premium line*

## Nano grinding for small quantities

- Extra strong centrifugal acceleration with up to 95 g and up to 1100 rpm
- Extremely fast bowl changing due to SelfLOCK clamping
- 2 grinding stations for grinding bowls 20 ml, 45 ml and 80 ml volume
- For the first time grinding bowls and lid form a single unit
- Intuitive touchscreen operation

Due to sunken grinding bowls, the high-performance Planetary Micro Mill PULVERISETTE 7 *premium line* reaches unprecedented relative rotational speeds of the grinding of up to 2200 rpm and centrifugal accelerations of 95 times the force of gravity. Thereby is the application of energy approximately 150 % above that of conventional Planetary Mills. For ultra-fine grinding results down into the nano range in shorter times.

**FRITSCH premium advantage:** Fast, easy and safe operation due to extremely fast bowl changing without complex bowl clamping. In the case of impermissible operating states, the mill blocks the start and automatically shuts off if imbalance occurs. Maximum safety for man and machine.





**FRITSCH premium advantage: Adjustable touchscreen**

with logical menu structure in 10 languages for easy, intuitive user navigation. Adjustable with a single hand motion for easy adaption to any set-up situation. Here you enter the variable rotational speed and define the grinding time. You can programme interval and pause times using the minutes and seconds timer and can save up to 10 programmes.



**Easy recording**

due to perfect integration into the IT structure of your laboratory and the MillControl software. All data can be easily exported via USB.



## The patent: SelfLOCK

**For maximum safety at maximum rotational speeds: For the first time, the bowl and lid form a single unit – and snap securely into place in the machine due to the revolutionary SelfLOCK clamping. Without additional clamping and without the risk of incorrect operation.**



### **FRITSCH premium advantage: Bowl and lid as a secure unit**

By using two side snaps, we combine the lid and bowl into a secure unit which is just as easy re-opened. Simple, fast and absolutely safe.

### **FRITSCH premium advantage: Intelligent bowl detection**

An RFID chip in the button of the bowl lid saves the exact parameters of the grinding bowl. Your advantage: when a bowl is inserted into the mill, the control system detects the specific bowl, automatically sets the grinding parameters to the maximum permitted default values to prevent impermissible grinding settings.\* Your advantage: always optimal and guaranteed constant results.

### **FRITSCH premium advantage: Securely sunken bowls**

Discover a completely new dimension in high-tech grinding with the FRITSCH PULVERISETTE 7 *premium line*: for the first time, we have sunken the grinding bowls of our high-performance mill in the grinding chamber. This enables us to reach unprecedented rotational speeds and ultra-fine grinding results down into the nano range. Brilliantly simple – brilliantly effective!

\* At [www.fritsch.de](http://www.fritsch.de), you find the maximum speed limits for different grinding ball diameters and grinding bowls made of agate.

## ONLY AVAILABLE FROM FRITSCH

Turn your Planetary Mill into an analytical measuring system with the EASY GTM system.



### Safe grinding under overpressure

The standard lids of the grinding bowls for the PULVERISETTE 7 *premium line* are equipped with a manual device that allows a controlled reduction of overpressure. As a result, the grinding bowls can always be easily and safely opened.





## As simple as a centrifuge



### **FRITSCH premium advantage: Snapping bowl lids**

To close the grinding bowls, the lid is simply placed on the bowl and securely fastened with a single hand motion due to two practical snaps.



### **FRITSCH premium advantage: Easy bowl positioning**

The grinding chamber of the PULVERISETTE 7 premium line opens automatically. The bowl holder automatically rotates into a convenient position.



### **FRITSCH premium advantage: SelfLOCK**

The bowl is simply inserted with light pressure and automatically snaps into place.



### **FRITSCH premium advantage: Automatic closing**

The grinding chamber also closes automatically. Grinding starts once it is closed. After grinding, the bowls are removed and opened with just two simple hand motions. For this reason, the PULVERISETTE 7 premium line is just as simple to operate as a centrifuge.



## FRITSCH-COMPETENCE

### PATENTS

EP 1 933 984 B1  
EP 1 933 985 B1  
EP 1 945 364 B1  
EP 2 010 329 B1

### UTILITY MODELS

No. 20 2005 015 896.8  
No. 20 2006 006 747.7  
No. 20 2006 007 543.7  
No. 20 2006 007 738.3  
No. 20 2006 007 799.5  
No. 20 2006 007 800.2  
No. 20 2006 007 801.0

### TECHNICAL DATA

#### Electrical details

100-240 V/1~, 50-60 Hz, 1200 watt

Motor shaft power in accordance with VDE 0530, EN 60034

0,94 kW

#### Weight

Net 44 kg

Gross 61 kg

#### Dimensions w x d x h

Bench top instrument 40 x 58 x 36 cm

#### Packaging w x d x h

Case 68 x 54 x 72 cm

#### Emissions value of workplace

according to DIN EN ISO 3746:2005

approx. 80 dB(A)

(depending on the material to be ground, grinding bowls/balls used, selected rotational speed)

#### Order no.

07.5000.00



Optimal preparation of a granite sample using the Planetary Micro Mill PULVERISETTE 7 *premium line*

IQ/OQ documentation available to support equipment qualification.



Glass before and after grinding with the Planetary Micro Mill PULVERISETTE 7 *premium line*

### APPLICATION EXAMPLES

<b>Geology/Mineralogy</b>	Rocks, gravel, sand, minerals
<b>Metallurgy</b>	Ores, slags
<b>Ceramics</b>	Porcelain, sintered ceramics, clay, fireclay
<b>Material research/ Mechanical alloying</b>	Pigments, precious materials, new materials, alloys, mechanical alloying and activation
<b>Nanotechnology</b>	Graphite, titanium dioxide, silicon dioxide, aluminium oxide, diazepines
<b>Pharmaceuticals</b>	Ophthalmological agents, gels, creams, extracts, drugs, pastes, dragées, tablets
<b>Chemistry</b>	Pesticides, fertilisers, salts, inorganic and organic materials
<b>Biology</b>	Plants, leaves, freeze-dried samples
<b>Sample preparation for analysis</b>	Spectroscopy, x-ray fluorescence, x-ray structure analysis, chromatography

### FACTS AND ADVANTAGES

- Absolutely safe operation – due to the revolutionary SelfLOCK, grinding bowls snap into place in the machine – without any additional clamping
- Min. sample quantity 2 ml, max. sample quantity 70 ml
- Simultaneous processing of to 2 samples
- Grinding ball diameters 0.1–20 mm
- Easy-to-clean grinding elements
- Rotational speed of main disk 100–1100 rpm, relative rotational speed of grinding bowls up to 2200 rpm
- Transmission ratio planetary disk / grinding bowl  $i_{\text{relative}} = 1 : -2$
- Effective diameter of main disk 140 mm
- Centrifugal acceleration ( $g = 9.81 \text{ m/s}^2$ ) 95 g
- Up to 10 programmes can be saved, software MillControl (optional), USB interface for transmission of process parameters
- 2-year guarantee



## Well-conceived grinding bowls

All grinding bowls *premium line* and the corresponding balls are available in different materials to directly prevent contamination of the sample as a result of undesired abrasion. In normal cases, grinding bowls and balls of the same material are used. You can select different grinding ball sizes in order to adapt the grinding to your specific application. Our tip: To shorten the grinding time, grinding bowls and balls with a higher density and correspondingly higher impact energy can be used.



All grinding bowls of the FRITSCH *premium line* are cased in stainless steel, have a label and the same inner diameter regardless of their volume.

**Please note:** The material of the grinding elements must always be harder than the material to be ground.

### Material data for grinding bowls/grinding balls

Material	Main component of the material*	Density g/cm <sup>3</sup>	Abrasion resistance	Use for sample material
Agate	SiO <sub>2</sub>	2.65	Good	Soft to medium-hard samples
Sintered corundum	Al <sub>2</sub> O <sub>3</sub>	3.8	Fairly good	Medium-hard, fibrous samples
Silicon nitride	Si <sub>3</sub> N <sub>4</sub>	3.25	Excellent	Abrasive samples, metal-free grinding
Zirconium oxide	ZrO <sub>2</sub>	5.7	Very good	Fibrous, abrasive samples
Stainless steel	Fe – Cr – Ni	7.8	Fairly good	Medium-hard, brittle samples
Hardened steel	Fe – Cr	7.9	Good	Hard, brittle samples
Hardened, stainless steel	Fe – Cr	7.65	Good	Hard, medium-hard, brittle samples
Hardmetal tungsten carbide	WC	14.95	Very good	Hard, abrasive samples

\* At [www.fritsch.de](http://www.fritsch.de), you can find the corresponding element analyses with detailed information about the materials.



**FRITSCH premium advantage:** Grinding in inert gas and mechanical alloying/activation are possible with the gassing lids *premium line*.

### IN SITU measurement

Turn your Planetary Mill PULVERISETTE 6 *premium line* and Planetary Micro Mill PULVERISETTE 7 *premium line* into an analytical measuring system by using the EASY GTM system (Gas Pressure and Temperature Measurement System) with special lid and transmitter as well as a receiver board and the included MillControl software. Your advantage: easy and safe monitoring and analysis of thermal effects, physical and chemical reactions or increases/decreases in pressure through continuous measurement of gas pressure and temperature directly in the grinding bowl. The mill is automatically controlled to ensure that the set parameters are not exceeded. EASY GTM bowls are available in different materials and volumes.

### FRITSCH software MillControl

The FRITSCH Planetary Mills *premium line* can also be controlled in addition to the touchscreen via the FRITSCH software MillControl.

#### Your advantages:

- Automatic control of the mill and validation of grinding process
- Monitoring and graphical display of the set and actual rotational speed and power consumption
- Creation and saving of individual SOPs for various grinding processes with different parameters to ensure identical conditions for recurring grinding tasks
- Generation of standardised reports with the most relevant parameters
- Archive function for documenting of all grinding processes performed



EASY GTM grinding bowls  
PULVERISETTE 6 *premium line*  
and PULVERISETTE 7 *premium line*



Grinding bowls PULVERISETTE 6 *premium line*

**Grinding bowls for the PULVERISETTE 6 *premium line*** are available in the sizes 160 ml, 250 ml and 500 ml. This gives you total flexibility for optimal adjustment to your specific sample volume. If you would like to grind four samples simultaneously, simply order four grinding bowls, each with 160 ml volume and 2 stacking rings.

In general, smaller grinding balls achieve finer grinding results. We will be happy to assist you to select the right grinding bowls and ball size. Just ask us.

**+49 67 84 70 150 · [service@fritsch.de](mailto:service@fritsch.de)**

**Recommended grinding bowl filling**  
**PULVERISETTE 6 *premium line***

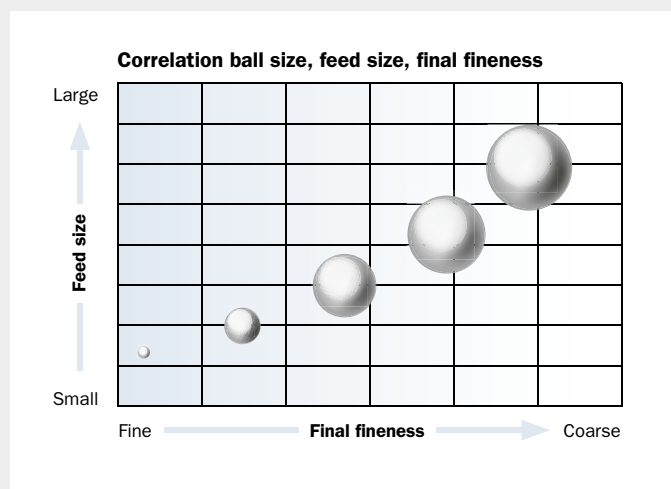
**I. Grinding balls  $\geq 5$  mm: Recommended number of balls per grinding bowl**

Grinding bowl/ useful capacity (sample volume)	160 ml 20–70 ml	250 ml 30–125 ml	500 ml 80–225 ml
Ball diameter			
40 mm			4
30 mm		6	8
20 mm	10	15	25
15 mm	30	45	70
10 mm	35	50	100
5 mm	350	1200	2000

**II. Grinding balls  $\leq 3$  mm\*: Recommended ball mass per grinding bowl**

Grinding bowl/ useful capacity (sample volume)	160 ml 20–70 ml	250 ml 30–125 ml	500 ml 80–225 ml
Material			
Zirconium oxide	250 g	400 g	800 g
Stainless steel/hardened steel	350 g	500 g	1100 g
Hardmetal tungsten carbide	650 g	1000 g	2100 g

\* Grinding balls with a diameter of 3 mm and less must be weighed out. The respective tables for the PULVERISETTE 6 and PULVERISETTE 7 *premium line* provide you with the required mass per grinding bowl.





Grinding bowls PULVERISETTE 7 *premium line*

## Recommended grinding bowl filling PULVERISETTE 7 *premium line*

### I. Grinding balls $\geq 5$ mm: Recommended number of balls per grinding bowl

Grinding bowl/ useful capacity (sample volume)	20 ml 1–9 ml	45 ml 3–20 ml	80 ml 10–30 ml
Ball diameter			
20 mm			5
15 mm		7	10
10 mm	10	18	25
5 mm	80	180	250

### II. Grinding balls $\leq 3$ mm\*: Recommended ball mass per grinding bowl

Grinding bowl/ useful capacity (sample volume)	20 ml 1–9 ml	45 ml 3–20 ml	80 ml 10–30 ml
Material			
Zirconium oxide	30 g	70 g	100 g
Stainless steel/hardened steel	40 g	90 g	150 g
Hardmetal tungsten carbide	80 g	200 g	300 g

The specified ball filling per bowl is the minimum quantity and should possibly be increased depending on the material properties. In exceptional cases, the number of grinding balls can be reduced by up to 15%. However, increased abrasion should be expected.

## Grinding bowls for the PULVERISETTE 7 *premium line*

are available in the sizes 20 ml, 45 ml and 80 ml for optimal adaption to your sample volume. For uniform grinding without imbalance, always choose two grinding bowls of the same weight.

## Special emptying device

After grinding in suspension, the FRITSCH special emptying device with 2 sieves enables a quick and easy separation of grinding balls and suspension. For this purpose, the device is firmly attached onto the grinding bowl and the suspension is drawn out with a syringe. The grinding balls remain in the bowl.



**ORDERING DATA**

Order no. Article

**PLANETARY MILL *premium line*****PULVERISETTE 6***Instrument without grinding bowls and balls, incl. ServoLOCK clamping*

06.3020.00 For 200-240 V/1~, 50-60 Hz, 2950 watt  
 06.3030.00 For 200-230 V/3~, 50-60 Hz, 2950 watt  
 The PULVERISETTE 6 with voltage of „/3~“ can **only** be operated on a three-phase supply network.

**GRINDING BOWLS WITH LID AND SEAL RING *premium line*****Grinding bowls 500 ml volume****for PULVERISETTE 6 *premium line***

50.6400.00 Agate, with steel casing  
 50.6490.00 Zirconium oxide, with steel casing  
 50.6550.00 Hardened, stainless steel, with steel casing  
 50.6580.00 Hardmetal tungsten carbide, with steel casing

**Grinding bowls 250 ml volume****for PULVERISETTE 6 *premium line***

50.6610.00 Agate, with steel casing  
 50.6700.00 Zirconium oxide, with steel casing  
 50.6760.00 Hardened, stainless steel, with steel casing  
 50.6790.00 Hardmetal tungsten carbide, with steel casing

**Grinding bowls 160 ml volume****for PULVERISETTE 6 *premium line***

50.6840.00 Agate, with steel casing  
 50.6900.00 Zirconium oxide, with steel casing  
 50.6920.00 Hardened, stainless steel, with steel casing  
 50.6940.00 Hardmetal tungsten carbide, with steel casing

50.6830.13 Stacking ring for grinding bowls 160 ml volume  
 (essential, if 2 grinding bowls 160 ml volume per grinding bowl holder are used)

**Replacement seal rings****for all grinding bowls PULVERISETTE 6 *premium line***

84.0163.15 Replacement seal ring Viton 88.49 x 3.53 mm for all grinding bowls *premium line* 500 ml, 250 ml, 160 ml volume

**Certification****for PULVERISETTE 6 *premium line***

96.0310.00 IQ/OQ documentation  
 (questionnaire format – implementation by customer)

**ACCESSORIES FOR GRINDING IN INERT GAS AND FOR****MECHANICAL ALLOYING****Gassing lid with valves and seal ring****for all grinding bowls *premium line* 500 ml, 250 ml, 160 ml volume****for PULVERISETTE 6 *premium line***

50.6497.00 Zirconium oxide, with steel casing  
 50.6557.00 Hardened, stainless steel, with steel casing  
 50.6587.00 Hardmetal tungsten carbide, with steel casing

**EASY GTM – GAS PRESSURE AND TEMPERATURE MEASURING SYSTEM****for controlling the grinding process and continuous measurement of****gas pressure and temperature****for PULVERISETTE 6 *premium line***

81.0013.00 Receiver unit - board and software MillControl  
 50.9250.00 Grinding bowl made of zirconium oxide with special lid and transmitter  
 50.9280.00 Grinding bowl made of hardened stainless steel with special lid and transmitter  
 50.9310.00 Grinding bowl made of hardmetal tungsten carbide with special lid and transmitter  
 Only one receiver unit with software MillControl has to be ordered.

Order no. Article

**PLANETARY MICRO MILL *premium line*****PULVERISETTE 7***Instrument without grinding bowls and balls, incl. SelfLOCK clamping*

07.5000.00 For 100-240 V/1~, 50-60 Hz, 1200 watt

**GRINDING BOWL WITH LID AND SEAL RING *premium line*****Grinding bowls 80 ml volume****for PULVERISETTE 7 *premium line***

50.9620.00 Agate, with steel casing  
 50.9630.00 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>), with steel casing  
 50.9670.00 Silicon nitride, with steel casing  
 50.9660.00 Zirconium oxide, with steel casing  
 50.9610.00 Stainless steel, with steel casing  
 50.9650.00 Hardened steel, with steel casing  
 50.9640.00 Hardmetal tungsten carbide, with steel casing

**Grinding bowls 45 ml volume****for PULVERISETTE 7 *premium line***

50.9720.00 Agate, with steel casing  
 50.9730.00 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>), with steel casing  
 50.9770.00 Silicon nitride, with steel casing  
 50.9760.00 Zirconium oxide, with steel casing  
 50.9710.00 Stainless steel, with steel casing  
 50.9750.00 Hardened steel, with steel casing  
 50.9740.00 Hardmetal tungsten carbide, with steel casing

**Grinding bowls 20 ml volume****for PULVERISETTE 7 *premium line***

50.9820.00 Agate, with steel casing  
 50.9830.00 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>), with steel casing  
 50.9870.00 Silicon nitride, with steel casing  
 50.9860.00 Zirconium oxide, with steel casing  
 50.9810.00 Stainless steel, with steel casing  
 50.9850.00 Hardened steel, with steel casing  
 50.9840.00 Hardmetal tungsten carbide, with steel casing

**Replacement seal rings****for all grinding bowls PULVERISETTE 7 *premium line***

84.0342.15 Replacement seal ring Silicone 57.5 x 48 x 2 mm for all grinding bowls *premium line* 80 ml, 45 ml, 20 ml volume  
 84.0341.15 Replacement seal ring Viton 57.5 x 48 x 2 mm for all grinding bowls *premium line* 80 ml, 45 ml, 20 ml volume

**Accessories****for all grinding bowls PULVERISETTE 7 *premium line***

50.9900.00 Special emptying device for all grinding bowls *premium line* 80 ml, 45 ml, 20 ml volume  
 50.9890.00 Counterweight for all grinding bowls *premium line* 80 ml, 45 ml, 20 ml volume  
 (essential for weight compensation, if only one grinding bowl is used for grinding)

**Certification****for PULVERISETTE 7 *premium line***

96.0260.00 IQ/OQ documentation  
 (questionnaire format – implementation by customer)

**ACCESSORIES FOR GRINDING IN INERT GAS AND FOR****MECHANICAL ALLOYING****Gassing lid with valves and seal ring****for all grinding bowls *premium line* 80 ml, 45 ml, 20 ml volume****for PULVERISETTE 7 *premium line***

50.9627.00 Agate, with steel casing  
 50.9637.00 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>), with steel casing  
 50.9677.00 Silicon nitride, with steel casing  
 50.9667.00 Zirconium oxide, with steel casing  
 50.9617.00 Stainless steel, with steel casing  
 50.9657.00 Hardened steel, with steel casing  
 50.9647.00 Hardmetal tungsten carbide, with steel casing  
 Gassing lids with Swagelok valves are available on request.

**EASY GTM – GAS PRESSURE AND TEMPERATURE MEASURING SYSTEM****for controlling the grinding process and continuous measurement of****gas pressure and temperature****for PULVERISETTE 7 *premium line***

81.0013.00 Receiver unit - board and software MillControl  
 50.9040.00 80 ml grinding bowl made of agate with special lid and transmitter  
 50.9080.00 80 ml grinding bowl made of sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>) with special lid and transmitter  
 50.9090.00 80 ml grinding bowl made of silicon nitride with special lid and transmitter  
 50.9070.00 80 ml grinding bowl made of zirconium oxide with special lid and transmitter  
 50.9020.00 80 ml grinding bowl made of stainless steel with special lid and transmitter  
 50.9050.00 80 ml grinding bowl made of hardened steel with special lid and transmitter  
 50.9060.00 80 ml grinding bowl made of hardmetal tungsten carbide with special lid and transmitter  
 Only one receiver unit with software MillControl has to be ordered.  
 EASY GTM is also available for further grinding bowl volumes on request.

Order no. Article

## ACCESSORIES FOR AUTOMATIC CONTROL OF THE MILL AND VALIDATION OF THE GRINDING PROCESS

**Software MillControl**  
for **PULVERISETTE 6** and **PULVERISETTE 7 premium line**

83.5605.00 Software MillControl for Windows

## GRINDING BALLS 40 MM – 5 MM DIAMETER (PIECE)

**Grinding balls 40 mm diameter**  
for grinding bowls 500 ml

55.0400.27 Zirconium oxide  
55.0400.10 Stainless steel  
55.0400.09 Hardened steel  
55.0400.08 Hardmetal tungsten carbide

**Grinding balls 30 mm diameter**  
for grinding bowls 500 ml, 250 ml

55.0300.05 Agate, polished  
55.0300.27 Zirconium oxide  
55.0300.10 Stainless steel  
55.0300.09 Hardened steel  
55.0300.08 Hardmetal tungsten carbide

**Grinding balls 20 mm diameter**  
for grinding bowls 500 ml, 250 ml, 160 ml, 80 ml

55.0200.05 Agate, polished  
55.0200.06 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>)  
55.0200.31 Silicon nitride  
55.0200.27 Zirconium oxide  
55.0200.10 Stainless steel  
55.0200.09 Hardened steel  
55.0200.08 Hardmetal tungsten carbide

**Grinding balls 15 mm diameter**  
for grinding bowls 500 ml, 250 ml, 160 ml, 80 ml, 45 ml

55.0150.05 Agate, polished  
55.0150.06 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>)  
55.0150.31 Silicon nitride  
55.0150.27 Zirconium oxide  
55.0150.10 Stainless steel  
55.0150.09 Hardened steel  
55.0150.08 Hardmetal tungsten carbide

**Grinding balls 10 mm diameter**  
for grinding bowls 500 ml, 250 ml, 160 ml, 80 ml, 45 ml, 20 ml

55.0100.05 Agate, polished  
55.0100.06 Sintered corundum (99.7% Al<sub>2</sub>O<sub>3</sub>)  
55.0100.31 Silicon nitride  
55.0100.27 Zirconium oxide  
55.0100.10 Stainless steel  
55.0100.09 Hardened steel  
55.0100.08 Hardmetal tungsten carbide

**Grinding balls 5 mm diameter**  
for grinding bowls 500 ml, 250 ml, 160 ml, 80 ml, 45 ml, 20 ml

55.0050.05 Agate, polished (100 units weigh approx. 17 g)<sup>1)</sup>  
55.0050.27 Zirconium oxide (100 units weigh approx. 38 g)<sup>1)</sup>  
55.0050.10 Stainless steel (100 units weigh approx. 51 g)<sup>1)</sup>  
55.0050.09 Hardened steel (100 units weigh approx. 52 g)<sup>1)</sup>  
55.0050.08 Hardmetal tungsten carbide (100 units weigh approx. 97 g)<sup>1)</sup>  
<sup>1)</sup> With aid of the indication of the weight, can the high number of balls per grinding bowl be determined by weighing.

## GRINDING BALLS ≤ 3 MM DIAMETER (100-G PACKAGE)

**Grinding balls ≤ 3 mm diameter**  
for grinding bowls 500 ml, 250 ml, 160 ml, 80 ml, 45 ml, 20 ml

55.0030.27 Zirconium oxide 3 mm diameter  
55.0020.27 Zirconium oxide 2 mm diameter  
55.0015.27 Zirconium oxide 1.5 mm diameter  
55.0010.27 Zirconium oxide 1 mm diameter  
55.0005.27 Zirconium oxide 0.5 mm diameter  
55.0001.27 Zirconium oxide 0.1 mm diameter

55.0030.10 Stainless steel 3 mm diameter  
55.0010.10 Stainless steel 1 mm diameter

55.0030.09 Hardened steel 3 mm diameter  
55.0010.09 Hardened steel 1 mm diameter

55.0030.08 Hardmetal tungsten carbide 3 mm diameter  
55.0016.08 Hardmetal tungsten carbide 1.6 mm diameter  
55.0006.08 Hardmetal tungsten carbide 0.6 mm diameter



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