In focus: Vibrating Cup Mill PULVERISETTE 9

The most obvious truth concerning the Vibrating Cup Mill is: it has stood the test of time and is still EFFECTIVE! There is hardly any other mill faster at grinding hard and brittle materials down to analytical fineness is so easy to clean!

Operating principle: The grinding set is set on a vibrating disk with a quick-release clamping system. The disk vibrates in a horizontal circular motion which results in the grinding set exerting both high impact and frictional forces on the sample being ground.

Fields of application: Fast dry and wet grinding of hard, brittle as well as fibrous materials down to analytical fineness without weight loss is achievable. The recommended feed size of 12 mm is significantly exceeded by many users. Even a feed-size of 20 mm is not uncommon. Final fineness of the x50 value down to 5 µm can be achieved.

Accessories: We recommend hardened steel or chromium-free tool steel grinding sets for most applications. For extremely hard samples grinding sets made of hardmetal tungsten carbide should be used. For glass and ceramics are grinding sets made of zirconium oxide suitable and for soil samples agate grinding sets.

Vibrating Cup Mill PULVERISETTE 9

Products Highlights

Top performance

Motor output is not the complete answer - but even more important is the transfer of energy to the sample material being ground. Because of this, as the first company worldwide, we have developed a special motor equipped with an especially interference-resistant, torque-optimised frequency converter. It ensures that the motor output is precisely matched to the grinding material and grinding set.

- Exact adjustment of the grinding speed between 600 and 1500 rpm in steps of 50.
- Precise adjustment of rotational speed, grinding time and pause periods.
- Programming and saving of grinding cycles enabling reproducibility.
- Self-explanatory multilingual menu navigation.
- Complete soundproof lining.

Fritsch GmbH • Milling and Sizing
Industriestrasse 8 • 55743 Idar-Oberstein • Germany
Telephone +49 67 84 70 0 • Fax +49 67 84 70 11
info@fritsch.de • www.fritsch.de

Top Operation
The PULVERISETTE 9 grinding sets, which have been considerably reduced in weight, are placed at an optimised working height on a practical guide rail and then easily moved to the final position. Ergonomically perfect for your back!

- The grinding sets are now considerably lighter.
- Grinding sets are equipped with heat-insulated handles.
- The cleaning is second to none since only a few large parts have to be cleaned.

Top Safety

- Optimised tensioning of grinding set with anti-rotation lock.
- Defined final positioning for the grinding set.
- Automatic monitoring of the grinding set clamping.
- Automatic recognition for agate grinding sets to reduce the maximum rotational speeds.

Moving beyond theory – experiences in practical use

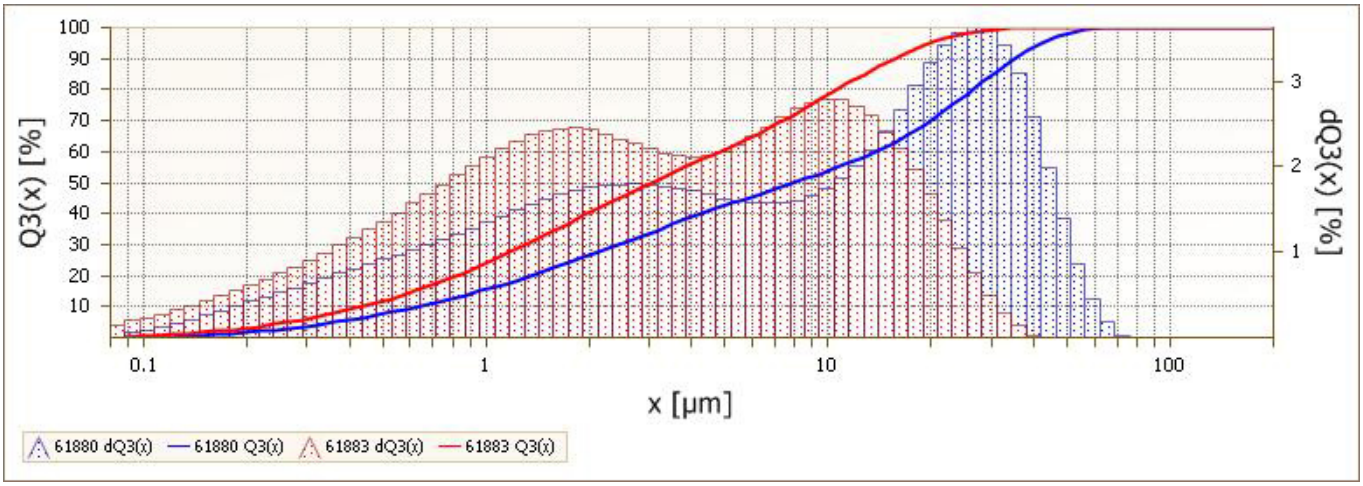
- **Soil samples** using an agate grinding set, analytical fineness is achieved after 30–60 seconds.
- **Rock samples**: Geologists and mineralogists prefer to use Vibrating Cup Mills with grinding sets of agate or hardmetal tungsten carbide to prepare samples for spectroscopic analysis.
- **Activated charcoal**: Activated charcoal can generally be ground very well in ball mills. However some types exhibit odd behaviour: A very fine powder is created which appears to behave like a highly viscous liquid. The balls are slowed down by this effect and some coarse particles escape the comminution. In this case, Vibrating Cup Mills are recommended.

RoHS and WEEE were recently hot topics
Objective: A single electronic component of approx. 5 mm length with two long contacts of approx. 20 mm. Planetary ball mills, vibratory mills and cutting mills did not succeed or were too large. The Vibrating Cup Mill with 50 ml hardmetal tungsten carbide grinding set guarantees fast and loss-free comminution.

Climate discussion is currently the number one topic. Grinding worn out solar cells so that they can be compressed into a tablet with an absolutely compressed and smooth surface is a difficult task. Planetary ball mills exhibit the phenomenon described above for activated charcoal. Only a Vibrating Cup Mill using a hardmetal tungsten carbide grinding set offers a solution here. After three minutes a sample was taken and the slightly condensed material removed from the walls of the grinding cup. After two additional minutes a powder was obtained which could be pressed to a tablet according to the requirements.

Industriestrasse 8 • 55743 Idar-Oberstein • Germany
Telephone +49 67 84 70 0 • Fax +49 67 84 70 11
info@fritsch.de • www.fritsch.de

Measurement with the Laser Particle Sizer ANALYSETTE 22 MicroTec plus



Blue curve — 3 minute grinding
Red curve — 5 minute grinding

Tab. 1: Distinctive specific values

	d10	d50	d90	100%
3 min grinding	0,6 µm	8,0 µm	35,0 µm	< 65 µm
5 min grinding	0,4 µm	3,0 µm	15,5 µm	< 35 µm

In summary it can be stated that anyone who must reduce extremely quickly hard and brittle and even fibrous materials to analytical fineness combined with ease of cleaning should look no further than the FRITSCH **Vibrating Cup Mill PULVERISETTE 9**. Already after three minutes the ground sample is for most analysis sufficiently fine enough.

Author: Dipl. Chem. Wieland Hopfe, Fritsch GmbH
E-Mail: info@fritsch.de