

# MIXER MILL MM 500 VARIO

Variability redefined



## PRODUCT ADVANTAGES

### PROCESSING 2 TO 50 SAMPLES IN ONE BATCH

The new Mixer Mill MM 500 vario is a versatile bench-top unit which provides ultimate performance with maximum flexibility for your sample preparation process. It is used for dry, wet and cryogenic grinding of small sample amounts with high throughput. The MM 500 vario can be equipped with screw-top grinding jars from 1.5 ml to 50 ml. Available materials include hardened steel, stainless steel, tungsten carbide, agate, zirconium oxide, PTFE.

For biological applications such as homogenization of plant materials, tissues or for cell disruption via bead beating, the MM 500 vario can be equipped with different adapters for single-use vials from 0.2 - 5 ml.

## MM 500 VARIO INTRODUCTION VIDEO



[Click to view video](#)

## PERFORMANCE AND DESIGN

- | Grind sizes down to 5 µm possible
- | Powerful pulverization with up to 35 Hz
- | Twice as fast as mills with only 30 Hz
- | Ergonomic design with touch display

## FLEXIBILITY

- | Suitable for dry, wet or cryogenic grinding
- | Equally suited for rapid (<2 min) and long-term grinding (up to 99 hours)
- | 12 SOPs and 4 program cycles with max. 99 repeats facilitate routine applications
- | Grinding jars of various sizes and materials; adapters for single-use vials



## SOLUTIONS FOR BIOLOGICAL APPLICATIONS AND CELL DISRUPTION

Mixer mills are widely used for homogenizing biological samples such as tissue, liver, muscle, plants, corn or sputum. For cell disruption via bead beating mixer mills are also the perfect solution. The MM 500 vario accommodates adapters for different single-use vials:

0.2 ml / 1.5 ml / 2 ml / 5 ml

Depending on the tube and the type of adapter, 5-10 tubes can be inserted per adapter, resulting in the following maximum vial capacity per batch:

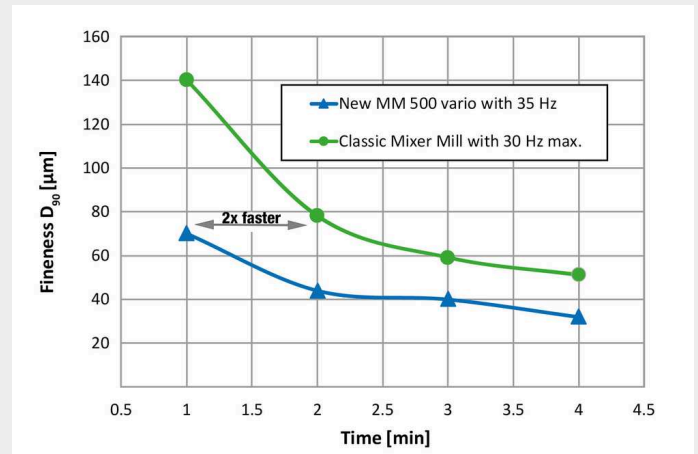
50 x 1.5 or 2 ml (or 60 x 0.2 ml)  
20 x 5 ml

Typical grinding / homogenizing processes of biological materials take less than 2 min. Cell disruption with a good reproducibility and efficiency takes 20 sec to 5 min, depending on the cell type. Cryogenic grinding in single-use vials can also be a suitable way to pulverize tough or temperature-sensitive samples.



## MAXIMIZE YOUR THROUGHPUT

- Maximum frequency of 35 Hz reduces grinding time to 50% compared to mixer mills with only 30 Hz
- Six grinding stations instead of two, as in classic mixer mills, ensure high throughput
- In combination, the throughput of the MM 500 vario is 6 times higher compared to a classic mixer mill



*Grinding of basalt in the MM 500 vario results in better fineness compared to classic Mixer Mills thanks to the increased frequency of 35 Hz instead of 30 Hz (50 ml jar + 12 x 12 mm grinding balls).*

FOR SAFE AND EFFECTIVE GRINDING PROCESSES  
**ACCESSORIES FOR THE MM 500 VARIO**



**GRINDING JARS IN 6 DIFFERENT MATERIALS**

All grinding jars of the smaller MM 400 model are compatible with the MM 500 vario. The nominal volume ranges from 1.5 ml to 50 ml and available materials include hardened steel, stainless steel, agate, tungsten carbide, zirconium oxide and PTFE, ensuring contamination-free sample preparation.

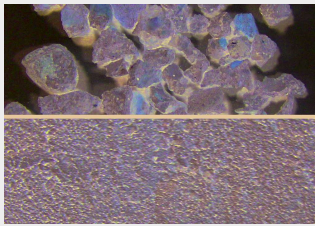


**ADAPTERS FOR SINGLE-USE VIALS**

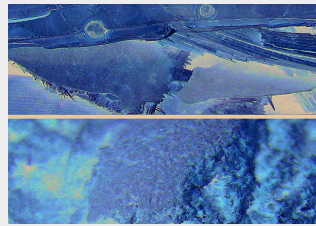
The adapters for 0.5 / 1.5 / 2 / 5 ml single-use vials of the smaller MM 400 model can be used in the MM 500 vario.

## TYPICAL SAMPLE MATERIALS

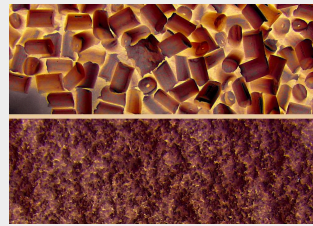
RETSCH mixer mills are true allrounders. They homogenize, for example, waste, soil, chemical products, coated tablets, drugs, ores, grain, tissue, glass, hair, ceramics, bones, plastics, alloys, minerals, oil seeds, plants, sewage sludge, pills, textiles, wool etc.



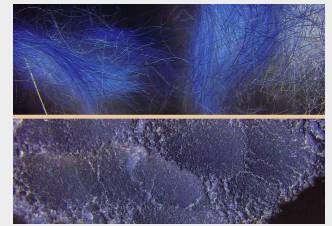
concrete



wood



plastic granulates



hair

To find the best solution for your sample preparation task, visit our application database:

MIXER MILL MM 500 VARIO

## TECHNICAL DATA

<b>Applications</b>	mechanochemistry, mechomogenization, size reduction, cryogenic grinding, mechanical alloying, mixing,
<b>Field of application</b>	agriculture, biology, chemistry / plastics, construction materials, engineering / electronics, environment / recycling, food, geology / metallurgy, glass / ceramics, medicine / pharmaceuticals
<b>Feed material</b>	hard, medium-hard, soft, brittle, elastic, fibrous
<b>Size reduction principle</b>	impact, friction
<b>Material feed size*</b>	<= 8 mm
<b>Final fineness*</b>	~ 5 µm
<b>Batch size / feed quantity*</b>	max. 6 x 20 ml
<b>No. of grinding stations</b>	6
<b>Setting of vibrational frequency</b>	digital, 3 - 35 Hz (180 - 2100 min <sup>-1</sup> )
<b>Typical mean grinding time</b>	30 s - 2 min
<b>Dry grinding</b>	yes
<b>Wet grinding</b>	yes
<b>Cryogenic grinding</b>	yes
<b>Cell disruption with reaction vials</b>	yes
<b>Self-centering clamping device</b>	yes
<b>Type of grinding jars</b>	screw top design
<b>Material of grinding tools</b>	hardened steel, stainless steel, tungsten carbide, zirconium oxide, agate, PTFE
<b>Grinding jar sizes</b>	1.5 ml / 5 ml / 10 ml / 25 ml / 35 ml / 50 ml
<b>Setting of grinding time</b>	digital, 10 s - 8 h
<b>Total grinding time</b>	99 h
<b>Storable SOPs</b>	12
<b>Number of storable cycle programs</b>	4 (with 99 repeats)
<b>Electrical supply data</b>	100-120V, 50/60 Hz; 200-230V, 50/60Hz
<b>Power connection</b>	1-phase
<b>Protection code</b>	IP 30
<b>Power consumption</b>	750 W
<b>W x H x D closed</b>	690 x 375 x 585 mm

**Net weight** ~ 60 kg

**Standards** CE



MIXER MILL MM 500 VARIO

## FUNCTION PRINCIPLE

The grinding jars of the mixer mill MM 500 vario perform radial oscillations in a horizontal position. The inertia of the grinding balls causes them to impact with high energy on the sample material at the rounded ends of the grinding jars and pulverize it. Also, the movement of the grinding jars combined with the movement of the balls result in the intensive mixing of the sample. The degree of mixing can be increased even further by using several smaller balls.



[Click to view video](#)

## THE NEW RETSCH APP



As the leading solution provider for sample preparation equipment, RETSCH has taken operating convenience to the next level and created the new RETSCH App. This tool makes working with your RETSCH mill easy and convenient:

- | Operate your devices via your smart phone or tablet
- | Control your devices based on your own application routines
- | Access information from the RETSCH database
- | Get in touch with the RETSCH service team via the app

[www.retsch.com/mm500-vario](http://www.retsch.com/mm500-vario)