

## MIXER MILL MM 200



The mixer mill MM 200 is a compact versatile benchtop unit, which has been developed specially for dry grinding of small amounts of sample.

It can mix and homogenize **powders in only a few seconds**. It is also perfectly suitable for the **disruption of biological cells** as well as for **DNA/RNA extraction**.

You may also be interested in the High Energy Ball Mill Emax, an entirely new type of mill for high energy input. The unique combination of high friction and impact results in extremely fine particles within the shortest amount of time.

## APPLICATION EXAMPLES

alloys, animal feed, bones, ceramics, cereals, chemical products, coal, coke, drugs, glass, grains, hair, minerals, oil seeds, ores, paper, plant materials, sewage sludge, soils, straw, tablets, textiles, tissue, tobacco, waste samples, wood, wool, ...

## PRODUCT ADVANTAGES

- | reproducible, efficient grinding, mixing and homogenization in seconds
- | powerful grinding by impact and friction, up to 25 Hz for up to 20 samples per run
- | 9 SOPs can be stored
- | wide range of accessories including various jar and ball sizes, adapter racks, grinding tool materials

## FEATURES

<b>Applications</b>	size reduction, mixing, homogenization, cell disruption
<b>Field of application</b>	Chemistry, agriculture, biology, construction materials, engineering / electronics, environment / recycling, food, geology / metallurgy, glass / ceramics, medicine / pharmaceuticals
<b>Feed material</b>	hard, medium-hard, soft, brittle, fibrous
<b>Size reduction principle</b>	impact, friction
<b>Material feed size*</b>	<= 6 mm
<b>Final fineness*</b>	~ 10 µm
<b>Batch size / feed quantity*</b>	max. 2 x 10ml
<b>No. of grinding stations</b>	2
<b>Setting of vibrational frequency</b>	digital, 3 - 25 Hz (180 - 1500 min <sup>-1</sup> )
<b>Typical mean grinding time</b>	30 s - 2 min
<b>Dry grinding</b>	yes
<b>Wet grinding</b>	no
<b>Cryogenic grinding</b>	no
<b>Cell disruption with reaction vials</b>	yes, up to 10 x 2.0 ml
<b>Self-centering clamping device</b>	no
<b>Type of grinding jars</b>	with push-fit lid
<b>Material of grinding tools</b>	hardened steel, stainless steel, tungsten carbide, agate, zirconium oxide, PTFE
<b>Grinding jar sizes</b>	1.5 ml / 5 ml / 10 ml / 25 ml
<b>Setting of grinding time</b>	digital, 10 s - 99 min
<b>Storable SOPs</b>	9
<b>Electrical supply data</b>	100-240 V, 50/60 Hz
<b>Power connection</b>	1-phase
<b>Protection code</b>	IP 30
<b>Power consumption</b>	100 W
<b>W x H x D closed</b>	371 x 266 x 461 mm
<b>Net weight</b>	~ 25 kg
<b>Standards</b>	CE

\*depending on feed material and instrument configuration/settings

## FUNCTIONAL PRINCIPLE

The grinding jars of the MM 200 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. If several small balls are used (e.g. glass beads) then, for example, biological cells can be disrupted. The large frictional impact effects between the beads ensure effective cell disruption.



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[www.retsch.com/mm200](http://www.retsch.com/mm200)