

Mixer Mills, RETSCH

MM 200 / MM 400 / MM 500 / CryoMill mixer mills

Application:

Mixer mills are all-round talents in the laboratory. They have been developed especially for grinding, homogenizing and mixing of small sample amounts within seconds. Furthermore, they are perfectly suitable for disruption of biological cells as well as for DNA/RNA extraction. For the MM 400, dust-proof and closed milling containers with screw cap are available, which also enable wet millings and cryogenic grinding.

The MM 500 is the first ball mill in the world that, thanks to its high energy input, is suitable for efficient wet grinding of samples down to the nanometer range or for mechano-chemical applications without significant heat generation. Performance, operation, application areas and design of the new MM 500 make this mill a perfect combination of a classic mixer mill and a planetary ball mill!

The CryoMill is suitable for cryogenic grinding of materials that cannot be milled at room temperature, or the composition of which would change when milled at room temperature. The integrated conditioning system constantly cools the grinding jar with liquid nitrogen before and during milling. In this way, the sample is embrittled, slightly volatile components are retained. As the CryoMill can also be operated without cooling, it is fit for universal use. Thanks to the patented LN₂ supply, direct contact with LN₂ is avoided, ensuring particularly safe operation.

Features of MM 200 / MM 400:

- Reproducible, efficient grinding, mixing in homogenizing within seconds
- Impact and friction for powerful grinding, up to 20 samples in one go
- For dry, wet, and cryogenic grinding (MM 400)
- Grinding jar with screw cap for loss-free grinding (MM 400)
- 9 Standard Operating Procedures (SOP) can be stored
- Extensive range of accessories, e.g. grinding jars and ball grinders in various sizes and materials, adapters

Features of MM 500:

- Suitable for continuous long-term milling processes and efficient short-term milling with a high energy input
- Pulverization < 100 nm (depending on product properties and process parameters)
- Powerful grinding with 35 Hz
- Jars remain conveniently clamped for periodic sample extraction
- Choose from 4 different jar materials
- 12 standard operating procedures (SOP) can be saved
- 4 program cycles with up to 99 repetitions can be saved

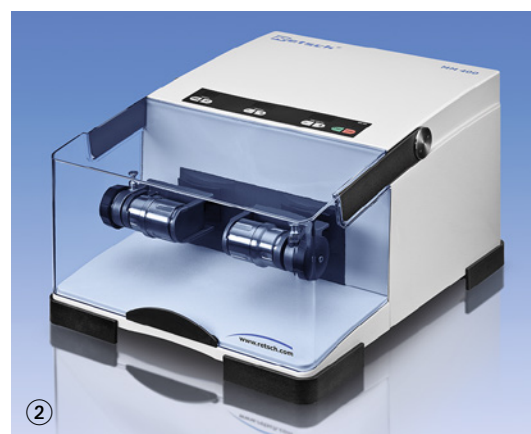
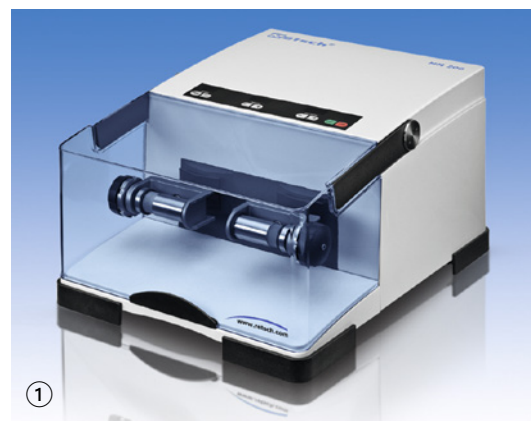
Features of CryoMill:

- Impact and friction at 30 Hz for powerful grinding
- Direct user contact with LN₂ is avoided thanks to the patented LN₂ supply
- Autofill system for automatic dosing of the liquid LN₂
- Grinding jar with screw cap for loss-free grinding
- Clearly structured user interface, 9 SOPs storable
- Extensive range of accessories, e.g. LN₂ supply, grinding jars and ball grinders in various sizes and materials, adapters

Technical data:

	MM 200	MM 400	MM 500	CryoMill
Input grain size ¹⁾ :	up to 6 mm	up to 8 mm	up to 10 mm	up to 8 mm
Final grain size ¹⁾ :	approx. 10 µm	approx. 5 µm	approx. 0.1 µm	approx. 5 µm
Discharge ¹⁾ :	up to 2 × 10 ml	max. 2 × 20 ml	up to 2 × 45 ml	max. 20 ml
Digital preselection of vibrational frequency:	3 – 25 Hz	3 – 30 Hz	3 – 35 Hz	3 – 30 Hz
	(180 – 1500 min ⁻¹)	(180 – 1800 min ⁻¹)	(180 – 2100 min ⁻¹)	(180 – 1800 min ⁻¹)
Dry / Wet /	yes / no / no	yes / yes / with Kryokit	yes / yes / yes	yes / yes / yes
Cryogenic grinding:		for grinding bowl precooling	Kryokit for grinding bowl precooling	
External dimensions (W×H×D):	371 × 266 × 461 mm	371 × 266 × 461 mm	690 × 375 × 585 mm	385 × 370 × 570 mm
Weight (net):	approx. 25 kg	approx. 26 kg	60 kg	40 kg
Power supply:	100 – 240 V, 50/60 Hz	100 – 240 V, 50/60 Hz	100 – 230 V, 50/60 Hz	100 – 240 V, 50/60 Hz

¹⁾ Depending on feed material and instrument configuration/settings



Article	Order No.
① Mixer mill MM 200	10 29 20200
② Mixer mill MM 400	10 29 20400
③ Mixer mill MM 500, 200 – 230 V	10 29 20003
③ Mixer mill MM 500, 100 – 120 V	10 29 20004
④ Mixer mill CryoMill	10 29 20800

Grinding jars and grinding balls please order separately.

IQ/OQ documentation on request.

Accessories for cryogenic grinding with MM 400 and MM 500 on request.

CryoMill: Autofill with LN₂ container and safety valve on request.



⑤ Grinding jars MM 200

Material	Vol. ml	Order No.
Hardened steel	25	10 29 22052
Stainless steel	1.5	10 29 22057
Stainless steel	5	10 29 22059
Stainless steel	10	10 29 22061
Stainless steel	25	10 29 22119
Tungsten carbide	5	10 29 22115
Tungsten carbide	10	10 29 22009

Material	Vol. ml	Order No.
Zirconium oxide	10	10 29 22194
Zirconium oxide	25	10 29 22195
Agate	5	10 29 22113
Agate	10	10 29 22008
PTFE	10	10 29 22184
PTFE	25	10 29 22151

⑥ Grinding jars MM 400, screw top design

Material	Vol. ml	Order No.
Hardened steel	25	53 29 20237
Rust-proof steel	1.5	53 29 20230
Rust-proof steel	5	53 29 20231
Rust-proof steel	10	53 29 20236
Rust-proof steel	25	53 29 20213
Rust-proof steel	35	53 29 20214
Rust-proof steel	50	53 29 20216
Tungsten carbide	10	53 29 20235

Material	Vol. ml	Order No.
Tungsten carbide	25	53 29 20217
Agate	5	53 29 20232
Agate	10	53 29 20233
Zircon oxide	10	53 29 20234
Zircon oxide	25	53 29 20201
Zircon oxide	35	53 29 20215
PTFE	25	10 29 22238
PTFE	35	10 29 22244

Grinding jars MM 500, Screw-Lock

Material	Vol. ml	Order No.
Hardened steel	50	10 29 20463
Hardened steel	80	10 29 20468
Hardened steel	125	10 29 20470
Stainless steel	50	10 29 20447
Stainless steel	80	10 29 20467
Stainless steel	125	10 29 20420

Material	Vol. ml	Order No.
Tungsten carbide	50	10 29 20466
Tungsten carbide	80	10 29 20479
Zircon oxide	50	10 29 20464
Zircon oxide	80	10 29 20417
Zircon oxide	125	10 29 20471

Grinding jars CryoMill, screw top design

Material	Vol. ml	Order No.
Hardened steel	5	10 29 22300
Hardened steel	25	10 29 22297
Hardened steel	35	10 29 22298
Hardened steel	50	10 29 22299
Rust-proof steel	5	10 29 22290

Material	Vol. ml	Order No.
Rust-proof steel	10	10 29 22331
Rust-proof steel	25	10 29 22289
Rust-proof steel	35	10 29 22288
Rust-proof steel	50	10 29 22284
PTFE	25	10 29 22309

* for use with adapter 10 29 26272

Accessories for CryoMill

Article	Order No.
Autofill with LN ₂ container and safety valve, 50 litres	10 29 22482
Connection tube, incl. safety valve for LN ₂ supply provided by customer	10 29 27101
Adapter for use of 2/4 grinding jars, 5 ml	10 29 26272
Adapter for use of 2/4/6 reaction vials, 2 ml	10 29 26277
Safe-lock reaction vials 2 ml, 1000 pcs.	10 29 27491



Grinding balls MM 200 / MM 400 / MM 500 / CryoMill

Article	Order No.
Grinding ball, hardened steel, 5 mm	53 29 46084
Grinding ball, hardened steel, 7 mm	53 29 46085
Grinding ball, hardened steel, 10 mm	53 29 36859
Grinding ball, hardened steel, 12 mm	53 29 46045
Grinding ball, hardened steel, 15 mm	10 29 28108
Grinding balls, stainless steel, 3 mm, approx. 200 pcs.	10 29 25002
Grinding balls, stainless steel, 5 mm, approx. 200 pcs.	10 29 25005
Grinding ball, stainless steel, 5 mm	53 29 46087
Grinding ball, stainless steel, 7 mm	53 29 46088
Grinding ball, stainless steel, 10 mm	53 29 36863
Grinding ball, stainless steel, 12 mm	53 29 46046
Grinding ball, stainless steel, 15 mm	10 29 28109
Grinding ball, stainless steel, 20 mm	53 29 43032
Grinding ball, stainless steel, 25 mm	53 29 36805
Grinding balls, tungsten carbide, 3 mm, approx. 200 pcs.	10 29 25006
Grinding balls, tungsten carbide, 5 mm, approx. 200 pcs.	10 29 25004
Grinding ball, tungsten carbide, 5 mm	53 29 46090
Grinding ball, tungsten carbide, 7 mm	53 29 46091
Grinding ball, tungsten carbide, 10 mm	53 29 36871
Grinding ball, tungsten carbide, 12 mm	53 29 46047
Grinding ball, tungsten carbide, 15 mm	10 29 28110
Grinding ball, agate, 12 mm	53 29 46044
Grinding ball, agate, 5 mm	53 29 46094
Grinding ball, agate, 7 mm	53 29 46095
Grinding ball, agate, 10 mm	53 29 36867
Grinding balls, zirconium oxide, 0.1 mm, 0.5 kg	10 29 28805
Grinding balls, zirconium oxide, 0.5 mm, 0.5 kg	10 29 28803
Grinding balls, zirconium oxide, 1 mm, 0.5 kg	10 29 28804
Grinding balls, zirconium oxide, 3 mm, approx. 200 pcs.	10 29 25007
Grinding balls, zirconium oxide, 5 mm, approx. 200 pcs.	10 29 25009
Grinding ball, zirconium oxide, 12 mm	53 29 46073
Grinding ball, zirconium oxide, 15 mm	10 29 28113
Grinding ball, zirconium oxide, 20 mm	53 29 43044
Grinding ball, PTFE, 10 mm	10 29 26045
Grinding ball, PTFE, 12 mm	10 29 26043
Grinding ball, PTFE, 15 mm	10 29 28115

Contact us to ask for other diameters and glass beads.

Accessories MM 200 / MM 400 / MM 500 for cell disruption

Article	Order No.
Adapter MM 200/400 for 5 test tubes 1.5 and 2.0 ml	10 29 28005
Adapter MM 200/400 for 10 test tubes 0.2 ml	10 29 28006
Adapter rack MM 400 for 10 standard test tubes 1.5 and 2.0 ml	10 29 28008
Adapter MM 400 for 5 standard test tubes 5 ml	10 29 28010
Adapter for 4 conical centrifuge tubes e.g. for Falcon Tubes, 2 pcs., incl. 20 tubes	10 29 28009
Grinding balls, stainless steel, 3 mm, approx. 200 pcs.	10 29 25002
Grinding balls, tungsten carbide, 3 mm, approx. 200 pcs.	10 29 25006
Grinding balls, zirconium oxide, 3 mm, approx. 200 pcs.	10 29 25007
Grinding balls, stainless steel, 5 mm, approx. 200 pcs.	10 29 25005
Grinding balls, tungsten carbide, 5 mm, approx. 200 pcs.	10 29 25004
Grinding balls, zirconium oxide, 5 mm, approx. 200 pcs.	10 29 25009

Other dimensions and glass beads available on request.

Accessories MM 500

Article	Order No.
Aeration lid for MM 500 grinding jar 50 ml, stainless steel	10 29 20568
Aeration lid for MM 500 grinding jar 80 ml, stainless steel	10 29 20688
Aeration lid for MM 500 grinding jar 125 ml, stainless steel	10 29 20567
Aeration lid for MM 500 grinding jar 50 ml, tungsten carbide	10 29 20636
Aeration lid for MM 500 grinding jar 80 ml, tungsten carbide	10 29 20693
Aeration lid for MM 500 grinding jar 50 ml, zirconium oxide	10 29 20569
Aeration lid for MM 500 grinding jar 80 ml, zirconium oxide	10 29 20689
Aeration lid for MM 500 grinding jar 125 ml, zirconium oxide	10 29 20564
Grinding jar stabilization pad	10 29 26006
Jar wrench for grinding jars	10 29 20049
Cryo kit for cooling the grinding jars with liquid nitrogen incl. insulated container 4-liter, 2 grinding jar holders, 1 pair of safety glasses	10 29 24003
Retsch Box for external device control via Retsch App incl. data cable	10 29 20012
IQ/OQ Documentation for MM 500	10 29 20034

