

Order data for Ultra Centrifugal Mill ZM 200

Ultra Centrifugal Mill ZM 200													Item No.
ZM 200 with cassette (900 ml) (please order push-fit rotor and ring sieve separately)													
ZM 200	for 230 V, 50/60 Hz												20.823.0001
ZM 200	for 110 V, 50/60 Hz												20.823.0002
ZM 200	for 120 V, 50/60 Hz												20.823.0003
Push-fit rotors and ring sieves for normal use													Item No.
Push-fit rotor										6-tooth	12-tooth	24-tooth	
Push-fit rotor, stainless steel										02.608.0040	02.608.0041	02.608.0042	
Ring sieves													
Trapezoid holes										Round holes			
Aperture sizes in mm													
	0.08	0.12	0.20	0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00	5.00	6.00
Ring sieves, stainless steel													
Item No.: 03.647...	0231	0232	0233	0234	0235	0236	0237	0238	0239	0240	0241	0242	0243
Ring sieves, stainless steel, with reinforced rim, recommended for tough materials													
Item No.: 03.647...	0244	0245	0246	0247	0248	0249	0250	0251	0252	0272	0273	0274	0275
Distance sieves, stainless steel, recommended for temperature-sensitive materials													
Item No.: 03.647...	0253	0254	0255	0256	0257	0258	0259	0260	0304	-	0261	-	-
Distance sieves, stainless steel, square holes, 10 mm, for pre-grinding													03.647.0298
Push-fit rotors and ring sieves for abrasive products													Item No.
Push-fit rotor										6-tooth	12-tooth	24-tooth	
Push-fit rotor, stainless steel, with wear-resistant coating										02.608.0043	02.608.0044	02.608.0045	
Ring sieves													
Trapezoid holes										Round holes			
Aperture sizes in mm													
	0.08	0.12	0.20	0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00	5.00	6.00
Ring sieves, stainless steel, with reinforced rim, wear-resistant coating													
Item No.: 03.647...	-	-	0262	0263	0264	0265	0266	0267	0268	0269	-	-	-
Push-fit rotors and ring sieves for heavy-metal-free grinding													Item No.
Push-fit rotor										12-tooth			
Push-fit rotor, titanium										02.608.0047			
Cassette, titanium-niobium coating, complete (base, cover and seal)										22.355.0006			
Ring sieves													
Trapezoid holes										Round holes			
Aperture sizes in mm													
	0.08	0.12	0.20	0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00	5.00	6.00
Ring sieves, titanium, with reinforced rim													
Item No.: 03.647...	0270	0271	0276	0277	0278	0279	0280	0281	0282	-	0283	-	-
Accessories for grinding small volumes													Item No.
Conversion set for grinding small volumes, consisting of 8-tooth push-fit rotor, labyrinth disc and cassette (50 ml)													22.786.0002
8-tooth push-fit rotor, corrosion-resistant steel 1.4404 (316)													02.608.0057
Labyrinth disc													02.706.0247
Cassette (50 ml), corrosion-resistant steel 1.4404 (316), complete (base, cover and seal)													02.010.0039
Ring sieves													
Trapezoid holes										Round holes			
Aperture sizes in mm													
	0.08	0.12	0.20	0.25	0.50	0.75	1.00	1.50	2.00	3.00	4.00	5.00	6.00
Ring sieves, corrosion-resistant steel 1.4404 (316)													
Item No.: 03.647...	0287	0288	0289	0290	0285	0291	0292	0293	0294	-	-	-	-
Accessories for grinding large volumes													Item No.
Cyclone for ZM 200 with passage receptacle and holder, with 5 liter collector													22.935.0009
Cyclone for ZM 200 with passage receptacle and holder, with 3 liter collector													22.935.0010
Paper filter bags (12 pieces) with passage receptacle and flange													22.261.0003
Accessories for automatic material feed													Item No.
Feeder kit DR 100, complete with feed attachment and 40 mm push-fit feed chute, length 250 mm, hopper, stand and data cable													
DR 100	for 220-240 V, 50 Hz												22.936.0001
DR 100	for 110-120 V, 60 Hz												22.936.0002
Other accessories / Spare parts													Item No.
Spare cassette (900 ml), stainless steel, complete (base, cover and seal)													02.010.0037
Spare cassette cover, stainless steel, with seal													22.355.0003
See price list for further accessories													

ZM 200 – powerful, safe, versatile

Rotors and ring sieves

The selection of the push-fit rotors and ring sieves depends on the properties of the sample, the required final fineness and the subsequent analysis.

The selection of the ring sieve aperture size depends on the required final fineness and the feed material. With most materials approx. 80% of the total sample achieves a fineness of less than half the aperture size of the ring sieve used.

Rotors and ring sieves are available in various materials and types. The reinforced rims provide the ring sieves with greater stability.

Temperature-sensitive, brittle materials such as powder coatings and resins are particularly easy to grind with the **distance sieves** that have been specially developed for this purpose.



(1) Standard ring sieve
(2) Ring sieve with reinforced rim
(3) Distance sieve

Rotors and ring sieves with an abrasion-resistant coating are used for reducing the size of abrasive substances such as fertilizers.

For **heavy-metal-free size reduction** of non-abrasive materials we recommend the use of rotors and ring sieves made from titanium together with cassette bases and

covers with a titanium-niobium coating.

Thanks to the wide range of accessories with rotors, ring sieves and different types of collection systems, the ZM 200 can be easily adapted to suit a wide variety of applications.

Rotor selection guide

Rotor	Field of application
6-tooth rotor	coarse, bulky, fibrous goods such as feed pellets, hay and straw
12-tooth rotor	medium-coarse goods such as wheat, oats, corn, tablets, powder coatings and plastics
24-tooth rotor	fine goods such as chemicals, coal and sugar
8-tooth mini-rotor	specially for size reduction of small sample amounts up to 20 ml



Accessories for grinding small volumes

In many fields, e.g. in the pharmaceutical industry, the required sample amounts are very small. Therefore the ZM 200 is now available with a mini-cassette for small sample volumes of up to 20 ml which is used in combination with the 8-tooth mini-rotor. The loss-free recovery of smaller amounts of sample is made easier by the reduced cassette diameter. Suitable ring sieves are available with aperture

sizes from 0.08 to 2.00 mm. If the grinding tools for small volumes are used in the ZM 200 only a small labyrinth disc is required. The necessary accessories are available as a conversion kit.

All parts coming into contact with the sample, including the cassette and ring sieves, are made from corrosion-resistant steel 1.4404 (316).



Controlled and uniform material feed:
ZM 200 with Vibratory Feeder DR 100



Automatic size reduction of large amounts:
ZM 200 with Vibratory Feeder DR 100 and cyclone

Suitable for almost any task

Its wide range of accessories and the possibility to individually select the rotor speed make the ZM 200 easily adaptable to any size reduction task.

The feed material is introduced either manually or via an optional load-controlled Vibratory Feeder DR 100. This automatic sample feed ensures **particularly uniform grinding results**. The ground sample is collected in the cassette. The innovative cassette principle ensures easy and loss-free material removal and avoids cross-contamination.

For **grinding larger amounts** we recommend the use of a paper filter bag or a cyclone with a 3 l or 5 l collecting receptacle. If a cyclone or paper filter bag is used then the sample will be cooled by the air stream and discharged more rapidly from the grinding chamber via the passage receptacle.

All parts coming into contact with the sample can be removed, cleaned and reassembled without using any tools.

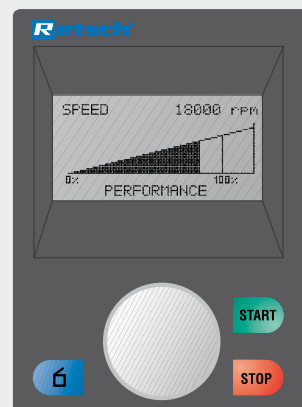
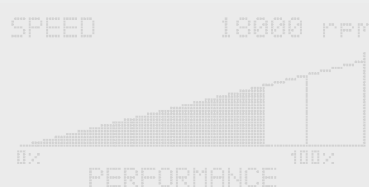
Performance data		ZM 200
Application		fine grinding
Field of application		agronomy, chemistry, biology, medicine, pharmaceuticals, plastics, foods, environment, construction materials
Feed material		soft, medium-hard, brittle, fibrous
Feed size		up to 10 mm
Final fineness*		<40 µm
Sample volume (nominal)	with standard cassette	up to 300 ml (900 ml)
	with mini-cassette	up to 20 ml (50 ml)
	with paper filter bag	up to 1000 ml (3000 ml)
	with cyclone	up to 2500 ml (3000 ml), or up to 4500 ml (5000 ml)
Speed range		6000 - 18000 min ⁻¹ , freely selectable
Rotor peripheral speed		30.9 - 92.8 m/s
*depending on feed material and instrument configuration/settings		
Technical data		
Power consumption		approx. 1300 W (VA)
W x H x D		410 x 515 x 365 mm
Weight, net		approx. 38 kg
Noise values (noise measurement according to DIN 45635-31-01-KL3)		
Emission value with regard to workplace		L _{pAeq} 77.5 dB(A)
Measuring conditions:		
Sample		burnt lime
Feed size		< 5 mm
Rotor used		12-tooth rotor
Ring sieve used		0.5 mm trapezoid holes

New technology with maximum operating comfort

The ZM 200 is very simple and safe to use. The parameters are easily set via a graphics display and 1-button operation. All relevant data can be comfortably entered or called up, e.g.

- speed
- drive load factor
- operating hours
- service intervals
- clear text error messages

The multi-language menu guidance system allows the adaptation of the display to the user's requirements. The electronic safety and diagnosis system **virtually rules out operating errors**.



Ultra Centrifugal Mill ZM 200



Benefits at a glance

- Versatile in use due to wide range of accessories
- High final fineness
- Wide speed range, adjustable from 6 000 to 18 000 min⁻¹
- Considerably increased throughput due to optimally matched frequency converter and 3-phase motor
- Safety housing with automatic cover closure
- Motor compartment and electronics protected against dust and material penetration
- Safe design to CE standard
- 2-year warranty

Versatile and efficient

The RETSCH Ultra Centrifugal Mill ZM 200 is used for the rapid fine size reduction of soft to medium-hard and fibrous materials. Because of the efficient size reduction technique and the comprehensive range of accessories **the ZM 200 ensures the gentle preparation of analytical samples in a very short time.**

The suitability of the ZM 200 for **universal use** is shown by the following examples:

- **chemicals, drugs, spices, coal, synthetic resins, plastics, pharmaceutical raw materials and finished products, fertilizers**

High-speed power for excellent grinding results

With the Ultra Centrifugal Mill ZM 200 RETSCH now offers a mill with previously unmatched performance. The new "Powerdrive" ensures higher performance with increased torque. The machine even reacts to temporary overloads with a continued throughput which ensures particularly efficient grinding.

The extremely quick size reduction increases sample throughput in the laboratory and, in combination with the 2-step rotor-ring sieve system, is also extremely gentle on the material.

Soft, elastic products such as plastics, which do not process well at room temperature, can be fed into the mill after embrittlement with liquid nitrogen or dry ice.

- **nitrogen and protein determination in food and feedstuffs**
- **environmental studies into plant constituents**
- **preparation of bones**
- **fossil fuels and secondary fuels**
- **sample batch production of customized powder coatings**
- **surfactant determination in washing powders**

The ultra centrifugal mill is used in both quality control and R&D.

ZM 200 technology

In the ultra centrifugal mill size reduction takes place by impact and shearing effects between the rotor and the fixed ring sieve. The feed material passes through the hopper (with splash-back protection) onto the rotor. Centrifugal acceleration throws it outward with great energy and it is pre-crushed on impact with the wedge-shaped rotor teeth moving at a high speed. It is then finely ground between the rotor and the

ring sieve. This 2-step grinding ensures particularly gentle but fast processing. The feed material only remains in the grinding chamber for a very short time, which means that the characteristic features of the sample to be determined are not altered. The ground sample is collected in the collecting cassette surrounding the grinding chamber or in the downstream cyclone or paper filter bag.

