Accessories and extras for GM 200

A range of different containers and lids is available for the RETSCH knife mill and can be used to optimally adapt the GRINDOMIX for a particular application.

**Grinding containers**

The selection of the right grinding container depends on the products that are to be reduced in size. Standard plastic containers are suitable for the majority of applications. Other cutting containers are available as accessories for special applications.

1. **Standard plastic container, PP**
   Part of the standard delivery of the GRINDOMIX. For soft and elastic materials, products containing water, oils and fats.

2. **Glass container (borosilicate glass)**
   Suitable for the same products as the plastic container. Additional advantages: the cutting process can be observed through the glass walls; it can also be sterilized and autoclaved.

3. **Stainless steel container**
   Suitable for soft, medium-hard and elastic materials, products containing water, oils and fats. Particularly recommended for comminuting medium-hard products such as cereals, nuts or feed pellets. It keeps its shape even under excessive loads and can also be sterilized and autoclaved.

**Grinding container lids**

The various container/lid combinations allow adaptation to different applications.

1. **Standard lid, PP**
   Part of the standard delivery of the GRINDOMIX. For use with large sample amounts of small materials such as seeds as well as meat, fish and cheese. If this lid is used then the maximum amount of sample is between 300 ml and 700 ml.

2. **Lid, PP, for grinding chamber reduction to 500 ml**
   For smaller amounts of small samples (max. 300 ml) it is advisable to reduce the grinding chamber volume. This lid can only be used with the standard plastic container.

3. **Gravity lid, PP**
   The gravity lid allows the exact adaptation of the grinding chamber volume to the particular amount of sample. It moves downward during the comminution process and optimizes the grinding chamber volume. It is available without (o) and with (o) overflow channels. The latter is used with water-containing materials such as potatoes, sweet peppers, salads or tomatoes. The maximum amount of sample is 300 ml. Separate gravity lids are available for all types of containers.

**Scraper and knives**

1. **Scraper**
   Facilitates the recovery of sticky samples from the container.

2. **Knife**
   Made of stainless steel (standard) or titanium, with PVDF knife cylinder. Sterilizable and autoclaveable. Cutting angle 15°, counterblade angle 30°.

**Order data GM 200**

<table>
<thead>
<tr>
<th>GRINDOMIX GM 200</th>
<th>Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRINDOMIX GM 200, complete with standard plastic container, PP, standard lid, PP, and stainless steel knife</td>
<td>20.251.0001</td>
</tr>
<tr>
<td>GM 200 for 230 V, 50/60 Hz</td>
<td>20.251.0000</td>
</tr>
<tr>
<td>GM 200 for 100-120 V, 50/60 Hz</td>
<td>20.251.0003</td>
</tr>
<tr>
<td>Cutting container for GM 200</td>
<td>03.045.0000</td>
</tr>
<tr>
<td>Cutting container, 1 liter</td>
<td>03.045.0043</td>
</tr>
<tr>
<td>Container lid for GM 200</td>
<td>03.045.0050</td>
</tr>
<tr>
<td>Standard lid, PP</td>
<td>03.107.0309</td>
</tr>
<tr>
<td>Lid, PP, for chamber reduction to 0.5 liter</td>
<td>03.107.0310</td>
</tr>
<tr>
<td>Gravity lid, PP, with overflow channels</td>
<td>02.107.0308</td>
</tr>
<tr>
<td>Gravity lid, PP</td>
<td>02.107.0328</td>
</tr>
<tr>
<td>Accessories and spare parts for GM 200</td>
<td>02.723.0001</td>
</tr>
<tr>
<td>Scraper, for easier recovery of sticky samples</td>
<td>02.446.0021</td>
</tr>
<tr>
<td>Knife, titanium, with PVDF knife cylinder</td>
<td>02.446.0014</td>
</tr>
<tr>
<td>Spare knife, stainless steel, with PVDF knife cylinder</td>
<td>02.446.0014</td>
</tr>
</tbody>
</table>
Performance that convinces

Fast, precise and flexible sample preparation

Even after an operation time of only 10 to 30 seconds, most of the samples processed by the GRINDOMIX are so homogeneous that a random but nevertheless representative sample can be taken. In comparison to samples prepared with normal household mixer the analytical results can be shown to have a standard deviation which is up to 10 times smaller. This applies even to difficult substances such as streaky bacon or heterogeneous types of meats.

The short grinding time and the possibility of choosing between different vessels and lids guarantees efficient individual or serial sample preparation. In this way the GRINDOMIX GM 200 provides the best preconditions for representative sampling and reliable analytical results.

The standard equipment of the GM 200 includes an attachable 1 liter plastic container with a polypropylene (PP) lid as well as an attachable two-blade knife made of stainless steel. A Lexan cover protects the grinding chamber and container. The housing can be completely recycled.

<table>
<thead>
<tr>
<th>Performance data</th>
<th>GM 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications</td>
<td>size reduction, homogenization and mixing</td>
</tr>
<tr>
<td>Feed material</td>
<td>soft, medium-hard, elastic; containing water, fat or oil, dry</td>
</tr>
<tr>
<td>Feed size*</td>
<td>10 - 40 mm</td>
</tr>
<tr>
<td>Final fineness*</td>
<td>&lt;300 µm</td>
</tr>
<tr>
<td>Grinding chamber volume with</td>
<td>standard lid   reducing lid   gravity lid</td>
</tr>
<tr>
<td></td>
<td>1000 ml    500 ml    400 - 1000 ml</td>
</tr>
<tr>
<td>Max. feed quantity</td>
<td>700 ml    300 ml    300 ml</td>
</tr>
<tr>
<td>Speed setting</td>
<td>digital, 2000 - 10000 min⁻¹</td>
</tr>
<tr>
<td>Grinding time setting</td>
<td>digital, 1 second – 3 minutes</td>
</tr>
<tr>
<td>Interval operation</td>
<td>yes</td>
</tr>
</tbody>
</table>

Technical data

Drive                               | series wound motor |
Power consumption                   | 750 W              |
Protection code                     | grinding chamber and keypad: IP 42 near ventilation slots: IP 20 |
W x H x D                           | 200 x 370 x 270 mm |
Weight (without accessories)        | approx. 7.5 kg     |

Noise values (noise measurement according to DIN 45635-31-01-KL3)

Emission value with regard to workplace |
| L_{ wei } | 66.9 dB(A) |

Measuring conditions: 
- Container | glass container with gravity lid |
- Sample    | quartered tomatoes, approx. 40 x 25 mm |
- Sample weight | 100 g |
*depending on feed material and instrument configuration/ settings

Patented – the variable-volume grinding chamber of the GRINDOMIX GM 200

In order to prevent the sample being thrown against the container walls by the rotating knives and therefore not being subjected to the size reduction process, the gravity lid developed by RETSCH reduces the volume of the container (patent EP 906 741). This piston-like lid is free-floating and during the comminution process, it drops under its own weight so that it always rests directly on the sample material. In this way the GRINDOMIX knife mill can achieve an optimal degree of homogenization suitable for modern analytical methods within a very short time.

The gravity lid can also be supplied with overflow channels as an option. This lid is particularly suitable for products with a very high liquid content. The cell liquid released at the start of the comminution process can separate out by centrifugal force and flow up the container walls as a thin film. If this liquid penetrates the gap between the gravity lid and the container wall then it is returned to the center of the container via the overflow channels. The result is perfect homogenization.

A complete overview of the accessories for the GM 200 is given on the following page.
Knife Mill GRINDOMIX GM 200

In food or nutritional laboratories, in chemical or biological research institutes – homogeneous sample material is required everywhere for the accurate analysis of food and feed materials (Several organizations, including the Federal Institute for Risk Assessment, Germany, recommend the GRINDOMIX GM 200 for the sample preparation to analyses on acrylamide). With the GRINDOMIX GM 200 knife mill, RETSCH has designed a size reduction and homogenization instrument that meets and exceeds all special laboratory and analytical requirements. It can process substances with a high water, oil or fat content just as quickly and reliably as dry, soft and medium-hard products. RETSCH now offers a professional alternative to commercially available household mixers.

As well as fruit, vegetables, sausages, meat, fish, cheese, ham or deep-frozen products, the GRINDOMIX mill is also suitable for feed pellets, spices, seeds and seedlings. With its special cutting knife system and variable-volume grinding chamber, the GRINDOMIX can process these substances quickly and easily to provide homogeneous analytical samples.

The new dimension in food sample preparation

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Benefits at a glance

- Very rapid and gentle size reduction and homogenization of food and feed materials
- Powerful speed-controlled 750 W industrial motor
- Speed pre-selectable, range 2000 - 10000 min⁻¹
- Digital display of grinding time and speed
- Interval operation possible
- Three memory keys
- Gravity lid for automatic grinding chamber volume adaption
- Comprehensive range of accessories
- Sample vessel easy to clean and exchange
- 2-year warranty, CE-conforming

Simple and convenient handling

Working with the GRINDOMIX knife mill from RETSCH is extremely user-friendly. The grinding vessel and knives are easily attached. When the size reduction process has finished the motor switches off automatically. The vessel, with its lid, inserted knives and sample, can be removed and attached as a complete unit. In contrast to conventional mixers, the grinding container can be filled outside the instrument which also makes emptying and cleaning very convenient. Cross-contamination by sample residues is eliminated.

The operation of the GM 200 is easy and comfortable. The speed can be freely selected in steps of 500 min⁻¹ in the range 2000 to 10000 min⁻¹. The time can be set between 1 second and 3 minutes. The speed and running time can be read off from a digital display. Three memory keys allow for storage of frequently-used parameter combinations. In this way the GM 200 guarantees reproducible analytical results. It is also possible to operate the GM 200 in interval mode (ideal for products with a tough elastic consistency).

Knife Mill GRINDOMIX GM 200 technology

Two straight knives, which are arranged at different heights at right angles to the direction of rotation, rotate in the center of the grinding vessel (Double Level Knife System). The sharp and slim steel blades comminute and homogenize reliably. In order to protect them from damage by hard sample material, they are provided with a counterblade.

The powerful industrial motor with its 750 W continuous rating (1200 W for short periods) drives the knives directly. Pre-selectable speeds, held constant by the electronics, ensure that even difficult samples are comminuted and homogenized in only 10 to 30 seconds.
RETsch knife mills supply completely homogeneous analysis-grade size reduction results that allows samples to be taken from any location in the container.

RETsch cutting mills are used for the preliminary size reduction of soft, medium-hard, fibrous and tough materials. A representative sub-sample should then be taken for the subsequent reduction down to analytical fineness.

No matter whether rotary sample dividers, rotary tube sample dividers or sample splitters - RETSCH sample dividers will provide you with representative sub-samples from pourable powders and bulk materials.

The following fine size reduction can then be carried out with the following RETSCH mill, for example:

The RETSCH ultra centrifugal mill effortlessly reduces the size of soft, medium-hard and brittle materials with a feed size of up to 10 mm. A final fineness of down to < 40 µm can be achieved.

The RETSCH ultra centrifugal mill (Patent EP 906 741) optimizes the grinding chamber during the size reduction process and in this way ensures outstandingly good results. See page 5 for more details.

In conventional knife mills (e.g. house-hold mixers) the sample can separate out and no longer be subjected to the size reduction process. This means that some part of the sample has not been fully reduced in size. In contrast, with the GRINDOMIX you will always obtain an optimal and completely homogeneous sample. The sample is so homogeneous that it is possible to take a random, yet representative sample from any location in the grinding container. With the GRINDOMIX GM 200, standard deviations from the analytical results have proved to be 10 x smaller than with household mixers!

The illustration shows a comparison between the degree of size reduction of raw potatoes homogenized with a household mixer (top) and the GRINDOMIX GM 200 (below).

Universal use

As a result of the combination of grinding containers and container lids as well as the appropriate parameter settings, the GRINDOMIX can be adapted to meet a wide range of sample preparation applications. This means that it is suitable for use in many sectors, e.g.:

- Foods, drugs, coffee, tea, cigarettes, etc.
- Animal feeds
- Biology
- Microbiology

The illustration shows a glass vessel with gravity lid.

Gravity lid provides variable-volume grinding chamber

This RETSCH innovation (Patent EP 906 741) optimizes the grinding chamber during the size reduction process and in this way ensures outstandingly good results. See page 5 for more details.

Superiority in detail – technology from RETSCH

Knife Mill GRINDOMIX GM 200

Complete sample homogenization