

**FrymaKoruma**  
> technology in motion

**FrymaKoruma CoBall<sup>®</sup>-Mill**  
Annular gap bead mill for fine milling



# Annular gap bead mill

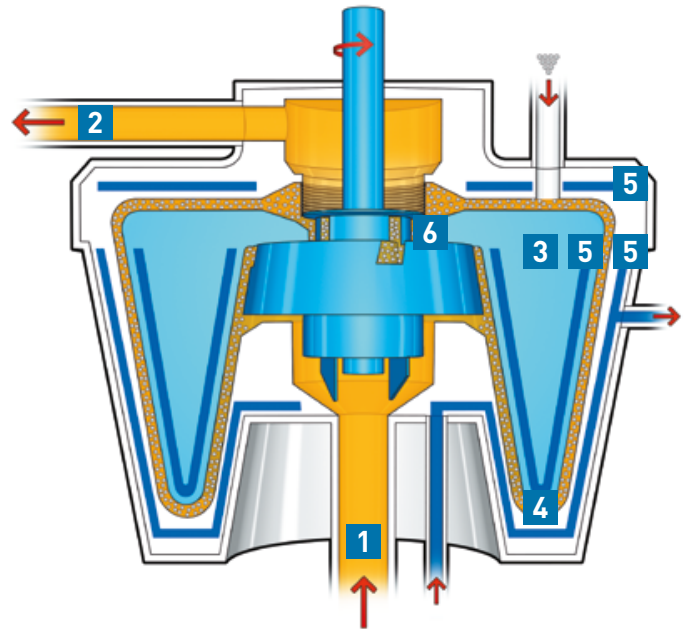
The CoBall®-Mill is used for fine milling of suspensions and high-viscosity products. First-class results are assured, thanks to intelligent design coupled with the application of the latest research in nanotechnology. The CoBall®-Mill is a triumph of engineering, combining FrymaKoruma's years of experience and knowledge with the latest scientific developments. This mill is supremely versatile, satisfying the most demanding quality requirements efficiently and cost-effectively.

The product is fed to the milling chamber by an external variable-flow pump. The milling action is created in the gap between the conical working vessel – the stator – and a conical rotor. The gap is in the range 6.5 to 17 mm depending on the model selected. The movement of the rotor creates radial movement of the grinding media (metal, glass or ceramic beads). Momentum amplifies the outward motion so that the product shear force increases steadily during the milling operation. Milling beads and product are separated at the end of the cycle by a sieve located at the outfeed such that only perfectly milled product with an even particle size is discharged. The beads then rejoin the product flow via a channel and re-enter the milling chamber, thus, continuous circulation is achieved.

The quality of the finished product is influenced by the peripheral rotor speed, the milling gap, the material and diameter of grinding media, bead load and flow velocity. Each of these parameters can be varied at will to create the optimum conditions for each product.

CoBall®-Mill technology sets the standard for reproducibility, high quality results with consistently sized particles are assured.

Annular gap bead mills transfer four times more energy into the product than conventional stirrer mills which improves the particle size but generates some heat. A standard feature of the CoBall®-Mill is a high efficiency cooling circuit with a large surface area that effectively removes the unwanted heat. Therefore the finished product is protected from temperatures that may affect quality.



- |                         |                                     |
|-------------------------|-------------------------------------|
| <b>1</b> Product infeed | <b>4</b> Grinding gap               |
| <b>2</b> Product outlet | <b>5</b> Heating/cooling            |
| <b>3</b> Rotor          | <b>6</b> Bead recirculation channel |

## Key benefits

- High quality product with consistent particle size distribution
- Optimum adjustment for each product
- Product temperature controlled
- High throughput with very fine milling results, even for highly viscous products
- Economical use of cleaning agents
- Quick changeover between products
- Fully CIP-compatible, cleaning without removing milling beads
- SIP (for pharmaceutical applications)

Grinding media



Rotor/stator





## Standard version

- /// Single acting mechanical seal
- /// Seals in EPDM
- /// Milling chamber cooling
- /// Zircon oxide milling beads
- /// IP 55 protection for mill motor and switchboard

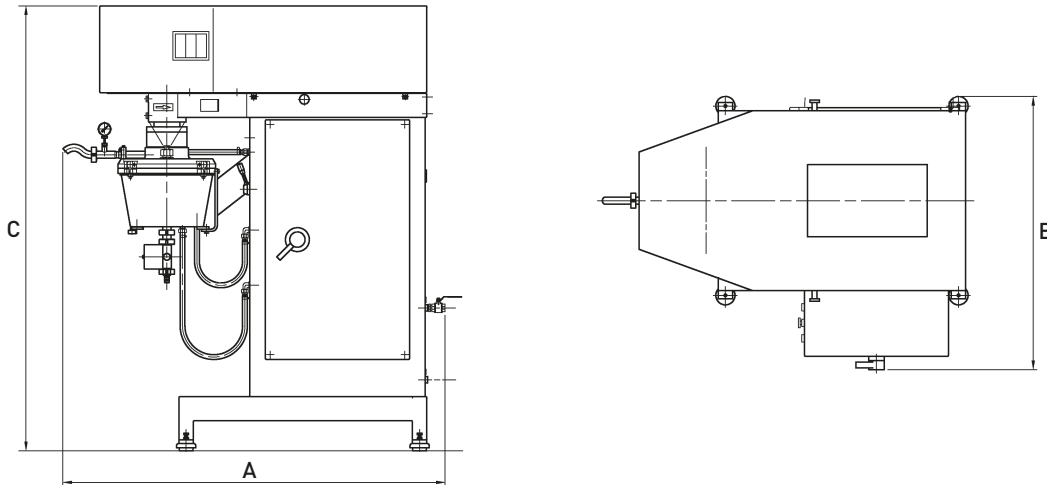
## Options

- /// CIP cleaning system
- /// Explosion-proof design (ATEX)
- /// Double acting mechanical seal with fluid flush
- /// Temperature control
- /// Product flow control
- /// Pressurization of milling space (up to 5 bar)
- /// Sterile version available
- /// Pharmaceutical finish with unit certification
- /// Frequency converter for speed control
- /// Peristaltic or gear pumps
- /// Milling chambers and rotors available to suit your product
- /// Choice of milling media
- /// Further options upon request

## Applications

- /// Precision milling of chocolate coatings and crude cacao pulp
- /// Roasted nuts, peanuts, hazelnuts, almonds, sesame
- /// Pharmaceutical actives
- /// High-pigment pastes, lipstick masses
- /// High-tech and sanitary ceramics
- /// Paints and varnishes
- /// Semiconductor coatings
- /// Agro- and fine chemicals
- /// Paper pulp, thermographic paper coating, heat-sensitive coatings
- /// Precision filler milling, e.g. titanium oxide





	Through-put (l/h), approx.	Grinding chamber volume (l)	Installed power (kW), approx.	Dimensions (mm)			Weight (kg), approx.
				Length A	Width B	Height C	
<b>MS 12</b>	5-40	0.5	3-4	885	515	775	160
<b>MS 18</b>	10-80	1	7.5-11	1160	1035	1633	400
<b>MS 32</b>	40-300	3	22-37	1560	1140	1855	800
<b>MS 50</b>	150-1000	8	45-55	1800	1200	2070	1750
<b>MS 65</b>	300-1750	26	75	2320	1540	2730	3100

For over 65 years, FrymaKoruma has been a leading international supplier of processing machinery and equipment for the pharmaceutical, cosmetics, food and chemical industries. Based in Germany and Switzerland, the company employs about 150 people. Our goal is not simply to meet all our customers' expectations without any ifs and buts; we also attach great importance to the development of long-term partnerships. Our pursuit of this objective is altogether successful – over 23000 installations are currently in use in more than 180 different countries.

#### Customer support

FrymaKoruma is more than just a supplier of machines and plant. As a customer focused partner for plant engineering, we take an idea and turn it into a high-tech solution that matches your requirements exactly – with installation, documentation and commissioning from one source. If you need to be further

convinced before you commit yourself, ProTec – our process technology and training centre – lets you do just that. Profit from our specialists' vast know-how and years of experience in the development of liquid and semi-solid products. In our well-equipped, modern laboratory, you can develop or optimize recipes, test machine models, scale up processes and produce test batches for pharmaceutical, cosmetics, food or chemical applications.

Our Customer Service, which is available worldwide, makes sure you continue to keep abreast of a constantly evolving market long after the development and manufacture of your plant has finished. It includes much more than simply maintenance, modifications and upgrading. We also advise and support you in all matters relating to your equipment, provide on-site training and stock a range of spare parts which can be shipped to you promptly.