

# DYNO<sup>®</sup>-MILL KD *Horizontal agitator bead mill*

Proven performance in the field of dispersion  
and ultra fine wet grinding with  
thousands of installations worldwide



# WAB – your expert for wet milling and ultra fine dispersion

For many decades WAB has been the undisputed specialist in dispersion and milling technology with its world renowned **DYNO®-MILL**. The stringent requirements, which the finished product has to fulfil, also demand the highest standards of quality and abrasion resistance from the mill components.

With an extensive mill program, WAB will supply the perfect mill for both your product and your process.



**DYNO®-MILL KD 120 A** – with 126-litre grinding container, contact pressure gauge and thermometer



## The features of the DYNO®-MILL KD

- Ideal for pass mode with consistent efficiency to obtain narrow particle size distribution in the micrometer range
- The optimum configuration for every product with an extremely wide choice of materials for components coming into contact with the product – including hardened and stainless steel, hard chrome plated stainless steel, polyurethane, ceramic
- Maximum operating safety – the basic model already complies with **CE** and ATEX (Ex II 2 G cb IIB T3)
- Grinding bead size range from 0.3–2.5 mm
- Adaptation of the grinding chamber volume to the batch size, combined with an ideal cooling process due to the flow in the cooling jacket, allows the handling of temperature-sensitive products
- Easy to use – all **DYNO®-MILL KD** types can be taken apart in just a few steps, allowing simple rapid change-over to a different mill configuration
- Simple operation and easy setting of operating parameters
- The consistent milling design enables scaling-up to any size in the **DYNO®-MILL** type **KD** series
- Low operating and maintenance costs



The reliable **DYNO®-MILL KD** production mill is used for continuous dispersion and wet grinding of pumpable products with high to low viscosities down to micron sizes.

# Top performance for your product – | fully developed and proven

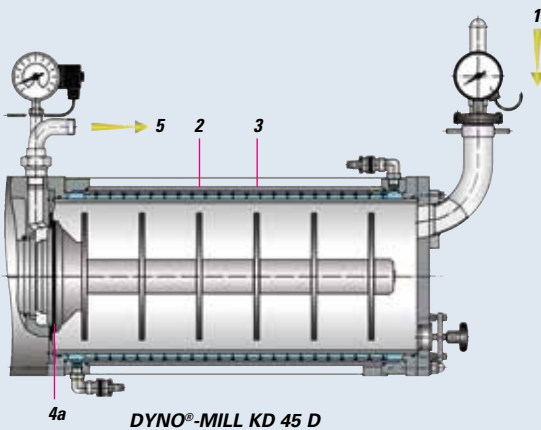


## Grinding bead separation

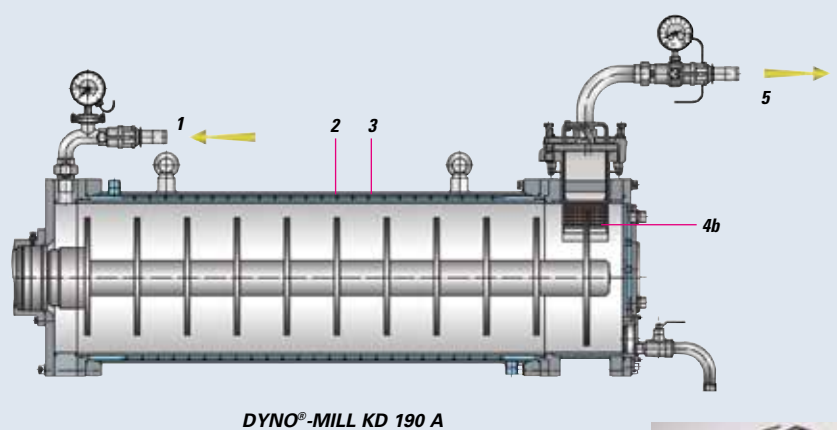
On the **KD 6** to **KD 60** mills, the grinding beads are retained in the mill by means of a dynamic gap separator with rotor and stator made of tungsten carbide. The gap width is adjustable to suit the grinding bead size. The medium-sized production mills (KD 20B-60) are also available with a screen separator as an option. The **KD 120A** to **KD 600** types are fitted exclusively with an easily removable arched screen. Grinding beads of different materials and sizes (0.3–2.5 mm) can be used.

Self-cleaning dynamic gap separator

Easily accessible screen



4a DYNO-MILL KD 45 D



DYNO-MILL KD 190 A

## Mode of operation

- 1 Product inlet
- 2 DYNO® agitator discs in a wide range of materials
- 3 Cooled grinding container with easily interchangeable grinding cylinder in hardened or stainless steel, hard chrome plated stainless steel, polyurethane, ceramic
- 4a Dynamic gap separator
- 4b Screen separator
- 5 Product outlet

## Shaft seal

The shaft sealing is achieved by means of a single or double mechanical seal developed by WAB. The compact design of this seal enables quick and easy replacement. The shaft seal is pressurized with a product-compatible rinsing and barrier liquid in a closed system. All mechanical seals are tested for quality prior to delivery, ensuring complete reliability of WAB seals. In addition to the simple maintenance, the mechanical seal can be returned to the factory for inspection and repair and for WAB to replace the vital components. The refurbished seal is then subjected to the standard WAB final

inspection. In this way, you have the maximum possible benefits and achieve a significant reduction in maintenance costs.

## Grinding container cooling

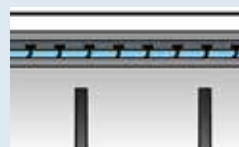
The uniquely designed cooling system is comprised of a flexible rubber strip in order to efficiently channel the water around the milling vessel and produce the best possible turbulent heat exchange. This design feature allows the inner cylinder to be removed and replaced without any difficulty, even after many years of service.



Agitator discs



Shaft seal



Grinding container cooling

# Contamination free? Sterile version? – No problem!

## We tailor the machine to your needs

Contamination free dispersion and fine wet grinding of high value products, demand the highest possible process standards. To meet these high demands, high quality ceramic and no metallic parts are used to assure contamination free processing.



### Non-metallic material selection

The **DYNO®-MILL KD** can be equipped with wearing parts in contact with the product that are made either from plastic or from industrial fine ceramics. The following materials may be used, according to the intended purpose of the mill along with the function and size of the components:

- Aluminium oxide
- Aluminium oxide reinforced with zirconium oxide
- Zirconium oxide stabilised with yttrium
- Silicon carbide
- Polyurethane
- Polyamide

Most mills, from the laboratory to production scale, can be supplied with ceramic or non-metallic wetted contact parts. Additionally, because of high quality and design standards, most mills can be simply retrofitted with ceramic or non metallic wetted contact parts.



### DYNO®-MILL KD in sterile version

For the cosmetics, pharmaceutical and biochemical industries, WAB is able to deliver the **DYNO®-MILL** in an all stainless steel finish and with specially adapted installations to suit customer needs. Below are some examples of the versions available to meet individual customer specifications:

- Machine housing in stainless steel according to GMP standard – external components polished and brushed with grain size 160
- Rinse liquid container with cooling coil and hose connectors in stainless steel
- Wearing components in contact with the product made from zirconium oxide
- Agitator discs in polyamide or zirconium oxide
- Product inlet and outlet with welded stubs and Tri-clamp connections
- Cooling jacket suitable for cooling/heating media from -15°C to 80°C
- Hygienic tubular PT 100 and pressure gauge
- Hermetically sealed machine housing with forced air ventilation
- Water-cooled main motor



# Reproducibility and top quality – | the WAB control and validation concept

## Comprehensive control package

From manually operated through semi-automated up to fully automated controls – the **DYNO®-MILL KD** can be supplied as an explosion-proof version in accordance with 94/4/EG (ATEX).



## WAB VIEW control

In addition to clear and simple operation of the mill, the WAB VIEW control takes care of monitoring and recording of all process-relevant parameters. The programmable control is modular and can be upgraded:

- Data collection
- Process control by means of product temperature or energy input (kWh)
- Visualization systems with comprehensive formulation management
- External communication system via modem
- Attachment to a PC or control system is an integral part of the package

## WAB CONTROL (IP 65)

The WAB CONTROL can be used not only for the operation of the mill but also the monitoring, capture and recording of all process-relevant parameters such as:

- Agitator shaft speed (rpm)
- Product outlet temperature (°C)
- Energy input (kWh)
- Attachment to a PC for fast and simple recording
- Torque measurement



## GMP standard version – with WAB validation concept

The **DQ, IQ, OQ** qualification documents required for validation or the certificates for process-relevant machine components such as calibration and material certificates are available for all **DYNO®-MILL** types. On request, we will also conduct the **FactoryAcceptanceTests** here in the factory or the **SiteAcceptanceTests** together with you on your premises.





# Your long-term benefit – | our service and support

## Our reliability – your added value

We export our machines and equipment all over the world. They prove their capabilities over a long service life under the toughest possible operating conditions. This is the result of the high quality and functionality of our products and services. Through our worldwide network with subsidiaries and independent representatives, we ensure highly qualified advice and support even after the delivery of the machines. The shipment of spare parts within 24 hours from our own warehouse guarantees minimum machine downtimes and offers optimum customer benefits.

## Spare parts supply – after sales service

To ensure swift and trouble-free delivery of spare parts, WAB operates a modern warehouse with dynamic stock level monitoring. Spare parts and wearing parts are also available for machines over 20 years old. Competent advice from trained and experienced personnel guarantees fast and dependable service all over the world.



*Short delivery times are a challenge for us that we take up with professionalism and personal commitment.*



*Spare parts shipment within 24 hours from stock*

## Production

State-of-the-art, computer-based production machines are your guarantee of **DYNO®-MILL's** consistently superior quality.



## Research and development

A world class team of engineers and technicians plan and develop new solutions and processes using state-of-the-art tools. Their work takes account of the latest scientific and engineering findings as well as the latest regulations and industry standards. The possible utilization of high-tech materials is part of the project work from the outset.



*Technical center with the latest DYNO®-Mill versions*

A technical centre with the necessary infrastructure is available for tests on behalf of individual customers and for trials of new developments and prototypes. State-of-the-art analytical facilities are used to evaluate the results. The process engineers provide customers with expert, in-depth advice either here in MuttENZ or at the user's premises, while supporting our design department in working out custom solutions.



*Analytical laboratory featuring the latest high-tech equipment*

# Scaling-up from the lab to production

The complete and well-thought-out **DYNO®-MILL KD** program extends from the **MULTI LAB** for research and development tasks, up to the **DYNO®-MILL KD 600** for large-scale production. Due to the design, scalability from laboratory size to large-scale production mills is guaranteed.

Thanks to the uniform geometries of the milling system throughout the **DYNO®-MILL KD** program, highly reproducible grinding and milling results can be obtained on all **DYNO®-MILL** type **KD** mills.

**DYNO®-MILL  
MULTI LAB**



**DYNO®-MILL  
KD 600**

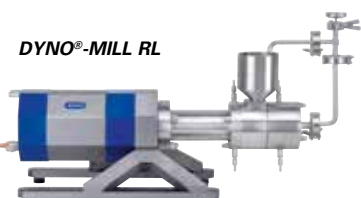


## An overview of the DYNO®-MILL KD series

TYPE	GRINDING BEAD SEPARATION		GRINDING CONTAINER VOLUME l	CAPACITY RANGE l/h	MILL DRIVE kW	COOLING WATER CONSUMPTION l/h	WEIGHT kg	DIMENSIONS L/W/H mm
	GAP	SCREEN						
<b>MULTI LAB</b>	x		<b>0.15 – 1.4</b>	<b>1 – 50</b>	<b>3.3 – 4.6</b>	<b>250 – 400</b>	<b>95 – 125</b>	<b>680 x 740 x 580</b>
<b>KD 6 (6)</b>	x		<b>6</b>	<b>20 – 150</b>	<b>10 – 15</b>	<b>800 – 1500</b>	<b>800</b>	<b>1300 x 1025 x 1385</b>
<b>KD 6 (8)</b>	x		<b>8</b>	<b>20 – 200</b>	<b>12.5 – 17.5</b>	<b>800 – 1500</b>	<b>850</b>	<b>1412 x 1025 x 1385</b>
<b>KD 20 B</b>	x		<b>16,5</b>	<b>70 – 500</b>	<b>17.5 – 24</b>	<b>800 – 1500</b>	<b>700</b>	<b>1500 x 882 x 1515</b>
<b>KD 20 BS</b>		x	<b>18</b>	<b>70 – 500</b>	<b>17.5 – 24</b>	<b>800 – 1500</b>	<b>750</b>	<b>1515 x 882 x 1515</b>
<b>KD 25</b>	x		<b>25</b>	<b>100 – 700</b>	<b>24 – 30</b>	<b>800 – 1500</b>	<b>850</b>	<b>1740 x 882 x 1515</b>
<b>KD 25 S</b>		x	<b>26</b>	<b>100 – 700</b>	<b>24 – 30</b>	<b>800 – 1500</b>	<b>850</b>	<b>1754 x 882 x 1515</b>
<b>KD 45 D</b>	x		<b>46</b>	<b>180 – 1000</b>	<b>36 – 45</b>	<b>1800 – 2500</b>	<b>1600</b>	<b>2030 x 1210 x 1780</b>
<b>KD 45 DS</b>		x	<b>49</b>	<b>180 – 1000</b>	<b>36 – 45</b>	<b>1800 – 2500</b>	<b>1600</b>	<b>2060 x 1210 x 1780</b>
<b>KD 60</b>	x		<b>60</b>	<b>200 – 1300</b>	<b>36 – 58</b>	<b>1800 – 2500</b>	<b>1800</b>	<b>2205 x 1210 x 1780</b>
<b>KD 60 S</b>		x	<b>62</b>	<b>200 – 1300</b>	<b>36 – 58</b>	<b>1800 – 2500</b>	<b>1800</b>	<b>2235 x 1210 x 1780</b>
<b>KD 120 A</b>		x	<b>128</b>	<b>300 – 2000</b>	<b>55 – 75</b>	<b>2000 – 4000</b>	<b>2500</b>	<b>2900 x 1360 x 2130</b>
<b>KD 190 A</b>		x	<b>196</b>	<b>500 – 3000</b>	<b>55 – 84</b>	<b>2000 – 4000</b>	<b>3000</b>	<b>3100 x 1360 x 2160</b>
<b>KD 280 A</b>		x	<b>296</b>	<b>800 – 5000</b>	<b>70 – 110</b>	<b>2000 – 5000</b>	<b>3200</b>	<b>3270 x 1360 x 2130</b>
<b>KD 600</b>		x	<b>612</b>	<b>1000 – 8000</b>	<b>160 – 250</b>	<b>2000 – 6000</b>	<b>8000</b>	<b>3900 x 2495 x 2018</b>

*Changes in design reserved. The performance data quoted is intended solely as a guide and depends on the product to be processed.*

**DYNO®-MILL RESEARCH LAB** – specially developed for the R&D department. For processing very small product batches of >100 ml in single pass or circulation modes! Ask for our product brochure or visit our website: [www.wab.ch](http://www.wab.ch)



# Top performance for your product |

## The best in class



- for aqueous,
  - solvent-based
  - and contamination sensitive products
- in laboratories and production areas  
of countless sectors of the industry

- Paints and varnishes
- Printing inks
- Coatings
- Pigments and dyes
- Automobile coatings
- Food industry

- Filling
- Agrochemicals
- Paper industry
- Life sciences
- Biotechnology

### Test the performance of the future

Experience the future live in our technical center. Test the **DYNO®-MILL KD** and see its amazing performance potential for yourself. We will be pleased to arrange an appointment for you and provide assistance with any process engineering questions.

### WAB global: our service and sales network

Our worldwide network of more than 40 sales and service points is available to our customers for expert advice and efficient support. It ensures always a quick response and minimum down times. In addition to the comprehensive stock at our head office, our subsidiaries and other sales and service points maintain well-stocked spare parts stores.

## WAB-GROUP

### Willy A. Bachofen AG

Junkermattstrasse 11  
P.O. Box 944  
4132 MuttENZ 1  
Switzerland  
Tel. +41 61 6867-100  
Fax +41 61 6867-110  
wab@wab-group.com  
www.wab-group.com



Headquarters of the WAB-GROUP

### WAB Machinery (Shenzhen) Co., Ltd.

Unit 102, Floor 1, Plant Building 1  
Everbrite Technology Park, Minqing Road  
Longhua District, Shenzhen 518109  
China  
Tel. +86 755 2813 5108  
Fax +86 755 2813 5008  
wab-cn@wab-group.com  
www.wab-group.com

### Willy A. Bachofen GmbH

Liebigstrasse 16  
61130 Nidderau-Heldenbergen  
Germany  
Tel. +49 6187 9394-00  
Fax +49 6187 9394-29  
wab-de@wab-group.com  
www.wab-group.com

### WAB India Pvt. Ltd.

Unit No. 1, 2, 3, 4. Plot No. D1/D2  
T.T.C. Industrial Area, Turbhe  
Navi Mumbai – 400 705  
India  
Tel. +91 22 613 171-00  
Fax +91 22 613 171-10  
wab-in@wab-group.com  
www.wab-group.com

### Willy A. Bachofen S.à.r.l.

3 rue Paul Henri Spaak  
68390 Sausheim  
France  
Tel. +33 389 31 17 00  
Fax +33 389 61 89 94  
wab-fr@wab-group.com  
www.wab-group.com

### WAB US Corp.

3 Pearl Court  
Suite E  
Allendale, NJ 07401  
USA  
Tel. +1 973 873-9155  
wab-us@wab-group.com  
www.wab-group.com

WAB