

# WAB-GROUP® PHARMA TECHNOLOGIES



Proven mixing & milling equipment  
for the Pharmaceutical Industry

# Fields of Application



Injectables



Ophthalmics



Oral dosage



Ointments



Inhalation



Powder mixing

# Wet Milling of active pharmaceutical ingredients

**The processing of poorly water-soluble ingredients has become increasingly important in the pharmaceutical industry in the past few years. Wet milling technology using agitator bead mills to reduce the particle size of ingredients has been proven to be very effective. Due to the increased use of this technology, new machinery standards have been developed and established on the market.**

Wet milling ingredients to reduce particle size increases the surface of the active ingredients. The proportional increase in surface area is particularly great when the particle size is less than 1 micrometre. This submicron range is only accessible through wet-milling technology. In suitable ingredients, the increased surface areas allow for significant improvements, for example:



- enhanced bioavailability
- better dose control
- smaller variation in patient response
- Smaller dose of the active pharmaceutical ingredients in the medicinal product
- less sedimentation in suspensions
- easier processing

The wet-milling technology with agitator bead mills offers fundamental advantages with regard to operator and equipment safety. Production takes place in a closed system and is completely dust-free. This is particularly advantageous for processing highly active substances. In addition, loss of product is minimal because processing is carried out in the liquid phase.

## DYNO<sup>®</sup>-MILL PHARMA in real world applications

The final product quality is also determined by the process parameters chosen for a specific product. Quality, size and quantity of the grinding beads, peripheral speed of the agitator discs, throughput and many other factors significantly influence particle size distribution and the reproducibility of results. Therefore, besides the suitability of an agitator bead mill for a certain application, the manufacturer's experience and support is crucial when implementing a solution.



# WAB – Your expert in Wet Milling

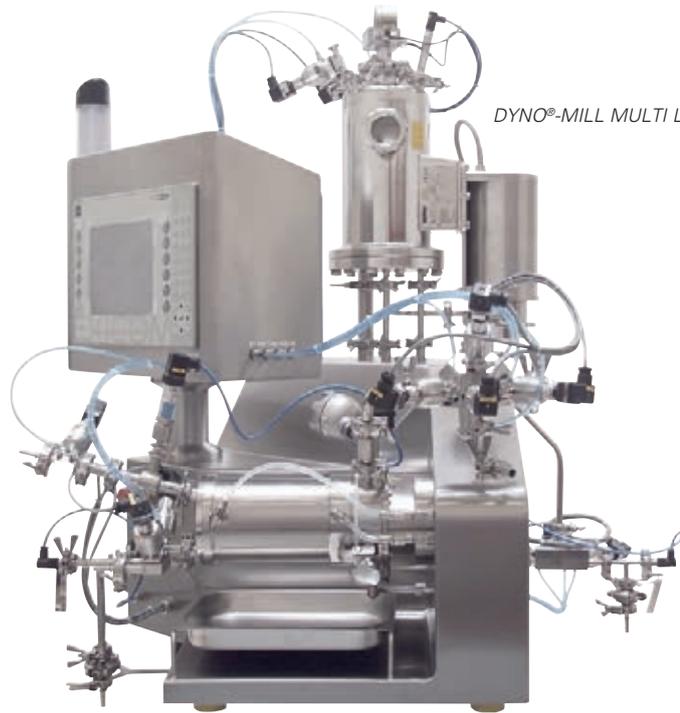
For over 50 years, WAB has been a leader in the field of wet micromedia milling with thousands of the famous DYN<sup>®</sup>-MILL agitator bead mills installed worldwide. Wet milling by agitated small beads (media) allows for the efficient grinding of suspended particles to the low micrometre range – even the low nanometre range – with narrow particle size distribution. With its extensive experience and complete range of GMP compliant agitator bead mills, WAB delivers perfect wet milling results for a broad range of user requirements.

## DYN<sup>®</sup>-MILL MULTI LAB CIP SIP

The DYN<sup>®</sup>-MILL MULTI LAB CIP/SIP flexibility is uniquely suited for sterile research and development, pilot, and production work. With the easy interchangeable grinding containers from 0.3l till 1.4l the machine is capable to process low to high viscous products with batch sizes greater than 500 ml. The DYN<sup>®</sup>-MILL MULTI LAB CIP/SIP can be fitted with the proven WAB KD agitator discs as well as the DYN<sup>®</sup>-ACCELERATOR.

The rigorous implementation of hygienic design guidelines, together with the automated processes, ensure the Cleaning-In-Place (CIP) and Sterilization-In-Place (SIP) capability. These CIP/SIP functionalities are examined, evaluated, and validated by experts following cutting-edge methods.

Completed with the 21 CFR Part 11 conform WAB SCADA system, the DYN<sup>®</sup>-MILL MULTI LAB CIP/SIP is the perfect solution for your sterile process.



DYN<sup>®</sup>-MILL MULTI LAB CIP SIP



DYN<sup>®</sup>-MILL KD 6 CIP SIP

## DYN<sup>®</sup>-MILL KD 6 CIP SIP

With its 6 liter chamber volume, the DYN<sup>®</sup>-MILL KD 6 CIP/SIP ensures for you the bigger volume sterile production of active pharmaceutical ingredients.

The DYN<sup>®</sup>-MILL KD 6 CIP/SIP implies all features of the DYN<sup>®</sup>-MILL MULTI LAB CIP/SIP and guarantees the proper scale-up.



DYNO®-MILL RESEARCH LAB

#### DYNO®-MILL RESEARCH LAB

The compact sized DYNO®-MILL RESEARCH LAB is a high-efficiency bead mill that enables users to effectively achieve particles sizes below 100 nanometres.

The DYNO®-MILL RESEARCH LAB is the perfect device for wet-milling feasibility studies, especially when only a limited amount of active pharmaceutical ingredient is available for testing. Batch starting from 100 ml only need a few grams of solids to be processed in circulation mode.

After use, the milling chamber of the DYNO®-MILL RESEARCH LAB is quickly disassembled from the drive for easy cleaning. All product contacted parts can be sterilized.

#### DYNO®-MILL ECM-AP

The innovative DYNO®-MILL ECM-AP series of agitator bead mills offers unique API wet milling advantages. These mills are designed for running in single/multi pass or circulation with constant efficiency in both modes and provide the flexibility to choose the best possible process mode for each ingredient.

The ability to change the process parameters in a wide range enables to fine-tune the process for a broad spectrum of products to achieve narrowest particle size distributions and full reproducibility.



DYNO®-MILL ECM-AP 10

## The DYNO®-MILL PHARMA series

TYPE	Milling Chamber (l)	Smallest Bead ø (mm)	Mill Drive (kW)	Batch Size (l)
DYNO®-MILL RESEARCH LAB	0.08	0.05	1.1	0.1–1
DYNO®-MILL MULTI LAB	0.15 to 1.4	0.1	3.3–4.3	0.08–10
DYNO®-MILL ECM-AP 05	0.5	0.1	4	1–20
DYNO®-MILL ECM-AP 2	1.9	0.1	11	>10
DYNO®-MILL ECM-AP 10	9	0.1	30–37	>50
DYNO®-MILL ECM-AP 20	21	0.1	44–58	>80
DYNO®-MILL KD 6	6	0.5	10–15	>20
DYNO®-MILL KD 20 B	17	0.5	17.5–24	>80

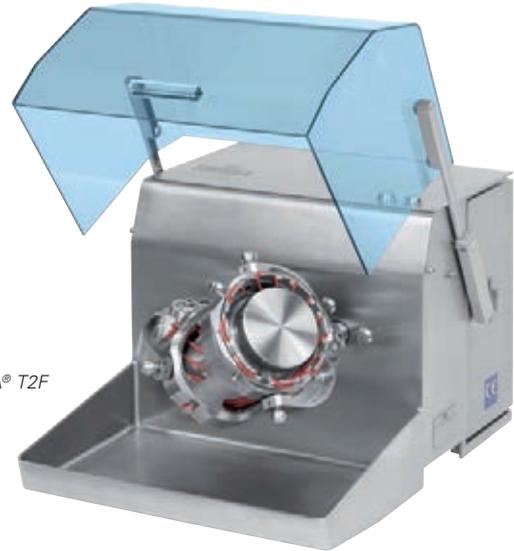
# WAB – Your expert in Dry Mixing

The wide range of WAB mixing equipment has been developed to satisfy most demanding user requirements in the pharmaceutical industry. WAB excels in tumble batch mixing technology offering full containment by change can design. All mixers from WAB create 3-D mixing movements to achieve mixes of high homogeneity. The TURBULA® and *dyna-MIX*® Shaker Mixers are used for the mixing of powdery substances, different wet components, or a combination of wet and dry components.

## TURBULA®

The exceptional efficiency of the TURBULA® Shaker Mixer comes from the use of rotation, translation, and inversion according to the Schatz geometry. The worldwide proven TURBULA® Shaker Mixers mixing results fulfill the highest requirements in a minimum of time without product re-segregation (unmixing) even after extended runs.

Due to their reliability, the TURBULA® mixers have been used for decades in demanding industries like the pharmaceutical industry, the cosmetic industry, the food industry, and analytical laboratories. The TURBULA® mixing container volume ranges from 0.1 to 55 litres.



TURBULA® T2F



*dyna-MIX*® CM 100

## *dyna-MIX*®

The principle of the *dyna-MIX*® Shaker Mixer is based on its independently controlled movement of two rotational axes which create the three-dimensional mixing movements for gentle, constant, and reproducible mixing results.

The *dyna-MIX*® product line with its PLC control unit allows adjusting the mixing motion to suit a wide range of products. The control unit can save up to eight different mixing programs (each with up to nine different mixing sequences) to cover all kind of mixing requirements. The PLC control satisfies the pharmaceutical industries demand for reproducible results.

The *dyna-MIX*® equipment is designed for middle to large scale production with container volumes from 40 to 1200 litres.

TYPE	Max. container volume (l)	Max. load (kg)	Dimensions LxHxW (mm)
TURBULA® T2F	2	10	~ 501 x 608 x 772
TURBULA® T10B	17	30	~ 960 x 880 x 850
TURBULA® T50A	55	75	~ 1350 x 1550 x 1520
<i>dyna-MIX</i> ® 100	100	200	~ 2950 x 1600 x 1550
<i>dyna-MIX</i> ® 200	250	400	~ 3910 x 2100 x 1940
<i>dyna-MIX</i> ® 500	650	900	~ 4350 x 3100 x 2600

# Your Qualification expert

The WAB qualification concept ensures a GMP compliant equipment qualification according to international standards (EU, USA, WHO, PIC/S). The documents of the qualification phases DQ, IQ, OQ and PQ-support with calibration and material certificates of process- and GMP-critical machine parts are available for all DYN0®-MILL units. FAT and SAT are integrated parts of the qualification concepts and are available on request for non-GMP applications as well.



## Service offered

Professional advice on all aspects of the machine, your product and your process plays a key role in its successful and long-term deployment. With over 40 sales and service locations, our global network guarantees competent advice and efficient support before and after the purchase of a WAB-GROUP® machine.

Shipment of wear parts from our own warehouse within 24 hours guarantees maximum uptime and provides optimum customer benefits.



- Sales, Consultancy and Training
- After-Sales Service and Support
- Spare and Wear Parts Warehouse
- Rental Machine Park
- Process Technology Center for Development and Trials
- Development, Design and Production

# WAB-GROUP®

## Global availability with members and partners

The WAB-GROUP® is the undisputed specialist in wet milling technology and in dry mixing technology with its three-dimensional shaker mixers.

For our international customer base from many industries such as paints & coatings, pigments and agrochemistry as well as life sciences, including applications in pharmaceuticals, cosmetics and food technology, WAB counts as an innovative and reliable partner. We strive to earn the ongoing trust of our customers with expert support, high quality performance and service and on-time deliveries.



[www.wab-group.com](http://www.wab-group.com)

WAB-GROUP®

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