



**FIBRES  
CRYSTALS  
PIGMENTS  
SUSPENSIONS  
CORUNDUM  
STONE MILLS**

**PLUS  
ECO  
SUPPORT**

**FOR HPC & PHARMA**

**FrymaKoruma**

# GREAT FORMULATIONS NEED EXPERT MILLS.

Lipstick or mascara, dietary supplements or APIs, lab use or industrial production – FrymaKoruma Corundum Stone Mills (MK) are the most versatile experts when it comes to dispersion and wet milling of liquid, viscous and pasty products.

**Their high efficiency and extreme flexibility make our MKs the first choice for use in the health, personal care & pharma industry.**

At the heart of our MK mills are the corundum stones, which are available in various grains. While the rotor element rotates against the fixed stator at high speed, extreme shear and cutting forces in the adjustable milling gap reduce the product in size. The processing zone is sealed by an innovative, single or double acting mechanical seal, with no dead spaces.

## MULTIPLE HPC APPLICATIONS

Corundum Stone Mills are highly versatile and adept at a wide range of processing applications in the HPC and pharmaceutical industry. Make-up or ointments? Emulsions or tablets? Our MK mills expertly grind, for example, pigments, softgel capsules filling or plant-based active ingredients.

## CONSTANT TECHNOLOGICAL DEVELOPMENT

ProXES brand FrymaKoruma has been building Corundum Stone Mills for more than four decades. We see the success of our proven technology as a challenge and we make it our mission to constantly improve and further develop our milling technology. It is our goal to equip our customers with solutions that meet their markets changing requirements and to help make their business future-proof.

## KEY BENEFITS

- excellent wet grinding performance for small to large throughput
- reliably high product quality
- adjustable grinding gap
- minimal product loss
- fully scalable technology for R&D as well as industrial use
- exceptional lifespan
- low-wear ceramic grinding tools
- easy assembly/ disassembly

# FINE WET-MILLING DISPERSING



# MORE OPTIONS, MORE FLEXIBILITY.



# EFFICIENT RELIABLE VERSATILE

No two processing facilities are alike – nor are our MKs. You can choose between throughput capabilities from 10 to 5,000 l/h, units with feeder pump or funnel, vertical or horizontal designs, and many other options.

## CORUNDUM GRINDING DISCS IN MULTIPLE GRAINS

ProXES grinding discs are made of high-quality synthetic corundum grains. Each batch of our self-sharpening grinding discs is tested to eliminate potential defects. Corundum grinding discs are available in grains from 16 to 120 grit.

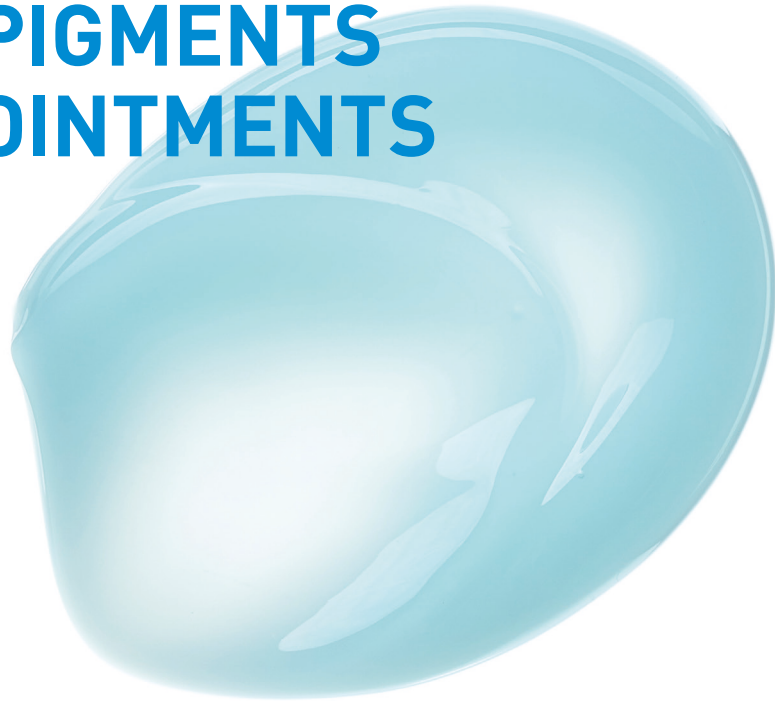
## DIFFERENT DESIGNS AND MODULAR EXTENSIONS

Thanks to various modular extensions, FrymaKoruma Corundum Stone Mills are highly configurable to meet your requirements.

- product infeed via pump or hopper with feed screw
- grinding tools with different grits
- optimal surface quality
- tri-clamp and flange connections
- different positions for inlet/outlets
- heatable/coolable
- explosion-proof design for processing of hazardous products (ATEX)
- double and single-acting mechanical seal
- qualification process

Machine	Throughput (l/h) approx.	Installed power (kw)	Dimensions (mm) L x W x H	Weight (kg)
MK 95	10 – 160	5.5	560 x 370 x 350	100
MK 160	30 – 500	11	760 x 450 x 500	200
MK 180	50 – 1000	15	840 x 480 x 500	200
MK 250	90 – 2000	22	1130 x 530 x 560	400
MK 300	150 – 3000	37	1260 x 670 x 850	650
MK 320	200 – 5000	45	1130 x 370 x 870	650

# MAKE-UP LIPSTICK MASSES PIGMENTS OINTMENTS



## AND WHAT ABOUT VEGAN PRODUCTS?

From vegan toothpaste to 'clean and green' shampoo, cremes or ointments – just like the food industry, the health and personal care category is experiencing a drift towards plant-based alternatives. Ask our experts about how ProXES can help you embrace the vegan trend. Let's accelerate your ideas!

# COARSER? FINER? WHATEVER YOU NEED!

What's your target particle size: 1,000 microns or 1  $\mu\text{m}$ ? At ProXES we pride ourselves in offering a wide range of reliable mills for coarser and extra-fine wet grinding. In addition to our Corundum Stone Mills (MK), our portfolio includes Perforated Disc Mills (ML), Toothed Colloid Mills (MZ) and Coball Bead Mills (MS). Thanks to the modular design of our technologies and their interchangeable parts, our mills can be adapted to different tasks, for example when you are revising existing processes or starting new ones.

## PULPING AND MASHING WITH THE PERFORATED DISC MILL (ML)

Perforated disc mills (ML) are used for the initial size reduction and pre-milling of bulky products (e.g. fruit and vegetables).

- Plant based cosmetic active ingredients (aloe vera, ginger, extracts)
- Nutritional supplements (algae, collagen)
- Algae

## TOOTHED COLLOID MILL (MZ) FOR SUSPENSIONS AND EMULSIONS

Toothed Colloid Mills (MZ) are experts for the wet milling of fluids and high-viscosity suspensions and emulsions. Tailored to your requirements, ProXES offers a range of colloid milling sets. While the standard milling set is suitable for universal use, the coarse-toothed set is ideal for size reduction of solids in suspensions, and the cross-toothed set delivers smaller particle sizes and finer dispersions.

## COBALL BEAD MILL (MS) FOR SUSPENSIONS

The Coball Bead Mill is used for very fine milling, for suspensions of medium to high viscosities. The versatile mills deliver prime product quality efficiently and cost effectively.

- Pharmaceutical active ingredients (eye drops, sterile suspensions, creams)
- Compounds for dental fillings
- Pigments and dyes
- Vitamins and minerals



Mills and particle size



# LET'S GROW SUSTAINABLY!

More and more consumers are making choices based on the environmental impact of their health and personal care products. A challenge for the industry? Yes. But: At ProXES we know that sustainability and profit increase are not contradictions. Let's talk!

**The ProXES experts support your company in finding new ways to optimise your production sustainability, e.g. for processes or engine technology.**

An optimised life-cycle assessment reduces the consumption of resources and operating costs. There is no need to re-organise your whole operation: Your proven process systems can also be retrofitted. This way, you can sustainably extend their service life, save energy, and generate additional potential. Some examples:

## REDUCED WATER CONSUMPTION

- New mechanical seals within a closed circuit reduce water consumption to a minimum.

## REDUCED POWER CONSUMPTION

- Our IE3 motors with premium efficiency help reduce CO<sup>2</sup> emissions.
- Conversion from direct current to alternating current provides a higher degree of efficiency without extra maintenance costs.

## REDUCED PROCESS & CLEANING TIMES

- Our on-site ProXES technicians will explain how to minimize batch or cleaning times.

**Ask our ProXES experts about how to synchronise ecology with economy!**





## WE ACCELERATE YOUR IDEAS

With three leading brands FrymaKoruma, Stephan and Terlet under one roof, ProXES combines long-standing expertise with a challenger mindset. As an agile partner, we support our customers from first product concept to industrialisation and empower them to bring their ideas to life. Together we set trends: Through sustainable and innovative solutions we drive our customers' success today and help them shape future markets.

In addition to the standalone FrymaKoruma, Stephan and Terlet products, ProXES combines their technologies to create modern process lines. By using the most advanced

automation and service concepts, ProXES facilitates competitive advantages for customers in the food, pharmaceutical, cosmetics and chemical industries. How can we help your business?

## FROM INSPIRATION TO FEASIBILITY

Our process technology and training centre is a space to try out new ideas. Here you can develop or improve formulas in a professionally equipped laboratory, test any kind of machine, perform scale-ups and produce test batches. You will receive expert advice and support on all the capabilities of the technical equipment and modifications.

## GET IN TOUCH WITH OUR EXPERTS



For a full list of our global subsidiaries and their contact details, please visit:

**[www.proxes.com](http://www.proxes.com)**

**ProXES GmbH**  
Kolumbusstrasse 14  
22113 Hamburg  
Germany

**T.** +49 40 35625-70  
**E.** [info@proxes.com](mailto:info@proxes.com)