



THICKENING AGENTS

Optimal results through maximum effectiveness



**HOSOKAWA
MICRON GROUP**



The Hosokawa Micron Group offers you innovative technology from one single source for customised solutions. Due to 120 years of experience in your process, we can deliver the highest quality machines for your plant and product safety. Our established base of technical experts represents the conviction and trust in our know-how all over the world.

»» INNOVATIVE TECHNOLOGY FROM ONE SINGLE SOURCE

»» CUSTOMISED SOLUTIONS FOR OPTIMUM RESULTS

»» HIGHEST QUALITY FOR YOUR MACHINE AND PRODUCT SAFETY

»» MORE THAN 120 YEARS OF EXPERIENCE IN YOUR PROCESS

»» POSSIBILITY OF TRIALS IN OUR TEST CENTRES FOR THE BEST POSSIBLE TECHNICAL SOLUTION

»» CONTRACT MANUFACTURING FOR FRONT-END MARKET INTRODUCTION

FOUR TIMES COMPETENCE

We create synergies

The Hosokawa Micron Group, headquartered in Japan, has various locations around the world. Our European competence centres have combined their know-how to offer you customised process technologies for optimum solutions. With more than 120 years of experience in the processing of thickening agents, we are a market leader in the development, design and manufacture of powder and particle processing machines and systems for size reduction, drying, grinding and blending.

With its wide range of particle processing technologies, the Hosokawa Micron Group has been setting and still sets trends and standards in particle processing.

HOSOKAWA MICRON LTD.
Size Reduction | Containment

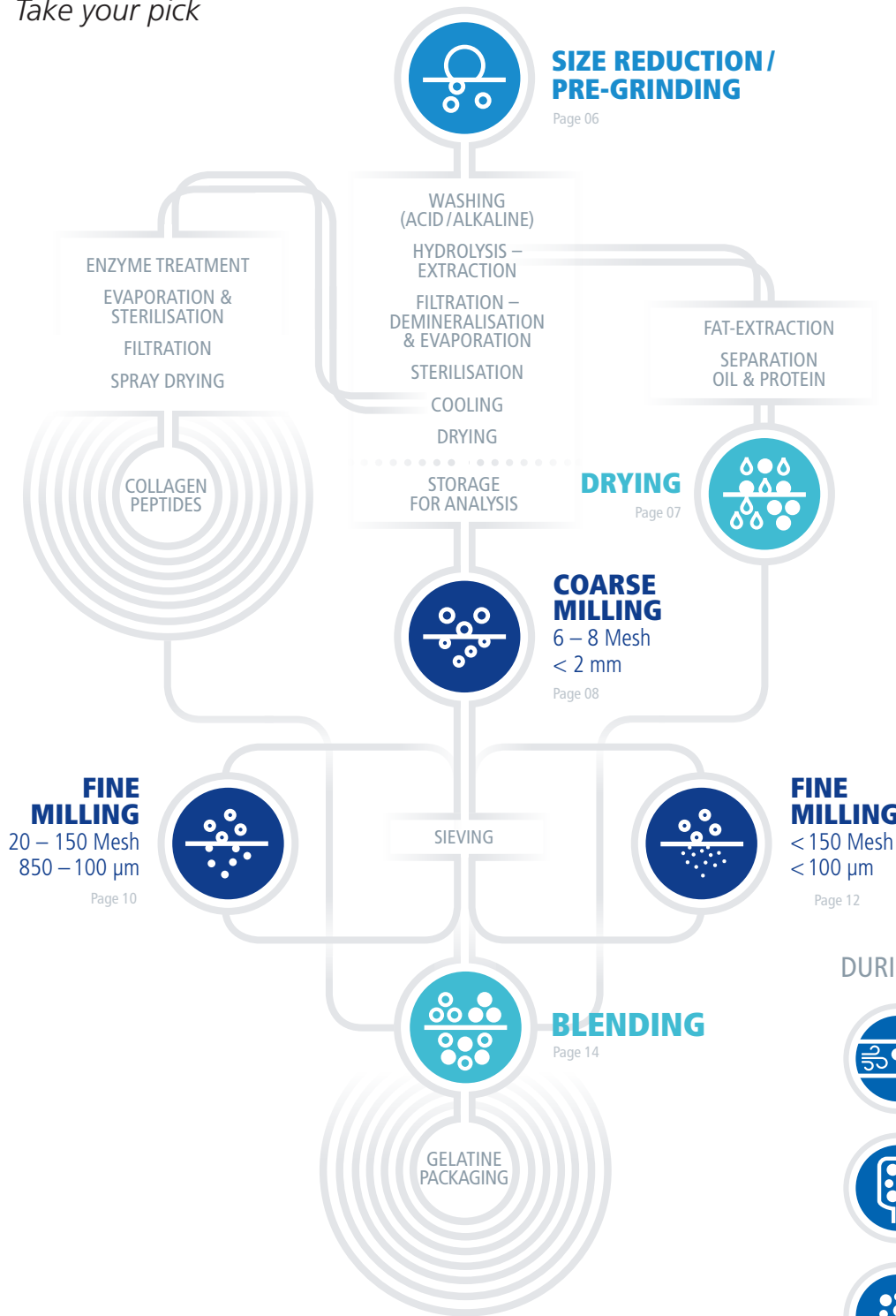
HOSOKAWA MICRON B.V.
Mixing | Drying | Agglomeration

HOSOKAWA ALPINE AG
Milling | Classifying | Compaction

HOSOKAWA SOLIDS
Conveying | Weighing | Storage




POWDER, FLAKES OR GRANULES

Take your pick



The production of gelatine is a high-tech process comprising different steps for which high-performance machines and systems are needed. The feed material constitutes by-products from the livestock industry. Skins and bones are processed to extract the collagen that is then converted into gelatine. Gelatine is a well known ingredient that is commonly used in the food industry and is still finding new applications, e.g. as a source of natural protein.

DURING THE WHOLE PROCESS:

-  **PNEUMATIC CONVEYING**
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-  **STORAGE, CHARGE & DISCHARGE**
Page 21
-  **DOSING AND WEIGHING**
Page 21

This process describes the gelatine production process.



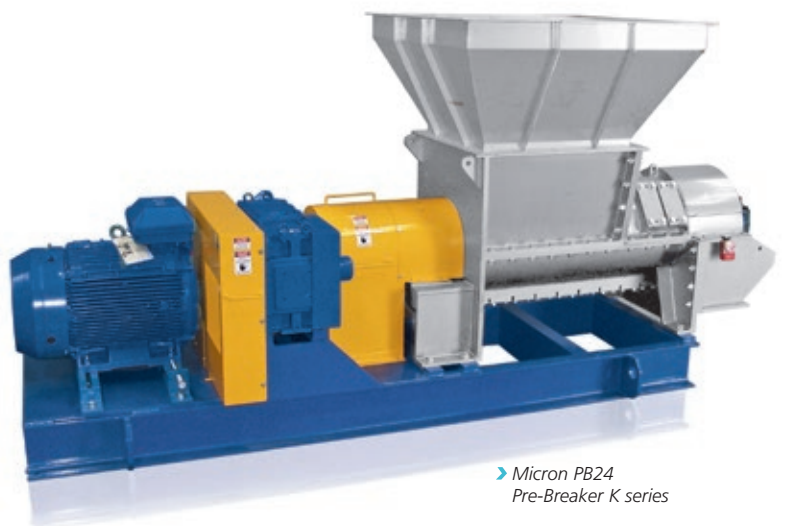
SIZE REDUCTION

The requirements for robust, reliable and low-maintenance machinery designed for the pre-cutting of bovine and porcine hides and skins for use within the gelatine industry for thickening agents are high. The Micron Pre-Breaker fulfills these demands and offers users the highest machine availability, minimum downtime, maximum availability and highest process yields.

The low rotational speed and high torque enables the machine to be used with heavy hides and similar tough materials at minimum material temperature increase.

ADVANTAGES OF MICRON PRE-BREAKER

- Robust construction, low maintenance
- Available up to 150 kW for the most demanding applications
- Wet capacities typically up to 20 t/h with machinery power of 90–132 kW
- Ability to withstand heavy loads and shock loads often encountered with bovine and porcine materials
- Available in stainless steel or carbon steel



➤ Micron PB24
Pre-Breaker K series



DRYING

BATCH DRYING

Hosokawa Micron vacuum dryers are suitable for gentle low temperature drying. They can also be applied to other phases in the process such as reaction/crystallisation, heating/cooling, sterilisation, liquid/solid separation and mixing.

- Efficient and fast drying
- Batch sizes from 5 to 20,000 litres
- Solvents/water evaporation and recovery
- Multi-purpose processing
- Fully compliant with FDA, cGMP and EHEDG
- Automated CIP/SIP cleaning possible

CONTINUOUS DRYING

The Hosokawa Drymeister (DMR-H) continuous flash dryer combines drying, milling and classifying in one operation. It can handle moisture fluctuations from a few % up to more than 80 % and safely dry temperature sensitive products, in a matter of seconds!

- Drying, milling and classification in one operation
- Turns pasty products into ultra-fine powders in one processing step
- High evaporation capacity (up to 2,000 kg/h)
- Short residence time/low product temperatures



➤ Conical paddle dryer



➤ Drymeister continuous flash dryer



COARSE MILLING

6–8 Mesh / < 2 mm

Concentrated gelatine liquor is converted after a post-sterilisation processing step into chilled “noodles”. These noodles are then deposited on a continuous belt that feeds them into a controlled air dryer, which reduces the moisture content of the noodles to approx. 10–12%. The dried gelatine is then ground with the well known ALPINE granulator. Due to the precise scissor-cut, low dust generation can be guaranteed which is important for further processing. The granulator has become a standard in the processing of gelatine.

ADVANTAGES OF ALPINE ROTOPLEX GRANULATORS

- Powerful, robust & compact design for a long lifetime
- Ease of cleaning reduces labour costs
- Low dust formation for better post-handling



➤ *Alpine Rotoplex granulator*



TECHNICAL SPECIFICATIONS

	RO 28/40	RO 36/60
Scale-up factor (F)	1	1.8
Motor drive (kW)	7.5 – 15	15 – 30
Rotor speed (rpm)	1,000	740
No. of knife rows – rotor	3	4
No. of knife rows – stator	2	2

Several machine sizes available.

TECHNICAL HIGHLIGHTS

The Alpine Rotoplex granulator offers an efficient way to disintegrate dried thickening agents with a fineness of < 2 mm. For simple handling, the product size can be adjusted as a function of the perforation size in the product outlet.

The patented cross-scissor-cut rotor guarantees optimal material distribution at maximum cutting performance. The special shaft bearing prevents a penetration of the product into the bearing and the ingress of excess lubricant into the grinding chamber. Dependent on requirements, different machine sizes with a capacity up to several tonnes are available.



REFERENCE PRODUCTS

Product	Fineness	Throughput	Machine
Gelatine	97 % < 1700 µm	360 kg/h	Ro 28/40
Gelatine	95 % < 2000 µm	730 kg/h	Ro 28/40
Carrageenan	only precut for further fine milling		
Gum Arabic			
Guar			
Pectin			

Reference values for grinding at ambient temperature.

It is only possible to quote reference values here because of the enormous differences in the grindability of organic products. A number of factors influence the grindability e.g. moisture, purity, origin, preceding process steps, etc.

» We have been setting standards for 120 years. You can count on our track record! First-rate quality – made in Germany.



FINE MILLING

20–150 Mesh / 850–100 μm

Because gelatine is used in a number of different applications in the food industry, the flexible adaptation to developing market requirements must be possible with an easily exchangeable base material, which is represented by a fine gelatine powder. Since fineness is crucial for different material properties of gelatine, all machines can produce an adjustable particle size of the end product. Size reduction is achieved by the principles of impact and shearing: the feed product enters the grinding chamber and is comminuted between the rotating (CW II) or the rotating and stationary grinding elements (UPZ).

ADVANTAGES OF ALPINE CONTRAPLEX PIN MILL CW II

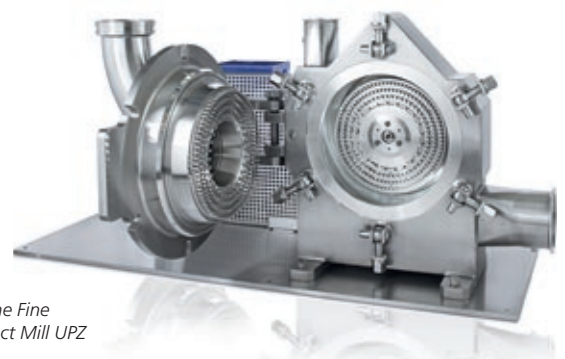
- Wide grinding chamber allows continuous production with sticky products
- High relative speeds for grinding to a high fineness
- Self-cleaning effect due to two contra-rotating pin discs

ADVANTAGES OF ALPINE FINE IMPACT MILL UPZ

- Generation of products with low fines and good flow properties
- Easily interchangeable grinding elements for fast product changes
- Various machine sizes available to match your capacity needs



➤ *Alpine Contraplex
Pin Mill CW II*



➤ *Alpine Fine
Impact Mill UPZ*



TECHNICAL SPECIFICATIONS

	UPZ 315	UPZ 630		CW 250 II	CW 630 II
Scale-up factor (F)	1	3.6	Scale-up factor (F)	1	5
Drive (kW)	18.5	75	Drive – housing (kW)	15	75
Max. relative speed plate beaters (m/s)	110	105	Drive – door (kW)	15	75
Total air flow rate (m ³ /h)	1,200	4,300	Total air flow rate (m ³ /s)	870	3,700

Several machine sizes available.

TECHNICAL HIGHLIGHTS

The particle size determines the application area of the thickening agent powder. The Alpine Fine Impact Mill UPZ offers different tools to obtain the required particle size distribution and simple handling for fast product changes. For a higher fineness, the Alpine Contraplex Pin Mill CW is ideal. With its wide chamber, a good throughput of sticky materials is possible and it achieves a particle size reduction down to 100 µm.



REFERENCE PRODUCTS

» Discover the benefits of the latest generation of Contraplex pin mills.

Product	Fineness	Throughput	Machine
Agar-Agar	96 % < 200 µm	270 kg/h	315 UPZ
Carrageenan	98 % < 500 µm	140 kg/h	315 UPZ
Carrageenan	97 % < 150 µm	280 kg/h	CW 250 II
Gelatine	99 % < 160 µm	37 kg/h	315 UPZ
Gellan gum	96 % < 250 µm	52 kg/h	315 UPZ
Guar	90 % < 200 µm	280 kg/h	315 UPZ
Gum Arabic	98 % < 90 µm	225 kg/h	315 UPZ
Instant Gelatine	98 % < 150 µm	110 kg/h	315 UPZ
Instant Gelatine	94 % < 100 µm	130 kg/h	CW 250 II
Pectin	90 % < 75 µm	200 kg/h	315 UPZ

Reference values for grinding at ambient temperature.

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FINE MILLING

< 150 Mesh / < 100 μm

Due to the various product sources which have different effects on the swelling properties and stability of the product, the food industry is interested in ultra-fine gelatine powders with a uniform particle size. The combination of an ultrafine grinding mill with integrated classifier makes it possible to reach particle sizes below 100 μm with a precise top cut. In the process, the gelatine is ground until the particles can pass through the classifying wheel. This results in a consistent powder quality for a guaranteed uniform application.

ADVANTAGES OF ALPINE CLASSIFIER MILLS ZPS AND ACM

- › Grinding and classifying in one machine for a uniform particle size
- › High air flow rate for cool grinding and high product quality
- › Excellent precision of cut and steep particle size distribution for a uniform end product
- › Low specific energy requirement for a cheaper production of fine particle sizes
- › Compact and space-saving design for easy integration into the production process
- › Simple to clean and maintain which makes fast product changes possible
- › Different sizes and designs available



› *Alpine Classifier Mill ZPS*



› *Alpine Classifier Mill ACM*

TECHNICAL SPECIFICATIONS

	ACM 10	ACM 100		ZPS 200	ZPS 630
Scale-up factor (F)	1	9	Scale-up factor (F)	1	6.5
Mill drive (kW)	7.5	75	Mill drive (kW)	15	132
Classifier drive (kW)	2.2	15	Classifier drive (kW)	7.5	30
Total air flow rate (m³/h)	900	9,000	Total air flow rate (m³/h)	1,200	12,000

Several machine sizes available.

TECHNICAL HIGHLIGHTS

Dependent on your needs, Hosokawa Alpine has different classifier mills in its portfolio which guarantee a precise top cut for a uniform product. Compared to other grinding systems a gentle and conditioned production process can be achieved due to higher air flow rates. A wide range of different machine sizes is available for your throughput requirements.



REFERENCE PRODUCTS

Product	Fineness	Throughput	Machine
Agar-Agar	99 % < 100 µm	12 kg/h	ACM 10
Carageenan	99.9 % < 75 µm	24 kg/h	ZPS 200
Gelatine	99 % < 150 µm	52 kg/h	ZPS 200
Gellan gum	90 % < 150 µm	18 kg/h	ACM 10
Guar	98 % < 125 µm	30 kg/h	ACM 10
Locust bean gum	90 % < 90 µm	37 kg/h	ZPS 200
Pectin	95 % < 63 µm	47 kg/h	ZPS 200

Reference values for grinding at ambient temperature.

It is only possible to quote reference values here because of the enormous differences in the grindability of organic products. A number of factors influence the grindability e.g. moisture, purity, origin, preceding process steps, etc.

» We also offer you wear protection solutions!
 Do you need more information?
 Contact us today!



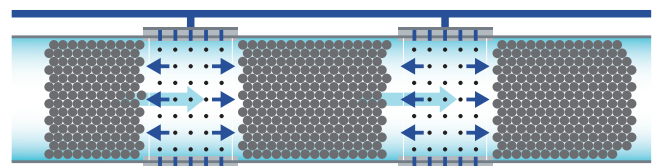
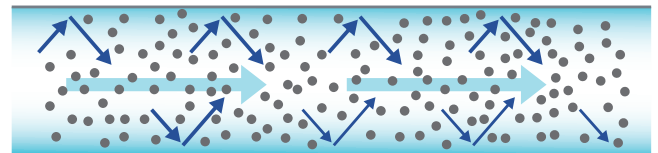
PNEUMATIC CONVEYING

Of various spices

To guarantee optimum product quality, different conveying methods must be used at various process steps. Adapted to the product characteristics (grain size & shape, density, hardness, fat & water content, ...) as well as to the individual process requirements (capacity, conveying distance, environmental conditions, truck unloading, ...), the most advantageous system for pneumatic conveying is applied.

YOUR ADVANTAGES AT A GLANCE

- Dilute phase conveying: simple and cheap implementation
- Plug conveying: gentle to the product, almost no grain destruction
- Preservation of aroma substances and essential oils through gentle conveying
- Individually adapted processes as pressure or suction conveying system
- Reliable, proven conveying systems





STORAGE, CHARGE & DISCHARGE

Product-appropriate storage of spices

The special properties of spices place special demands on storage. This can be done in a mass flow silo with a suitable discharge aid, in big bags or sacks.

YOUR ADVANTAGES AT A GLANCE

- First in, first out
- Reliable, residue-free discharge
- Complete systems with full equipment
- Dust-tight
- Gentle handling of the material to be discharged



➤ Emptying silos, hoppers



DOSING & WEIGHING

Dosing and filling of spices

Via dosing and weighing technology, your product arrives where it is needed in the right quantity: in the mixer or for filling of silo vehicle, big bag or bag. The weighing process is optimized by matching the dosing unit, scale and control system to the special requirements of the spices.

YOUR ADVANTAGES AT A GLANCE

- Integrated control system for high operational reliability
- User-friendly system
- Functionally reliable system technology
- Precise weighing and dosing technology
- Filling under hygienic conditions





BLENDING

As most thickening agents have a natural source, there are often variations in composition, structure and particle size. These variations can often be neutralized by introducing a blending operation. Besides mixing accuracy, important points of attention for mixing are aspects such as heat generation, product distortion and yield. All mixers are flexible in operation and can be used for various batch sizes from 10 to 100 % filling without compromising to quality.

NAUTA® CONICAL SCREW MIXER (LOW SHEAR)

The Nauta® conical screw mixer is especially suited to processing delicate products, offering gentle mixing without product distortion and constant product quality.

- › Gentle mixing without product distortion
- › Batch sizes from 5 to 80,000 litres
- › Perfect mixing quality and accuracy
- › Fast and complete emptying using a bottom discharge

CONICAL PADDLE MIXER (MID SHEAR)

The conical paddle mixer is a multi-purpose mixer for processes where high accuracy and fast mixing with limited product distortion are important.

- › Gentle and fast mixing
- › Batch sizes from 20 to 20,000 litres
- › Compact and simple design
- › Suitable for mixing, drying and reaction processes



› Nauta® conical screw mixer



› CPM conical paddle mixer



ADVANTAGEOUS SYNERGIES

The know-how and experience of numerous specialists are bundled in the Hosokawa Micron Group to produce perfect solutions. Experience from a variety of customer segments in mechanical process engineering ensures that you, as the user, enjoy optimum solutions for practically every product – from an individual component to an entire plant.



INNOVATIVE TEST CENTRES

Our research and testing facilities can provide you with a wealth of machines and complete systems for the most varied plant configurations, all available on a global level. Precision, quality and innovative technologies: Do your testing with us.



YEARS OF EXPERIENCE

Profit from our many years of experience in the provision of solutions and our mastery of sophisticated processes. Well-known customers all over the world place their trust in the technology and know-how of the Hosokawa Micron Group.



GLOBAL SERVICE

Our service teams take care of repairs and maintenance, both on site and in our modern workshops equipped with the latest technology – smoothly, speedily and all around the world! The Hosokawa Micron Group – a partner you can rely on. Find out for yourself, you're sure to be impressed.



CONTRACT MANUFACTURING

The Hosokawa Micron Group is also your professional and reliable partner for toll processing. We are allowing you to concentrate fully on your core business and to offset capacity bottlenecks without investment risks or long-term personnel commitment. Whether for a one-time project or a recurring job – our crew as well as our equipment are very flexible in adapting to your specifications!



HOSOKAWA MICRON GROUP



HOSOKAWA ALPINE

Milling | Classifying | Compaction

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