CONTINUOUS AGGLOMERATION

Powered by DUTCH TECHNOLOGY

HOSOKAWA MICRON

HOSOKAWA MICRON B.V.

PROCESS TECHNOLOGIES FOR TOMORROW

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ABOUT HOSOKAWA MICRON B.V.

Hosokawa Micron B.V. is specialist in the design, manufacture and supply of powder processing systems and equipment for the mechanical and thermal processing of dry and wet powders. Located in Doetinchem in the Netherlands, Hosokawa Micron B.V. is expert in mixing, drying and agglomeration.

Hosokawa Micron B.V. was established in 1987 as a result of a merger between Nautamix in Haarlem (founded in 1923), Machinefabriek Vrieco in Zelhem (founded in 1939) and ISEM in Doetinchem (founded in 1928). In 1992 Schugi in Lelystad (founded in 1954) was merged into the Hosokawa Micron Group and integrated in the Doetinchem site in 2000.

MISSION STATEMENT

Hosokawa Micron B.V. is a leader in offering technological know-how and solutions in the field of mixing, drying and agglomeration. By our professionalism, service orientation and dedication we help clients to achieve their goals, or even exceed them. In doing so we achieve long-term relationships with both clients and suppliers as well as an attractive return for our shareholders.

We offer a challenging and motivating work environment for our employees and want to contribute to a sustainable society.

CONTENTS

Food

Pharmaceuticals

Chemicals

Minerals & metals

PARTICLE SIZE ENLARGEMENT

The powder processing industry is tasked with creating powders or granules that are suitable for the end user's objective. If the end user needs to dose, mix and dissolve the product, for example, the granules must flow freely, must have a specific strength and particle size and must be optimally wettable. Particle size enlargement is an excellent solution for this purpose.

Particle size enlargement demonstrably improves flowability, dispersibility, wettability, density and product appearance while preventing segregation and reducing dust.

When formulating recipes, it is important to understand the complex mechanisms of particle size enlargement and the various different processes. The most commonly used processes for enlarging powdery particle sizes are agglomeration, briquetting, coating, compaction, extrusion, granulation, pelletizing and layering. Each of these processes has its own pros and cons. The ideal process for a particular application depends on factors such as product, capacity, feed particle size, end particle size, end use, etc.

At Hosokawa Micron B.V., we have many years of experience in the field of particle size enlargement for a variety of applications, and we are happy to share our expertise with you.

POWDER PROCESSING TECHNOLOGY AND KNOW-HOW UNDER ONE ROOF

At Hosokawa Micron B.V. we design and manufacture innovative powder processing technologies for a wide range of industries, including food, feed, pharma, chemicals, minerals and metals.

By focusing on these over the years, we have developed in-depth and unparalleled expertise that we enjoy sharing with our customers. We have translated this wealth of knowledge and experience into several technologies which are now fundamental in a great number of industries and applications.

Our R&D centre in Doetinchem, the Netherlands, provides state-of-the-art test facilities for customers looking to perform agglomeration tests on a laboratory, or pilot and semiproduction scale. Besides testing, we also offer a wide range of unique toll processing possibilities.

This enables us to offer the perfect mix of powder processing technology and knowhow, all under one roof.

Pigments
Sugars
Detergents
Feed antibiotics
Instant soup
Cocoa
Polymers
Catalysts
Bulk pharmaceuticals
Flavours
Ceramics
Metal salts
Phosphates
Herbicides
Lactose
Food ingredients
Agrochemicals

Particle size enlargement principles

There are various approaches to particle size enlargement. Since each approach is based on a different principle, it results in completely different behaviour of the end product. Therefore, when developing the processes for a particle size enlargement application, it is important to first have a very clear understanding of the purpose of the enlargement in combination with the intended end use.

PRESSURE

When using dry pressure as the principle for enlarging particles, a technology like dry mechanical compaction is most commonly used which results in large, strong and dense particles.

THERMAL

When using thermal energy to increase particle size, the particles are molten or partly molten to generate an adhesive effect, after which they are cooled again.

DRYING

The most common drying technologies are spray dryers and spray towers. When using spray towers, the material is diluted in water – sometimes with an additional binder – and then dried into a powder or agglomerate.

WET AGITATED GRANULATION

Several technologies are based on the principle of wet agitated granulation, such as:

> **Drum/pan granulators**
Drum and pan granulators generate a 'rolling' effect whilst an adhesive is sprayed onto the powder bulk. This results in layered spheres that are typically 3-10 mm in diameter.

> **Fluidized-bed granulators**
Within fluidized bed granulators, a powder is fluidized by an airflow. A liquid binder is sprayed onto the powder while it is in motion, resulting in fluffy agglomerates which can be layered.

> **High shear granulators**
Typical high shear granulators are horizontal and vertical mixers in which liquid binders are mixed into a powder (mixture). This typically results in small (<2 mm in diameter), dense granules.

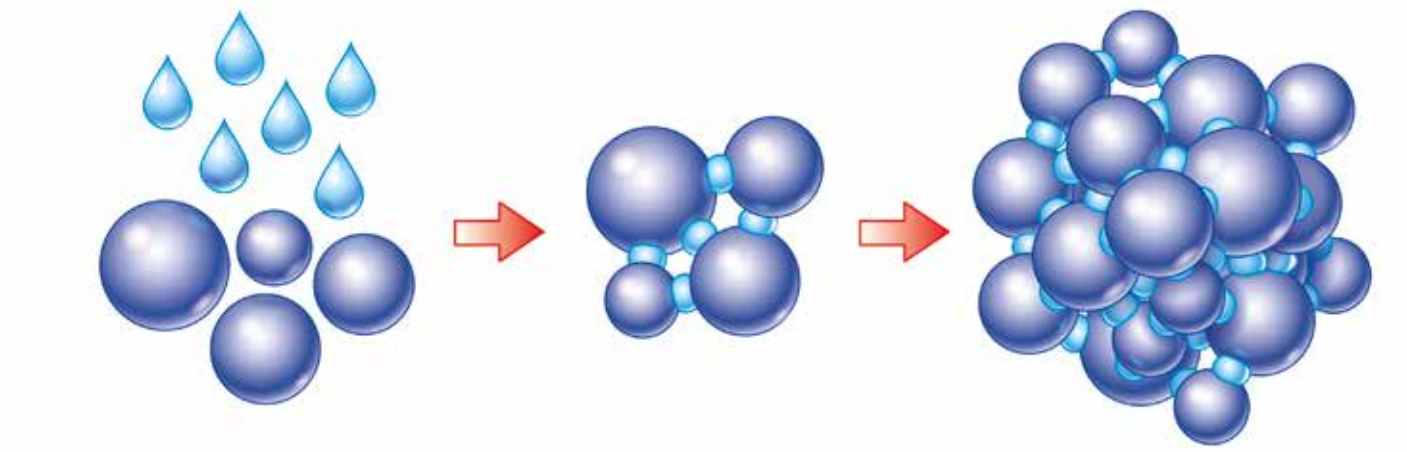
> **Hosokawa agglomeration technology**
The Hosokawa agglomeration system combines two proven Hosokawa technologies: The Flexomix mixer granulator and the Schugi fluid bed dryer and cooler. With this system, particles are 'glued' together to increase their particle size, thus retaining the characteristics of the initial particle size to the benefit of the end product. Thanks to the optimal process control it provides, this combination is the ultimate powder processing solution!



Principle	Pressure		Drying	Wet agitated granulation			
Technology	Compaction, briquetting	Extrusion	Spray tower	Drum/pan	Drum/pan	High shear granulator	Hosokawa agglomeration system
Product picture							
Product description	High density briquette	Extrudate	Hollow sphere	Layered sphere	Porous, layered granule	Dense small granule	Porous agglomerate

> *Overview of particle size enlargement processes*

The art of agglomeration



Liquid addition **Solidifying** **Porous agglomerate**

The Hosokawa agglomeration system

At the heart of the Hosokawa continuous agglomeration technology is the unique Flexomix agglomerator. This was developed by the Dutch company 'Schugi Process Engineers', which was acquired by the Hosokawa Micron Group in 1992.

The Flexomix is a unique and widely used agglomerator because of its reliability, simplicity, compact design and maximum process flexibility to produce the agglomerate required. It creates agglomerates with an open and raspberry-shaped structure, resulting in a large specific particle surface. The system is also often referred to as 'instant' agglomeration technology since the Flexomix agglomerator is extensively used for the production of instantly soluble agglomerates for food, chemical and pharmaceutical applications.

Flexomix technology can improve the powder characteristics in terms of:

- Solubility
- Flowability
- Sinkability
- Dispersibility
- Particle size enlargement
- Increased/decreased bulk density
- Particle shape
- De-dusting
- Prevent segregation
- Surface coating

Although the actual agglomeration process takes place in the Flexomix, the Hosokawa continuous agglomeration system is actually made up of several different pieces of equipment, each with its own functionality. It is this unique combination of technology that guarantees you of an agglomerate which meets your needs.

With this system, porous agglomerates can be made in a range of from 100 to 1,500 microns with a typical D50 value of between 200 and 700 microns. Capacities can vary from 100 kg/h up to 40 000 kg/h, depending on system design and the characteristics and requirements of the product.

Every agglomeration system supplied by Hosokawa Micron B.V. is developed in close cooperation with you and based on thorough testing of the product and requirements in our test laboratory, on a semi-production scale.



PROCESS AUTOMATION

At Hosokawa Micron B.V. our experienced team of process and electrical engineers helps you to identify the right degree of automation for your processes. Our engineers are experts in translating process technology know-how into essential hardware and software for optimum bespoke control solutions.

Functional Specification

After agreeing on the User Requirement Specification, our engineers will assess the special unique demands of your production sequence, any restrictions created by the supply network and the environmental conditions in your production area (e.g. a potentially explosive atmosphere) and convert their findings into a viable concept, the Functional Specification.

Hardware Design Specification

In terms of hardware, our engineers select the right combination of safety, switching and operating elements that best suit your production process to maximize the efficiency and reliability of your production sequence. Before leaving our manufacturing facilities, your custom-made control cabinet is thoroughly inspected and tested in accordance with international IEC and EN standards.

Software Design Specification

We then create a tailor-made process control software program that is precisely aligned with your process yet is also flexible enough to allow for quick and easy adaptations or process upgrades. We use tried and tested program modules for maximum reliability and efficient program generation.

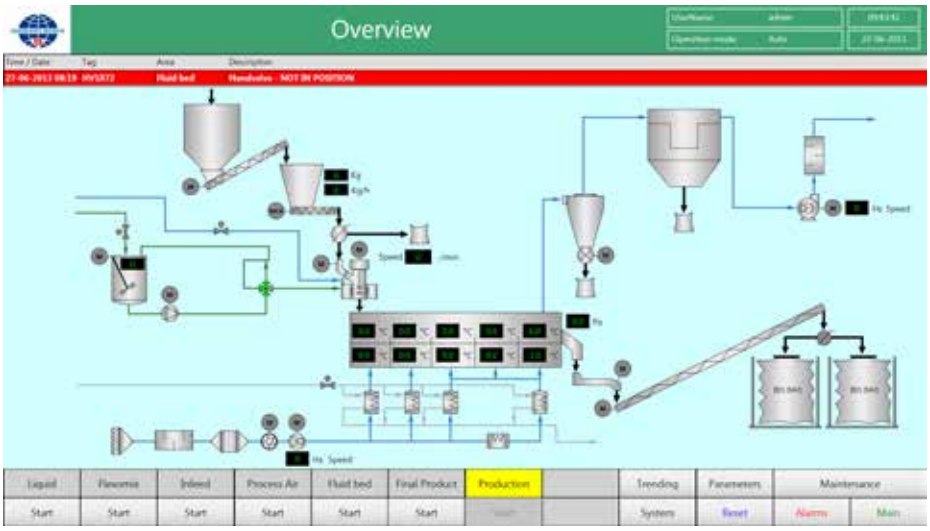
The software functionality is thoroughly tested before delivery of the process control unit to allow the start-up team to fully concentrate on process optimization following successful implementation.

Human-Machine Interface

From a simple operating and monitoring system, up to a system that is integrated – or communicates – with your DCS, we can design the process visualization to fully meet your demands.

User-friendly & reliable

All our systems, hardware, software and control solutions are user-friendly, error-free and reliable. We have reinvested the practical experience gained from implementations in a wide variety of industries in optimizing and further improving our process technologies and automation controls.



> *Example of a Hosokawa agglomeration system control panel / HMI*

The Flexomix agglomerator

1. Powder inlet

This is where the powder enters the Flexomix from the pre-installed feeding device. The powder inlet is designed in such a way that it always guarantees the smoothest transfer of powder from feeder to mixing chamber without creating any bottlenecks.

2. Drive configuration

The Flexomix is supplied with a direct drive configuration, suitable for frequency converter operation, and rotation speed indicator. It includes a heavy-duty and stand-alone bearing configuration for high-speed operation combined with gas-purged labyrinth sealing.

3. Liquid injection

Nozzles are installed for introduction of liquids or steam into the mixing chamber. The type of spray nozzle can be changed per product and process, and is selected during the test phase.

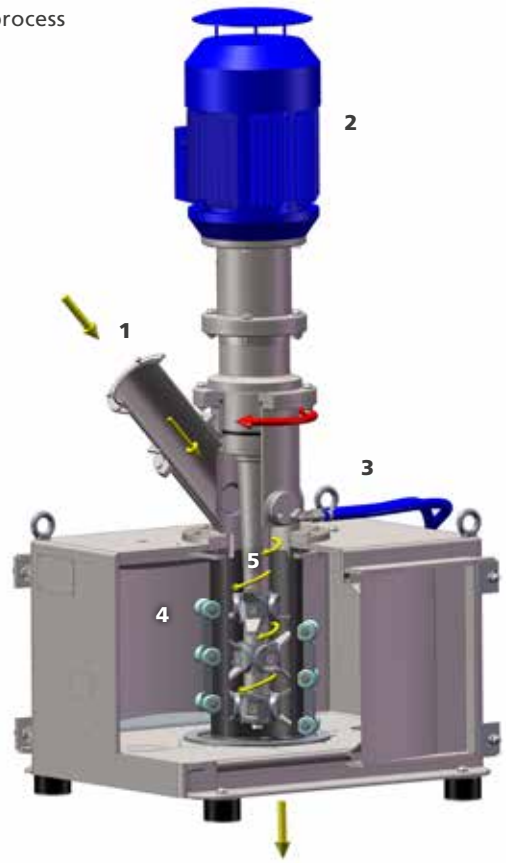
Standard two-way gas/liquid nozzles are installed and the design is prepared for this configuration, which also includes tubing and mounting to a central liquid diverter block for connection to the liquid dosing system. The nozzle holders are provided with quick release fasteners for easy and safe disassembly of the holders.

4. Mixing chamber / Roller cage

The mixing chamber consists of a flexible wall fitted with an external roller cage. This massages the wall from the outside during operation, keeping the mixing chamber clean at all times. The roller cage has a split-body design allowing easy access and disassembly of the flexible wall for inspection, cleaning or maintenance purposes. Depending on the product characteristics and process requirements, the flexible wall is available in several different materials.

5. Mixing element

The mixing element comprises a central drive shaft with knife blocks and air-purged sealing outside the mixing zone. Typical rotor speed can vary between 1000 and 5000 rpm depending on the process and Flexomix model. The knife blocks installed on the rotor enable adjustment of the knife angle to optimize the agglomeration process inside the Flexomix.

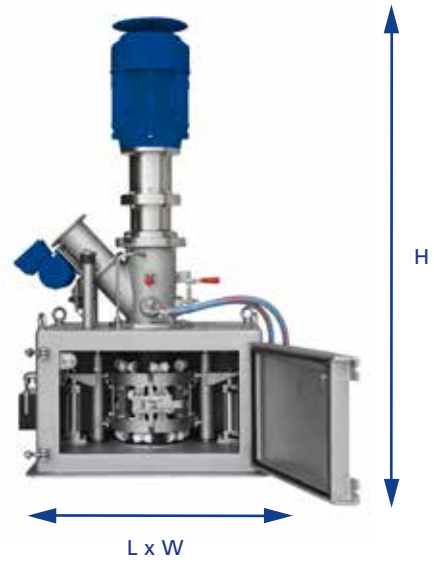




SIZES & SPECIFICATIONS

The Flexomix is available in six different sizes. The capacity can vary from 100 to 40 000 kg/h, depending on product characteristics and/or liquid volumes to be added during the mixing operation.

Type specification, for example FXD-160:
FX = Flexomix
D = Direct drive
160 = Diameter mixing chamber [mm]



Model	[-]	FXD-100	FXD-160	FXD-220	FXD-250	FXD-335	FXD-400
Length (L)	[mm]	520	702	976	976	1270	1270
Width (W)	[mm]	650	620	880	880	1100	1100
Height, incl. motor (H)	[mm]	1265	1500	1967	1967	2770	2910
Capacity (bulk density of 0.5 kg/l)	[kg/h]	100 - 400	250 - 1000	800 - 2500	2000 - 4000	3000 - 10 000	8000 - 40 000
Typical power motor	[kW]	3	7.5	7.5 - 10	11 - 15	22 - 45	37 - 75

> *Flexomix models with their typical characteristics. Please note that these values are indicative only. Detailed information is available on request.*

KEY BENEFITS

Excellent mixing effect
Flexomix end products are homogenous from sample to sample. Because all ingredients are mixed instantaneously, de-mixing of powders cannot occur. Each sample has a uniform dispersion of liquid(s) and solids that is beyond the capability of conventional mixers.

Self-cleaning
The external roller cage massages the outside of the mixing chamber to prevent build-up of product on the inside.

Flexible
As product life cycles shorten, production facilities need to be able to switch easily to the manufacture of other types of products. The Flexomix is designed to handle a wide range of different materials with varying product properties.

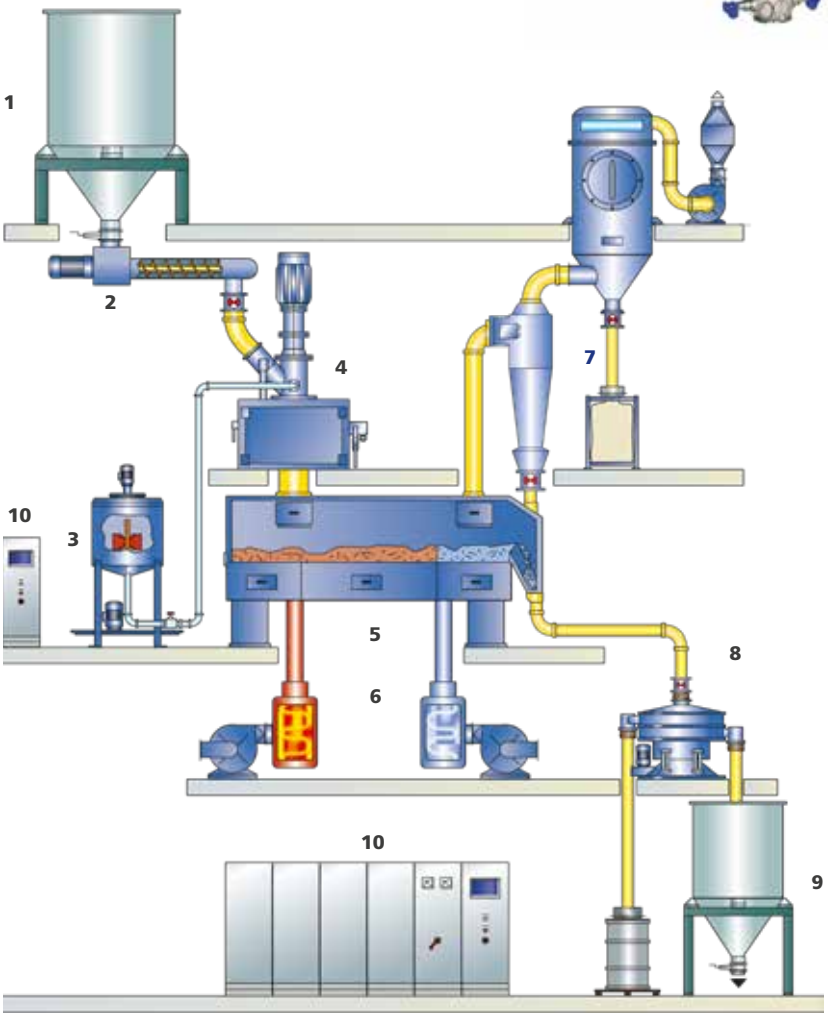
Low manpower requirements
Thanks to the operation of the Flexomix in continuous processing mode, productivity is high and manpower requirements are low. The process is operator-insensitive.

Maintenance-friendly construction
The clever design of the Flexomix, with a single rotating shaft plus blades and the external roller cage, reduces the maintenance effort. It can be disassembled in less than two minutes and the liquid injectors are easy to remove.

Bespoke systems

High-quality and efficient agglomeration is achieved through a delicate balance of conveying, charging, mixing, agglomeration, drying, discharging, sieving, packing and so on. That is why we offer bespoke agglomeration systems based on a combination of the following components, which are designed, manufactured and integrated to your exact specifications.

Liquid premixes can be prepared in the make-up tank and, in case multiple powders need to be premixed, a live hopper / Nauta® mixer can be applied. Powder(s) and liquid(s)/binder(s) are introduced into the flexible mixing chamber of the Flexomix.



> *Typical Hosokawa agglomeration system*

Hosokawa agglomeration system

System components

The Hosokawa continuous agglomeration system typically consists of:

1. Powder storage
2. Powder dosing
3. Binder preparation and dosing
4. Flexomix agglomerator
5. Schugi fluid bed dryer and cooler
6. Air preparation system including heating/cooling
7. Air exhaust system including cyclone and filter
8. Product classification (and crusher)
9. Big bag filling station
10. Integrated system and process controls

2

3

To guarantee a constant and accurate flow of powder and liquid to the Flexomix, high-quality powder dosing feeders and liquid dosing systems are an integral part of the system. To avoid the risk of product build-up in the mixing chamber, the flexible wall is constantly massaged by externally fitted rollers. They move up and down automatically while the Flexomix is running and keep the mixing chamber clean.

4

Due to very short residence times, there is no unwanted heat generation or impact on the product characteristics. In the Flexomix, the speed of the central rotor and the knife settings combine to create a centrifugal force. This accelerates the product towards the flexible wall and forces it into a downward spiral movement.

Within less than a second, wet agglomerates are formed, which fall under the influence of gravity into the static fluid bed dryer below.

5

Here, the agglomerates are dried, cooled and conveyed to the product classifying section for preparation of the final product.

After classification the product is split into on-size, over-size an (if needed) fines material. Over-size material can be crushed and fines can be reprocessed if applicable. On-size agglomerates can be stored in big bags or transported to a final packaging line. This whole process takes place in continuous mode.

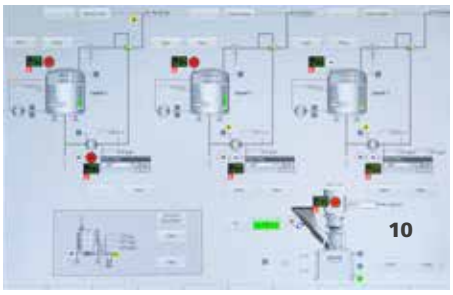
6

7

The performance and functionality of the fluid bed in combination with the air treatment section is an important part of the agglomeration process as this can have a direct impact on the level of agglomeration and product quality.

8

System controls



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The system controls are designed in such a way that different equipment components work together with a high level of accuracy and that a constant product quality can be achieved under varying circumstances.

Applications

Hosokawa agglomeration technology is suitable for a large variety of applications in the food and beverages, feed, pharma, chemical and minerals & metals industries. As a result, there are many factors to take into account when selecting the right approach for you. Our experts work closely with you to determine the most suitable agglomeration system for your processing requirements.

FOOD & BEVERAGES

The challenge in the food industry is to continuously develop new, innovative and convenient products in line with strict quality & safety standards, combined with cost-efficient processes. The Hosokawa continuous agglomeration system based on Flexomix technology offers the perfect solution for the production of highly soluble agglomerated particles which is flexible in terms of powder receipts and liquid binders.

Food safety & hygienic design

Hosokawa Micron B.V. is an active participant in the European Hygienic Engineering & Design Group (EHEDG). This consortium of equipment manufacturers, food industries, research institutes and public health authorities share the goal to increase food safety by improving hygienic engineering and design in all aspects of food production.

The long-term benefit is not only improved product safety, but also increased durability of equipment, reduced maintenance and lower operational costs.

Hosokawa Micron B.V. is an active EHEDG-member and we always take current hygienic engineering guidelines, such as EHEDG and 3-A, into account when designing, manufacturing and implementing food processing equipment.

Examples

> Instant cocoa
> Instant soup
> Bread improvers
> Granulated spices & flavourings
> Instant milk products
> Extruded pectin & yeast
> Specialty sugars
> Nutritional drinks

Instant cocoa Bread improvers

Spices & flavourings **Vitamins**

Instant milk products Yeast

Pectin Nutritional drinks

Sugars **Instant soup**



Example: Thickening agents

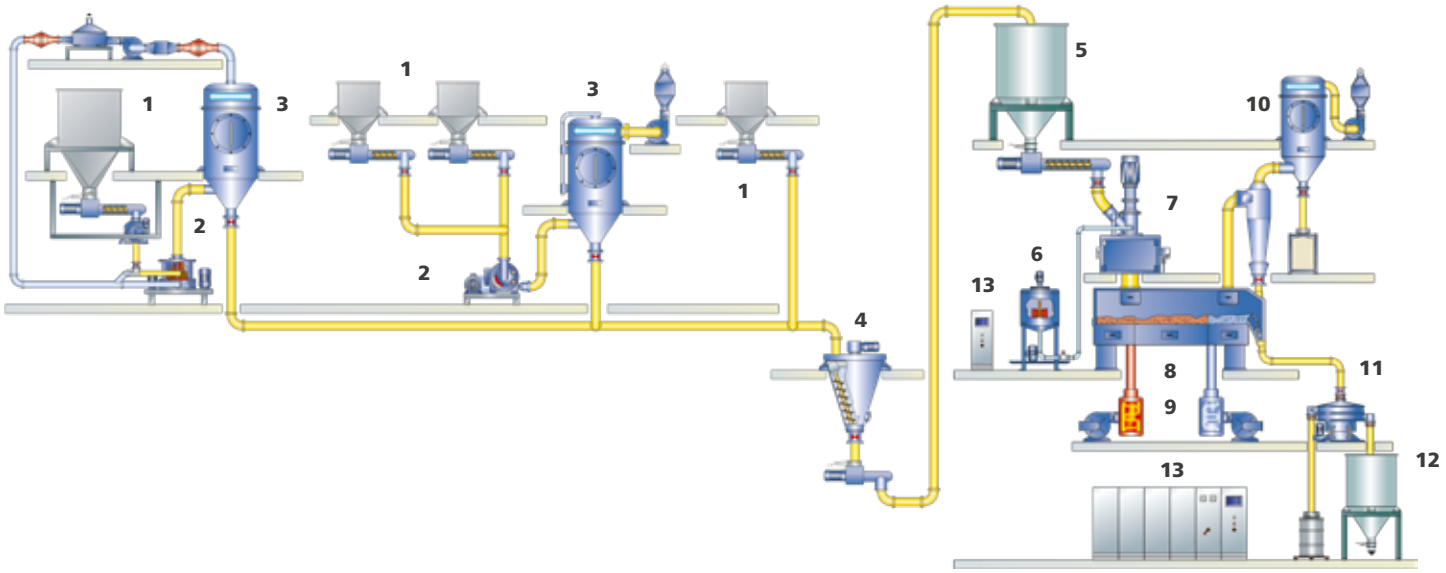
(e.g. gelatines, pectins, starches, alginates, gums, yeast)

Thickening agents, also known as gelling agents or stabilizers, are high molecular weight components such as gelatines or complex carbohydrates like pectins, starches, alginates and gums. For most food applications, it is important that thickening agents have good and controlled solubility, i.e. do not form layers or lumps, combined with good sinkability, i.e. do not remain on the surface. Use of the Hosokawa continuous agglomeration system to enlarge the particle size ensures that the particles sink through the liquid surface to the bottom more easily, dissolving as they do so. This results in a faster and more controlled dissolving process.

Example: Instant beverages

(e.g. soup, cocoa, powdered milk, nutritional drinks)

Agglomeration is an ideal technique to achieve a fine yet dense powder with the right characteristics (light, flowable, dispersible, good wettability) for use in instant beverages. The end product's intended use – either by consumers in the home or in a vending-machine environment – will affect the desired size and properties of the granulate. However, since the Hosokawa continuous agglomeration system can precisely control the particle size by defining the type and amount of binder to be sprayed on the powder during the agglomeration process, it is possible to manufacture products for both vending and consumer applications.



1. Powder storage
2. Mill
3. Filter
4. Pre-blending
5. Intermediate hopper and dosing
6. Liquid dosing
7. Flexomix agglomerator
8. Schugi fluid bed dryer and cooler
9. Air heating and cooling
10. Air exhaust system including cyclone and filter
11. Classifier
12. End product collector
13. System- and process controls

Applications

FEED

The manufacture of animal feed products and additives is a fast-moving industry faced with ever-changing quality demands and regulations. The focus is on high-capacity and cost-efficient processing. Many feed products are based on complex formulations made up of a number of components with different physical characteristics.

Due to the long supply chain from manufacturer to farmer and ultimately to the livestock, feed products are often required to have a long shelf life.

This places extra demands on the product quality and stability. The Hosokawa continuous agglomeration system helps to prevent segregation and de-mixing of the end product.

Examples

> Feed mixtures
> Additive pre-mixtures
> Fish feed
> Milk substitutes
> Instant milk products
> Antibiotics
> Enzymes

Additive pre-mixtures
Antibiotics
Fish feed
Feed mixtures
Milk substitutes
Enzymes



PHARMACEUTICALS

The top priorities in the pharmaceutical industry are safety and risk management/ reduction and manufacturers must comply with industry standards like cGMP and GAMP. In addition to meeting the highest possible standards of hygiene, we at Hosokawa Micron B.V. also advise you on issues such as climate-controlled logistics, safety and control systems to ensure you select the right agglomeration system for your needs. Hosokawa control systems can be supplied in accordance with the 21 CFR part 11 requirements.

Examples

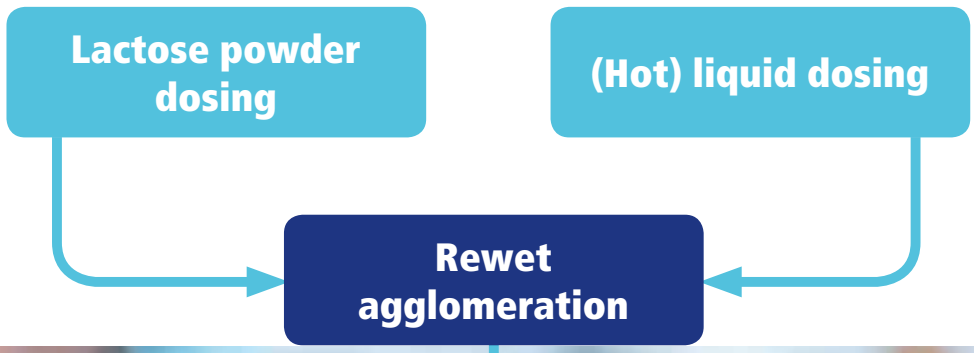
> Mineral-vitamin premix mixed/de-dusted with molasses
> Instant/granulated lactose
> Wetting before extrusion

Example: Lactose

Pharma lactose is used as base material for pressing tablets in the pharma industry. For this application, fine lactose powder is transferred into a compressable product. The base material is agglomerated to give it a porous structure. Apart from that fine lactose powder is very hygroscopic, susceptible to pick up moisture. Finally, the base material's flowability is improved to secure good filling properties for the tablet press.

Vitamins

Lactose



Applications

CHEMICALS, MINERALS & METALS

The wide range of capacities (up to 40 000 kg/h), in combination with its excellent mixing effect as well as its ability to handle a wide range of liquid-to-powder ratios (from 0.01% up to 45%), means that the Hosokawa continuous agglomeration system offers tremendous potential for use in many chemical, mineral and metal applications.

Examples

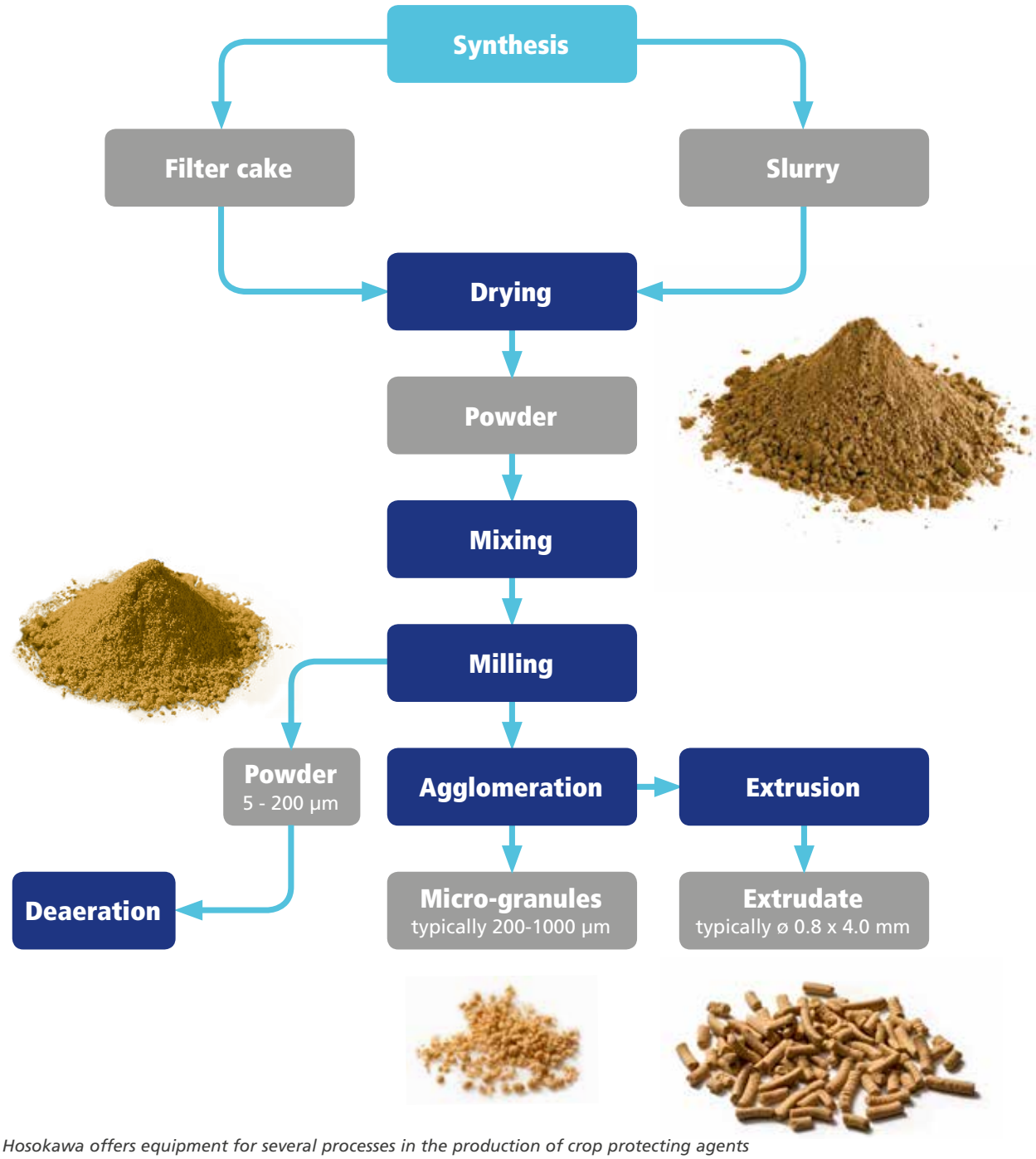
- Detergents granulation/formulation before fluid bed drying/cooling
- Detergent additives granulation
- Crop protection agents wetting/granulation
- Phosphates hydration and/or granulation
- Starting a chemical reaction, e.g. adding surface cross-linking agents to super absorbent polymers (SAP)
- Produce heterogeneous catalysts for use with reactants
- Colouring powders by mixing in a liquid pigment
- Nickel/cobalt formulation for rechargeable batteries
- Graphite granulation for rechargeable batteries
- Tungsten carbide granulation for moulding material

Pesticides
Detergents
Fungicides
Phosphates
Colouring powders
Herbicides
Super Absorbent Polymers
Pigments



Example: Crop protection agents (WDG)

In addition to liquid crop protection agents or pesticides, there are three common dry forms: wettable powders (WP), (micro) granules and extrudates. The Hosokawa continuous agglomeration system can be used to produce a water dispersible granule (WDG) as the basis for these dry forms. The resulting dedusted powers are easier to handle, which is beneficial in view of the toxicity of most crop protection agents. The resulting agglomerates also rapidly disperse in water yet are strong enough that they don't break during storage, thus improving the quality of the end product.



> Hosokawa offers equipment for several processes in the production of crop protecting agents

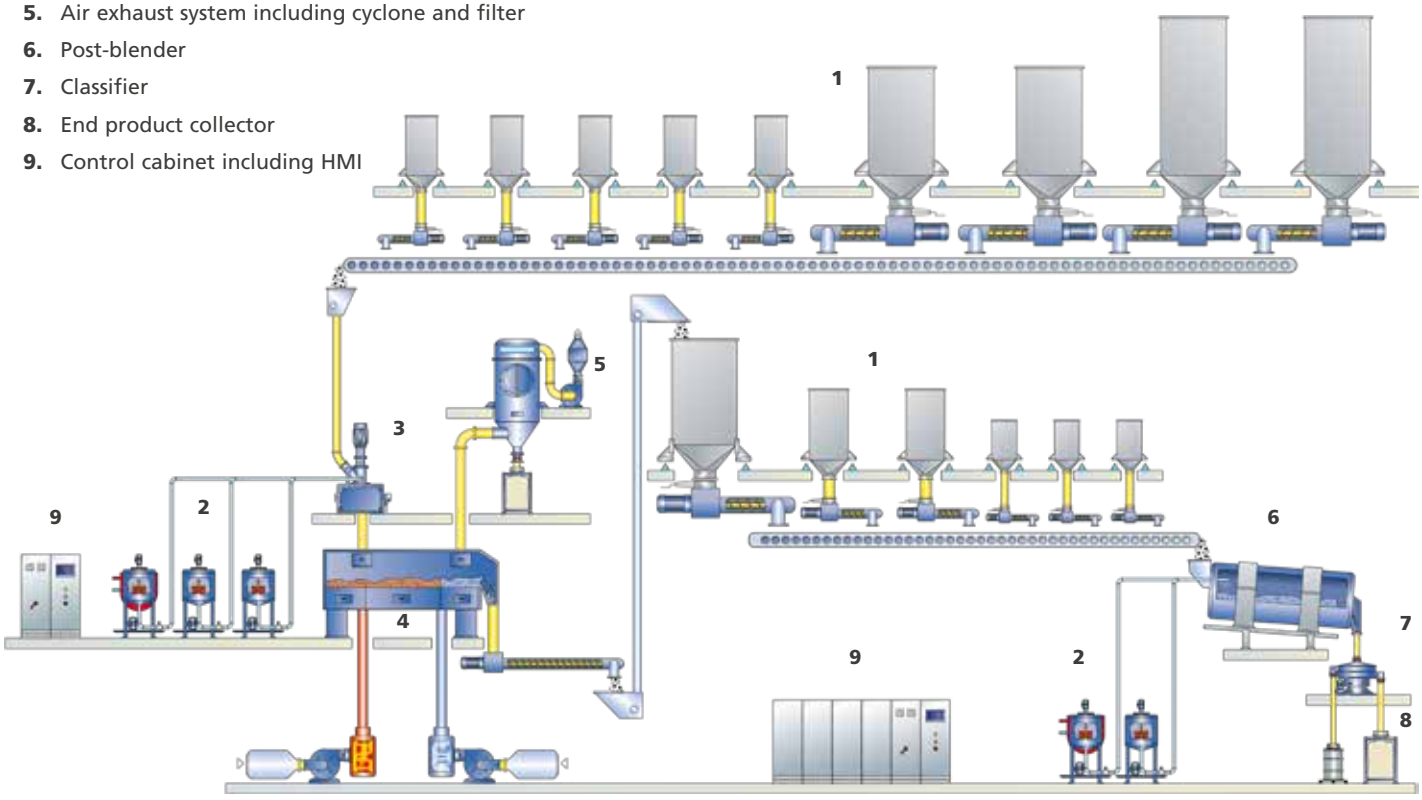
Applications

Example: Detergent powders

Manufacturing detergent powders involves various process stages. This can vary from preparing powdery ingredients, to agglomerating ingredients or half compounds, to post-blending final formulations or to manufacturing the complete formulation.

The wetted porous agglomerates are almost completely dust-free, and the flexibility (in terms of number of powdery ingredients, varying bulk densities, flow behaviour, etc) and high liquid-to-powder ratio of the Hosokawa system enables a wide range of formulations to be made.

1. Powder dosing units
2. Liquid dosing units
3. Flexomix agglomerator
4. Schugi fluid bed dryer and cooler
5. Air exhaust system including cyclone and filter
6. Post-blender
7. Classifier
8. End product collector
9. Control cabinet including HMI



> *Hosokawa detergent powder processing system*



Example: Carbon black

The leading uses for carbon black are as an additive in car tyre production or as a pigment. In both cases, the carbon black must be mixed in with other components in the production phase. This makes small particles are desirable, but the big disadvantage of small carbon black particles is that they are very, very dusty.

The Hosokawa continuous agglomeration system solves this problem, since it produces larger carbon black particles (mostly also with a larger bulk density) that generate less dust yet have good flow and mixing properties.

Example: Metal salts

Metal salts are not only used in food, but also in many chemical applications. The metal salts often need to be larger than their original size and, in order to be used as an ingredient in a formulation, they must also have good mixing properties.

The Hosokawa continuous agglomeration system makes it possible to combine the advantages of a fine powder (easy mixing) with the advantages of a larger powder (free flowing, less dust and adjusted bulk density).

Calcium carbonate

Carbon black

Zircon sand

Aluminium oxide

Zinc oxide

Graphite

Rare earth elements

Ceramics

Lithium powder

Magnesium oxide

Testing & Tolling

Testing & Tolling

At Hosokawa Micron B.V. we have our own testing and process development centre in Doetinchem, the Netherlands. It offers unique possibilities for testing your product to determine the most efficient process, system or plant prior to final design. We can provide laboratory-level as well as production-sized trials.

Whether you wish to test a single machine or a complete powder processing system, the same skilled and experienced staff are here to help ensure that your requirements are met, and that you are entirely satisfied with the results.

Is testing necessary?
If we could summarize the behaviour of powders in a set of rules and guidelines – in other words, if results could be predicted – then testing would be unnecessary. Of course the reality is somewhat different.

Testing isn't only necessary; it is the foundation of any successful product or process. At Hosokawa Micron B.V., we enjoy helping our customers test their latest ideas and requirements and, thanks to our state-of-the-art testing facilities, we can help you put theory into practice.

We have test equipment at your disposal for:
- Batch mixing from 1 up to 6000 litres
- Continuous mixing from 2.5 up to 1000 kg/h
- Batch vacuum drying from 5 up to 6000 litres
- Batch freeze drying of 1.5, 5 and 60 litres
- Continuous drying from 1 up to 250 kg/h (evaporation)
- Batch agglomeration from 5 up to 500 litres
- Continuous agglomeration from 100 up to 500 kg/h.

Feasability and scale-up
The base powder or pre-mixed powder is fed into the Flexomix agglomerator by one or more loss-in-weight feeding systems, to ensure a precise and constant product feed. One or more positive displacement pump(s) in combination with mass flow measurement supplies a precise and constant liquid flow(s) through air-atomized nozzles located in the top of the mixer, just above the mixing blades.

Initially the formed granules are discharged from the Flexomix into a container using a diverter valve. At this point the achieved product is judged visually on particle size and homogeneity. Fine tuning by adjusting parameters is done prior transferring the wet granules into a batch fluid bed dryer. The product in the fluid bed will be dried using hot air. After drying, the product is discharged and analysed.

For more precise scale-up purposes, our continuous fluid bed dryer is put in-line with the Flexomix agglomerator enabling us to perform fully continuous production simulation tests.

With the same set-up, we also offer toll processing and contract manufacturing services.

Testing
Contract manufacturing
Toll processing
Rental equipment
Laboratory- and production scale trials



Rental equipment

Our testing centre is fully equipped with all of our latest equipment for operational trials related to mixing, drying and agglomeration, but we also offer a range of rental equipment so that you can carry out operational trials at your own facilities too. This means that you can fine-tune process parameters and monitor production process designs.

To help things go smoothly, our experienced process engineers will work closely with your engineering team to advise and develop the best solution for your processing requirements.

Your advantages:

- Clearly defined costs
- No investment in equipment and buildings
- Efficient production of small quantities
- Test your process in a lab and on a production scale
- Define the specifications of your machine
- Use toll processing as part of your development process
- Produce materials for marketing activities, prior to investing in new production capacity
- Bridge the gap between design and start-up of your new equipment or plant
- Launch new products using toll processing, until your sales have reached a solid and profitable base

Service & Support

Downtime is unacceptable, which is why customers demand security and peace of mind for their processes and service and support for their machinery. At Hosokawa Micron B.V. we pride ourselves on a highly competent engineering department and a responsive and smoothly operating service department.

Repair & maintenance

Our Technical Services Team carries out repair and maintenance services onsite or in our own fully-equipped workshop in Doetinchem, the Netherlands. This team comprises specialists in mechanical engineering, maintenance, instrumentation and controls as well as process engineering.

Protect your investment

Create added security for your capital investment with one of our regular maintenance contracts. Our sales engineers will be more than happy to discuss a bespoke agreement that meets your specific maintenance needs, either for single machines or entire process lines.

Spare Parts Service

Minimise the hassle of sourcing spare parts with our Spare Parts Service. We have a team of engineers on standby that can deliver the spare parts and install them for you on site. And if that isn't efficient enough, we will happily discuss the options for your own in-house Hosokawa Micron B.V. inventory: spare parts to hand, 24/7.

Predictable **Reliable**
24 hrs service & support
Avoid down-time **Upgrade**
Repair **Value for money**
Improve **Replace**

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+31 314 373 505



Preventative maintenance

Preventative maintenance means knowing that your production processes are in good working order and increasing the lifetime of your plant. At Hosokawa Micron B.V. we have a dedicated team of experienced maintenance engineers specialized in just that: providing on-site advice, engineering and training to help you optimize your processes. Our experienced engineers are focused on identifying potential mechanical, safety and process line problems before they cause unnecessary downtime.

On-site services

- Preventative maintenance
- Inspection and troubleshooting
- Repairs & servicing
- Process support and optimization
- Modifications and upgrading to latest technology
- Internal transport, relocation and construction
- Operator training either at your premises or in Doetinchem, the Netherlands
- Commissioning
- Certification and validation
- Reconditioning of used machines
- Swap drives

Replacing old machinery with new

A retrofit, upgrade or refurbishment can be easier and more economical than specifying and buying a new system.
At Hosokawa Micron B.V. we offer exactly that: combining our high-quality products and spare parts with expert design and engineering as well as experienced manpower. Our goal is to make sure that this solution performs just as well as brand-new equipment would.

Retrofitting

We will send in our expert engineers for an initial assessment, to fix mechanical failures and replace broken parts. In short, we will give your machines a new lease of life.

Any new parts come with a 12-month guarantee but may well last much longer; 25-30 years is no exception! Now that's what we call value for money.

Upgrading

Our engineers can also help you improve production, increase capacity and upgrade your existing processes to the latest industry standards. We can minimize mechanical failures, convert to food-grade specifications and CIP cleaning, all without necessarily having to replace the entire system.

Refurbishment

Refurbishment is more than a retrofit or upgrade – it's the whole package. From start to finish, we will work with you to improve your processes: come up with a plan, to improve, repair, replace and upgrade whilst considering the application, the market sector, industry standards and of course your wishes and requirements.

HOSOKAWA MICRON

Hosokawa is the world's largest provider of processing systems for the field of powder and particle processing. Renowned brand names such as Alpine, Micron, Nauta, Schugi, Stott, Vitalair and Vrieco are all included in the Group's range.

Regardless of the size, i.e. production-scale systems, pilot systems or laboratory equipment, Hosokawa's products and technologies are used in numerous process stages, for example during mixing, drying, agglomeration, containment, filling, metering, size reduction and classification.

CONTACT

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HOSOKAWA MICRON B.V.

Hosokawa Micron B.V. is a member of the Hosokawa Micron Group, responding to global needs through emphasis on materials science and engineering. The Group is an international provider of equipment and technology for powder and particle processing, plastics processing and confectionery products. The Group maintains facilities for research, engineering, manufacturing and service in each of the world's major industrial markets.

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