Hosokawa Alpine 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.

© Hosokawa Alpine 2008. Printed in Germany.
Hosokawa Alpine has been in business for over 100 years. Regardless of the field, i.e. blown film processing or powder & particle processing, we are traditional trendsetters on the market. The driving force behind refining our technologies is the experience we gain and the challenges we face as market leaders.

**ONE COMPANY - TWO BUSINESS DIVISIONS**

**BLOWN FILM PROCESSING**

As a specialist for film blowing lines to manufacture thin plastic film, Hosokawa Alpine ranks among the world’s foremost suppliers in this market segment. The vast fund of know-how, the high quality standards, the continuous innovation and high degree of reliability are all reasons for the constant growth of innovation and high degree of reliability quality standards, the continuous.

**POWDER & PARTICLE PROCESSING**

Formed in 1898, Hosokawa Alpine’s range includes the development, design and manufacture of components and turnkey systems to produce powders, granules and bulk materials for the chemical, pharmaceutical, food, minerals, metals and recycling industries. Whether the task is comminution, classification, dust removal, handling, metering, weighing or packing, you will always find Hosokawa Alpine to be a competent and innovative partner.

**DIVISIONAL STRUCTURE**

The name ALPINE stands for competence in all areas of comminution technology. The long years of close cooperation between our engineers and the development departments of our customers have made us leading specialists for powder and particle processing technology around the world. Because our aim is to offer our customers the very best in professional and accomplished advice tailored to their specific branch of industry, our powder and particle processing division is divided into five subdivisions:

- **PHARMA & FOOD**
  The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and performance, including special processes for the food industry. Whatever method of size reduction is used, we are the specialists.

- **MINERALS & METALS**
  We supply complete dry and wet processes with state-of-the art mills and classifiers for processing mineral raw materials. Our machines and systems for fillers, ceramic raw materials, metallic compounds and alloys all meet the high demands set by our customers. We are not just manufacturers, however, but also competent partners for the engineering and design of complete turnkey systems.

- **CHEMICALS**
  The range of chemical products is just as wide and diverse as are the different demands on the properties of pigments or powders. We supply process-technological solutions for the chemical industry as a single-source partner. Our comprehensive range of products means that we are able to meet a vast number of different requirements. We also offer competent advice on solutions for basic chemical products and auxiliary products, as well as for toners, paints, pigments, herbicides or fertilisers.

- **RECYCLING & GRANULATORS**
  We design, build and deliver complete granulator systems to include all necessary system components. Whether the feed material is injection mouldings, spumes, film webs or film edge trims, our granulators are designed for even the most difficult cutting tasks. In addition, we also supply in-line recycling solutions for rubber or cable which are tailored to the individual requirements.

- **MICRON, COLOGNE**
  All our dealings are oriented towards an objective of prime importance, namely the satisfaction of our customers. Our strategy is to deliver grading and classifying systems which produce qualities to match the specifications. A point of focus thereby is that both system and components are easy to operate, clean and maintain. It is above all our classifier mills and hammer mills, air classifiers and cyclones that are employed in just about every industry, e.g. the powder coating, chemicals, pharmaceuticals, food and minerals industries.

**SERVICE**

Our service division gives support during the entire lifetime of any Hosokawa Alpine system or machine. Our extensive range of services includes spare parts supply, maintenance, inspection, servicing, repairs, general overhauls, system upgrading, and training. A fairly recent addition to our portfolio of services is a range of pre-owned ALPINE machines.

**EVERYTHING FROM ONE SINGLE RESPONSIBLE SOURCE**

---

Hosokawa Alpine is your competent partner around the world, offering sound advice and active support for project management, installation, commissioning, training, maintenance and system optimisation.
**PRODUCT RANGE**

**HOSOKAWA ALPINE Customer Divisions**

- PHARMA & FOOD
- CHEMICALS
- MINERALS & METALS
- RECYCLING & GRANULATORS
- TECHNICAL CUSTOMER SERVICE
- MICRON COLOGNE

Interested in hearing more about ALPINE’s Powder & Particle Processing Technology range? Simply contact the respective customer division or your nearest ALPINE agent.

[www.alpinehosokawa.com](http://www.alpinehosokawa.com)

---

**PRODUCT RANGE**

**AIR CLASSIFIER MILLS**

<table>
<thead>
<tr>
<th>Size Reduction</th>
<th>Air Classifying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammer Mills</td>
<td>Turboplex Air Classifiers</td>
</tr>
<tr>
<td>Pre-crushers</td>
<td>TURBOPLEX AIR CLASSIFIERS</td>
</tr>
<tr>
<td>Fine Cutting Mills</td>
<td>AGITATED BALL MILLS</td>
</tr>
<tr>
<td>Fine Impact Mills</td>
<td>MULTI PROCESSING SYSTEM</td>
</tr>
<tr>
<td>Fluidised Bed Opposed Jet Mills</td>
<td></td>
</tr>
<tr>
<td>Fine Impact Mills</td>
<td></td>
</tr>
<tr>
<td>Spiral Jet Mills</td>
<td></td>
</tr>
<tr>
<td>Ball Mills</td>
<td></td>
</tr>
<tr>
<td>Table Roller Mills</td>
<td></td>
</tr>
<tr>
<td>Agitated Ball Mills</td>
<td></td>
</tr>
<tr>
<td>Ventoplex Air classifiers</td>
<td></td>
</tr>
<tr>
<td>Turboplex Air classifiers</td>
<td></td>
</tr>
<tr>
<td>Stratoplex Air classifiers</td>
<td></td>
</tr>
<tr>
<td>Micron Air classifiers</td>
<td></td>
</tr>
<tr>
<td>Ultrafine Air classifiers</td>
<td></td>
</tr>
<tr>
<td>Zigzag classifier Mills</td>
<td></td>
</tr>
</tbody>
</table>

---

**PRODUCT RANGE**

**MULTI PROCESSING SYSTEM**

- Sieving
- Wet Processing
- Drying
- Product Recovery
- Laboratory & Pilot Plant
- Particle Size Analysis

---

**PRODUCT RANGE**

<table>
<thead>
<tr>
<th>Key Products</th>
<th>Standard Product Range</th>
<th>Range of Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key Products</td>
<td>Standard Product Range</td>
<td>Range of Services</td>
</tr>
</tbody>
</table>

---

**PRODUCT RANGE**

**PHARMA & FOOD**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CHEMICALS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MINERALS & METALS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**RECYCLING & GRANULATORS**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TECHNICAL CUSTOMER SERVICE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MICRON COLOGNE**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONSULTING SERVICES

Problem specification, exploration of different technical solutions, product-specific processes, consideration of safety aspects, different system concepts, e.g. pressure-shock-proof, inert gas mode, CIP/SIP, etc.

ENGINEERING

Initial design stage:
- concept studies - basic engineering, flowcharts - installation planning;
- safety concepts, e.g. ATEX; project documentation

Detail planning:
- P&I diagrams, calculation and layout, specification of components, design, programming and networking of visualisation systems, structural steel engineering with static calculations, planning the piping and ductwork, official acceptance of subcontractor work

TRIALS

The Alpine application testing centre offers unique possibilities for conducting customer trials with the objective of determining the optimum system layout and the processing-technological warranted values. Both laboratory- and production-scale trials are possible.

For example: grinding and classifying tests, analysis in our lab, evaluation of energy consumption, production costs, production of samples.

PROCESS AUTOMATION

Control cabinets, logic diagrams, process control with PLC, visualisation systems, process data archiving, process control systems, teleservice connection for remote maintenance.

DOCUMENTATION

- Operating instructions, operating manuals
- "As built" documentation
- Software documentation
- Documentation as per 21 CFR Part 11 for the pharmaceutical industry
- CE certification

MANUFACTURING

Hosokawa Alpine has its own production facility in Augsburg which is characterised by a high percentage of in-house manufacturing. The production facility is made up of a sheet metal and structural steel engineering shop for the manufacture of complex subassemblies (including pressure-shock-proof subassemblies), the machine shop with an extremely wide range of production machines and equipment, and a total of 6 assembly groups assigned to the different company divisions.

ENGINEERING PLANNING AND SUPERVISION

- Project coordination
- Installation and assembly of complete systems on the customer’s premises by competent field service erection engineers – anywhere in the world.
- On-site supervision

COMMISSIONING

- Commissioning, training, test runs, system hand-over.

MADE IN GERMANY

A high-quality product calls for competence in development, design, manufacture and assembly. And this competence in turn stems from the training, know-how, experience and motivation of the company staff. The setting of the company headquarters in Augsburg has always fulfilled these requirements in the best possible way. And it is here that we find the dedicated and excellently trained staff who render a great service to the company, the products and the success of our customers. For this reason and in the tradition of our own self-imposed commitment to high quality, we will continue to lay store by Germany as a business location. The new logo for our letterheaded company paper with the message ENGINEERED, MANUFACTURED AND ASSEMBLED IN GERMANY underlines this commitment.

A total of 20 million euros was invested in manufacturing operations in Augsburg during the years 2007 and 2008. New production and assembly halls were built to bring the manufacturing facilities up to a standard which better meets the demands of a modern mechanical engineering company. Implementation of the factory building project constituted the last link in the chain of planned restructuring measures.
Process solutions for:

- Foodstuffs: Cereals, pulses (peas, beans), starch and starch derivatives, sugar and sugar substitutes, spices, tea, dried fruits and vegetables, thickening agents (gelatine, pectin, carrageenan), emulsifiers, vitamins
- Cosmetics: Face powder, eye-shadow, etc.
- Pharmaceuticals: Active substances (BPC/API); Auxiliary agents such as: lactose, cellulose, starch; Compounds

Engineering

The pharma & food division offers the complete range of basic and detail engineering services. These services include not only system technology, but also automation and process visualisation as well as system qualification.

Material samples which are used for downstream tests or for customer applications are produced by ALPINE in the laboratory and testing centre.

Product range

- Crushers, Hammer Mills
- Granulators
- Fine Impact Mills
- Contra-rotating Pin Mills
- Mechanical Classifier Mills
- Long Gap Mill
- Spiral Jet Mills
- Fluidised Bed Opposed Jet Mills
- Static Air Classifiers, e.g.: Multiplex Zigzag Classifiers
- Dynamic Air Classifiers, e.g.: Stratoplex Classifier ASP Turboplex Classifier ATP, etc.
- Laboratory Air Classifiers
- Laboratory-scale sieving technology and particle size analysis: Air Jet Sieve 200 LS-N, Wet sieving technology, On-Line particle analysis, Containment, Agitated Ball Mills

Division profile

The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and services. Developed in close cooperation with the customer, this division designs and manufactures aseptic processing systems for powdery products, and enjoys market leadership on this sector. The demand to separate operator and process resulting from the dictates of hygiene is met by the integration of cGMP technology or isolation technology.

We supply machines and systems which permit the highly automated manufacture of high-quality foodstuffs and functional food in innovative processes.

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

CONTAINMENT TECHNOLOGY

Field of activity with comprehensive services regarding technologies, machine design and plant engineering according to the efficient cGMP standards.

Pharma & Food Division

Division profile

The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and services. Developed in close cooperation with the customer, this division designs and manufactures aseptic processing systems for powdery products, and enjoys market leadership on this sector. The demand to separate operator and process resulting from the dictates of hygiene is met by the integration of cGMP technology or isolation technology.

We supply machines and systems which permit the highly automated manufacture of high-quality foodstuffs and functional food in innovative processes.

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

CONTAINMENT TECHNOLOGY

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

DIVISION PROFILE

The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and services. Developed in close cooperation with the customer, this division designs and manufactures aseptic processing systems for powdery products, and enjoys market leadership on this sector. The demand to separate operator and process resulting from the dictates of hygiene is met by the integration of cGMP technology or isolation technology.

We supply machines and systems which permit the highly automated manufacture of high-quality foodstuffs and functional food in innovative processes.

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

CONTAINMENT TECHNOLOGY

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

DIVISION PROFILE

The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and services. Developed in close cooperation with the customer, this division designs and manufactures aseptic processing systems for powdery products, and enjoys market leadership on this sector. The demand to separate operator and process resulting from the dictates of hygiene is met by the integration of cGMP technology or isolation technology.

We supply machines and systems which permit the highly automated manufacture of high-quality foodstuffs and functional food in innovative processes.

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

CONTAINMENT TECHNOLOGY

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

DIVISION PROFILE

The manufacture of powdery substances for the pharmaceutical industry is a job for specialists. Hosokawa Alpine conforms with international pharma standards and supplies a wide range of products and services. Developed in close cooperation with the customer, this division designs and manufactures aseptic processing systems for powdery products, and enjoys market leadership on this sector. The demand to separate operator and process resulting from the dictates of hygiene is met by the integration of cGMP technology or isolation technology.

We supply machines and systems which permit the highly automated manufacture of high-quality foodstuffs and functional food in innovative processes.

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.

CONTAINMENT TECHNOLOGY

One objective is to avoid the risk of aseptically manufactured products becoming microbiologically contaminated by the environment.
The specialists for all your questions regarding fine powders.
The scope of activities of the Chemicals Division is just as wide as the vast range of materials for which Alpine offers process solutions.

DIVISION PROFILE

The systems and processes offered by the Chemicals Division cover all the basic operations of mechanical process technology such as size reduction, separation, air classification, mixing, conveying, product collection and feeding. The target of the Chemicals Division is to find the most practical and economical solution for the case in hand.

WET PROCESSING TECHNOLOGY

Besides the classic dry processing techniques such as size reduction and air classification, Hosokawa Alpine has extended its range to include wet grinding and wet classification. Boosted by this complement to the traditional range of dry processing techniques, the Chemicals Division is now even better equipped to cope with customer-specific requirements and to elaborate suitable process solutions.

HORIZONTAL WET MILL AHM

Applications: Basic chemicals, catalysts, pigments, dyes, plant protectors, fine chemicals, metallic oxides - Mill housing: cylindrical, cooled. - Agitator: perforated discs and special agitating elements. - Separating device: slotted pipe screen, exchangeable without emptying of the mill.

FLUIDISED BED OPPOSED JET MILLS TFG

New product line for quick and easy cleaning.
- Eminently suitable for toner and pigments, especially if the product or colour is changed frequently. - Integrated ultrafine classifier for extremely spatter-grain-free end products with steep particle size distributions. - Classifying wheel with vertically mounted drive. Can be opened hydraulically by 180° for cleaning.

ULTRAFINE CLASSIFIERS TSP, TTSP

New and precise one- or two-stage ultrafine classifiers for excellent coarse material qualities.
- Minimisation of the fines portion < 2.5 µm with black and coloured toner. - Dedusting of powder coatings to reduce the 10-µm portion to < 5%. - Dedusting of silicic acids and silica gels. - Fine reduction in the case of pigments with strong coating behaviour. - Low pressure drop permits the use of standard radial fans.

PRODUCT RANGE

- Turnkey lines for the production of toner. From the premix to the finished toner powder. - Turnkey systems for the formulation of plant protectors. - Standard systems for non-explosive materials. - Explosion-protected systems pressure-shock-proof, with and without venting and/or explosion suppression. - Inert-gas systems as explosion protection or because the product demands it. - Dyestuff and pigment processing systems easy to dismantle and reassemble, easy to clean (important for frequent product changes). - Laboratory machines and analysis units for the production of mini batches, for quality control and quality assurance. - Wet grinding and wet classification - Grinding beads: Alpine Power Beads zirconia YSZ and zirconium silicate S2S.
**Table Roller Mills AWM**

Drive power: 5 - 500 kW

- Mineral fillers: limestone, dolomite, talc, chalk, barite...
- Precipitated calcium carbonate: complete turnkey plants for the production of different types of PCC
- Ceramic raw materials: feldspar, quartz, zircon sand, aluminium oxide...
- High-tech materials: SiC, boron carbide, Al₂O₃, graphite...
- Ceramic glazes
- Building materials: gypsum, clay, bentonite...
- Rare earths
- Wood, cork...

**Applications:**
- Limestone, dolomite, talc, bentonite, clay.

**Product Range**

- **Table Roller Mills AWM**
- **Classifiers:** Zirkoplex Classifier Mill ZPS, Micron Classifier Mill ACM
- **Long-Gap Mill LGM**
- Stratoplex Air Classifier ASP for high performance in the medium-fine range
- Turboplex Air Classifier ATP in one-wheel or multi-wheel design
- Micron Air Classifier MS with ceramic wear protection
- Turbo Twin Classifier

**Your Partner for**

Project management, installation, commissioning, training, maintenance and system upgrades.

**Agitated Ball Mills ATR/ANR**

Over 1500 of these classifiers have been sold in a variety of designs. With the new ATP-NG (NG = New Generation), fineness values of \(d_{97} = 2 \mu m\) or throughputs of 6 t/h at a \(d_{97} = 7.5 \mu m\) in the case of the 630/4 ATP-NG are achieved at energy savings of up to 50%.

**Applications:**
- Fine products \((d_{97} = 10 \mu m)\), low energy requirement, low noise operation, low vibrations, low investment costs, high performance.

**Engineering, manufacturing, supply and service. Product and process know-how as the basis.**

**MINERALS & METALS DIVISION**

**TABLE ROLLER MILLS AWM**

The ball mill is still the workhorse in the mineral powder industry. Since developing the S.O.-S.F. (superfine) mill, we are in a position to produce extremely fine fillers \((60-70\% < 2 \mu m)\) in direct circuit using a dry, low-energy and low-cost process.
**DIVISION PROFILE**

- Engineering & supply of complete systems: cutting, precrushing, disintegration, rolling into balls, fine grinding, fractionation, separation, dedusting.
- Engineering “Made by ALPINE”
- Recycling processes, process development
- Plastics processing, regeneration systems
- Film recycling
- Fine grinding systems for plastics and rubber
- Precious metal recovery: scrap cable, electronic scrap, etc.
- Plastics processing for chemical or energetic reuse

**SERVICES**

- Engineering and trials
- Customer service

---

**PRODUCT RANGE**

- Polymer Line Granulators PL
  Drive: 4 - 75 kW
- Compact Line Granulators CL
  Wide-chamber design.
- Rotoplex Granulators Ro
  Heavy-duty design.
- Universal Shredders UZ
  Powerful single-shaft shredders
- Fine Cutting Mills AFS
  for powdered plastics
- Dedusting Systems
- Plastics Recycling Systems with RE-Extruders
  Output: approx. 60 - 1200 kg/h
- Hammer mills, crushers, pulverisers, air classifiers, etc.

**POLYMER LINE GRANULATORS PL**

- Fine Cutting Mills AFS for powdered plastics
- Granulate Dedusting Systems
- Plastics Recycling Systems with RE-Extruders

**COMPACT LINE GRANULATORS CL**

- Robust design with integrated wear protection.
- Wide-chamber design with electrohydraulically actuated machine top section and screen support.
- Rotors in patented cross-scissor-cut design.

**FINE CUTTING MILLS AFS**

- Drive power: 15 - 132 kW
- State-of-the-art gear ring technology in proven quality.
- The innovative and central gap adjustment ensures optimum operation and rapid maintenance.
- Variable gear ring and gap geometry.

**ROTOPLEX GRANULATORS RO**

- Unparalleled heavy-duty design principle.
- High number of rotor knives and stator knives.
- Rotors in patented cross-scissor-cut design.

---

**COMPLET EcYCLING PROCESSES EXAMPLE: PVC WINDOW PROFILES RECYCLING**

**Task:**
- Fine grinding of PVC profiles.
- Separation of dust and protective film.
- Feed material:
  - Rejects and start-up profiles up to 6 m in length.

**Product yield points:**
- Plastic profiles
- PVC granules
- PVC powder (end-product)
- Film particles
- Metal particles

**Diagram:**

- Feed chute
- Granulator 45/1 CL
- Fine Cutting Mill 500 AFS
- Dedusting System DE
- Metal separator
- Silo
- Filter
- Sieving machine
- Fan
- Conveying channel
- Filter
- Control cabinet

---

**GRANULATORS IN STAINLESS STEEL**

To order, Alpine granulators completely or partly in stainless steel. Alternatively with anti-corrosion coating.
Our total concept is what makes the difference. We take care of the complete engineering process – from feeding the product to filling the end product into the container.

**DIVISION PROFILE**

Since the company was formed in 1957, grinding and classifying systems have been designed and built for the fields of powder coatings, chemicals, food, pharmaceuticals and minerals. Originally active under the names „Pulverizing Machinery“ and „MikroPul“, the company has long been a member of the Hosokawa Group and just recently became a division of Hosokawa Alpine Aktiengesellschaft in Augsburg, and has thus strengthened its image as a provider of complete solutions on the sector of comminution, classifying and dust extraction.

With over 3,000 classifier mills sold around the world, Hosokawa Micron Cologne is the market leader on the sector of classifier mills, patented over 40 years ago and still being improved today.

**COMPLETE SYSTEMS: GRINDING, CLASSIFYING, DEDUSTING**

**EXAMPLE: POWDER COATING SYSTEM**

**MIKRO PULVERIZER HAMMER MILL**

- Predestined for universal application.
- Special features:
  - Grinding of soft to medium-hard products
  - Grinding, mixing and homogenisation in one single processing step
  - Easy to clean and maintain
  - Well-proven in combined grinding and drying systems, as well as in cryogenic and inert gas systems
  - Different rotors, liners, screens and grinding elements for a wide range of applications and products, e.g. carbon black, iron oxide, casing, melamine, sugar, urea, etc.

**MIKRO MAK CLASSIFIER FOR FIBROUS/NATURAL PRODUCTS**

- Specially developed for fibrous and natural products. Wood, corn, grain, dried peas, reed and straw, to name just a few examples, can be ground with no fibrous residues because the grinding elements are developed and tailored to suit the product in question.

**MIKRO ACM CLASSIFIER MILL**

- Grinding and Classifying in one single machine: this is the major advantage of classifier mills. The four available designs and the different sizes make it possible for us to offer an optimum solution for just about every application. Fineness values of 99% <10 µm are possible.
- Cx: Standard with coaxial bearing assembly
- CL: Separate bearing for a longer service life
- EC: Easy-clean concept for frequent production changes
- EC-CL: Unites the advantage of the EC and CL system

**PROCESS SOLUTIONS FOR**

- **CHEMICALS**
  - Powder coatings: epoxide/polyester, acrylate clear varnish, polyamide, UV-curing powder coatings, carbon black, polyester resin, stearate, fungicides, herbicides, bisphenol, vulcanisation products
- **FOODSTUFFS**
  - Sugar, icing sugar, cocoa, rice starch, lactose, thickening agents
- **FIBROUS/NATURAL PRODUCTS**
  - Wood, cellulose,reed, peas, cereals
- **PHARMACEUTICALS/COSMETICS**
  - Face powder, algae, paracetamol, tartaric acid, ascorbic acid, vitamins
- **MINERALS**
  - Talc, uranium oxide, bauxite, limestone, kaolin, calcium phosphate

**ENGINEERING**

Trials are carried out in our testing centre to produce reference samples and to determine the throughput and optimum grinding elements. This serves to create the basis for an engineering process that is tailored exactly to your requirements. Together with the customer, we develop solutions which will later enable a smooth production process. This includes both automation and process visualisation as well as tele-maintenance.

**PRODUCT RANGE**

- **CLASSIFIER MILLS**
  - Mikro ACM
  - Mikro MAK
  - Mikro Pulverizer Hammer Mill
- **LABORATORY MILLS**
  - Mikro ACM 2/5 Compact System
  - Bantam Hammer Mill
  - Mikro Classifier CC Air Classifier
- **VME-SERIES CYCLONES**
  - Additive dosing with the Mikro Inject
- **DOSSING AND DISCHARGE ELEMENTS**
  - Injectors
  - Rotary airlocks
  - Double butterfly valve
  - Removable quick-change rotor
  - Hot-gas applications
  - Pneumatic air-lock valve
 Alpine's Technical Service Division forms an integral part of the quality of every Alpine product. The wide range of technical services is geared to the needs of our customers. The range of services includes:

- Consulting services
- Inspections
- Maintenance and maintenance agreements
- Servicing and repairs - either on site or at Alpine, dependent on the complexity
- Optimisation of the active and passive wear protection
- Spare parts service for long-term machine availability
- Machine modifications and overhauls
- System and process optimisation
- Operating training - either on site or at Alpine

Competent service by fully trained and experienced personnel forms the solid foundation of the Technical Service Division combined with a fast response and worldwide presence. This is essential, because Alpine machines are integrated into important production processes where faults or standstills could have disastrous effects for the customer on his process flow and production.

REPAIRS AND UPGRADES

We offer advice with respect to the preventative maintenance of Hosokawa machines and also offer maintenance contracts. These maintenance contracts include inspection and maintenance at fixed intervals.

We inspect all size reduction and classifying machines. Our comprehensive inspection report informs you in detail about the condition and status of your system.

Upon request, we can inform you about possible improvements in terms of process technology, mechanics, cost-effectiveness and safety.

In the event of machine failure, repairs are made direct on site wherever possible. If this is not possible, these repairs are carried out in the workshops of the individual Hosokawa companies by qualified personnel.

It goes without saying that we are also your competent partner for the planning and execution of optimisation measures for your systems and processes.

Example Alpine 200 LS-N air jet sieve

Alpine's 200 LS-N air jet sieve is a particle size analyser which is employed in many cases for quality control. The DIN ISO 9000 ff. standard dictates that measuring equipment of this type be inspected at regular intervals. Alpine's full-service maintenance package guarantees a high availability of the 200 LS-N air jet sieve and moreover gives you the assurance that the analyses carried out on your products are of maximum precision.

We offer advice with respect to the preventative maintenance of Hosokawa machines and also offer maintenance contracts. These maintenance contracts include inspection and maintenance at fixed intervals.

Example Alpine 200 LS-N air jet sieve

Alpine's 200 LS-N air jet sieve is a particle size analyser which is employed in many cases for quality control. The DIN ISO 9000 ff. standard dictates that measuring equipment of this type be inspected at regular intervals. Alpine's full-service maintenance package guarantees a high availability of the 200 LS-N air jet sieve and moreover gives you the assurance that the analyses carried out on your products are of maximum precision.

In an emergency:
We are at your service around the clock.
24 hours a day - 7 days a week.
Assistance is always close to hand.

FOR EMERGENCIES CALL OUR SERVICE HOTLINE:
+ 49 821 5906-111

In an emergency, simply call our hotline and wherever possible, we will offer you immediate assistance.

TECHNICAL CUSTOMER SERVICE
Tel.: + 49 821 5906-462
Fax: + 49 821 5906-457
E-mail: service@alpine.hosokawa.com

TELESERVICE AND PARTS SERVICE

Teleservice
With PlexConnect, we developed a teleservice system to monitor service schedules and make remote diagnoses. Dependent on your application, we can analyse running processes in an interactive manner and upon request even intervene in the process control. Your advantages are:

- Improved product quality
- Constant system optimisation
- Rapid problem solving
- Higher availability
- Higher profitability

Parts service
The on-line parts service under http://eps.alpine.hosokawa.com can help you to optimise your maintenance and brings you the following advantages:

- Quicker identification of the necessary parts
- Agreed price and availability
- Simple on-line ordering process
- Improved procurement quality
Automation technology from Hosokawa Alpine can be seen as process-technological know-how translated into software and hardware. A team of experienced electrical engineers develops the basic principles for our automation technology and makes sure that the module interfaces are compatible and that all modules are seamlessly documented. Together as a team, process engineers and electrical engineers develop the optimum solution for each customer. Dependent on the process and degree of required automation, modular automation components are individually combined. The customers profit from our process technology expertise. The solutions from Hosokawa Alpine are always user-oriented and proven in practical operation, a result of the many systems we have in operation under production-scale conditions in our application testing centre in Augsburg. The practical experience thus gathered has led to constant optimisation of the mechanical and process engineering as well as the measuring & automation technology of our systems, meaning we are able to offer our customers a maximum degree of user-friendliness, zero-defects manufacturing and reliability in operation. Our PLEXCONTROL process automation system comprises 4 modules. The minimum equipment of any one system is PlexWire and PlexLogic, which can be combined with the PlexView and/or PlexConnect modules dependent on the required level of automation.

PLEXVIEW - THE PROCESS VISUALISATION MODULE

The process sequence and the process parameters are represented graphically on screen. The system flowchart forms the basis for representation of the process, and is formatted, animated and supplied with the requisite process parameters. Process operation is also carried out with the visualisation unit. The user interface is simple in design; the operator is guided intuitively through the hierarchical menus. This prevents operating errors and avoids the necessity of additional training measures.

PLEXLOGIC - THE CONTROL PROGRAM MODULE

The Simatic S7 automation system is used for the process control. The programs are universally structured and documented. Tested program modules are used for the structuring, thus avoiding programming errors. The program modules can be retrieved from libraries and permit efficient program generation.

PLEXWIRE - THE CONTROL CABINET AND CONTROL PANEL MODULE

The control cabinet is an all-important component in ensuring efficient and reliable production sequences. All the safety, switching and operating elements must be geared to suit the production process and the ambient conditions at the site of production.

PLEXCONNECT - THE TELESERVICE MODULE

The PlexConnect module makes it possible to set up a connection between Hosokawa Alpine’s premises and your production system in the form of a point-to-point connection via the telephone network. This method ensures that the data security and access security of your system remains intact; by simply pulling the telephone jack out of its socket, you can effectively interrupt any external link to your system. The benefit of the teleservice module is that we can optimise your system and make changes to both the process control and the visualisation system without any of our engineers needing to be on site. It is also possible to plan system maintenance and in the event of a total breakdown, we can diagnose the fault over the telephone and prepare the service assignment or maintenance measures in a targeted manner. The availability and efficiency of your system are thus kept at a very high level.

ARCHIVING

Every delivered process solution is archived by us on our premises. This gives our customers the assurance of being able to refer to the original program at any time.
ALPINE PROCESS TECHNOLOGY

APPLICATION TESTING CENTRE

Alpine’s application testing centre offers unique facilities for carrying out customer trials aimed at finding the best possible system design and at determining the technical warranty parameters. Tests are carried out both on a production scale and a pilot scale.

Spread over approx. 3000 m², the application testing centre provides ample space for execution of all the basic operations of mechanical and thermal process technology, e.g.:

- Size reduction (dry and wet)
- Granulator technology / shredding
- Air classification
- Sieving, separation
- Mixing, drying, flash drying
- On-line (i.e. direct at the grinding-classifying system) particle size analysis of test results that are submitted to the customer.

Taking advantage of ALPINE’s application technology also means being on the receiving end of our customer service, the scope of which includes detailed test reports containing all the relevant testing data and parameters.

With over 60 machines and complete systems, ALPINE’s application testing centre is ideally equipped to meet every customer testing requirement. Annexed to the testing centre is a laboratory equipped with numerous state-of-the-art measuring and testing units for determination of powder properties. All system operating data can be recorded. This enables seamless documentation of the test results that are submitted to the customer.

Test systems must always be state of the art if optimum scale-up data are to be delivered. Our plant and machinery is renewed on an ongoing basis and is constantly supplemented with newly developed machines.

- Selected systems used for size reduction and classification in the fine and ultrafine range are protected against dust explosions.
- Oil-free and water-free compressed air.
- Cryogenic operation with LN₂ to -80°C operating temperature.
- Contamination-free processing trials carried out with special systems for ultrafine comminution and air classification.
- Grinding-classifying circuit mode, e.g.: closed circuit between ball mill and ultrafine classifier; open product circuit between impact mills and sieving machines, air classifiers.

SPECIAL FEATURES OF THE TESTING CENTRE:

HOSOKAWA MICRON JAPAN

Hosokawa Micron Corporation was established in 1916 as Hosokawa Iron Works in Osaka, Japan. Today, the Hosokawa Micron Group is a world leader in providing process solutions in the fields of powder and particle processing, blown film processing, and confectionary production.

The Hosokawa Micron Group maintains facilities for research, engineering, manufacturing and service throughout Asia/Oceania, the Americas and Europe. The Hosokawa Micron is advancing our 90 years of powder and particle technology experience and market leadership into the future with the application, development and commercialization of ultrafine composite particles in the rapidly expanding field of nanotechnology.

POWDER AND PARTICLE PROCESSING

- Grinding and classifying
- Mixing and drying
- Agglomeration and compaction
- Particle modification and composition
- Containment and clean air technology
- Toll processing and contract manufacturing

LOWD FILM PROCESSING

- Blown film extrusion
- Film orientation
- Process control systems
- Film winders

CONFECTIONERY & BAKERY TECHNOLOGY

- Mass preparation
- Weighing, cooking, dosing
- Mixing, depositing
- Extruding, forming, cutting
- Enrobing, cooling, tempering
- Processing lines

MISSION STATEMENT

The purpose of the Hosokawa Micron Group is to provide economical technical solutions to solve customer business problems and ensure customer satisfaction and to provide a challenging and satisfying work environment for all employees in order to ensure a reasonable return to shareholders.

CORE BUSINESS

The Hosokawa Micron Group is a global leading supplier of a comprehensive range of powder & particle processing, blown film processing, and confectionary & bakery technology & systems. We offer value-added material solutions responding to global needs through emphasis on material science and engineering for the future. Hosokawa is your competent partner both in micron and nano technologies throughout the world.

The Hosokawa Micron Group is an international provider of machines, systems, processes and services. The range of services also includes process solutions for key industries such as the chemical industry, mineral and ore industry, foodstuffs and confectionery industry as well as the plastics processing industry.
Alpine’s vast experience and knowledge, combined with high quality standards, reliability, and continuous innovation fuel the consistent growth of the blown film division.

Film producers worldwide rely on Hosokawa Alpine to provide complete system integration. We supply the most sophisticated extrusion and die technology combined with the most advanced control systems for process optimisation. Hosokawa Alpine designs and manufactures all the major components of a blown film system as well as auxiliary equipment including gravimetric dosing, corona treatment, on-line gauge measurement and extrusion towers. To meet the ever-increasing demands for multi-layer films, Hosokawa Alpine offers co-extrusion systems up to nine layers to process barrier films with nylon, EVA, EVOH and mLLDPE. Our systems offer tremendous performance, reliability and versatility.

Hosokawa Alpine’s blown film lines set the standard in blown film processing. Our systems are the most innovative and technologically advanced currently in use. Hosokawa Alpine specialises in the design, engineering and manufacturing of the most sophisticated systems available to meet the needs of blown film producers for a variety of applications such as: grocery and merchandise bags; institutional and consumer trash bags; industrial packaging and food packaging film. Another value-added Hosokawa Alpine service is turnkey installation of your new blown film system. Hosokawa will completely manage the installation of your new line and guarantee you will be up and running on schedule.

Alpine manufactures monoaxial orientation equipment to significantly improve the properties of blown cast film. Our orientation equipment increases machine direction strength, film stiffness, barrier properties and the opacity of mineral-filled film, while decreasing machine direction elongation and enabling you to tailor properties such as shrinkage, tear properties and material density. This results in improved consumer packaging, directed tearing, freshness of packaged goods, longer packaging life of meats, improved organoleptics, improved protection of packaged goods and material savings.

At Hosokawa Alpine, customer satisfaction means extensive support of customer projects from the testing and commissioning phases up to market introduction of the final product. State-of-the-art fully equipped test laboratories in Germany, USA and Japan are available for customer trials and product development. The laboratories are also used intensively for the internal testing and development of Hosokawa Alpine’s blown film equipment.
The Hosokawa Micron Group is an international supplier of machines, systems, processes and services. Based on this comprehensive performance range, Hosokawa offers process solutions for a great number of different business segments:

1. **Powder and Particle Processing**

Hosokawa is the world’s largest provider of processing systems for the field of powder and particle processing. Renowned names such as Alpine, Bepex, Stott, Vitalair, Rietz, Mikro, Micron, and Vrieco-Nauta 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 comminution, mixing, drying, agglomeration, classification, weighing and metering.

2. **Blown Film Processing**

Hosokawa Alpine is one of the world’s foremost suppliers of film blowing systems. As a one-stop shopping partner, Alpine supplies complete systems for the manufacture of blown film, from granule feeding systems to film winders, from single-layer die heads to 9-layer lines, and from simple speed regulators to state-of-the-art process control systems. And with Alpine’s own film orientation lines, complete systems are now available which facilitate film upgrading and enhancement processes.

3. **Confectionery & Bakery Technology**

The vast fund of know-how built up by the Bepex, Kreuter and Ter Braak companies over many long years makes the Hosokawa Confectionery & Bakery Group the ideal partner for the confectionery industry. A complete range of machines and production systems is available or can be custom-designed for each process step, from preparation of the raw materials and confectionery pastes to the end product.

**Germany**

Hosokawa Alpine Aktiengesellschaft
P. O. Box 10 11 51
86001 Augsburg, Germany

Delivery address:
Peter-Doerfler-Str. 13-25
86199 Augsburg, Germany

Tel.: + 49 821 5906-0
Fax: + 49 821 5906-101
E-mail: mail@alpine.hosokawa.com
Internet: www.alpinehosokawa.com

Hosokawa Micron
A Division of Hosokawa Alpine AG
Welserstr. 9/11
51149 Cologne, Germany

Tel.: + 49 2203 308-0
Fax: + 49 2203 308-125
E-mail: sales@hmgmbh.hosokawa.com
Internet: www.hosokawamicron.de

**POWDER AND PARTICLE PROCESSING**

**Chemicals**

Tel.: + 49 821 5906-238
Fax: + 49 821 5906-438
E-mail: chemical@alpine.hosokawa.com

**Pharma & Food**

Tel.: + 49 821 5906-283
Fax: + 49 821 5906-620
E-mail: pharma@alpine.hosokawa.com

**Minerals & Metals**

Tel.: + 49 821 5906-29
Fax: + 49 821 5906-610
E-mail: mineral@alpine.hosokawa.com

**Recycling & Granulators**

Tel.: + 49 821 5906-124 or 161
Fax: + 49 821 5906-600 or 123
E-mail: plastics@alpine.hosokawa.com

**Technical Service**

Tel.: + 49 821 5906-21
Fax: + 49 821 5906-45
E-mail: service@alpine.hosokawa.com

**www.alpinehosokawa.com**