TOLL PROCESSING
Contract Grinding & Manufacturing

HOSOKAWA MICRON GmbH

PROCESS TECHNOLOGIES FOR TOMORROW™
Mikro ACM · Mikro Pulverizer · MikroClassifier
How do we define toll processing?

For us, toll processing is more than just providing our customers with a number of different basic process-technological operations. Your ideas and wishes constitute our challenge to devise new concepts and solutions. In addition to a customised solution for your individual product processing and refining problem, we also offer comprehensive logistical support. Because it is only when you are successful on the market with your products that we are really satisfied.

Our strategy:

We plan to constantly expand the sector of toll processing and manufacturing at our location in Cologne, Germany. Which means that in addition to our established comminution technology, we will in future also offer innovative new technologies and processes aimed at refining and upgrading your products.

Our service:

Make full use of our long years of experience as well as the expertise of the entire Hosokawa Group on the sector of mechanical process technology to solve your problem specification. We offer:

- An extensive stock of plant and machinery and competent personnel to ensure high-quality product processing
- Constant quality control in accordance with your requirements
- Procurement of raw materials and packaging materials
- Interim storage and shipping of the finished products to your end customers
- Flexible integration into your own just-in-time supply chain

What are the advantages of toll processing?

- No planning costs and no capital outlay
- No space required for processing systems and warehousing
- Immediate supply capability even without your own production plant
- Reduction of fixed payroll costs
- Qualified processing at reasonable costs

We have the equipment and offer solutions for:

- Crushing
- Comminution
- Ultrafine grinding
- Deglomeration
- Compacting
- Agglomeration
- Pelletisation
- Classification
- Sieving & screening
- Homogenisation
- Mixing
- Packaging

Mikro ACM 30 classifier mill with sack-filling machine

ACM 30 CL classifier mill  Mikro Pulverizer 2SCB  Mikro Classifier CC 15  Schugi Flexomix
What Kind of Products do we Process?

<table>
<thead>
<tr>
<th>Product Examples</th>
<th>Fineness in µm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium phosphate</td>
<td>99% &lt; 71</td>
</tr>
<tr>
<td>Bisphenol A</td>
<td>99% &lt; 63</td>
</tr>
<tr>
<td>Calcium fluoride</td>
<td>99% &lt; 5</td>
</tr>
<tr>
<td>Calcium stearate</td>
<td>99% &lt; 71</td>
</tr>
<tr>
<td>Dextrose</td>
<td>99% &lt; 20</td>
</tr>
<tr>
<td>Dried raspberries</td>
<td>99% &lt; 100</td>
</tr>
<tr>
<td>E-PVC</td>
<td>99% &lt; 40</td>
</tr>
<tr>
<td>Ethylene diamine</td>
<td>97% &lt; 5</td>
</tr>
<tr>
<td>Fish meal</td>
<td>99% &lt; 100</td>
</tr>
<tr>
<td>Glass frits</td>
<td>99% &lt; 20</td>
</tr>
<tr>
<td>Graphite</td>
<td>99% &lt; 90</td>
</tr>
<tr>
<td>Iodine-deoxycytidine</td>
<td>99% &lt; 30</td>
</tr>
<tr>
<td>Iron oxide</td>
<td>99% &lt; 6</td>
</tr>
<tr>
<td>Lactose</td>
<td>98% &lt; 30</td>
</tr>
<tr>
<td>Melamine resin</td>
<td>99% &lt; 100</td>
</tr>
<tr>
<td>Organic pigments</td>
<td>99% &lt; 18</td>
</tr>
<tr>
<td>Pectin</td>
<td>99% &lt; 250</td>
</tr>
<tr>
<td>Pentaerythritol</td>
<td>99% &lt; 63</td>
</tr>
<tr>
<td>Powder coating</td>
<td>99% &lt; 12</td>
</tr>
<tr>
<td>Silica gel</td>
<td>99% &lt; 61</td>
</tr>
<tr>
<td>Sipernat</td>
<td>99% &lt; 9</td>
</tr>
<tr>
<td>Sodium benzoate</td>
<td>99% &lt; 10</td>
</tr>
<tr>
<td>Sodium bicarbonate</td>
<td>99% &lt; 150</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>99% &lt; 300</td>
</tr>
<tr>
<td>Sugar</td>
<td>99% &lt; 63</td>
</tr>
<tr>
<td>Swelling starch (rice)</td>
<td>99% &lt; 200</td>
</tr>
<tr>
<td>Talc</td>
<td>99% &lt; 20</td>
</tr>
<tr>
<td>Tartaric acid</td>
<td>99% &lt; 90</td>
</tr>
<tr>
<td>Theic</td>
<td>99% &lt; 40</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>99% &lt; 6</td>
</tr>
<tr>
<td>Urea formaldehyde copolymer</td>
<td>99% &lt; 10</td>
</tr>
<tr>
<td>Urea formaldehyde resin</td>
<td>99% &lt; 125</td>
</tr>
<tr>
<td>Vulcanisation accelerator</td>
<td>99% &lt; 63</td>
</tr>
<tr>
<td>Wax</td>
<td>99% &lt; 12</td>
</tr>
<tr>
<td>Xanthene</td>
<td>99% &lt; 90</td>
</tr>
<tr>
<td>Zeolite</td>
<td>99% &lt; 15</td>
</tr>
</tbody>
</table>
Your Processing Order in Reliable Hands

From the first contact right through to delivery:

- Contacting the customer
- Discussions with the customer
- Customer fills out our questionnaire with safety data sheet
- Entry of data to permit order processing
- If applicable, trials run with our systems
- Test results with report to customer
- Preparation of quotation
- Order placement
- Order confirmation
- Setting of deadlines in production plan
- Ordering of all necessary components
- Receipt/interim storage of raw materials
- Incoming goods control
- Product processing according to specs.
- Quality control in laboratory with report
- Stored sample per batch of end product
- Packaging
- Labelling
- Just-in-time production or interim storage
- Outgoing goods control
- Delivery to customer/end user
- Customer receives copies of the quality control sheets and particle size analyses as well as – if requested – stored samples
- Invoicing
- Our satisfied customer places a follow-up order

Quality assurance:

By the way, it goes without saying that we are certified in accordance with EN ISO 9001. Our laboratories are equipped with state-of-the-art measuring and analysis units to permit product characterisation:

- Sieving/screening analyses, dry and wet (> 30 µm)
- Laser diffraction with Sympatec Helos (0.1 µm < "X" < 875 µm)
- Density analyses
- Specific surface (BET)
- Pore radius distribution (adsorption method)
- Dynamic calorimeter DSC (-150°C to +750°C)
- Microscopy
- Moisture determination in drying chamber

Quotation preparation / costs / delivery times:

To make sure that the project is specified correctly, we send you a questionnaire along with a safety data sheet. After receipt of the completed forms, we check the project feasibility and request test material from you for trials.

The performance trials are naturally free of charge. We then prepare the quotation to include staggered prices for different batch sizes.

The delivery time is generally between 2 and 4 weeks from receipt of your written order.
Who could ask for more in the way of plant and machinery?

We have the following systems installed over a floor area of 2,500 m²:

<table>
<thead>
<tr>
<th>System</th>
<th>Application Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mikro ACM 5 classifier mill</td>
<td>Fine grinding with sharp top-size limitation, for small batches up to 10 tonnes, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>2 x Mikro ACM 10 classifier mills</td>
<td>Fine grinding with sharp top-size limitation, for medium batches between 10 and 30 tonnes, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>Mikro ACM 30 classifier mill</td>
<td>Fine grinding with sharp top-size limitation, for batches larger than 30 tonnes, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>Mikro ACM 25 classifier mill for cryogenic grinding</td>
<td>Fine grinding with sharp top-size limitation, also suitable for heat-sensitive materials, with regulated nitrogen cooling, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>Mikro ACM 30 classifier mills with VME 50 cyclone classifiers</td>
<td>Fine grinding with sharp top-size limitation and in-line classification to recover the fines, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>Mikro ACM 30 classifier mills with intake-air conditioning</td>
<td>Fine grinding with sharp top-size limitation, also suitable for hygroscopic and/or heat-sensitive materials, max. fineness $x_{99} = 20 \mu m$</td>
</tr>
<tr>
<td>Mikro Pulverizer 2 SCB hammer mill</td>
<td>Grinding in medium fineness range, optionally with intake-air preheating, max. fineness $x_{99} = 60 \mu m$</td>
</tr>
<tr>
<td>Mikro Pulverizer 2 SCB cryogenic grinding system</td>
<td>Low-temperature grinding of non-brittle and/or heat-sensitive products, max. fineness $x_{99} = 60 \mu m$</td>
</tr>
<tr>
<td>Hosokawa Alpine AFG 200 fluidised bed opposed jet mill</td>
<td>Superfine grinding with sharp top-size limitation, also suitable for abrasive products, max. fineness $x_{99} = 4 \mu m$</td>
</tr>
<tr>
<td>3 x pre-crushers (small, medium, large)</td>
<td>Coarse and primary crushing of soft and medium-hard materials</td>
</tr>
<tr>
<td>Hosokawa Alpine Rotoplex granulator</td>
<td>Processing of agglomerated materials and plastics</td>
</tr>
<tr>
<td>MikroCut Windsichter, MikroCut air classifier</td>
<td>Fines recovery in the cut point range between 2 and 30 µm</td>
</tr>
<tr>
<td>Hosokawa cyclone classifier VME CL</td>
<td>Fines recovery in the cut point range above 30 µm</td>
</tr>
<tr>
<td>Hosokawa Bepex compactor</td>
<td>High-pressure agglomeration with screening mill to generate dust-free and free-flowing granules</td>
</tr>
<tr>
<td>Hosokawa Schugi Flexomix</td>
<td>Agglomeration to generate granules with good flow properties and good solubility</td>
</tr>
<tr>
<td>Hosokawa Vrieco-Nauta mixer with intensifier</td>
<td>Mixing and homogenisation of solids, optionally with metered liquid injection</td>
</tr>
<tr>
<td>Allgaier tumbler screening machine</td>
<td>Universal in use for fine and ultrafine screening. Separation into up to 3 fractions</td>
</tr>
<tr>
<td>AZO centrifugal sifter</td>
<td>Efficient separation of oversize particles</td>
</tr>
<tr>
<td>Hosokawa Micron Denspack vacuum densifier</td>
<td>Discharge device designed to increase the bulk density and reduce the transport volume</td>
</tr>
<tr>
<td>Universal sack-filling machine (screw packer)</td>
<td>Combi-packer for low-air filling of open and valved sacks</td>
</tr>
</tbody>
</table>
Hosokawa Micron GmbH 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 systems for powder and particle processing, thermal processing and plastics processing. The Group maintains facilities for research, engineering, manufacturing and service in each of the world's major industrial markets.

Visit our website in Internet: www.hosokawamicron.de

One Company - Two Divisions

Grinding and classifying systems
Since its formation in 1957, Hosokawa Micron has been designing and manufacturing grinding and classifying systems for a number of different sectors and industries, among them the powder coating, chemicals, food, pharma, and minerals industries. Regardless of whether your problem specification calls for comminution, classification, dust-removal or dosing, Hosokawa Micron is your competent and innovative partner.

Products
- Mikro ACM classifier mills
- Mikro Pulverizer hammer mills
- MikroClassifier CC
- High-efficiency cyclone / cyclone classifier series VME
- Dosing and discharge elements
- Complete systems for powder and particle technology

Services
- System engineering
- Engineering
- Consulting
- After-sales service
- Spare parts
- Application testing centre

Contract grinding and manufacturing
As the specialist for grinding and classifying technology, we offer extensive services in the field of toll processing. You benefit from our high standard of quality and the innovative concepts we develop to permit realisation of your ideas. We have the know-how of the entire Hosokawa Group at our fingertips, meaning that we are always in a position to tailor our solution to match your individual requirements.

Toll services
- Crushing
- Comminution
- Superfine grinding
- Deglomeration
- Compacting
- Agglomeration
- Pelletisation
- Classification
- Screening
- Homogenisation
- Mixing
- Secondary packaging
- and much more...

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