Process Technology for Paints & Coatings
We bring Colors in your Life!
PAINTS AND COATINGS

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Over the decades, paint and coating formulations have become more and more complex. In addition to the new functions required of paints and coatings today, production costs play a significant role for continued market success.

Savings on raw materials, on the one hand, as well as an increase in batch sizes along with a fully-automatic plant design on the other hand offer great potential for sustained market success with consistent quality.

Numerous customers around the world trust NETZSCH for their production of paints and coatings.

When you want a little more …
Process- and Plant Engineering

Client responsibility

- Establish projects targets
- Test and evaluate available technology
- Produce initial process and budgets
- Develop project details

Engineering

- What is to be made today and in the future
- How much output is required
- What are the environmental regulations
- Test current and traditional process methods
- Compare effects on the product and other process stages
- Guarantee plant deliverables
- Design plant process and layout
- Establish final price and scope
- Detailed design of plant equipment
- Produce detailed programme of works

- Determine equipment costs
- Determine support equipment specifications
- Estimate the total cost including running costs
Plant Engineering

Whether it is a turnkey solution you need or help on a particular aspect of plant engineering, we have the know-how. NETZSCH has been engineering manufacturing plants for over 100 years, using state-of-the-art production equipment and manufacturing techniques. We undertake projects for companies around the world, including:

- Plant design
- Process monitoring, control and automation
- Software development and real time application programming
- Mechanical engineering
- Electrical engineering
- Steelwork design
- Abatement systems
- Machinery and vessel manufacturing
- Extraction systems

Project Management

From start to finish, you can rely on professional project management. At NETZSCH we have the resources and capability to oversee the entire project, even the most complex ones. All projects are approached with a total commitment to maintaining the highest standards in all areas, including:

- Project planning
- Health and safety expertise including, full working experience of ATEX 94/9 and ATEX 100a
- Construction site supervision and management
- Machinery installation
- Installation and testing of instrumentation and control systems
- Machinery and plant commissioning
- Employee training
- Support throughout production ramp-up

Our experience is your advantage
RAW MATERIAL HANDLING
For Wet and Dry Materials
With the infeed swaging process the raw material is fed into the paint production system. The chosen pulping systems determine the frequency of material input which can vary from continuous or periodic input. Typically, a distinction is made between conveying and handling systems for wet and dry materials and recovered dispersing systems. With regard to these specifications the infeed systems, or respectively, the pulping systems are designed to be able to fit a range of machines and measuring systems.

Due to several successfully realized projects and our profound know-how we can equip your paint plant with the optimal handling system for:

- Tank Farms
- Big Bags
- Silo Systems
- Mini/Medi Bulks
- Dosing Systems

**LIQUID DISPERSING SYSTEMS**
SOLUTIONS FOR LARGE BATCHES

DECORATIVE PAINT
The PMD-VC intensive mixers are stationary mixing and dispersing units for processing large batches. Separation of the mixing and dispersing operations provides an extremely energy-efficient process that is especially useful for batches over 2 000 l. The compact enclosed design of the intensive mixer allows the integration into fully-automatic plants and prevents contamination from gases and dust.

The Mega Ψ-Mix® inline disperser combines a new dispersion method in which the solid components are wetted on a large liquid surface with emission-free and dust-free inline operation. The combination of vacuum dispersion, micro-cavitation and pressure wetting results in homogeneous, fine dispersions with reproducible quality – all at high efficiency levels in a controlled process.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Interior paint</td>
<td>5 000 - 20 000</td>
<td>45 - 60</td>
<td>80 000</td>
<td>240</td>
</tr>
<tr>
<td>Exterior paint</td>
<td></td>
<td></td>
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<tr>
<td>Wall paint</td>
<td></td>
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<tr>
<td>Emulsion paint</td>
<td></td>
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<tr>
<td>Water based paint</td>
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</table>
**Handling Raw Material**

**Dry and Wet**

**Disperse**

Create an individual slurry

**Tinting Paste**

Color concentration from outside supplier or secondary process

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**Alpha® System Zeta®**

Suitable for every viscosity and almost any product, with this technology you will achieve the highest product qualities and finenesses down into the nanometer range. The closed horizontal agitator bead mill is designed for the highest product throughput rates and has a peg grinding system with extremely high grinding intensity.

**Alpha® System Discus**

The NETZSCH Alpha® Discus system is the quantum leap in disk grinding technology. The further optimized Discus® disk agitator combined with the NETZSCH DCC® separation system guarantees you extremely high throughput rates with significantly narrower dwell time distributions and therefore more intensive grinding with uniform impact intensity.

**MasterMill – Submersible Basket Mill**

The MasterMill is an exceptionally versatile dispersion system that can be applied to a wide range of processing industries. This basket mill has redefined batch dispersion systems. This design ensures that your materials pass through the high density dispersion zone within the milling chamber at a high frequency.

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<table>
<thead>
<tr>
<th>Pigment pastes</th>
<th>Our machines</th>
<th>Working capacity [kg/h]</th>
<th>Batch size [kg]</th>
<th>Dispersing time [min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Alpha® 22 Zeta®</td>
<td>130</td>
<td>400</td>
<td>180</td>
</tr>
<tr>
<td>Red</td>
<td>Alpha® 22 Zeta®</td>
<td>200</td>
<td>1000</td>
<td>300</td>
</tr>
<tr>
<td>Yellow</td>
<td>Alpha® 45 Discus</td>
<td>110</td>
<td>1500</td>
<td>780</td>
</tr>
<tr>
<td>Green</td>
<td>MasterMill 30</td>
<td>80</td>
<td>800</td>
<td>600</td>
</tr>
</tbody>
</table>
NETZSCH manufactures world class grinding and dispersion equipment with a wide range of applications in the decorative paint industry which, combined with solids and liquid handling, are used to accomplish complete turnkey projects, using well proven software to provide fully automatic plants. If large batch production is required NETZSCH has a number of solutions including the PMD-VC which can produce batches up to 25,000 l in volume and can accept solids feeding at rates of 90 t/hour using the patented “sound system” which ensures the dispersing tool is always in the correct position to accept solids. For inline dispersion for “high velocity” plants NETZSCH has the patented \( \Psi \)-Mix® mixer which can accept solids at a similar rate but in a continuous manner.

**Successfully Implemented Decorative Paint Plant**

*Note*

- bead size 0.1 - 0.4, circulation process
- bead size 0.4 - 0.5, circulation process
- bead size 0.6 - 0.8, 2-passes process
- batch process
SOLUTIONS FOR SMALL AND MEDIUM BATCHES

INDUSTRIAL PAINT

Examples
- Construction paint
- Protection coating
- Marine coating
- Antifouling coating
- Coil coating
**MasterMix® – Dissolver**

The MasterMix® dissolver is used for dispersing solids in liquids. The product is mixed in batches in an exchangeable tank. The speed of the dispersion disk is adjusted via a frequency-controlled drive.

**PMD-VC – Intensive Mixers**

The PMD-VC intensive mixers are stationary mixing and dispersing units for processing large batches. Separation of the mixing and dispersing operations provides for an extremely energy-efficient process that is especially useful for batches over 2000 l. The compact enclosed design of the intensive mixer allows for integration into fully-automatic plants and prevents contamination from gases and dust.
**Epsilon**

The **Epsilon** is used as an inline disperser in circulation mode, whereby the powder can be fed from a bag via suction lance, big bag, bag feeding station or silo. The liquid is circulated with the aid of a powerful rotor, creating a negative pressure in the process housing.

This negative pressure is used to draw in and wet the powder, with powder delivery occurring without the introduction of external air. Here, the wetting process is not based on the classic rotor-stator principle, but rather on physical factors such as pressure differentials and micro-cavitation.

**Alpha® System Zeta®**

Suitable for every viscosity and almost any product, with this technology you will achieve the highest product qualities and fineness’s down into the nanometer range. The closed horizontal agitator bead mill is designed for the highest product throughput rates and has a peg grinding system with extremely high grinding intensity.

**Alpha® System Discus**

The NETZSCH **Alpha® Discus** system is the quantum leap in disk grinding technology. The further optimized Discus disk agitator combined with the NETZSCH **DCC®** separation system guarantees you extremely high throughput rates with significantly narrower dwell time distributions and therefore more intensive grinding with uniform impact intensity.
Successfully Implemented
Industrial Paint Plant

The industrial paint industry is characterized by a huge variety of products, finishes, textures and applications. NETZSCH has a complete range of grinding and dispersion equipment which enables production of the smallest through to the largest batches. By incorporating the specific needs of each industry into the machines, NETZSCH is able to supply customized solutions to specialty areas such as coil coatings, marine paints and high build protective coatings.
**AUTOMOTIVE PAINT**

**SOLUTIONS FOR SMALL, MEDIUM AND LARGE BATCHES**

![Automotive paint machine](image)

**Examples for automotive paint**

<table>
<thead>
<tr>
<th>Material</th>
<th>Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top coat acrylic black</td>
<td>Alpha® 45 Zeta®</td>
</tr>
<tr>
<td>Filler</td>
<td>Alpha® 90 Discus</td>
</tr>
<tr>
<td>Dip coating</td>
<td>Alpha® 45 Discus</td>
</tr>
<tr>
<td>Primer</td>
<td>MasterMill® 50</td>
</tr>
<tr>
<td>Automotive refinishing paste</td>
<td>Alpha® 45 Zeta®</td>
</tr>
</tbody>
</table>

*Source: BASF*
**Examples for automotive paint Machine**

<table>
<thead>
<tr>
<th>Working capacity [kg/h]</th>
<th>Batch size [kg]</th>
<th>Dispersing time [min]</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>750</td>
<td>540</td>
<td>pre-dispersing with MaxShear</td>
</tr>
<tr>
<td>580</td>
<td>4500</td>
<td>420</td>
<td>single-pass, predispersing with MasterMix* 110</td>
</tr>
<tr>
<td>250</td>
<td>2000</td>
<td>480</td>
<td>2-passes a 500 kg, predispersing with MasterMix* 55</td>
</tr>
<tr>
<td>250</td>
<td>2250</td>
<td>540</td>
<td>batch process</td>
</tr>
<tr>
<td>50</td>
<td>400</td>
<td>480</td>
<td>circulation, predispersing with MaxShear</td>
</tr>
</tbody>
</table>

**MasterMill – Submersible Basket Mill**

The *MasterMill* is an exceptionally versatile dispersion system that can be applied to a wide range of processing industries. This basket mill has redefined batch dispersion systems. This design ensures that your materials pass through the high density dispersion zone within the milling chamber at a high frequency.

**Alpha® System Zeta®**

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**CATHODIC PAINT**
Protection against corrosion

**FILLER**
Compensation of unevenness, Protection against highway stones and UV raditation

**BASIC PAINT**
Compound of different pigments and materials

**CLEAR COAT**
Protection against environmental influence

**FILLER**
Compensation of unevenness, Protection against highway stones and UV raditation

**BASE PAINT**
Compound of different pigments and materials

**CLEAR COAT**
Protection against environmental influence

**MASTERMILL**
- Submersible Basket Mill

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**Compensation of unevenness, Protection against highway stones and UV raditation**

**Compound of different pigments and materials**

**Protection against environmental influence**

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**Compound of different pigments and materials**

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**BASIC PAINT**
- Compound of different pigments and materials

**CLEAR COAT**
- Protection against environmental influence
**MaxShear – Inline Disperser**

Compact enough to be included at virtually any point in your process. The self-pumping portable unit features rotor/stator based technology with multiple stator configurations available. Manufactured to extremely precise tolerances to eliminate product bypassing typical of other single stage dispersers. Exceptional high shear performance and powerful pumping action makes the MaxShear ideal for emulsifying and processing hard-to-wet materials.

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**MasterMix® – Dissolver**

In industry dissolvers are the most versatile and most frequently used machines for the mixing of solids in liquids. The NETZSCH MasterMix® high speed mixer is suitable for processing batches with a volume of up to 1500 l in exchangeable tanks. For larger batches of up to about 10 000 l our mezzanine mounted units with stationary tanks can be used. While the speed of the mixing tool is infinitely variable via a frequency controlled drive, its working height inside the mixing tank can be adjusted as required via the hydraulically actuated lifting column. A vessel wall scraper is available as an option for improving the mixing and dispersing process for high viscosity products.
NETZSCH is one of the main suppliers with a proven knowledge and expertise in automotive paint both in OEM and refinish production. NETZSCH has a full range of dispersion and grinding equipment to suit all batch sizes and inline processes to produce the quality requirements needed in the field. NETZSCH has the technology and knowledge to respond to the special requirements for metallic paint coatings as well as paint applied to interior and exterior plastics either with single machines or complete turnkey solutions.
Business Unit Grinding & Dispersing – The World’s Leading Grinding Technology

NETZSCH-Feinmahltechnik GmbH
Selb, Germany

NETZSCH Trockenmahltechnik GmbH
Hanau, Germany

NETZSCH Vakumix GmbH
Weyhe-Dreye, Germany

NETZSCH Lohnmahltechnik GmbH
Bobingen, Germany

NETZSCH Mastermix Ltd.
Lichfield, Great Britain

NETZSCH FRÈRES S.A.R.L.
Arpajon, France

NETZSCH España, S.A.U.
Terrassa/Barcelona, Spain

ECUTEC S.L.
Barcelona, Spain

Tramega
Terrassa/Barcelona, Spain

NETZSCH Premier Technologies, LLC.
Exton PA, USA

NETZSCH Indústria e Comércio de Equipamentos de Moagem Ltda.
Pomerode, Brazil

NETZSCH (Shanghai) Machinery and Instruments Co., Ltd.
Shanghai, China

NETZSCH Technologies India Private Ltd.
Chennai, India

OOO NETZSCH Tula
Tula, Russia

NETZSCH Makine Sanayi ve Ticaret Ltd. Sti.
Izmir, Turkey

NETZSCH Korea Co., Ltd.
Goyang, Korea

The NETZSCH Group is a mid-sized, family-owned German company engaging in the manufacture of machinery and instrumentation with worldwide production, sales, and service branches. The three Business Units – Analyzing & Testing, Grinding & Dispersing and Pumps & Systems – provide tailored solutions for highest-level needs. Over 3,500 employees at 210 sales and production centers in 35 countries across the globe guarantee that expert service is never far from our customers.