Seamless transition from laboratory to production

The magic LAB® is a unique and multi-functional laboratory machine. It is designed for inline mixing, dispersing, wet milling, homogenization and the incorporation of powders into liquids.

The magic LAB® is mainly used for the development of new products and processes as well as for the optimization of existing procedures, particularly in the chemical, cosmetics, pharmaceutical, and food industries.

It is the ideal simulation machine for continuous processes and for enrichment and batch procedures. Its versatility is especially useful in educational institutions such as universities and schools.

The dispersing parameters of the magic LAB® and the IKA® production machines are identical - providing the perfect prerequisite for a reliable scale-up.

Conversely, a scale-down is just as reliable, enabling the simulation of existing production plants.

For more information, please visit our website:

www.ikaprocess.com
IKA® magic LAB® | Applications

Easy module change

> Simple handling
> Fast set up and conversion
> Installation video
> Storage box for individual parts

IKA®+  

Food  
> Mayonnaise
> Ketchup
> Mustard
> Sauces
> Fruit juices
> Dressings

Chemical industry  
> Dyes + paints
> Waxes
> Detergents
> Resins

Cosmetics  
> Creams
> Lotions
> Toothpaste

Pharmaceutical industries  
> Vaccines
> Ointments
> Vitamins
> APIs
magic LAB® – UTL basic module

For simple homogenization tasks

A unique and versatile machine in laboratory scale for the development of new products and for product and process optimization. The eight exchangeable mixing modules make it the ideal machine for continuous, recirculation and batch processes. Standard design with ULTRA-TURRAX® UTL module.

**Modular design**

Depending on the application, the basic unit can be modified quickly using various working modules. Thus it can be perfectly adjusted to the product or procedural objective.

**DR/DRS module**

For the production of the finest emulsions and suspensions as well as for the simulation of single-pass processes.

**MK/MKO module**

Wet milling by means of a milling tool with an adjustable gap. Emulsification (MK) and de-agglomeration (MKO) of viscous products.

**MCD module**

Wet milling of oily, viscous or pasty products.

**UTC module**

Dispersing/mixing in batch mode.

**DEI module**

Direct feeding of liquid and solid additives into the dispersing chamber.

**MHD module**

Entry of high concentrations of solids in a single pass and simulation of continuous processes.

**CMS module**

Lump-free and dust-free incorporation of powders into liquids in recirculation mode.

** Package**

1 basic unit – 8 possibilities

**Rotor-stator system**

The best in dispersing technology.

A high circumferential speed and narrow gap for the entry of energy into the product by means of shearing and high turbulence.

**Stator**

**Shearing gap**

**Rotor**

**Stator**

**Shearing gap**

**Rotor**
The UTL is a single-stage dispersing machine for the production of emulsions and suspensions with a coarse or medium particle size and a narrow particle size distribution. There are numerous rotor-stator variants, enabling the adaptation of the machine to the respective application.

Regardless of the machine size, the UTL maintains a constant circumferential speed and can therefore be scaled up without problems.
The DR/DRS is a high-shear dispersing machine for the production of microemulsions and ultra-fine suspensions, for wet milling and for dissolving processes. Whilst the production machines of type DR are operated with standard circumferential speeds of approx. 23 m/s and 3 tools, with the magic LAB®, the fast-running variant of type DRS with circumferential speeds of up to 40 m/s and 2 tools in series can also be simulated.

Thanks to the freely configurable generators, which are arranged in series, the process objectives are achieved after a single pass. The multi-stage design has the additional advantage of enabling the combination of dispersing tools with different characteristics. In the case of challenging products, the quality can be improved by means of a narrow particle size spectrum.

<table>
<thead>
<tr>
<th>DR</th>
<th>Speed range [rpm]</th>
<th>3,000 – 26,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Throughput [l/h]</td>
<td>50 – 200</td>
</tr>
<tr>
<td></td>
<td>Circumferential speed [m/s]</td>
<td>5 – 40</td>
</tr>
</tbody>
</table>

The DBI is a high-performance mixing and dispersing machine for the production of finest emulsions and suspensions. To enable this, both solid and liquid additives are incorporated into a base liquid.

The unique device combines high flow speeds, even particle sizes reduction, and effective homogenization. Solid and liquid additives are fed directly into the dispersing chamber, which prevents the formation of lumps and ensures a fast process flow.

<table>
<thead>
<tr>
<th>DBI</th>
<th>Speed range [rpm]</th>
<th>3,000 – 20,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Throughput [l/h]</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>Circumferential speed [m/s]</td>
<td>5 – 30</td>
</tr>
</tbody>
</table>

Example applications:

- Creams
- Lotions
- Toothpaste
- Fruit juices
- Salt solutions
- Catalysts
- Lacquers
- Polymer emulsions
- Pesticides
- Herbicides
- Fungicides

Example applications:

- Sun cream
- Drinks
- Ointments
- Mayonnaise, dressings
- Lacquers and paints
- Starch solutions
- Greases

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- Greases
Corundum disk mills are for the ultra-fine milling of granules and tough pastes and for the wet milling of viscous products or fruits with a high liquid content.

The axially adjustable stator is pressed against the rotor, which runs at high speed. Thanks to the high shearing forces, the product is finely ground between the rotor and stator and is then discharged. A cooling jacket that is integrated into the milling chamber prevents the processed products from overheating.

**Example applications**
- Fine milling of:
  - Mustard
  - Chili
  - Spice pastes
  - Nuts
  - Almonds
  - Sesame
  - Cocoa
  - Soy beans
  - Fruits
  - Vegetables
  - Fish pastes

**Corundum disk mill | MCD 2000**

**Technical data**

<table>
<thead>
<tr>
<th>MCD</th>
<th>Speed range [rpm]</th>
<th>3,000 – 15,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow rate [kg/h]</td>
<td>1 – 20</td>
</tr>
<tr>
<td></td>
<td>Circumferential speed [m/s]</td>
<td>5 – 23</td>
</tr>
</tbody>
</table>

**Example applications**
- Lotions
- Waxes
- Polishes
- Gelling agents
- Color distribution
- Polymer emulsions

**ULTRA-TURRAX® | UTC**

**Example applications**
- > Lotions
- > Waxes
- > Polishes
- > Gelling agents
- > Color distribution
- > Polymer emulsions

**From an inline to a batch device**

Turn the magic LAB® upside down, give it an UTC tool list and you can start making the preparation in a beaker glass.

**Batch dispersing**

Batch dispersing is particularly suitable for small quantities. The required shear forces can be estimated here and rheological changes such as structure and viscosity, etc. can be detected quickly.

**Technical data**

<table>
<thead>
<tr>
<th>UTC</th>
<th>Speed range [rpm]</th>
<th>10,000 – 24,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Batch volume [l]</td>
<td>0.1 – 2</td>
</tr>
<tr>
<td></td>
<td>Circumferential speed [m/s] *</td>
<td>6 – 16</td>
</tr>
</tbody>
</table>

* With standard tool 18G
Single-pass powder incorporation | MHD 2000

Example applications
- Fertilizers
- Vitamins
- Pectins
- Guar gum
- Starches
- Cellulose
- Flour
- Fillers

The MHD can be used for quantity proportional incorporation of even high concentrations of solids into low- to high-viscosity liquids in a single pass. This is a highly efficient process, dust-free and with lowest temperature increase in the product.

The MHD mixes the solids and liquids and ensures a homogeneous final product. The MHD has a unique, patented design that does not require suction to draw in the powders, which essentially eliminates air inclusions.

<table>
<thead>
<tr>
<th>MHD</th>
</tr>
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<tbody>
<tr>
<td>Speed range [rpm]</td>
</tr>
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<td>Throughput [l/h]</td>
</tr>
<tr>
<td>Circumferential speed [m/s]</td>
</tr>
</tbody>
</table>

MHD setup example

This setup of the pilot plant enables the exact simulation of the process technology in production. A liquid is inserted into a storage tank. At the same time, the solid is fed using a powder dosing device. The MHD disperses and dissolves the powder in a recirculation process or - depending on the quantity - in a single pass. In the recirculation process, the resulting intermediate product serves as the liquid base into which further solids are dosed in accordance with the required quantity ratio in the subsequent process. To ensure the best possible product quality, the premixed product can be sheared again in a second step with an MKO cone mill.
The CMS was developed for the dust-free incorporation and dispersing of powdery solids into liquids. It uses a specially developed rotor that generates a high suction force, thus sucking in the solid and incorporating it into the liquid. The liquid is circulated until all of the powder has been incorporated.

<table>
<thead>
<tr>
<th>CMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed range [rpm]</td>
</tr>
<tr>
<td>Throughput [l/h]</td>
</tr>
<tr>
<td>Circumferential speed [m/s]</td>
</tr>
</tbody>
</table>

Example applications:
- Hydrocolloids
- Aluminum solutions
- Starch solutions
- Calcium carbonate
- Milk powder
- Fumed silica
- Carbopol

The CMS peripheral equipment is the perfect supplement to the CMS module. It contains all parts required to simulate the batch recirculation process for powder incorporation. Liquid is placed into the tank and powder into the funnel. Once the CMS has been switched on, the liquid circulates and the resulting vacuum sucks in and disperses the powder. Once the batch is ready, the valve is switched and the product is discharged.

The CMS peripheral equipment offers a complete solution for wetting of the most difficult of powders.
1 l MICRO-PLANT

The 1 l micro-plant is ideally suited for working in a recirculation process. The system has an open funnel with a 1-liter capacity. The micro-plant is available as an extension kit for the modules UTL / MK / MKO / DR / DRS / MCD / DBI.

2 l MICRO-PLANT

The 2 l micro-plant was specially developed for dispersing in a recirculation process. The 2-liter funnel has a temperature-controllable double jacket. Optionally, the funnel can be closed with a lid, thus enabling to work under pressure/vacuum. The machine is available as an extension kit for the modules UTL / MK / MKO / DR / DRS / MCD / DBI.

Transport box

The IKA® magic LAB® can be stored in a practical transport box. The various modules are neatly arranged into drawers with pre-shaped inserts. The back of the box has plug connections for the magic LAB® and to the power supply. For transport, the box has rollers and a telescopic handle with adjustable length. Box dimensions: (W x H x D) 350 x 460 x 560 mm.

magic LAB® XP

The magic LAB® XP is an upgraded version of the magic LAB®. It combines the low throughputs and production quantities of the magic LAB® with higher requirements pertaining to process parameters. It was developed for applications that are subject to one or more of the following requirements:

> High pressure/vacuum
> High power requirement
> Processing of abrasive products
The magic PLANT was designed especially for the simulation of the IKA SPP/MP/CD/CM process plants and for product requirements on a small scale.

The IKA® magic PLANT is an extremely versatile, multi-functional process plant. Depending on the field of application, it can be converted very easily into three different designs.

### magic PLANT inline

In the inline execution, the magic PLANT is used in recirculation or continuous mode. The integrated high-performance inline disperser magic LAB® is directly mounted to the bottom of the vessel. The modular design with exchangeable dispersing tools enables easy adjustment to product requirements. The machine is ideally suited for homogenization, emulsification, wet milling and dispersing.

### magic PLANT basic

Batch mixing of low-viscosity to high-viscous products. The components are inserted into the mixing vessel where they are mixed by means of the agitator.

### magic PLANT powder

For drying or mixing of bulk solids. The tilting of the vessel achieves optimum mixing and drying performances.

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The labworldsoft® software by IKA® enables the networking of up to 64 laboratory devices. These can be controlled via a PC at the same time. As well as IKA® products, laboratory devices of other manufacturers can be integrated with labworldsoft®.

This makes the automation of your laboratory experiments and procedures simpler and more efficient.
After project completion, our experienced engineers, electricians, application technicians, and assemblers will be happy to help you with the following additional services:

> Technical advice for questions concerning operation, process and maintenance of IKA® machines and plants
> Spare parts service
> Repair service
> Modification

Aftersales

IKA® products supposed to fully meet your requirements. That’s why we offer solutions that are specially adapted for those requirements.

From the initial planning stages to the final product realization, IKA® technology and service departments are at your side, offering a range of services:

> Designing complete production plants
> Performing test runs for the development new products
> Planning and implementation of mechanical, electrical and pneumatic installations
> Commissioning, test operations and training of operating personnel
> Qualification

Customization

Develop – optimize – scale up from laboratory to production

When new products are developed, the processes are first developed and tested in pilot plants. Tests on a laboratory scale are used to validate changed recipes and ingredients.

Thanks to the identical design and dispersion parameters, the IKA® systems enable a reliable scale-up with the same product quality.