Mixing and Processing Technology

designed
to work perfectly
IKA®-Werke GmbH & Co. KG in Staufen, Germany can now look back on a century of history.

The company which was founded in 1910 as a distributor for pharmacies and hospitals, was relocated from bombed-out Cologne to Staufen in 1942. There it quickly became the global market leader for laboratory technology as well as dispersing, stirring, and kneading machines. Today, IKA® employs over 800 people at eight different locations in four continents.

In the past decades the process equipment division of IKA® has attained a leading position in the mixing industry, as well as for engineered systems. This presence was established and strengthened by the IKA® innovative technology. Our high-quality stirring, mixing and kneading machines are widely used from the pharmaceutical to bitumen industry.

For more information please visit www.ikaprocess.com
The machine program of IKA® is as diverse as the mixing industry itself. We specialize in solving the most difficult mixing applications for the processing industries.

In order to provide a solution for almost any mixing application, we have developed a series of machines. The IKA® 2000 series offers more options than any other in the mixing industry, including: wet milling, high shear dispersing, powder-liquid incorporation and more!

For batch and continuous processes, IKA® offers a complete line of high quality stirring, mixing and dispersing machines.

Continuous research and development, along with applying many years of experience, provides the basis for the IKA® philosophy.

Partnering with customers and research universities, IKA® is continuously developing new technologies and applications.
It was a special honor for IKA® to receive the award shown on the right, confirming the unlimited use of the MHD 2000 in the chemical process technology. This machine has been developed for the inline and continuous mixing of solids into liquids. Additionally, the Food and Drug Administration (FDA) awarded IKA® the 3A-sanitary approval for the complete new line of series 2000 machines. Another proof substantiating IKA® professional know-how.

Regular patent applications testify to the steady development, whereas ISO certification is securing the high quality standard.

**Industries:**
- Food
- Chemical
- Pharmaceutical & Bio-Technology
- Personal Care & Toiletry
- Household Products
- Cosmetic
- Paper & Pulp
- Paints, Pigments and Coatings
- Crop science
- Petrochemical & Automotive
- Energy, Waste Disposal & Recycling
- Electronic
- Bitumen

**Powder – Liquid Incorporation**
- starches
- flours
- milk solids
- colloid
- sugar
- xanthan and guar gum
- carboxyl
pigments
- cellulose
- pectin

**Wet Milling / Suspending – liquid / solid systems**
- titanium dioxide
- pigments
- resins
- polishing agents
- seeds
- micro-encapsulations
- carbon black

**Dissolving – molecular / colloidal**
- dyes
- crystal powders
- salts
- detergents
- sugars
- binding agents
- hydrocolloids
- elastomers
- resins
- thixotropic agents

**Homogenizing – concentrating particle size distribution**
- flavors and essences
- creams
- sauces
- dressings
- condiments
- jellies
- sauces

**Emulsifying – liquid / liquid systems**
- margarine
- ice cream
- proteins
- creams and lotions
- mayonnaise
- salad dressing and sauces
- micro-encapsulations

In addition, IKA® high shear mixers have been proven in many other applications, such as:
- Decomposing - organic tissue/plants
- De-saponification/de-liming
- Precipitation - dehydration
- Chemical macerating - O/W
- Extraction - vortex extraction
- Shred/Macerate/Crush/Pulverize

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**Innovation & Awards**

IKA® magic LAB® 2000/03
The smallest MHD from the modular design series 2000. Equipped with the same tools and processing parameters as the industrial scale mixers, it is the ideal device for development of recipes, adaptation of processes, and of course for technical specification of production size machines. It should not be missing in any laboratory! 
**Inline Dispersing Solid-Liquid Mixing**

The details make the difference!

A high quality belt drive, along with a premium efficient, inverter-duty motor provides an efficient and flexible drive system. Scalability is ensured by maintaining a constant shear rate on all machine sizes. A cartridge seal minimizes assembly and disassembly time, and offers optimum reliability.

IKA® uses high quality materials for exceptional mechanical strength and corrosion resistance. By working closely with our customers and research institutions, the generators have been optimized for improved dispersing and efficiency. Generators are also available in many materials other than stainless steel for abrasive and corrosive applications. Some other key features are superior surface finishes, lack of dead spots, and designs that meet the stringent requirements of the FDA, EHEDG and 3A. IKA® Mixers can be cleaned or steamed in place. The 2000 Series has so many benefits, there are too many to list!

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**Applications**

- Sauces
- Fruit juices
- Marmalades
- Sugar solutions
- Dyes
- Binders
- Molten resins
- Lotions
- Adhesives
- Stabilizers

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The economic ULTRA-TURRAX® UTL 1000 machines are used for homogenizing and dispersing (emulsifying/suspending) of pre-mixed liquid-liquid or solid-liquid substances.

The machine has a pump effect which can circulate the product up to a viscosity of about 1,000 mPas. For higher viscosities, the use of a feeding pump is recommended. The dispersing tool is exchangeable and can be adapted to many different process requirements.

The mixing chamber is mounted horizontally and the dispersing tool directly coupled to the motor shaft.

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<table>
<thead>
<tr>
<th>Type</th>
<th>Flow rate (max.) [l/h]</th>
<th>Motor power [kW]</th>
<th>Motor speed [rpm]</th>
</tr>
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</tr>
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</tr>
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<tr>
<td>UTL 1000/50</td>
<td>125,000</td>
<td>110</td>
<td>1,500</td>
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</table>
Series 2000 | Sophistication in the details

Modular design – Provides better value and flexibility

2000 Series – Modular Design | A system with a great future!

As diverse as the mixing industry may be, there are many similarities from one machine to the next. IKA® has developed a new modular series of machines that takes advantage of these similarities. A basic drive unit can be fitted with a multitude of different machine heads, providing a solution for almost any mixing application. Our engineers, in cooperation with our customers, combined their expertise to develop the most innovative machine program in the industry!

Applications

> Sauces > Binders
> Fruit juices > Molten resins
> Marmalades > Lotions
> Sugar solutions > Adhesives
> Dyes > Stabilizers

Benefits of the 2000 series

> Self-draining due to vertical orientation
> Dead spots are eliminated
> Surface finishes meet FDA, 3A and EHEDG
> CIP and SIP capable
> Extensive mixing tool options
> Low noise levels
> Designed to meet food and pharmaceutical industry standards
> Suitable for high pressure and temperature
> Cartridge seal can convert into Single or Double mechanical
> Directly Scalable by maintaining constant tip speed

ULTRA-TURRAX® Inline | UTL 2000

The UTL is a single stage dispersing machine used for the production of emulsions and suspensions requiring a coarse to medium particle size with a narrow distribution. A wide variety of rotor-stator combinations (generators) are available for adapting the machine to the application.

The UTL maintains a constant tip speed, regardless of machine size, ensuring scalability. A wide range of options is available on the motor, base, materials of construction, and more. The ULTRA-TURRAX® has high quality surface finishes for easy cleaning, and the machine is self-draining and CIP capable.

<table>
<thead>
<tr>
<th>Type</th>
<th>Flow rate* [l/h]</th>
<th>Motor power [kW]</th>
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<tr>
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<td>23</td>
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<tr>
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<tr>
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<td>125,000</td>
<td>110</td>
<td>1,500</td>
<td>23</td>
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</tbody>
</table>

* Self pumping rate based on H2O and standard tool configuration
The DISPAX-REACTOR® is a high shear, three stage dispersing machine for the production of micro-emulsions and very fine suspensions, for wet milling and deagglomeration of fine solid particles. Three rotor-stator combinations (generators) in a series produce a small droplet or particle size, with a very narrow distribution. The generators can be easily interchanged, offering the ultimate in flexibility. The DR line offers the same advantages as the UTL for scalability and sanitary design, and is CIP and SIP capable.

Generators available: Coarse, Medium, Fine, Superfine, 2P.

It is well known that tip speed, and therefore shear rate, is one of the most important factors in achieving the finest micro-emulsions. The SUPER DISPAX REACTOR® combines extremely high shear rates with a fine generator geometry to produce the ultimate in high energy dispersing.

Due to the high tip speeds, two stages are often all that is needed to achieve the results that are desired. The DRS is designed with the same high quality features as the UTL and the DR, and is especially suited for even the toughest pharmaceutical applications. The DRS can be an alternative to costly high pressure homogenizers.

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<td>160</td>
<td>1,500</td>
<td>23</td>
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</thead>
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<td>13,800</td>
<td>41</td>
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<td>3,000</td>
<td>40</td>
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<tr>
<td>DRS 2000/10</td>
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<td>200</td>
<td>1,500</td>
<td>40</td>
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</table>
The colloid mill MK 2000 is especially used for wet milling, deagglomeration and the production of viscous emulsions. The high tip speeds, combined with an extremely small shear gap, produces intense friction on the material being processed. The friction and shear that result is commonly referred to as wet milling. The rotor and stator are cone shaped, and have three stages of increasingly fine serrations, or grooves. The stator can be infinitely adjusted to obtain the desired gap setting between the rotor and stator.

The grooves change directions in each stage for increased turbulence. With high quality finishes and materials, the MK tool offers an extremely efficient milling geometry.

Applications
- Pigments
- Polymers
- Coatings
- Crystals, wet milling
- Ceramic slurries

Another unique IKA® innovation, the cone mill MKO 2000 was designed to extend beyond the capabilities of the colloid mill. Given its innovative design, it is capable of wet milling and grinding, producing even smaller particle sizes than a colloid mill. The milling gap is infinitely adjustable so that exact amount of milling action can be obtained.

The surface of the milling tool is coated with an extremely hard coating that has a very rough surface texture. The coatings consist of high quality materials such as carbides and ceramics, and have different grain sizes. The milling tool produces an extremely intense shear zone that can process materials with high or low viscosities, but even finer distribution and particle sizes than a colloid mill.

Applications
- Pigments
- Polymers
- Coatings
- Crystals, wet milling
- Ceramic slurries

### Table 1: Flow Rate and Motor Specifications

<table>
<thead>
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<td>200</td>
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<td>3,000</td>
<td>23</td>
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<td>MK 2000/04 (PROCESS-Pilot)</td>
<td>300</td>
<td>1.5</td>
<td>3,000</td>
<td>23</td>
</tr>
<tr>
<td>MK 2000/05</td>
<td>2,500</td>
<td>3.5</td>
<td>3,000</td>
<td>23</td>
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<td>2,500</td>
<td>15</td>
<td>3,000</td>
<td>23</td>
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<tr>
<td>MK 2000/20</td>
<td>20,000</td>
<td>55</td>
<td>3,000</td>
<td>23</td>
</tr>
<tr>
<td>MK 2000/30</td>
<td>40,000</td>
<td>160</td>
<td>3,000</td>
<td>23</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor power [kW]</th>
<th>Motor speed [rpm]</th>
<th>Circumferential speed [m/s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKD 2000/03 (magic LAB®)</td>
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<td>3,000</td>
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<tr>
<td>MKD 2000/04 (PROCESS-Pilot)</td>
<td>10</td>
<td>1.5</td>
<td>3,000</td>
</tr>
<tr>
<td>MKD 2000/05</td>
<td>150</td>
<td>3</td>
<td>3,000</td>
</tr>
<tr>
<td>MKD 2000/10</td>
<td>500</td>
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<td>MKD 2000/20</td>
<td>1,500</td>
<td>37</td>
<td>3,000</td>
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<tr>
<td>MKD 2000/30</td>
<td>3,000</td>
<td>55</td>
<td>3,000</td>
</tr>
<tr>
<td>MKD 2000/50</td>
<td>6,000</td>
<td>160</td>
<td>1,500</td>
</tr>
</tbody>
</table>

*Typical flow rates for medium viscosity products at 0.1 mm shear gap.

* Self pumping rate with H2O, 0.1 mm shear gap and standard tool.
The high shear mixing and dispersing machine DBI 2000 is designed for the batch operation with a recirculating loop. It is directly flange-connected to the vessel outlet with a big cross section and pumps the product back into the vessel. Due to its wide inlet and the double stage design, it is suitable for processing low up to high viscous products. The DBI 2000 enables suction, pumping, dispersing and self-cleaning under CIP conditions.

This unique system combines high flow circulation, even particle size reduction and effective homogenization. Solid and liquid additives are fed directly into the dispersion chamber, which prevents lump formation and promotes rapid processing.

The DBI 2000 can also be integrated in an existing system or process to replace inefficient machinery.

### Applications
- sunscreen
- Beverages
- Ointments
- Mayonnaise, Dressings
- Paints and lacquers
- Starch solutions
- Grease

### Advantages
- Free selection pumping only or additional high shear dispersing
- Direct feeding of solid and liquid additives
- Effective dispersing with exchangeable tool designs
- No additional pumps required for product circulation, CIP and discharge
- The innovative design ensures shorter processing times and optimum dispersing quality

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor power [kW]</th>
<th>Max. total flow rate dispersing / pumping (l/h)</th>
<th>Max. viscosity final product [mPas]</th>
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<tbody>
<tr>
<td>DBI 2000/03 (magic LAB®)</td>
<td>0.9</td>
<td>max. 1,500</td>
<td>10,000</td>
</tr>
<tr>
<td>DBI 2000/04 (PROCESS-PILOT)</td>
<td>4</td>
<td>2,800 / 6,000</td>
<td>10,000 / 50,000</td>
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<td>DBI 2000/05</td>
<td>7.5</td>
<td>5,000 / 15,000</td>
<td>100,000</td>
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<td>DBI 2000/10</td>
<td>22</td>
<td>20,000 / 40,000</td>
<td>100,000</td>
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<tr>
<td>DBI 2000/20</td>
<td>45</td>
<td>40,000 / 80,000</td>
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</table>
Incorporating powders into liquids, without lumps and without dust, is an important part of many processes. The CMX 2000 utilizes a specially designed rotor that creates enormous suction to draw in solids, while it pumps the liquid at the same time. The liquid can then be re-circulated until all powders are incorporated.

Additional dispersing can be accomplished by continually re-circulating without adding more powder. Dispersing can then be continued with closed powder inlet. Depending on the product respective the powder characteristics, high solids concentrations can be achieved.

When production quantities require a continuous process, the MHD 2000 can get the job done. Solids and liquids are instantaneously mixed and dispersed in one step while maintaining a dust free environment. The MHD accurately combines the solid and liquid, and disperses them into a homogeneous, final product. Tanks and other auxiliary equipment can often be eliminated, saving capital and operating expenses. The MHD has a unique, patented design that doesn’t require suction to draw in the powders, which essentially eliminates aeration. The MHD offers the greatest flexibility in production, and offers maximum product consistency. The MHD can also run in recirculation mode as an enrichment process. The MHD prevents bridging and aeration. Scalability is ensured by maintaining a constant tip speed of 23 m/s throughout the product range.

### CMX 2000

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor power [kW]</th>
<th>Powder incorporation [kg/h]</th>
<th>Flow Rate (max.) [l/h]</th>
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<tr>
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<td>250</td>
<td>1,500</td>
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<tr>
<td>CMX 2000/04 (PROCESS Pilot)</td>
<td>4</td>
<td>1,300</td>
<td>5,000</td>
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<tr>
<td>CMX 2000/05</td>
<td>5.5</td>
<td>14,000</td>
<td>46,000</td>
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<td>CMX 2000/10</td>
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<td>CMX 2000/30</td>
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### MHD 2000

<table>
<thead>
<tr>
<th>Type</th>
<th>Motor power [kW]</th>
<th>Total Flow Rate (max.) [l/h]</th>
<th>Max. solids capacity [lb]</th>
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<td>0.9</td>
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<td>MHD 2000/04 (PROCESS Pilot)</td>
<td>2.2</td>
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<tr>
<td>MHD 2000/50</td>
<td>75</td>
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<td>11,200</td>
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For several decades, the ULTRA-TURRAX® name has been synonymous with quality and reliability. The machines are used for the production of any kind of emulsions, suspensions and hydro-colloidal solutions. A variety of exchangeable generators (rotor + stator) enable further adaptations to the respective mixing task. Moreover, different types of seals allow different fitting positions as well as working under pressure up to 10 bar and with temperatures up to approx. 160 °C.

The models UTC, UTS and UTE are basically only differing in their peripheral design, the type of seal and assembly in the vessel. Nevertheless, the generators from these models are always the same so that the same mixing result is achieved. While the machine types UTC and UTS are for top entry assembly, the UTE is mounted on the vessel bottom. Therefore the UTE model is preferred in case of varying filling levels in the container.

Batch Dispersing
IKA® is the world leader in the design and manufacturing of high shear mixers and systems. IKA® produces a full range of mixers from laboratory to production scale. Our high shear mixers and dispersers feature our proven rotor-stator designs that are used in thousands of chemical, food, pharmaceutical and cosmetic companies.

The machines are designed to withstand the most demanding applications while providing the ultimate flexibility for your application needs.
Applications

- Lotions
- Waxes
- Polishing agents
- Gelling agents
- Disperse dyes
- Polymer emulsions

Advantages of the ULTRA-TURRAX® UTC:

- Prevents aeration
- Capable of operating under pressures of up to 16 bar
- CIP and SIP capable
- No shaft tube where material can stick on
- Machine can run at very low liquid levels
- Easy for cleaning
- No bearings in the product

High-shear Batch Mixers - bottom & side entry

The ULTRA-TURRAX® UTE for bottom or side mounting to vessels is mainly used in case of varying filling levels and when strong spouts and air inclusions have to be avoided. Suitable for operation with pressures from 0.1 up to 16 bar and temperatures from -40 °C up to 160 °C.

<table>
<thead>
<tr>
<th>Type</th>
<th>Batch size range* [l]</th>
<th>Rotational speed [rpm]</th>
<th>Circumferential speed** [m/s]</th>
<th>Motor power [kW]</th>
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<td>15</td>
<td>1.5</td>
</tr>
<tr>
<td>UTC/UTS 150</td>
<td>350 – 1,700</td>
<td>3,000</td>
<td>21</td>
<td>7.5</td>
</tr>
<tr>
<td>UTC 220</td>
<td>500 – 2,500</td>
<td>1,500</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>UTC/UTS 280</td>
<td>750 – 3,500</td>
<td>1,500</td>
<td>20</td>
<td>18.5</td>
</tr>
<tr>
<td>UTC 340</td>
<td>800 – 4,000</td>
<td>1,500</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>UTC 930</td>
<td>1,000 – 5,000</td>
<td>1,000</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>UTC 350</td>
<td>1,250 – 6,000</td>
<td>1,000</td>
<td>17</td>
<td>32</td>
</tr>
</tbody>
</table>

* Depending on the product viscosity. Regular range 1 – 5,000 mPas.

** Higher Tip Speeds can be achieved with optional VFD Speed Controller on all UTC and UTS models.

<table>
<thead>
<tr>
<th>Type</th>
<th>Batch size range* [l]</th>
<th>Circumferential speed** [m/s]</th>
<th>Motor power [kW]</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTE 60</td>
<td>20 – 70</td>
<td>23</td>
<td>1.85</td>
</tr>
<tr>
<td>UTE 115</td>
<td>80 – 400</td>
<td>15</td>
<td>2.5</td>
</tr>
<tr>
<td>UTE 150</td>
<td>150 – 750</td>
<td>21</td>
<td>6.5</td>
</tr>
<tr>
<td>UTE 220</td>
<td>250 – 1,200</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>UTE 280</td>
<td>500 – 2,500</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>UTE 300</td>
<td>800 – 4,000</td>
<td>21</td>
<td>30</td>
</tr>
<tr>
<td>UTE 450</td>
<td>10,000 – 25,000</td>
<td>30</td>
<td>160</td>
</tr>
</tbody>
</table>

* Depending on the product viscosity. Regular range 1 – 5,000 mPas.

** Higher Tip Speeds can be achieved with optional VFD Speed Controller on all UTC and UTS models.
Batch Mixing/Stirring

Applications

> Food industry
  - Ice cream, chocolate, flavorings, drinks
> Paint and dye industry
  - Inks, watercolors
> Paper industry
  - Adhesives, Pulp
> Chemical industry
  - Dyes, fertilizers, pesticides

The IKA® ROTOTRON® RTS jet flow agitator is a universal overhead stirrer. RTS-type machines are used for homogenizing, dispersing, suspending, emulsifying, de-areation and dissolving. The jet flow agitator is characterized by its high level of efficiency, intensively circulating and mixing products while consuming little energy.

The ROTOTRON® RTS is suitable for top entry and submerged mounting into large vessels. For many applications, it replaces the use of conventional agitators with extremely long shafts. The IKA® ROTOTRON® RTS can be used to process media up to a viscosity of 15,000 mPas. Depending on the application the rotary direction is changeable. In order to prevent sedimentation and floating ingredients, the flow direction is downwards. For the treatment of high viscosities and to avoid air incorporation, the turning direction can be changed, affecting an upwards flow.

Advantages of the ROTOTRON® RTS:

> Rapid mixing and dispersing results
> Completely homogeneous mixing of the product in all areas of the container, even for critical shapes
> Energy efficient
> No rotation of the mixture, flow breakers are not required
> Whirlpool effects and air inclusions are prevented
> Flexible installation options in containers with a wide variety of shapes
> No seal in the product
> Exchangeable mixing heads available

The IKA® ROTOTRON® RTS jet flow agitator is a universal overhead stirrer. RTS-type machines are used for homogenizing, dispersing, suspending, emulsifying, de-areation and dissolving. The jet flow agitator is characterized by its high level of efficiency, intensively circulating and mixing products while consuming little energy.

The ROTOTRON® RTS is suitable for top entry and submerged mounting into large vessels. For many applications, it replaces the use of conventional agitators with extremely long shafts. The IKA® ROTOTRON® RTS can be used to process media up to a viscosity of 15,000 mPas. Depending on the application the rotary direction is changeable. In order to prevent sedimentation and floating ingredients, the flow direction is downwards. For the treatment of high viscosities and to avoid air incorporation, the turning direction can be changed, affecting an upwards flow.

<table>
<thead>
<tr>
<th>Type</th>
<th>Batch size max. (l)</th>
<th>Rotational speed (rpm)</th>
<th>Motor power (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTS 115</td>
<td>1,000</td>
<td>3,000</td>
<td>2.2</td>
</tr>
<tr>
<td>RTS 150</td>
<td>5,000</td>
<td>3,000</td>
<td>4</td>
</tr>
<tr>
<td>RTS 220</td>
<td>10,000</td>
<td>1,500</td>
<td>5.5</td>
</tr>
<tr>
<td>RTS 280</td>
<td>20,000</td>
<td>1,500</td>
<td>15</td>
</tr>
</tbody>
</table>
TURBOTRON® | RF/RK

The name IKA® TURBOTRON represents the classic stirrer. The machine can be fitted with a wide variety of mixing tools. Motor, drive and seal options are available to fit the machine to the application.

While the RK is meant for operation in ambient condition, the TURBOTRON® RF can operate under vacuum or pressure and in a wide temperature range. Installation lengths can be specified according to the vessel size and the mixing tool is specified according to the processing target.

The regular viscosity range for the high speed agitations type RF/RK is up to approximately 1,000 mPas.

Advantages of the TURBOTRON® machines:

> Different drives are available for slow or variable speeds
> Machines are suitable for ambient (RK) and pressure vessels (RF)
> Optional frequency converters enable infinite speed adjustment
> All wetted parts are stainless steel
> Suitable for use in the food or pharmaceutical industry

<table>
<thead>
<tr>
<th>Type</th>
<th>Batch size max. (H₂O) [l]</th>
<th>Rotational speed [rpm]</th>
<th>Motor power [kW]</th>
<th>Installation length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>RK1 RF 00</td>
<td>500 / 1,000</td>
<td>1,000 / 1,500</td>
<td>0.37 / 0.55</td>
<td>800 / 1,500</td>
</tr>
<tr>
<td>RK1 RF 01</td>
<td>1,000 / 2,000</td>
<td>1,500</td>
<td>0.55 / 0.75</td>
<td>1,000 / 1,500</td>
</tr>
<tr>
<td>RK1 RF 02</td>
<td>1,500 / 3,000</td>
<td>1,000</td>
<td>0.75 / 1.5</td>
<td>1,000 / 1,750</td>
</tr>
<tr>
<td>RK1 RF 03</td>
<td>2,000 / 4,000</td>
<td>1,000</td>
<td>1.1 / 2.2</td>
<td>1,250 / 1,500</td>
</tr>
<tr>
<td>RK1 RF 04</td>
<td>2,500 / 5,000</td>
<td>750</td>
<td>1.5 / 3</td>
<td>1,500 / 1,500</td>
</tr>
<tr>
<td>RK1 RF 05</td>
<td>3,000 / 6,000</td>
<td>750</td>
<td>2.2 / 4</td>
<td>1,750 / 1,750</td>
</tr>
<tr>
<td>RK1 RF 06</td>
<td>3,500 / 8,000</td>
<td>1,000</td>
<td>3 / 5.5</td>
<td>1,750 / 1,750</td>
</tr>
<tr>
<td>RK1 RF 07</td>
<td>4,000 / 12,000</td>
<td>1,000</td>
<td>4 / 7.4</td>
<td>1,750 / 2,000</td>
</tr>
</tbody>
</table>

TURBOTRON® | RFG/RKG

The RKG series is designed to be used with either open or closed vessels with ambient pressure. The agitator shaft is supported by an additional bearing in the flange. PTFE graphite material is used to seal the bearing, which provides excellent running properties and maximum resistance. Optional versions are available with mechanical seals.

The RFG models are designed for use with closed and pressure vessels (standard 2.5 bar) and are equipped with a massive lantern. Optional executions are suitable for full vacuum and/or pressures up to 10 bar. The agitator shaft is mounted in a gear box and can be equipped with an additional shaft coupling. The benefit of the models RKG/RFG is the suitability for viscous products and the possibility of long installation lengths.

<table>
<thead>
<tr>
<th>Type</th>
<th>Batch size max. (H₂O) [l]</th>
<th>Rotational speed [rpm]</th>
<th>Motor power [kW]</th>
<th>Installation length [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>RKG1 RFG 00</td>
<td>1,000</td>
<td>250</td>
<td>0.55</td>
<td>1,250 / 1,500</td>
</tr>
<tr>
<td>RKG1 RFG 01</td>
<td>1,500</td>
<td>250</td>
<td>0.75</td>
<td>1,250 / 1,500</td>
</tr>
<tr>
<td>RKG1 RFG 02</td>
<td>2,000</td>
<td>250</td>
<td>1.5</td>
<td>1,500 / 1,500</td>
</tr>
<tr>
<td>RKG1 RFG 03</td>
<td>4,000 / 6,000</td>
<td>250</td>
<td>2.2 / 3</td>
<td>1,500 / 1,750</td>
</tr>
<tr>
<td>RKG1 RFG 04</td>
<td>5,000 / 8,000</td>
<td>250</td>
<td>3 / 4</td>
<td>1,750 / 2,000</td>
</tr>
<tr>
<td>RKG1 RFG 05</td>
<td>6,000 / 12,000</td>
<td>250</td>
<td>4 / 5.5</td>
<td>2,000 / 2,500</td>
</tr>
<tr>
<td>RKG1 RFG 06</td>
<td>8,000 / 15,000</td>
<td>250</td>
<td>5.5 / 7.5</td>
<td>2,000 / 2,750</td>
</tr>
<tr>
<td>RKG1 RFG 07</td>
<td>12,000 / 20,000</td>
<td>250</td>
<td>7.4 / 9.2</td>
<td>2,000 / 3,000</td>
</tr>
</tbody>
</table>
A complete line of stands are available for all IKA® stirrers and ULTRA-TURRAX® batch machines. Lifting and lowering can be done with either a manual hydraulic pump, or an electro-hydraulic pump for automatic operation. The stands may also be equipped with a swivel bracket for angle adjustment of the mixer.

An optional vessel clamp is also available. Other options are available, including materials of construction and electrical controls. The lifting height of the stand can be specified according to the requirements. Stainless steel versions with high-quality surface finishes are available for the food and pharmaceutical industries.

### Stand Specifications

<table>
<thead>
<tr>
<th>Type of stand</th>
<th>Type of stand</th>
<th>Max. load [kg]</th>
<th>Max. lift height [mm]</th>
<th>Lift drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFH 150 / SFH 250</td>
<td>Mobile Stands</td>
<td>100 / 200</td>
<td>1,000</td>
<td>manual pump</td>
</tr>
<tr>
<td>SFAE 150 / SFAE 250</td>
<td>Mobile Stands</td>
<td>100 / 250</td>
<td>1,000</td>
<td>electric pump</td>
</tr>
<tr>
<td>SBH 150 / SBH 250</td>
<td>Floor Stands</td>
<td>100 / 250</td>
<td>1,300</td>
<td>manual pump</td>
</tr>
<tr>
<td>SBAE 150 / SBAE 250</td>
<td>Floor Stands</td>
<td>100 / 250</td>
<td>1,200</td>
<td>electric pump</td>
</tr>
<tr>
<td>SWH 150 / SWH 250</td>
<td>Wall Stands</td>
<td>100 / 250</td>
<td>1,800</td>
<td>manual pump</td>
</tr>
<tr>
<td>SWAE 150 / SWAE 250</td>
<td>Wall Stands</td>
<td>100 / 250</td>
<td>1,800</td>
<td>electric pump</td>
</tr>
</tbody>
</table>

**SFH 150 Stainless**

Mobile stand in stainless steel execution with hydraulic hand pump, control panel and vessel fixation device.
IKA® processing plants can be used for the production of solutions, emulsions and suspensions in many applications. Due to the advanced design, they can handle products that range from low viscosity up to pasty condition.

Flexible and easy to customize to the specific application, our plant systems can be used e.g. for cosmetic creams and lotions in the cosmetic and pharmaceutical industry, for mayonnaise or dressings in the food industry, for suspensions and emulsions in the chemical industry as well as for production of paints and lacquers.

Based on our long experience with many applications, IKA® is your competent partner for processing plants. In order to select the best configuration for your specific application, our test facility is staffed with experienced application engineers. It is equipped with a wide range of laboratory and pilot equipment to qualify the appropriate equipment to meet your application needs.

Develop – Optimize – Scale-up from laboratory to production scale

When new products are developed, the processes are initially tested in pilot plants. Small scale trials are also used to confirm changes in recipes or ingredients. Through the use of identical plant design and dispersion parameters, IKA® plant systems ensure a reliable scale-up with a constant product quality.
IKA® pilots allow you to:
- Choose the process technology to be used
- Define the required machine and system size
- Establish the necessary energy requirements
- Determine the required quality and volume of the raw materials
- Calculate and define the quality standard of the final product
- Determine the flow rate or batch times of the industrial system

IKA® magic LAB®
The magic LAB® is a modular laboratory mixing system that gives the user the ability to test a wide variety of applications on a laboratory scale. Using seven different, interchangeable mixing tools and variable speed control the entire scope of processing with rotor-stator systems can be tested.

IKA® magic LAB® XP
The magic LAB® XP is an upgraded version of the standard magic LAB®, built to handle applications with one or more of the following requirements;
- Higher pressure / high vacuum
- Abrasive or non-lubricating products
- High power requirements

IKA® LABOR-PILOT 2000/04
Modular inline dispersing machine in pilot scale; suitable for working under vacuum / pressure and at elevated temperatures. The machine is equipped with a double mechanical seal and lubrication system.

IKA® PROCESS-PILOT 2000/04
Inline dispersing machine in pilot scale; suitable for homogenization production of and basic emulsions and suspensions.

Technical data:
- Power supply [V]: 3 phases, 380 – 420
- Motor power [kW]: 3
- Max. admissible temperature [°C]: 120
- Max. process pressure/vacuum [bar]: 10/-1
- Rotational speed [rpm]: 8,050
- Circumferential speed [m/s]: 23
- Flow capacity [l/h]: 500
- Dimensions [W x D x H] [mm]: 450 x 250 x 900
- Weight [kg]: 53

IKA® pilots allow you to:
- Choose the process technology to be used
- Define the required machine and system size
- Establish the necessary energy requirements
- Determine the required quality and volume of the raw materials
- Calculate and define the quality standard of the final product
- Determine the flow rate or batch times of the industrial system

IKA® magic LAB® 2000/03
The magic LAB® is a modular laboratory mixing system that gives the user the ability to test a wide variety of applications on a laboratory scale. Using seven different, interchangeable mixing tools and variable speed control the entire scope of processing with rotor-stator systems can be tested.

Technical data:
- Power supply [V]: 3 phases, 380 – 420
- Motor power [kW]: 2.2
- Max. admissible temperature [°C]: 120
- Max. process pressure/vacuum [bar]: 10/-1
- Rotational speed [rpm]: 8,050
- Circumferential speed [m/s]: 23
- Flow capacity [l/h]: 500
- Dimensions [W x D x H] [mm]: 450 x 250 x 900
- Weight [kg]: 53

* Incl. controller
** Speed 14,600 rpm, module UTL, 4 M, H2O
IKA® introduces the next generation of laboratory scale processing plants. The perfect simulation of our batch mixing systems with smallest sample amounts.

The magic PLANT is the ideal laboratory scale process plant. It is specifically designed to test process and product conditions in an accurate small-scale simulation. Once a satisfactory product is obtained in the pilot scale, the next step is to transfer the manufacturing process to full-scale production. The magic PLANT system can be adapted to a wide range of applications and specific requirements especially in the food, cosmetic, chemical and pharmaceutical industries.

One machine | multiple applications
The IKA® magic PLANT is an extremely versatile and multi-functional process plant. Depending on the application, this unit can easily be modified into three different configurations.

**magic PLANT basic**
- Adjustable speed drive for perfect agitating of pure liquids or suspensions
- Tiltable, double jacketed and insulated vessel
- Exchangeable stirring tools
- Motor power [W]: 400

**magic PLANT inline**
- In combination with high shear inline disperser magic LAB® for high quality emulsions and suspensions
- Pipe loop with manual 3-way valve for circulation or product discharge
- Modular processing head for the simulation of various dispersing methods
- Adjustable tip speed up to 40 m/s for smallest particle sizes

**magic PLANT powder**
- Efficient and gentle mixing or drying of free flowing solids
- Special powder agitator
- Inclined working position for better mixing and drying results
- Discharge by complete tilting of the vessel

**Technical data**
- Useful volume [l]: 2
- Working pressure [bar]: -1 up to 2.5 (optionally 5 bar)
- Max. temperature in the vessel [°C]: 150
- Dimensions L x W x H [mm]: 430 x 520 x 670
- Voltage [V]: 1 x 230
- Viscosity [mPas]*: 1 – 100,000

**Agitator**
- Speed [rpm]: 0 – 2,000 rpm
- Stirring tools:
  - anchor
  - propeller
  - spiral agitator for drying
  - flow breaker
- Motor power [W]: 400

**Dispenser T 25 (optional)**
- Motor power [W]: 500
- Speed [rpm]: 3,400 – 24,000

* Depending on execution and product properties.
Cost-efficient Batch Mixing System

The IKA® Standard Production Plant is a state-of-the-art, yet cost-effective mixing system for all basic mixing and dispersion technology operations.

The IKA® Standard Production Plant is available in eight sizes for volumes ranging from 25 up to 4,000 liters.

---

Vessel Cover
The Standard Production Plant is equipped with a vessel cover tilting device. This enables the cover with agitator to open to a 90-degree angle.

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Mixing Vessel
The unique conical shape of the vessel bottom enables complete discharge—even for highly viscous products.

---

Funnel
for adding solid and liquid additives

---

Recirculation Loop
Large pipe with 2-way flap valves and clamp connections

---

Technical data

<table>
<thead>
<tr>
<th>Standard Production Plant</th>
<th>SPP 25</th>
<th>SPP 50</th>
<th>SPP 100</th>
<th>SPP 250</th>
<th>SPP 500</th>
<th>SPP 1000</th>
<th>SPP 2000</th>
<th>SPP 4000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total connected load [kW]</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>23</td>
<td>25</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Mixing vessel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. usable volume [l]</td>
<td>6</td>
<td>15</td>
<td>30</td>
<td>75</td>
<td>150</td>
<td>300</td>
<td>600</td>
<td>1,200</td>
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<tr>
<td>Max. usable volume [l]</td>
<td>25</td>
<td>50</td>
<td>100</td>
<td>250</td>
<td>500</td>
<td>1,000</td>
<td>2,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Dimensions (agitator)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (closed cover) [mm]</td>
<td>1,350</td>
<td>1,480</td>
<td>1,720</td>
<td>2,000</td>
<td>2,670</td>
<td>3,060</td>
<td>3,635</td>
<td>4,260</td>
</tr>
<tr>
<td>Height (open cover) [mm]</td>
<td>1,520</td>
<td>1,685</td>
<td>1,990</td>
<td>2,460</td>
<td>3,285</td>
<td>3,760</td>
<td>4,390</td>
<td>5,050</td>
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<tr>
<td>Width (open cover) [mm]</td>
<td>1,370</td>
<td>1,370</td>
<td>1,705</td>
<td>2,080</td>
<td>2,695</td>
<td>3,360</td>
<td>3,960</td>
<td>4,600</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>800</td>
<td>860</td>
<td>1,080</td>
<td>1,250</td>
<td>1,950</td>
<td>2,765</td>
<td>2,200</td>
<td>2,600</td>
</tr>
</tbody>
</table>

> Small minimum capacity
> Low installation height
> Flexible configuration
> Counter-rotating agitator for highest viscosities, inner agitator can be heated/cooling
> The complete plant can be sterilized with steam (SIP)
> CIP-cleaning, for which the DBI 2000 serves as pump and feeds the rotating spray nozzles

**Human-machine-interface (HMI)**
with touch-screen monitor

**Funnel**
for incorporation of solids and liquids

**Connections**
For vacuum, compressed air or funnel (additives)

**System Design**
completely encased in stainless steel

**Alternative**
Heatable or coolable spiral agitator

**Opposing agitators with movable scrapers and a heatable or coolable inner agitator**

**Dispensing Machine**
The high-performance dispensing machine DBI ensures high-quality, stable emulsions and suspensions.

---

**Master Plant MP | Perfection in detail**

---

**Technical data**

<table>
<thead>
<tr>
<th>Master Plant</th>
<th>MP 10</th>
<th>MP 25</th>
<th>MP 50</th>
<th>MP 100</th>
<th>MP 2000</th>
<th>MP 500</th>
<th>MP 1000</th>
<th>MP 2000</th>
<th>MP 4000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total connected load [kW]</td>
<td>5</td>
<td>7</td>
<td>8</td>
<td>12</td>
<td>13</td>
<td>31</td>
<td>35</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>Mixing vessel [l]</td>
<td>13</td>
<td>32</td>
<td>65</td>
<td>130</td>
<td>260</td>
<td>560</td>
<td>1,350</td>
<td>2,600</td>
<td>5,200</td>
</tr>
<tr>
<td>Useful volume [l]</td>
<td>10</td>
<td>25</td>
<td>50</td>
<td>100</td>
<td>200</td>
<td>500</td>
<td>1,000</td>
<td>2,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Working pressure in the vessel [bar]</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
<td>1 bar to 2.5</td>
</tr>
<tr>
<td>Max. temperature in the vessel [°C]</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Height (closed cover) [mm]</td>
<td>1,065</td>
<td>1,637</td>
<td>1,817</td>
<td>2,305</td>
<td>2,421</td>
<td>3,115</td>
<td>3,749</td>
<td>4,951</td>
<td>5,425</td>
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<tr>
<td>Height (open cover) [mm]</td>
<td>1,515</td>
<td>2,086</td>
<td>2,417</td>
<td>2,950</td>
<td>3,376</td>
<td>4,615</td>
<td>5,499</td>
<td>7,051</td>
<td>7,865</td>
</tr>
<tr>
<td>Width [mm]</td>
<td>635</td>
<td>850</td>
<td>850</td>
<td>1,215</td>
<td>1,215</td>
<td>1,900</td>
<td>1,900</td>
<td>2,710</td>
<td>2,710</td>
</tr>
<tr>
<td>Depth [mm]</td>
<td>661</td>
<td>1,010</td>
<td>1,010</td>
<td>1,407</td>
<td>1,407</td>
<td>1,900</td>
<td>1,900</td>
<td>2,710</td>
<td>2,710</td>
</tr>
</tbody>
</table>
IKA® Laboratory & Analytical Equipment

IKA® is the indisputable leader in the world market for laboratory technology. Numerous innovations are evidence of the growing momentum within the company.

Magnetic stirrers, agitators, dispersers, shakers, mills, rotary evaporators, calorimeters, temperature control instruments and laboratory reactors make up the laboratory and analytical technology product range.

Details can be found in our product brochures or online at www.ikaprocess.com

Dry Milling

Impact and cutting mill for dry products | Pilotina
Deagglomeration of solids | CONIKA

Kneading

Vertical, horizontal and continuous kneading

Vacuum Drying and Mixing

For applications with particle size requirements in the nano range

Dilution Plants

For highly efficient and economical production

High Pressure Homogenizer

For applications with particle size requirements in the nano range
IKA® machines and units are designed to be suitable for use in the pharmaceutical industry. According to GMP guidelines, pharmaceutical companies are required to validate processes that influence product quality. The applied machines and plants are subjected to a severe qualification process. During this qualification it is tested and documented that the pre-specified functionality is achieved. As early as in the planning stages, IKA® machines and units are designed to be suitable for use in the pharmaceutical industry. IKA® will provide the necessary documentation and, if desired, will conduct the design, installation and operation qualification together with you.

Qualification

IKA® machines and units are designed to be suitable for use in the pharmaceutical industry.

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Services | First-rate quality from initial consultation to full scale production

From the initial planning stages to final product realization, IKA® technology and services is with you each step of the way by offering a multitude of services:

> Designing complete production plants
> Performing test runs when developing new products
> Planning and implementation of mechanical, electrical and pneumatic installations
> Commissioning, including a test processing and training the operating personnel
> Qualification

After project completion, our experienced engineers, electricians, chemists, application technicians and assemblers will be available to assist you with:

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

Test Center | From Idea to Solution

The IKA® pilot plant station consists of a vast array of different machines and plants as well as measuring and analytical devices. The pilot plant trials have influenced the concept and design of many of our machines and their tooling.

Searching for a suitable machine for your application? At IKA® pilot plant station you can test out several mixing systems with a variety of tools. Our chemical engineers look forward to assisting and advising you during and after the trials. This way, an optimal solution for your specific mixing task can be determined.