

Solution For Perfect Fried Instant Noodles

Technology
solutions by Bühler

From grain to the perfect noodles. A processing solution from Bühler.



A variety of fried instant noodle products.

Bühler has developed a state-of-the-art process for the production of fried instant noodles, setting new standards for the noodle industry. Continuous dough preparation combined with an excellent centralized control system are key features in this fully automatic production line. Enhanced by a history of Swiss precision and expert knowhow in pasta processing, Bühler's instant noodle lines are designed and engineered to meet the highest hygiene, food safety, and operational requirements in noodle production.

Bühler holds globally leading market positions in technologies and methods for food processing, with more than 10,000 employees in over 140 countries who provide dedicated service worldwide. As we strive for innovations that make a better world, with a special focus on healthy, safe and sustainable processing solutions, we want our customers to be successful.

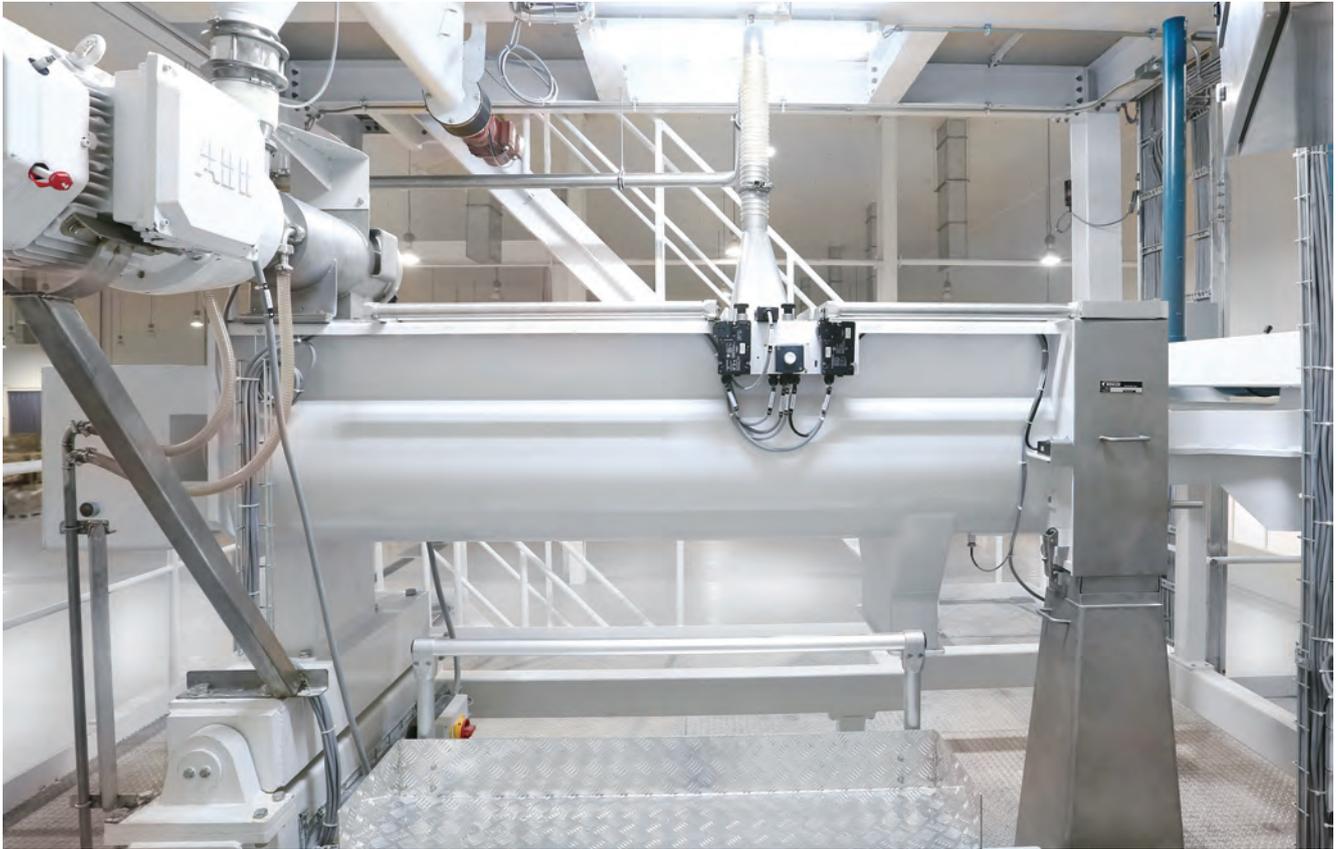
From raw material processing to intelligent control for user-friendly automation, Bühler's noodle lines are designed to meet every market requirement, helping customers produce exceptional products that meet customer demand.

Product varieties:

- Dropped, round cup noodles*
- Dropped, round bowl noodles*
- Dropped, square noodles*
- Folded, square noodles*

* All common noodle cake weights can be provided

Dough preparation. A system with state-of-the-art technology.



Continuous dough mixing system.

High quality dough preparation starts with maximum measuring accuracy of the loss-in weight dosing scale. The universal control system with intelligent weighing algorithms guarantees accurate dosing results and accurate water proportioning, which ensures the best possible starting point for the mixing process. The high speed mixer moistens flour particles with the right amount of liquid for an even hydration, and this is key to preparing a homogenous dough for premixing. This prepared raw material is then fed from the high-speed mixer into the main mixing trough where two counter-rotating shafts enable paddles to continuously mix the material. Depending on desired properties, angles of the paddles can be adjusted to accommodate retention times.

The entire dough mixing system consists of four machines operated by one control system, designed to meet the highest dough quality requirements and operational safety, while reducing operation costs at the same time. Due to its closed system, the highest standards of hygiene and food safety can be ensured.

An accurate, fast response control system can secure and control the impact of minimum changes in raw material and water dosing. The option to add additives with a micro dosing scale rounds out this advanced continuous mixing system.

Benefits:

- Fully automatic dosing of flour, liquids and additives with maximum measuring accuracy to ensure best homogeneity of dough and stable final product quality in all environments
- Consistent dough properties thanks to gravimetric dosing and accurate mixing
- Excellent sanitation and minimum maintenance due to continuous operation and food safe design
- Proven process expertise from pasta production technology

Double-shaft mixing trough. Continuous mixing brings high quality dough.



Dough mixer in cleaning position.

The double-shaft mixer processes the flours of raw material which is then combined with water and additives for the production of dough. It's human-centered design enables easy machine interaction, giving this solution high accessibility for maintenance and cleaning that complies with today's requirements for modern noodle production.

Features:

- Angles of paddles inside the mixer can be adjusted according to production and capacity to influence the retention time
- In cleaning mode, the trough can be lowered by 15° to fully empty the mixer
- Stainless steel is used to fit the highest standard for food safety

Benefits:

- Easy and fast cleaning of the mixer leads to increased plant availability, reducing labor costs and improving food safety
- Proven technology for flexible usage of wheat raw materials

Dough sheeting system. From dough to a perfect dough sheet.



Stable dough sheeting as a continuous process.

From mixed dough to the dough sheet, a continuous lamination transforms dough balls into a perfectly homogenous dough sheet. The position of the dough sheet is maintained by an automatic adjustment of the roller speed at each section, which guarantees an even thickness with the highest accuracy while also reducing waste. Every step in this process is designed for the highest levels of hygiene requirements and operational safety, as well as cleaning accessibility. The force ratio is adjustable and this enables an even, gluten matrix of dough sheet forming for the perfect product quality.

Benefits:

- Each pair of rollers is equipped with an independent motor and frequency converter, as well as a dough sheet position sensor
- Bühler casting technology produces a high quality, low-alloyed chilled roller
- A manual, one-time set-up of roller clearance height ensures the required dough sheet thickness

Steaming System.

A process to achieve the adequate gelatinization.



Changing the granule structure by steam-cooking.

The starch contained in wheat flour has an intricate molecular structure that makes it difficult for digestive enzymes to prevent fast rehydration of noodles. Adding water and applying heat helps to change this structure and turn it into a gelatinized starch, providing a structure which will rehydrate quickly. After the rolling process, the sliced noodle units are transferred onto a mesh conveyor which passes them through the steaming channel. The noodles are then cooked for one to three minutes by steam at ambient pressure. The cooking temperature at this stage generally ranges from 98°C to 100°C, and it takes one to three minutes to pass through this stage of production. Depending on space limitations, the steamer is variable in its design, to ensure the required gelatinization degree by adjusting the length and number of levels.

Benefits:

- Several temperature and pressure measuring points for each layer; each are separately controlled
- 1- or 3-layer design execution ensures the process while also accommodating space limitations
- Unique cleaning operation of 1-layer steamer with a mechanical opening for ceiling and bottom plates
- Special design to avoid escape of steam: Exhaust hoods are staggered and positioned at a lower level compared with the main steaming tunnel

Frying System.

A key process that guarantees the best taste.



Frying will solidify the gelatinous state of starch.

To dry a noodle cake and give the noodles a unique taste, the frying process is a key step in the production of fried instant noodles. The main quality parameters such as rehydration rate and viscoelastic texture can be influenced by frying time and temperature. The noodles are fried in heated oil at 140 to 160°C, for 90s to 180s, depending on the shape and weight of the noodle cakes. At this stage, the moisture content of the noodles usually ranges from 30 to 50%, which can then be reduced to a moisture content between 2 and 5%. At the same time, the oil content is influenced by the frying time, normally ranging from 15 to 20%.

The system used to heat the oil is an indirect method through a heat exchanger, preferably designed for use with high pressure steam, in order to guarantee a full food safe operation. The complete heating system is automatically controlled by the centralized control system that ensures a temperature accuracy of $\pm 1^{\circ}\text{C}$ within the frying unit. The two-stage filtering process is another component of the frying process, with a coarse and fine filter that enables the operator to have a continuous cleaning, with continuous replenishment and food safe oil conditions. In addition, the efficiency of the heat exchanger and oil usage can be increased; and consequently, the

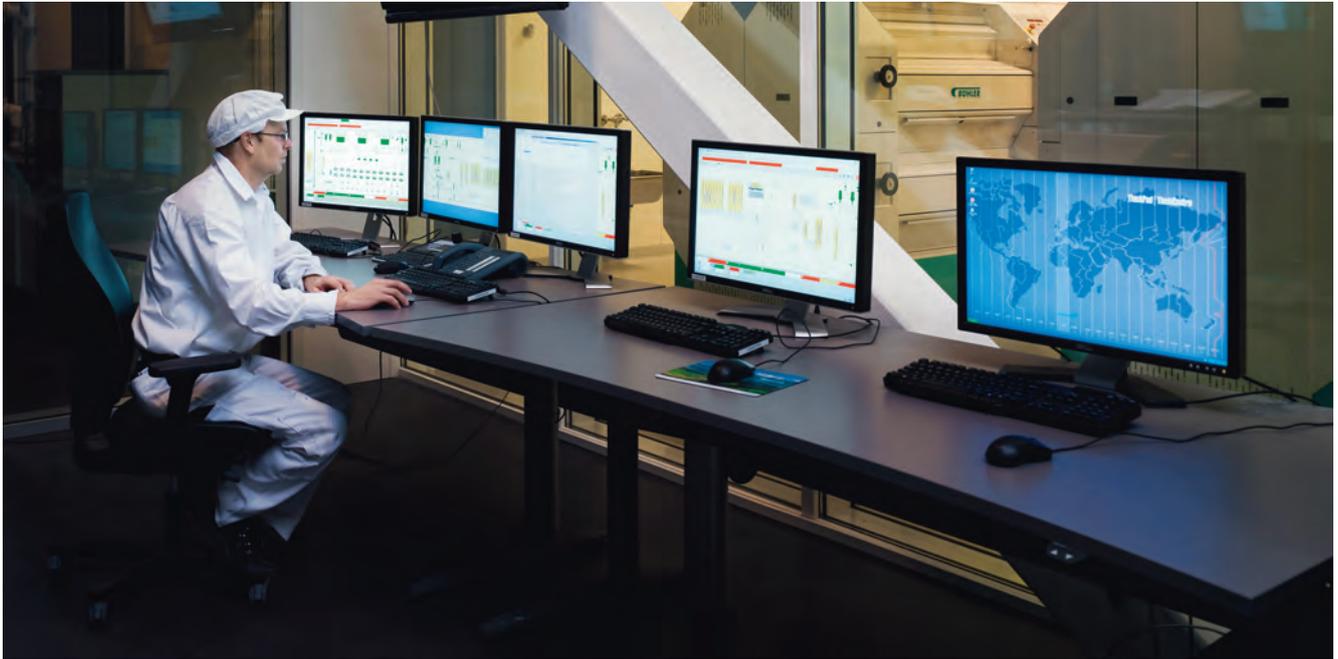
consumption of steam is reduced. An advanced piping route and structural design completes this process and ensures a uniform oil temperature and reduced amount of oil within the frying trough.

Noodle cakes of all weights and forms (dropped and folded) require different kinds of processing in order to meet market demands.

Benefits:

- Controlled turnover of oil, continuous frying intervals with strictly controlled oil temperature, continuous two-stage filtering units and replenishment of oil
- Return and cleaning route of frying moulds outside of the fryer to guarantee the oil quality and energy consumption
- Fully automatic operation with heating and washing cycle after cold start and production stop

Automated noodle processing by WinCos®. Full control for maximum production reliability.



In order to produce noodle for competitive and complex markets, efficient and flexible production processes are an important success factor. With WinCos®, Bühler provides an intelligent, proven process control system that ensures reliable and high-quality production – with more than 4,500 automation solutions in global operation. Its modular design enables it to be flexibly adapted to the size of your noodle production line and functionality requirements.

From grain milling to noodle production

Bühler WinCos® offers a common process-control system for everything from milling operations to noodle production. For customers who are integrated along the supply chain, this results in clear advantages for training, supervision, troubleshooting and traceability.

Efficient production planning and maximum product quality

WinCos® enables customers to process their jobs and product formulas in their ERP system and transfer them directly to the process-control system of the production line. This job-handling feature makes it easier to plan production and increase the capacity utilization rate: More than 10 production processes can be covered by a single system.

The comprehensive recipe-management system ensures optimal reproducibility of product formulas and consistent product quality at an unsurpassed level.

Unrivalled production reliability and traceability

WinCos® documents every step in the process, as well as every change in the parameters and settings, along with a time stamp and operator identification. This enables customers to completely trace all the production steps – from raw material and recipe versions to production batches and finished product. Clear graphic visualization helps to detect and correct production problems early on. This prevents expensive downtimes and increases the efficiency and availability of your equipment.



Full control over complex operations.



Noodle production traceability.

Easy operation and efficient energy management

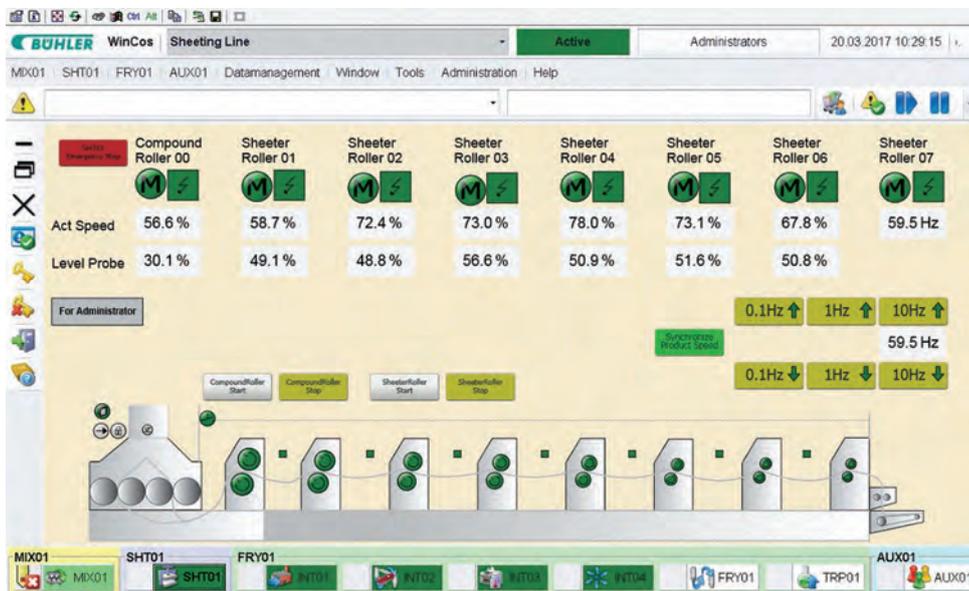
WinCos® offers full control over all functions and settings through a simple and intuitive graphic user interface. This allows you to intervene in the production process whenever required. It minimizes operating errors and increases production line uptime. WinCos® continuously monitors your energy consumption and ensures efficient balancing of loads to cut operating costs.

One important factor in noodle production is food safety. Bühler plants guarantee compliance with strict hygiene requirements in all manufacturing steps.

Automation solutions from Bühler not only provide maximum transparency, they also ensure that the plants run as economically and efficiently as possible. The focus here is on optimum controlling of the processes for the smooth production of high-quality noodle products.

Food safety

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Bühler WinCos® process control system for noodle production

A global presence. And a global service.

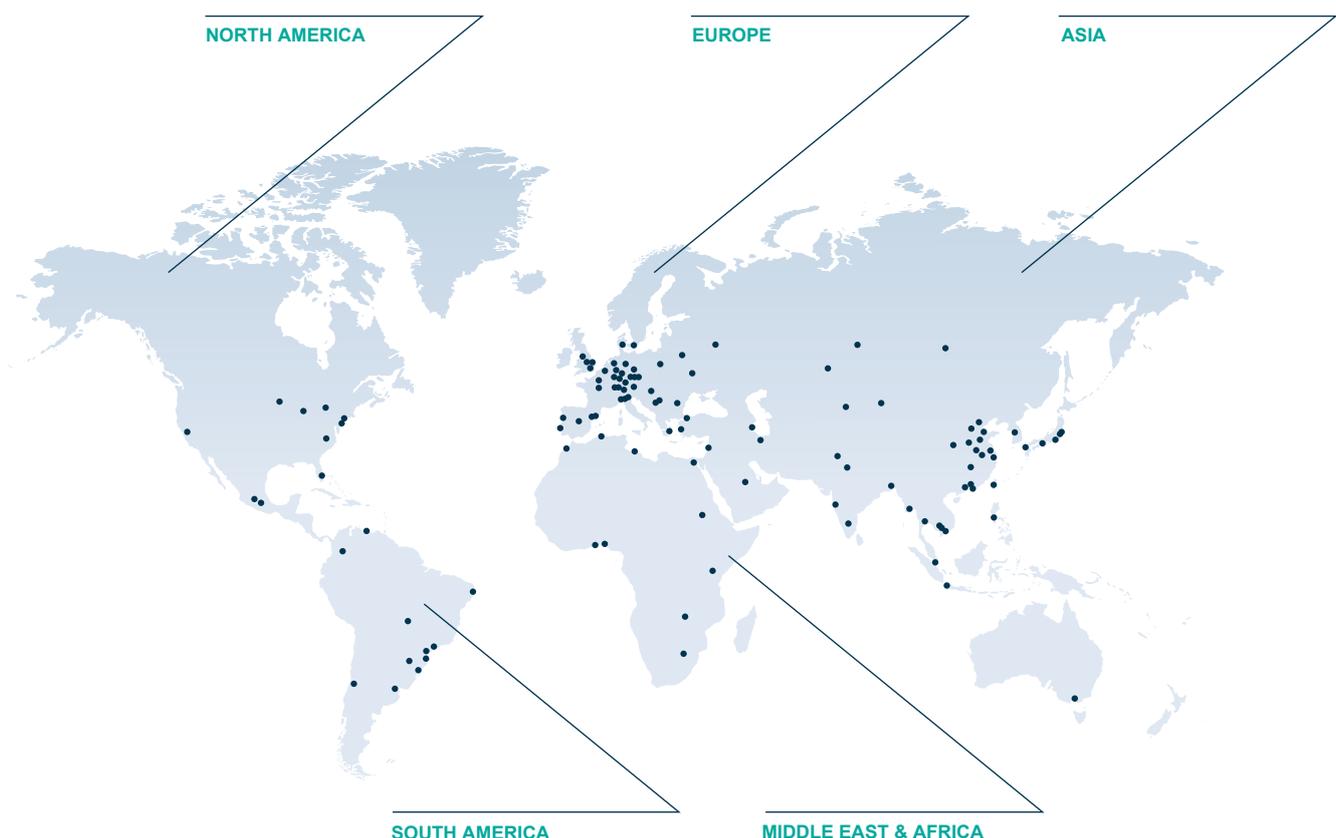
Bühler customer service is far more than just a phone number. Our engineers and service technicians support you throughout the lifecycle of your noodle production plant.

Bühler service starts long before you buy a production line. It begins with the development of processes and systems, based on a trust-based collaboration with our customers, tailored precisely to their needs. Our experts are not only specialized in their respective disciplines, they can easily address a wide variety of processes and problems. They can support you from the very start, throughout the entire lifecycle of your noodle plant, providing sound technological advice based on our extensive experience.

Sometimes, they can extend a machine's service life by replacing spare parts or retrofitting older equipment with the latest Bühler technology.

Our customers benefit from an extensive service network with a staff of more than 1,000 experts, and more than 80 service stations around the globe, all which will guarantee your peace of mind. Thanks to our comprehensive service expertise, you can focus on what you know best: your core business.

Bühler's global service network



Bühler customer service at a glance.

Always ready to support your business.

LAB SERVICES & PILOT PLANTS

Bühler maintains laboratories and competence centers around the world, where customers can test and optimize their processes, and improve their products.

These laboratories offer a broad range of analyses and testing of food and technical materials that can innovate processes and improve the equipment for our customers.

CONSULTING

Strategic plant-performance and energy consulting are just some of the consulting services that improve product quality, production processes and energy efficiency.

TRAINING

At Bühler training centers around the world, specially trained experts share their expertise and knowledge with customers.

During specialized seminars, participants learn about noodle processing technologies and how to operate modern noodle equipment for maximum success. These seminars directly link theory with practice, providing participants with education that is demonstrated in a well-equipped pilot plant.

MAINTENANCE

Packages are adjusted to fit production cycles, preventing downtime, loss in production efficiency and product quality. These range from individual services to complete outsourcing of maintenance.

SPARE AND WEAR PARTS

Original Bühler spare and wear parts meet the highest standards of reliability. They are perfectly adjusted to ensure performance and production safety.

REPAIRS

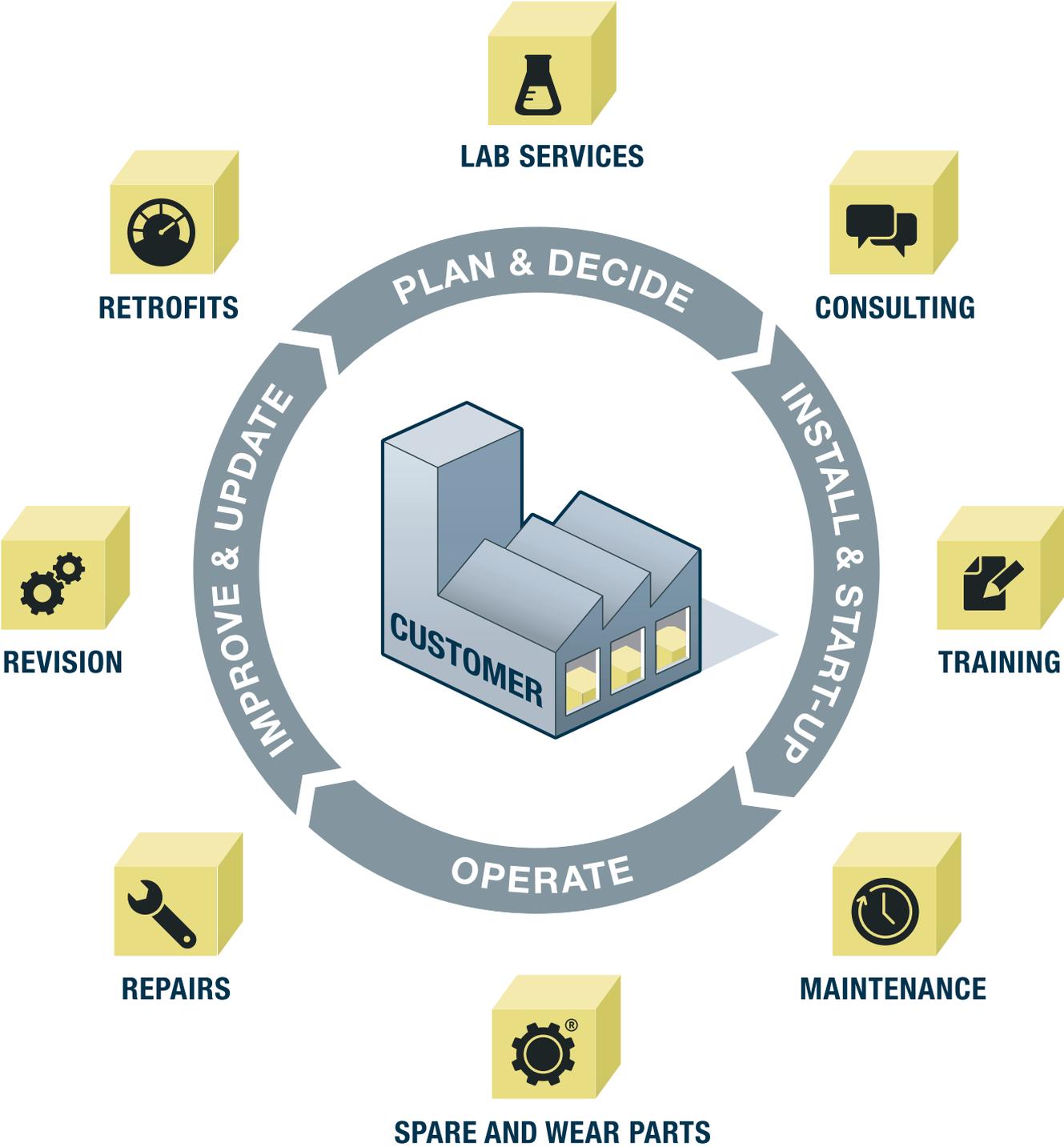
Dedicated to minimizing downtime in the event of an incident, fast and reliable technical repair services are available worldwide via the Bühler helpline, 24/7.

REVISION

Bühler can evaluate, adjust, and overhaul any customer installation, and this includes non-Bühler machines.

RETROFITS

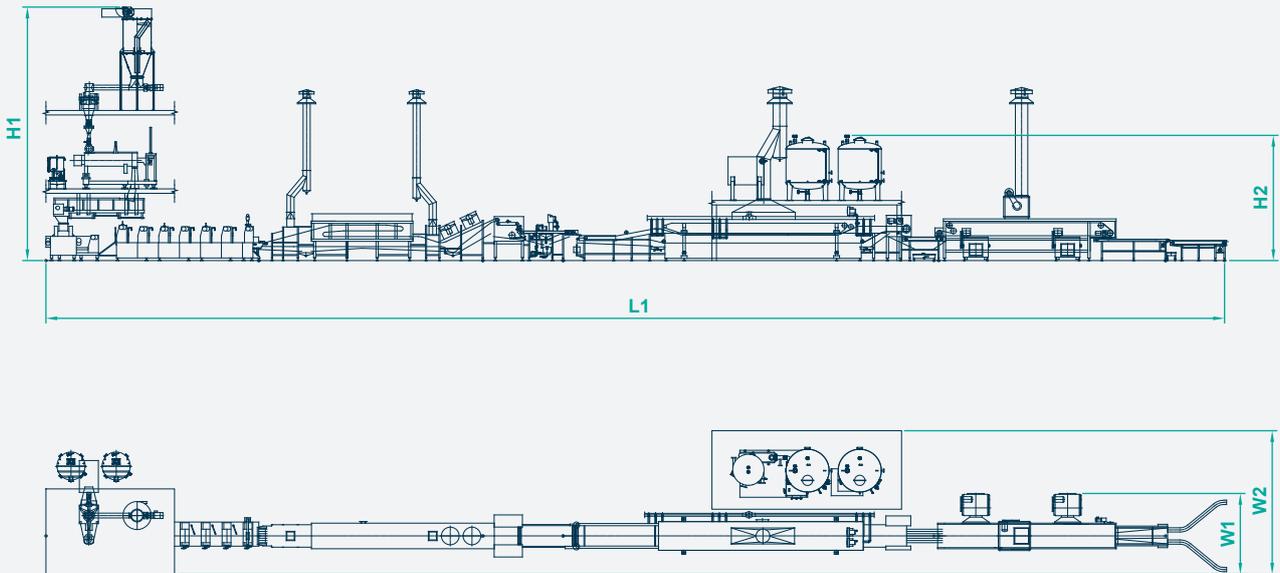
With individual upgrades and conversion kits, timeworn Bühler machines are able to perform to the current standards of technology and efficiency.



Technical data.

Fried instant noodle line at a glance.

Fried instant noodle line (capacity 80,000 pcs/8h - 240,000 pcs/8h).



Sample line shown has a capacity of 80,000 pcs/8h.

Dimensions.

Capacity [pcs/8h]	L1 [m]	W1 [m]	W2 [m]	H1 [m]	H2 [m]
80,000	55	4.5	6	11	6
100,000	60	4.5	6	11	6
120,000	57	4.5	6	11	6
160,000	60	4.5	6	11	6
200,000	67	4.5	6	12	6
240,000	83	4.5	6	12	6

All parameters are based on square noodle, 70g/pc.



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