Flexible, efficient, economical.

Bühler extrusion technology for foodstuffs and pet food.
Extrusion solutions without limits: from cereals to modified flours and starches, texturized proteins or vitamin-enriched rice.
Innovative extrusion solutions without limits. Productivity and profitability at their best.

Superior quality, consistent taste, attractively priced, and best of all, safe – exactly how food should be for people and pets. To master this challenge, manufacturers of foodstuffs and pet food need an innovative and competent partner for just the right production solution.

Thanks to the latest extrusion technology, a broad palette of products can be manufactured with extreme efficiency – and with virtually limitless variety: color, shape, ingredients and taste characteristics can all be varied to suit the preference of the customer.

Supplementary production steps such as drying, roasting or spraying give the extrudates the finishing touch. The result: exceptional food for people and pets, attractively priced, and energy-efficient in their manufacture. A win-win situation for industry and the consumer.

Extrusion systems add value to inferior raw materials and waste products in food manufacturing, such as processing dark flours or wheat bran into better-quality products. Even with pet food’s very distinct characteristics, there is much to be said for introducing specialized processes on the basis of extrusion solutions.

Bühler is among the leading suppliers of energy-efficient extrusion solutions, with representatives in over 140 countries. The company offers a comprehensive array of products and services for all process steps – from precise weighing, dosing and pre-treatment of raw materials, cooking and shaping using advanced extrusion techniques, to drying and spraying of extruded products.

Areas of application for foodstuffs and pet food:
- Directly expanded cereals and breakfast flakes
- Bread crumbs
- Modified flours and starches
- Texturized vegetable proteins (meat substitute)
- Rice from broken rice (enriched with vitamins and minerals)
- Dry and semi-moist food for pets
- Aquaculture and ornamental fish food

With its comprehensive extrusion know-how and passion for individual solutions, Bühler is always ready and able to create value and success for every product idea.

Bühler PolyTwin™ with the patented screw ejection unit for fast product changes.
Tasty, healthy, and visually appealing. Safety and hygiene for the best foods.

Using the sophisticated extrusion processes developed by Bühler, starch and protein-based raw materials are refined into foods and semi-finished products of unsurpassed quality. Thanks to a myriad of design options, extrusion is unsurpassed in the manufacture of multi-colored or filled products.

Consumers love variety. That explains the rich diversity of new foods that continually appear on the market. Fiber-rich breakfast cereals and expanded wheat, rice and multi-grain flakes, or cornflakes based on grains, flour and wheat bran are ideal applications for extrusion systems. The solutions from Bühler are perfectly tuned to customer requirements and enable the manufacture of extrudates in the widest range of colors, individually shaped, natural or coated, and with various fillings if desired.

Other products from the food sector also benefit from the advantages of innovative extrusion technology. Lesser-quality middlings and other byproducts from grain processing are rendered into higher-quality intermediate products for instant meals and baked goods. Extrusion is an extremely cost-efficient way to manufacture bread crumbs, because instead of using premium protein-rich wheat flour, lower-priced flour with a lesser protein content can be used without affecting the quality. Flours from corn or rice can also be used as raw materials. This creates value – as does the fact that the extrusion-based process is considerably more energy-efficient than conventional processes.

Extrusion processes are in tune with the times: they open up previously unforeseen ways to turn raw materials into valuable products and to conserve resources.

Application advantages in food manufacturing:

- Processing of various base and raw materials into a broad palette of products
- Virtually unlimited variety of formulations
- Excellent hygiene in production
- Seamless traceability and safety
- Considerable added value through improving lesser-quality raw materials
Foods in many colors and shapes, enriched with vitamins or minerals, in every flavor direction with various properties – no problem thanks to innovative extrusion technology.
Extrusion is perfect for modifying flours because it completely eliminates the need to add chemicals.
Application example: Modified flours. Clean label thanks to extrusion.

Modified flours are gaining in importance as a raw materials, semi-finished products, additives as a consequence of increased industrial manufacture of foodstuffs. Thanks to their different solubility properties in cold and hot water, modified flours are used as binders, fillers or freshness extenders in baked goods.

During extrusion, the viscosity of water-and-flour suspensions can be precisely adjusted to the customer application. Because no chemical additives are used, the ingredients list simply states “wheat flour” – an important step toward a clean label.

Efficient, cost-saving, impressive
The technology spectrum Bühler offers for the production of modified flours covers every process step. Even before the actual process in the twin-screw extruder, advanced preconditioners are used to warm and soak the flour mixtures used in the making of top-quality modified flours and starches. After the extrusion process, the product is dried and then ground to the desired granulometry using tried-and-tested Bühler technology.
For small pets and big fish. Healthy, top-quality nourishment.

With specialized system designs, ingenious formulations based on simple raw materials become top-quality pet food – from complete nutrition in premium products to treats, nutritionally fine-tuned to every type of pet and its preferences. And especially important for fish food – thanks to adjustable product parameters for perfect density and sinking speed, every fish finds its meal at just the right spot.

Pet food must meet the highest standards: superior quality, balanced, gently manufactured, flavorful, and visually appealing to the human eye. Innovative extrusion processes ensure cost-efficient manufacture across a wide range of different products.

**Recipes for successful products**
The manufacturing processes designed by Bühler convert formulations gently and precisely. From dosing of the various ingredients, mixing, coloring and shaping, to the precise moisture content, all parameters can be individually set. This is how to produce food that stands out in the marketplace, whether for dogs, cats, guinea pigs, hamster, birds, or any number of other animals. In its process solutions for fish food, Bühler also pays careful attention to the desired water stability and sinking speed of the pellets, thus maximizing digestibility and feed conversion efficiency.

**Application advantages in pet food:**
- Broad palette of product variants
- Limitless range of colors and shapes
- Precise control of product density and cooking temperature
- Economical thanks to high raw-material yield, energy efficiency and fast batch changes

Perfect food for pets and for use in aquaculture, economically produced using intelligent processing of raw materials and finely tuned to the consumer.
Dry food or semi-moist, filled or unfilled, one color or many – the options for manufacturing pet food are varied.
Bühler EcoTwin™ – tailor-made for producing pet food. Thanks to its modular design, the extruder can be optimally equipped for a wide variety of processes.
Application example: Pet food.
Products that please, big time.

Pet food trends change rapidly. Proven formulations gain new character through changes in shape and color or the addition of vitamins. Bühler solutions are flexible, making such adjustments easy.

Traditional pellets, simple dry food, multi-colored or marbled, co-extruded products, soft chews – whatever’s on the wish list, the experts at Bühler can find just the right solution for producing the broadest range of pet food products, appealing to both pets and owners. The addition of vitamins, minerals, and medicinal ingredients broadens the spectrum of applications and the range of functional pet food.

Customized production processes enable the precise determination of consistency, elasticity, texture, and taste characteristics of pet food. Even the shape of the individual pieces can be varied: stars, pellets, rings, cubes, and random shapes are all options. Cleverly combined with the right color, there’s no end to the variety, whether colorful fruits for rodents or treats for cats and dogs. And thanks to innovative technology, manufacturing multicolored or marbled food is possible in a single extruder. That saves time, investment costs, and energy compared with previous manufacturing processes.
Tailor-made.
Ideal solutions for every process.

Bühler gives its customers a wide array of proven machine and system concepts to choose from, ensuring the maximum number of options from which to build just the right solution for every production process.

At the core of this engineering philosophy lies the PolyTwin™, EcoTwin™, and PrioTwin™ extruder series – a variety of models with different performance characteristics. Other system components complete the Bühler portfolio: modules for transporting and mixing raw materials, dosing units for solids and liquids, batch mixers, preconditioners, flaking roller mills, spray-coating systems, dryers, roasters, sifters, and successful concepts for product grinding.

Bühler relies on flexible standard components that offer planning reliability and make maximum productivity possible from the outset. A user-friendly, uniform automation concept drives all components, enabling precise traceability of batches.

Planning, delivery and start-up
Experts from Bühler provide customers with support even before system installation. Thanks to individual planning, specific conditions such as limited space or a special layout for the system are taken into account.

At the Bühler pilot plant, advanced industrial-scale tests can be run and formulations finely tuned. The analytics laboratory offers customers scientific analyses of their products. All this accelerates start-up and ensures that the production system works efficiently right from the start, manufacturing products of the highest quality.

Bühler systems – perfectly tailored to the customer:
- Modular machine concept for maximum flexibility
- All components throughout the entire system from a single manufacturer
- Planning, installation and startup by one and the same supplier
- Central control concept for all system parts
- Energy consulting to optimize energy requirement
- Support in profitability planning and financing
Maximum flexibility and performance for customer trials: PolyTwin™ extruder in the Bühler pilot plant in Uzwil, Switzerland.
Bühler offers a myriad of solutions for handling valuable raw materials – from quality control and cleaning to sorting, weighing and mixing.
Optimal preparation for the core process. Weighing, dosing, humidification, heating.


Sophisticated cutting-edge technology, assembled with superior skill, making even unconventional product ideas a reality: that’s what the Bühler name stands for. Right at the planning stage, Bühler experts use all the potential of the various production steps to design a customized system. Because it’s precisely in the process steps prior to extrusion that the proper groundwork is laid. From the fully automatic feeding and weighing of the raw materials, to the precise mixing of key ingredients and microdosing, and on to cooking at high pressure.

Selected utilization of PolyTherm™ preconditioners unleashes even more potential. Combined with high-performance extruders, they considerably broaden the manufacturing spectrum for products. They positively influence the properties of the finished products and can boost throughput, which improves the efficiency of the overall process. Many processes thus profit from the advantages offered by Bühler’s two-stage preconditioners.

**Advantages for the user:**
- Additional potential for extruded products
- Greater energy efficiency in the overall process
- Flexible thanks to compatible models and sizes
- Consistently high product quality
- Space-saving integration into the systems

Proper pre-treatment of raw materials boosts quality as well as the cost- and energy-efficiency of the entire process.
Maximum flexibility for production. Mixing, cooking, kneading.

High-tech twin-screw extruders from Bühler are at the heart of many production processes in the food and feed industries. Pressure and temperature, combined with sophisticated technology, sound knowledge of the processes, and the instinctive skill of practiced experts result in refined products that wow consumers like never before.

Extruders are suited to continuous production processes whose variables must be individually controlled down to the finest detail. Thanks to advanced process automation, even differences in raw material properties can be balanced, ensuring consistent product quality. Extrusion systems enable the manufacture of a wide range products.

In an extruder, the many parameters can be finely tuned to produce just the right end product: the diameter and length of the barrel, the rotation speed and the configuration of the screws, the resulting temperature, as well as the pressure and retention time. Together with the composition of the raw materials, the texture and quality of the dough changes and is then pressed through a die and finally cut.

As for process technology, extrusion systems from Bühler feature high torques, screw speeds, and pressures. They also stand out in terms of food safety, fast product changeover, ease of cleaning, longevity, and top energy efficiency. The machines are modular in construction and flexible in use.

**Advantages for the user:**
- High operational reliability
- Dependable process control with intelligent recipe memory
- Flexibility for variations in raw materials
- Best food safety and traceability of lots
- Ease of maintenance, modular construction

From laboratory scale to powerful production systems – Bühler delivers just the right extrusion solution.
Bühler extrusion technology – planning, installation and startup from a single supplier.
The cutting apparatus moves laterally to allow exchange of the knife head even during production. The cutting knives are adjustable even during production.
Every product, styled to perfection.
Coloring, shaping, flaking, spray-coating.

Sophisticated processing techniques give extrudates their own signature style. Whether for coloring the dough, shaping it, or for other production steps, innovative processes developed by Bühler are easy to integrate into overall systems and can be centrally controlled. Color, shape and taste options know virtually no bounds.

Multicolored products are gaining in popularity, but are complicated to manufacture in the conventional way – and hence expensive. Bühler therefore developed a technology specifically for multicolored products that does away with multiple extruders and multi-stage batch production. A new add-on module, consisting of color tanks with individually controllable pumps and a special dosing unit, enables coloring using multiple colors and shades. The different-colored dough masses can be shaped separately or recombined at the outlet, creating products with interesting patterns or marbled color effects. The advantages: lower investment costs and no additional production steps. Furthermore, the extrudates are colored throughout, not just on the surface.

The PolyFloc™ flaking roller mill is also best in class. With a precision of within hundredths of a millimeter, it turns grains and cereal pellets into breakfast cereals, grain flakes and much more. For cutting, filling, shaping, and spray-coating, Bühler also has a broad range of machines and add-ons for downstream processing of extrudates. No matter what shape or flavor – Bühler has just the right technology for refining products.

Advantages for the user:
– Sophisticated technologies for coloring, cutting, shaping, and filling of extrudates
– Upgrades possible thanks to modular construction
– Unsurpassed opportunities for differentiation through diverse products

Every product gets just the right finishing touches. This is how Bühler turns marketing visions into reality.
Perfectly processed.
New dimensions in drying and toasting.

Different products require different toasting and drying technologies. Bühler provides customized high-performance solutions thanks to extensive thermal processing experience with a variety of foods including cereal, food ingredients and petfood.

The drying systems from Bühler enable industry-specific processing solutions that are perfectly tuned to customer requirements. Depending on the process and final product requirements, dryers, roasters, toasters and coolers are available in a variety of configurations with multiple airflow designs and material handling methods.

Technical expertise in a wide range of industry applications allows Bühler to deliver the right solution for every drying process. This includes products with a high moisture content such as petfood, as well as breakfast cereal flakes that develop their great taste and appearance only through proper toasting. Food safety is a top priority with sanitation features such as full interior access for inspection and cleaning, elimination of areas of product build-up, fines management and clean-in-place systems. Energy savings are an additional benefit, thanks to the high thermal efficiency and balanced airflow design of all Bühler dryers.

**Customer value:**
- Broad selection of dryers, roasters, toasters and coolers
- Customized designs to suit the product
- Seamless integration into the overall system
- High energy efficiency and cost efficiency
- High degree of food safety

Bühler specializes in thermal processing for a vast range of products and applications. Customers can be certain that Bühler will provide the best drying solution for their unique process.
High-performance Aeroglide conveyor dryers from Bühler can be adjusted perfectly to suit individual process requirements.
When customers need spare parts or support from a technician, Bühler stands ready – 24 hours a day, 7 days a week.
Service for discriminating customers. Available worldwide, reliable and fast.

Customers can rely on Bühler when it comes to service and maintenance of their extrusion systems. Thanks to company representatives the world over, specialists are always within reach when needed. A central spare parts service also ensures that required components are always at the ready for fast shipment.

Customized maintenance, retrofitting and reconditioning packages ensure that your Bühler equipment is always state of the art. The advantage: customers can operate profitably and reliably even with older systems. Training options tailored specifically to production personnel ensure smooth machine operation that results in excellent product quality with optimum throughput.

Bühler is represented on every continent, maintains its own production, development, and service locations worldwide, and is quickly on site when customers need good service. Special offerings enable optimum system output and keep personnel abreast of current technologies and safety standards – for labor law regulations as well as food safety.

**Focus areas of the Buhler service range:**
- Food safety
- Operator protection
- Operational reliability and quality consistency
- Overall equipment efficiency