

A photograph of a sorghum field with several stalks of grain in the foreground. The grain is a mix of reddish-brown and yellowish-orange. The background shows more sorghum plants under a clear blue sky. A large, semi-transparent green circle is overlaid on the right side of the image, and a white rounded rectangle is on the left side containing the text.

Innovative Process Technology for **Sorghum.**

Innovations for a **better** world.

 **BÜHLER**

Developed solutions for local grains.

Innovative engineering for value-added products.



Sorghum raw.



Sorghum pearled.



Sorghum flour.



Flatbread.



Sorghum puffed.

Revival of an ancient grain.

Gluten-free diet trends have boosted demand for new products such as sorghum. While this ancient grain has been harvested in Africa, Asia and America, it is relatively unknown in Europe. Its ability to cope with drought and high temperatures makes sorghum the fifth most important crop in the world. A variety of products including porridge, flatbread, puffed sorghum, cous-cous, syrup and beer can be made out of it, while its main use is in animal feed due to its comparable energy level to maize.

The large amount of tannins in the seed coat of certain sorghum varieties requires elaborate processing and thermal treatment before consumption. Additionally, the high fat content reduces the shelf life of sorghum flour significantly and impedes the milling process.

Benefits.

- Product stabilization and extended shelf life
- Consistent product quality and high hygiene standards
- Improved product flavor
- Low maintenance costs and energy consumption

Bühler has taken this challenge and developed an innovative technology, which reduces the antioxidants, stabilizes the lipids and eases the milling.

Integrated technology for high-quality.

A uniform hydrothermal treatment enables the inactivation of enzymes and extends product shelf life. Simultaneously, flavor is improved and starch is partly gelatinized.

A supplementary pearling step removes the fatty seed coat and reduces the tannin content.

Depending on customer requirements, Bühler provides tailored solutions for maintaining high product quality and food safety. Final grinding is done with state-of-the-art milling technology, leading to outstanding results.

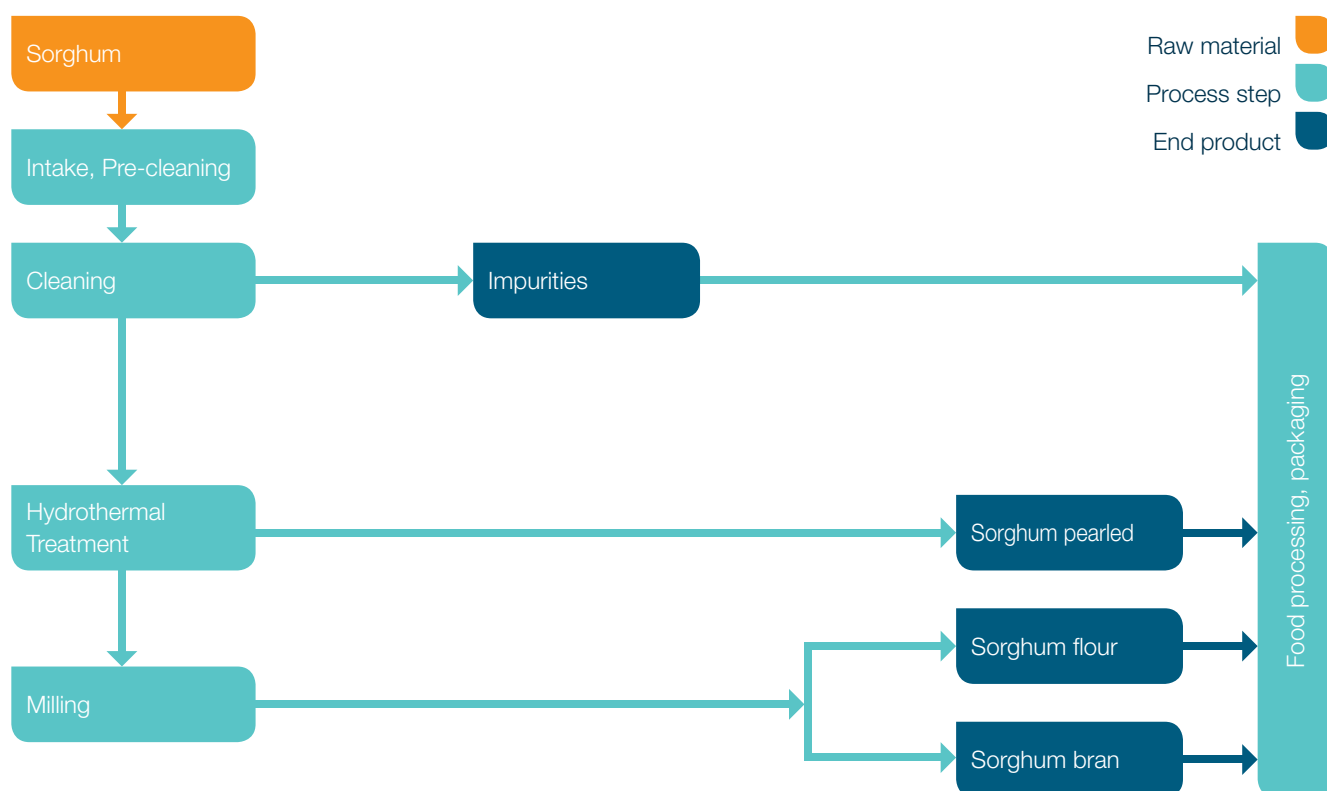
Dealing with different sorghum varieties is another challenge solved by adjusting each processing step accordingly. With integrated Bühler technology, a stable and high-quality product can be produced.

Efficient cleaning, insulated thermal treatment and accurate pearling combines Bühler know-how and expertise to achieve a high performance level.

Continuous process from grain to flour. **For an excellent result.**

Bühler process technologies – Individual handling for efficient product solutions.

Bühler is determined to find optimal solutions for individual customer demands. A reliable process enables high throughput, consistent product quality and food safety. Cleaning provides a well prepared product to enter the hydrothermal treatment. A final milling step, ensuring consistent grinding efficiency for outstanding products.



Combined solutions. **Innovation and know-how for outstanding results.**

Bühler develops integrated technologies for sorghum processing: from cleaning to stabilized finished products with extended shelf lives. Individual solutions offer flexibility and tailored product handling, while maintaining high product quality and reduced energy consumption.

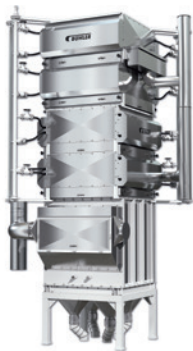


Separator: Screening and grading.

Cleaning.

Incoming sorghum is screened from coarse and fine impurities. Low density product is removed with an attached aspiration system and improves the overall separation.

During maintenance the screens are easy and quickly changed. Throughout the process a rubber-ball system constantly cleans the screens for an optimal separating efficiency.



Kiln Granotherm: Efficient enzyme inactivation.

Hydrothermal Treatment.

Steam-heated radiators heat up the entering sorghum, leading to enzyme inactivation, reduced bacterial count and improved flavor. Integrated thermometers monitor product temperature and effective insulation ensures low energy consumption. The flexible design enables adaptation to individual needs. Stainless steel provides improved hygiene and protection against corrosion.



Pearler Osiris: Uniform pearling.

Pearling.

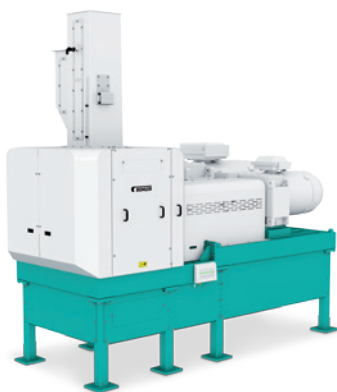
The pearler Osiris is equipped with diamond rotors, which lower energy consumption while increasing the rotors life time. Incoming product is uniformly pearled, ensuring high-quality of flour with minimal specks. The coat, which contains a high amount of fat, is removed to extend the shelf life of the flour and finished products.



Dolomit Roller Mill:
Consistent grinding quality.

Roller mill grinding.

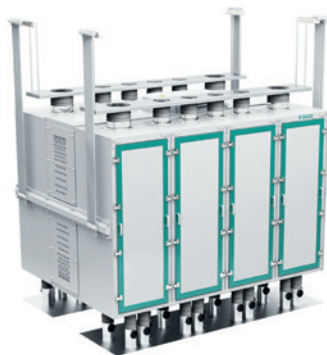
Roller mills are responsible for the efficient grinding of sorghum into flour and semolina. The Dolomit roller mill delivers high grinding performance and consistency in the processing of various grains including sorghum. The wide inlet and the variable roll speed ensure uniform product feed across the entire length of the grinding rolls. The durable technology of the roll pack and frame design, as well as the low-wear belt transmission, ensure a long service life and dependable operation of the machine.



PesaMill: Fast and accurate settings for different flour qualities.

PesaMill.

The high-compression mill is another solution for fast and efficient grinding of sorghum into flour. A high flexibility enables milling adjustments for individual requirements regarding starch damage, water absorption and granulation. Durable steel rolls and the smart design make cleaning simple and ensure a high level of food safety. Consistent product quality is given thanks to the sturdy design for safe and reliable operation.



Arenit Plansifter: Optimal sifting performance on a small footprint.

Sifting and grading.

The plansifter Arenit is responsible for efficient sifting and grading of floury and granular products. The Arenit is unique for its exceptionally robust frame structure and low energy consumption.

The NOVA generation of sieves is distinguished by a greater sifting area and optimal utilization of space. That means maximum throughput with minimal space requirement.

Ultra-dynamic acceleration increases the intensity of the sieve motion, consequently improving the sifting effect.

Automation.

Reliable control of product quality.



Automation solutions for reliable control of product quality.

As a market leader and process specialist, Bühler has comprehensive, practical experience in planning, commissioning and servicing efficient automated solutions. Bühler automated systems improve system performance and availability, result in measurable improvements to efficiency and productivity, reduce energy consumption, simplify servicing operations and ensure raw materials and end product can be traced throughout the production chain.

Bühler offers an extensive range of services for the automation of plants and equipment. Our basic rule is always “single source supply”. To fulfill the different market requirements, Bühler offers two plant control systems: WinCos® and LiteCos.

WinCos® plant control system.

WinCos® satisfies all of the requirements mentioned above, making it a sound system. It offers a favorable price-to-performance ratio, compatibility with all commonly used systems, and can be customized to suit every company-specific need. With WinCos®, Bühler has developed an automation system which integrally combines process technology and automation. This is the key to achieving the best production standards and highest level of competitiveness.

LiteCos plant control system.

LiteCos is a functional, easy-to-use and economical basic system for plant automation. Automated processes and process commands are clearly displayed in graphic form; manual intervention is possible at all times. Through the combination of parameter and user administration, internal know-how is optimally protected. The LiteCos plant control system is individually adapted to meet specific operational requirements.

Complete range of services. For maximum productivity.



Bühler service: Professional support worldwide.

Proven process performance: Bühler Application Centers.

Bühler operates more than 10 Application Centers around the world. These development and test centers allow customers to extensively simulate the processing of their products. In the Application Center in Uzwil (Switzerland), grain processing can be tested from intake to end product. These centers also allow testing of the processes and machines used for producing high-quality sorghum products.

Production systems and processes at their best.

Bühler offers a wide range of services to ensure sorghum processing plants can operate without interruptions. Over 1000 excellently trained service employees, in over 140 countries support and advise our customers on-site through 80 local service stations. Topics include customized maintenance contracts, fast repair and support services and innovative updates.

A selection of our services:



Retrofits.

- Up-to-date technology and efficiency standards
- Low operating costs
- Longer life cycles
- Fast adjustments



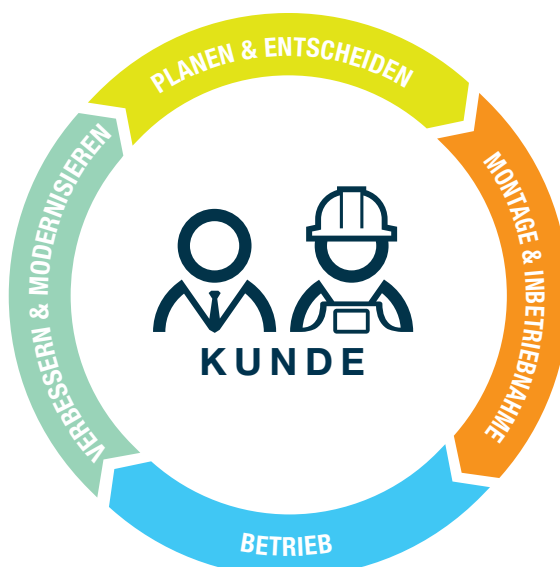
Repairs.

- Short response times
- Reduced downtimes
- 24/7 global helpline



Wear and spare parts.

- Longer machine life cycles
- Maximum operating reliability
- Bühler warranty



Consulting.

- Process optimization
- Productivity increase
- Higher energy efficiency



Training.

- Training and continuing education in training centers around the world



Maintenance.

- Minimized downtimes
- High reliability and availability
- Scheduled machine servicing

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