



State-of-the-art  
Process Technology  
for **MAIZE**

# Efficient process for maximum performance

## Combines tradition and innovation



Yellow maize raw



Yellow maize grits



Yellow maize flour



White maize raw



White maize grits



White maize flour

### Increasing attention for a staple food

Due to the fact that maize is one of the three most important food crops worldwide, a diverse variety of products exist. In addition, population growth and gluten-free trends have driven an increase in its use for human nutrition.

Maize is a staple food for many people around the world. New technologies, which extend product shelf life and ease preparation, would greatly impact their daily life. However previously, every attempt to accomplish this had been unsuccessful. Bühler responded to this lack of knowledge and by developing a state-of-the-art process technology for conventional maize milling.

### Innovative technology and best expertise

Incoming product requires extensive cleaning due to significant levels of aflatoxin, dust and other impurities. Therefore, correct product handling is crucial. Subsequent maize degermination leads to low-fat end products and maximum yield. Depending on product application and processing, different granulations are required. This is achieved through precise gap adjustment while milling, and sieving and grading on plansifters.

Bühler provides integrated process solutions for milling maize into premium-quality grits and flour. Furthermore, Bühler's innovative technology enables maximum product yield and meets the highest sanitation standards.

The conventional process can be adapted to special maize-based products such as Arepa Flour, Prime Masa Nixtamal and Instant Maize Meal. These pre-cooked end products offer consumers significant time savings and convenience.

### Benefits

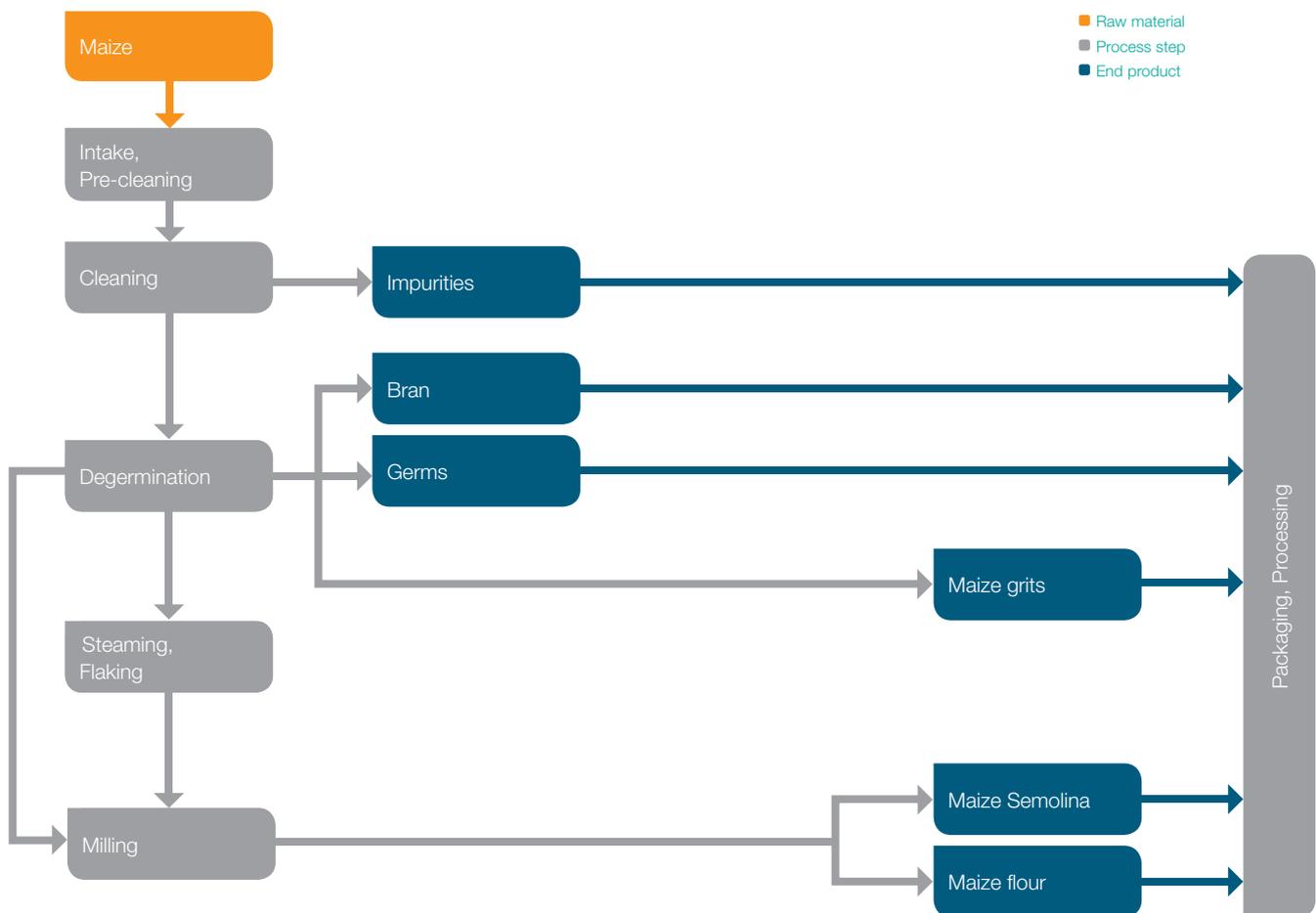
- Efficient product handling for maximum yield
- Controlled fat content of grits and flour
- Top-class end products of consistent quality
- Extended shelf-life and food safety

# Using the latest technology For high-quality end products

## Accurate process technologies

In conventional maize processing, the interaction of each step is crucial to ensure ideal results. Intake and cleaning remove impurities, defected material and fungal contaminations. Degermination efficiently separates bran, germ and endosperm for subsequent milling. Steaming and flaking are

optional process steps to produce pre-cooked end products. Bühler's seamless integration of each single process step into a fully integrated overall process, from the raw material to the end product, ensures maximum yield, food safety and product quality.



# Integrated components

## Effectiveness for maximum yield

Bühler develops integrated technology for producing premium-quality maize products. Flexible processing enables maximum yield through efficient cleaning, conditioning and degermination, up to final grinding. Reliable automation enhances productivity, reduces energy consumption and minimizes maintenance.



Separator classifier: Excellent separation efficiency

### Cleaning and separating

Accurate separation and cleaning of incoming maize is important for final product quality. The separator is equipped with sieves that are moved back and forth by two vibrators. Its excellent separating system and easy to change sieves result in a high throughput capacity. Attached or separated aspiration channels enhance grading efficiency.



Maize degerminator: Intensive degermination

### Degerminator

The degerminator separates bran, germ and endosperm to achieve maximum yield and top-quality end products. An intensive maize treatment by the roll rotor, and the specially structured sieve jacket, control the fat content of the end products. Several machine types are available for soft, medium-hard and hard maize varieties. In addition, the extraction of whole germs is possible, especially for subsequent oil extraction.



Flaking roller mill: production of pre-cooked products

### Flaking roller mill

Together with the steamer, the flaking roller mill is responsible for the gelatinization of the starch. The flaking roller mill has been specially developed for the flaking of various types of grain including maize grits. A roll temperature control unit, combined with peripherally drilled rolls, ensure a consistent roll temperature. This contributes significantly to uniformly high flake quality.



Roller mill Dolomit: High grinding capacity

## Roller mill grinding

Dolomit roller mills grind degerminated maize grits into semolina and flour. Robust machine controls, compact roll packs and direct aspiration systems lead to maximum operating reliability for consistent grinding quality and dustfree operation. Its optimal geometry and manual roll removal device meet the highest sanitation standards.



Plansifter Arent: Flexible and efficient sieving

## Sieving and grading

The plansifter is characterized by its sifting, sorting and classifying flexibility. NOVA sieves and cleaners made of special plastic reach every corner, enabling easy machine cleaning. An efficient separation of coarse and floury maize particles results in high throughput and premium product quality. In addition, the greater sifting area and optimal space utilization leads to high sifting performance. High-quality interior materials provide safe operation and reduced energy consumption.



Puomat Purifier: Results in clean, first-class semolina

## Purifying

The Puomat purifier efficiently sieves and separates bran from semolina. The ground maize particles are cleaned to reduce specks content for pure, high-quality semolina as intermediate or end product. Reliable feeding through a feed gate enables a continuous process and reproducible product quality. Metal sieve frames with brush cleaners and easy cleaning accessibility prevent product deposits for high hygiene standards.

# Pre-cooked maize products

## Innovative technology for traditional taste

Bühler has developed pioneering technologies in maize processing, which reduce cooking times of maize meals and allow waste water free production of nixtamal flour. Appearance and texture of the pre-cooked products are practically identical to those prepared in the traditional way.



Instant Maize Meal – Preparation within minutes

The new Instant Maize Meal process innovation drastically shortens cooking time of maize meal, while maintaining taste, texture and mouth feeling of the traditionally prepared dish. In many parts of southern Africa, maize meal is the single most important source of nutrition. Maize meal, also known as 'ugali', 'meali-meal' or 'pap', depending on the region, is eaten up to three times a day.

Bühler's innovative Instant Maize meal process reduces the cooking time from half an hour to just a few minutes. The process technology makes it possible to variably control the cooking time for the maize meal from two to five minutes.

Another advantage of Instant Maize Meal is the increased shelf life. By removing the germ, the instant maize meal can be safely stored up to one year



Prime Masa Nixtamal – Waste water free production

Prime Masa is a maize flour used to make tortillas, nachos and snack foods. The traditional nixtamalization cooking process requires large amounts of fresh water. This leads to enormous operating costs for the waste water treatment.

The Prime Masa Nixtamal process technology of Bühler reduced the water consumption by 90%. The waste water free production is achieved by replacing the cooking process with steaming and flaking. This changes the maize properties in a natural way without adding other ingredients.

Compared with the traditional nixtamalization cooking process, the Prime Masa Nixtamal process reduced the operating costs by 30%. The steaming process takes less time which reduced the energy consumption by 27%.

With Bühler's proven and reliable technology, it is possible to retain color, flavor and texture similar to that obtained during traditional processing

# Tailor-made automation and services **For safe and reliable operation**



Production processes and product quality, under control at all times with Bühler's automated solutions.

## Automation for reliable control of product quality

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



Optimal product quality thanks to regular maintenance

## Production systems and processes at their best

Bühler offers a wide range of services to ensure maize 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.

## 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 warrant



### Consulting

- Process optimization
- Productivity increases
- Higher energy efficiency



### Training

- Training and continuing education in Training Centers around the world



### Maintenance

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

## **Bühler AG**

CH-9240 Uzwil  
Switzerland

T +41 71 955 11 11  
F +41 71 955 66 11

[buhlergroup.com](http://buhlergroup.com)

Flyer MAIZE en 03/17 ZACC