

**PERFECT SOLUTIONS**  
for the food industry



**Food Processing Plants**

# ENGINEERING YOUR SUCCESS



Zeppelin Systems, the world leading plant manufacturer for high quality bulk material handling, has remarkably grown over the past 60 years. We cover the demands of a wide range of industries and supply all plant manufacturing services from one single source, whether basic engineering, in-house production of components, final assembly or comprehensive customer service. Thanks to our financial strength and our global network, we have long been a reliable partner for our customers.

Every Zeppelin plant is developed according to the clients' specific requirements, and realized, thanks to our customized innovative processes and technologies.

The knowledge we have acquired over more than 60 years of plant manufacturing and the world's largest network for bulk material handling is the key to providing ideal solutions, whatever the challenge; after all, your success is our goal.

## Zeppelin plant engineering – business fields

### **Polyolefin Plants**

Plants for plastics producers and forwarders

### **Plastics & Rubber Plants**

Plants for the plastics processors and rubber industry

### **Food Processing Plants**

Plants for the food, confectionery and baking industry

### **Mixing Technology**

HENSCHEL-Mixers®, mixing systems

### **Silos**

Storage silos, mixing silos, process silos

### **Components**

Rotary feeders, diverter valves, discharge and dosing units, sifters, filters ...

### **Service**

Spare parts, customer service and consulting

### **Modernization/Revamping**

Optimization of production lines and plant controls

# WE ARE PASSIONATE ABOUT FOOD

**No other company has so much experience in the construction of modern food technology systems.**

As a globally active company, we serve the key markets worldwide, know the various technical requirements, as well as regulations, and adapt these to our engineering concept.

Our team of specialists will gladly provide you with engineering advice as early as the plant design stage. Processes can be optimized in advance through computer simulations and even undergo practical testing with a number of comprehensive trials in our technology center. In doing so, we achieve high investment security for your project.

Our clients appreciate our extensive know-how in all aspects of raw material handling. We master the process steps and technology from raw material receiving to its processing, and develop integrated solutions designed to fit perfectly into the system – from one single source. Our scope naturally includes optimal control technology and professional customer service around the world.

## **The whole range of solutions – from one single source**

Receiving, storage, discharge, transport, treatment, dosing, mixing and control of raw material: we develop extraordinary solutions in all areas; this is why we are also the ideal partner for revamping, plant retrofit and modernization. All key components are from our own development and production and many are patented, which allows us to ensure reliable spare parts delivery for years to come. The excellent quality equipment is designed for continuous operation around the clock. It meets the industry's strict hygiene standards and is designed to be easy to clean.



### **Storage**

- Silo technology, containers
- Big-bag handling
- Filter technology
- Bags

### **Discharge**

- Vibratory cones and bottoms
- Fluidizing bed systems
- Discharge and blow-through rotary feeders
- Dosing and conveying screws
- Discharge and dosing units KOKEISL KA/KAD
- Multi-screw discharge system SPAS

### **Transport**

- Secondary air conveying (pressure, suction)
- Plug conveying
- Dilute phase conveying
- Conveying screws

### **Processing**

- Sifting
- Fermenting
- Temperature control
- Conditioning
- Recrystallization
- Dissolving

### **Dosing**

- Bulk materials
- Liquids

### **Mixing and kneading**

- Mixers
- System solutions

### **Cleaning**

- Design
- Processes

### **Control**

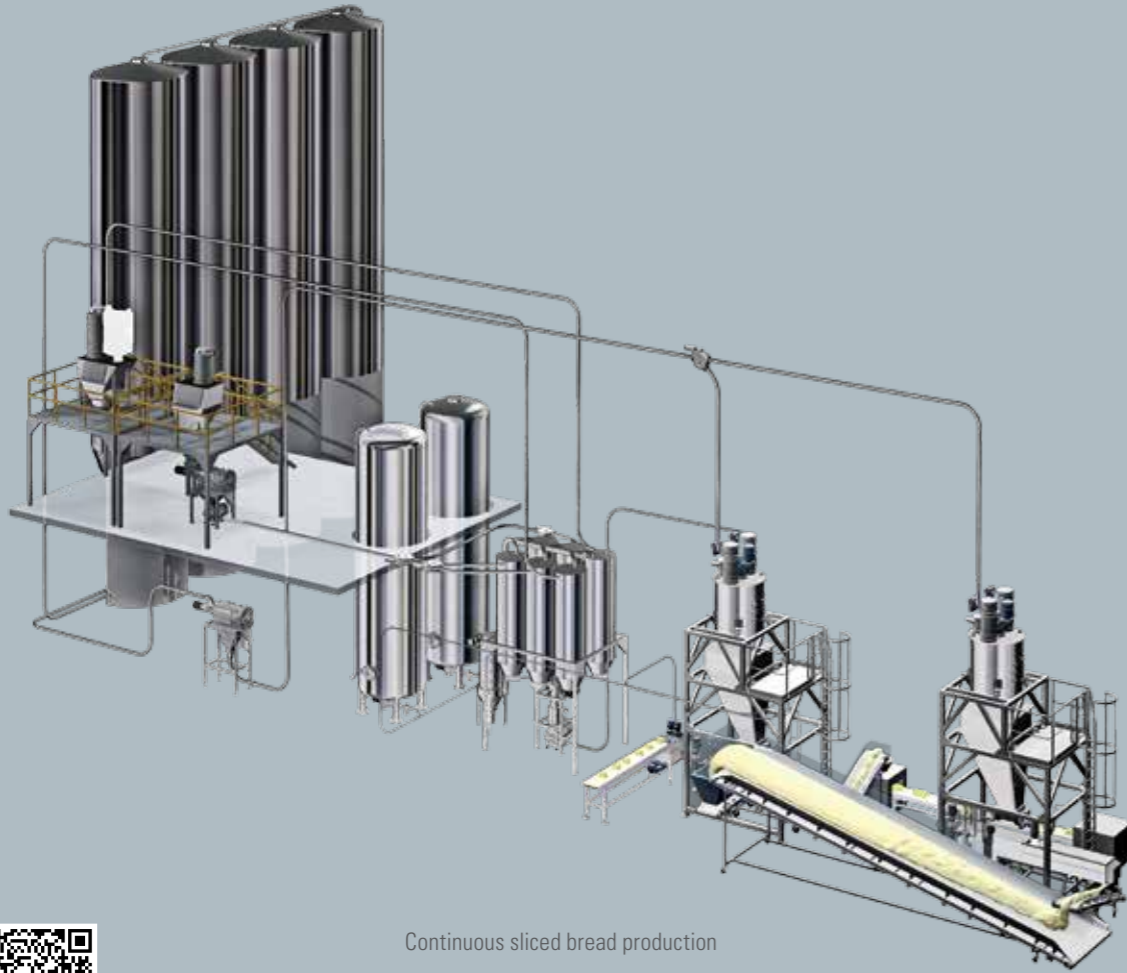
- Process automation
- Process management system
- Batch tracking
- Recipe dosing control
- Scale value digitizer
- Measuring and evaluation units
- Control cabinet construction

## BE THE FIRST TO KNOW WHAT'S GOING ON



Comprehensive analysis options in the technology center lab

Modular plant system in the Food Technology Center



Continuous sliced bread production



Our clients invest a lot of money in their plant, so they want to be sure that everything will function exactly as they imagined. In order to provide them with the necessary investment security right from the start, we invest a lot of money in technology.

Computer simulation ensures, among other things, the efficiency of production processes and optimal dimensioning. Several hours or days of production may be observed in real time or time lapse to identify possible blockages and bottlenecks, and reveal simplification potentials.

By optimizing the results, investment costs can be reduced. Our simulation software – developed in cooperation with a renowned university – has already convinced many of our clients.

We can also translate this theory into practice in our Food Technology Center.

## FROM THEORY TO PRACTICE

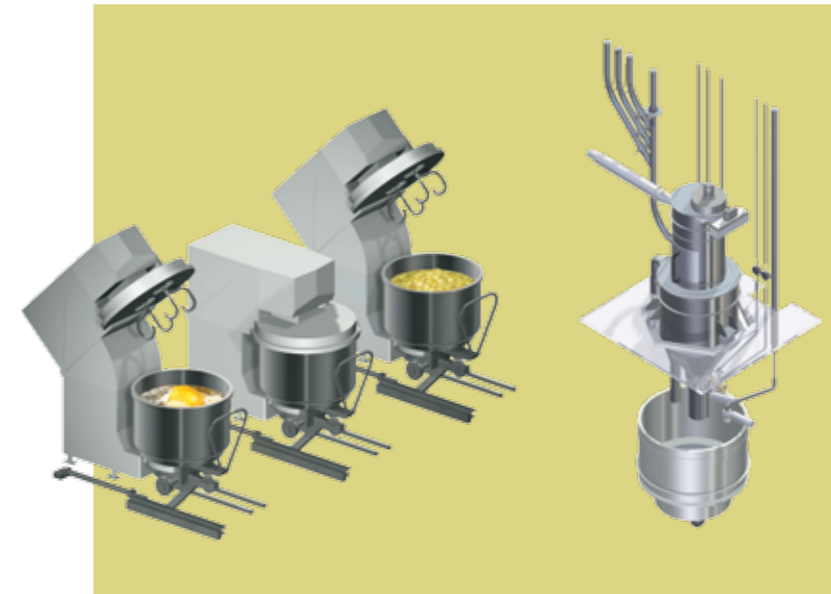
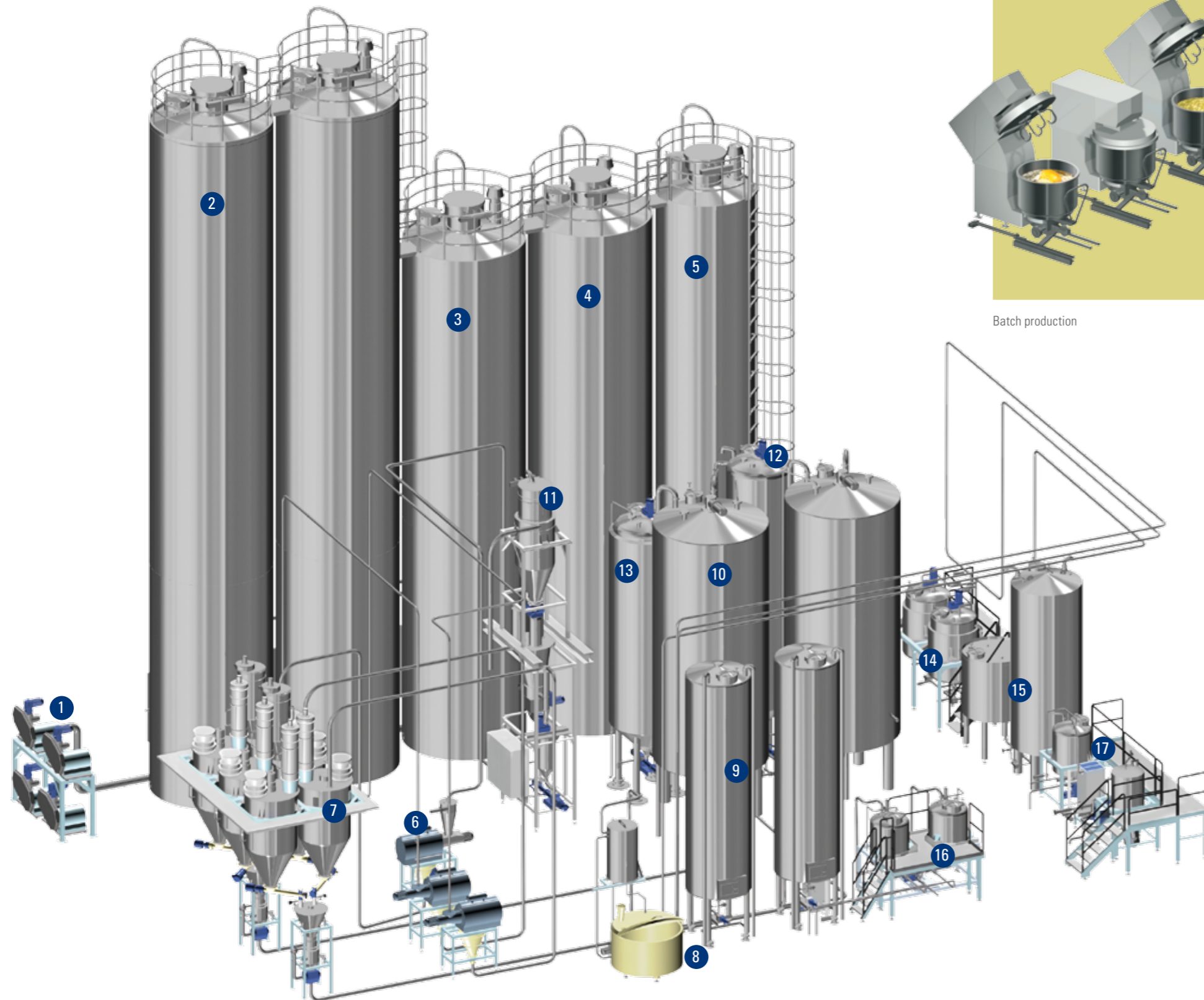
Would you like to know how the chocolate flakes will react when mixed into your new recipe, which type of conveying results in the lowest abrasion with one of your raw materials, or how your agglomerates can remain intact? Take advantage of our technology center.

We provide you with all necessary testing facilities for dosing, conveying, weighing, sifting and mixing of your recipe. Our operating staff and development engineers are there to assist and advise you. We can then evaluate your tests in the adjoining laboratory and analyze and discuss the results with you in our

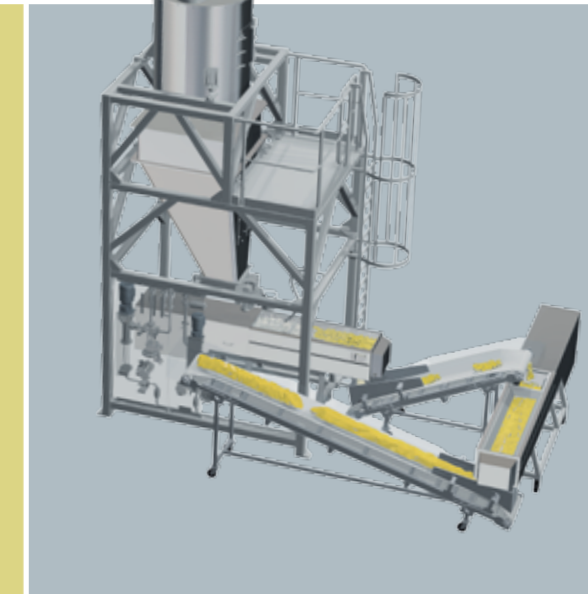
modern meeting rooms equipped with the latest office technology. If desired, you can also rent our technology center and, following some instructions, carry out the tests yourself.

We carry out dough processing tests together with the Institut für Getreideverarbeitung GmbH (IGV – institute for grain processing) near Potsdam with our lab-size mixing and kneading system Codos® for throughputs of up to 250 kg/h. There, we can produce and bake dough with your raw materials according to your recipe in order to analyze its texture and taste.

**24-HOUR PRODUCTION**  
with constant product quality through  
automatic raw material handling



Batch production



Continuous production

- 1 Blower station
- 2 Wheat flour silo
- 3 Sugar silo
- 4 Salt silo
- 5 Rye silo
- 6 In-line sifter
- 7 Storage and weighing of ingredients
- 8 Salt dissolving system
- 9 Oil tank
- 10 Yeast plant
- 11 Mixing tower for sourdough production
- 12 Fermentation tank
- 13 Storage tank (sourdough)
- 14 Sourdough starter vessel
- 15 Cleaning unit
- 16 Malt plant
- 17 Residual bread processor

Outdoor storage silo

Big-bag emptying station

Small components system

Filter plant



## FIRST IN – FIRST OUT

Storage of raw material is a decisive factor for the quality of the final product.

Zeppelin relies on the “first in – first out” principle to ensure particularly gentle handling of liquid and powdered raw materials. We develop individual storage solutions depending on the product properties, as they may require cooling, insulation, blanketing with dried air, discharge devices to avoid the forming of lumps and explosion protection according to ATEX directive.

Our silos and storage tanks are designed to ensure optimum conditions for cleaning, oxidation-free storage and appropriate temperature regulation.

### We are ready for everything

Our systems can be prepared for any kind of raw material delivery:

- In containers or tanks, as a standard or special version with heating, insulation, agitator, etc.
- In bags with or without inner liner
- In plastic big-bags with or without inner liner, as disposable or dual-use containers
- In tanker trucks with gravimetric, pneumatic or pump emptying

### Dry ingredients

- Ascorbic acid
- Casein
- Cacao beans
- Chocolate flakes
- Cocoa
- Coffee powder
- Coffee creamer
- Corn starch
- Crystal sugar
- Dextrose
- Egg powder
- Emulsifier
- Fillers
- Flour
- Gelatin
- Kaolin
- Lactose
- Milk powder
- Mustard seeds
- Nuts
- Potato flakes
- Potato starch
- Powdered sugar
- Rolled oats
- Salt
- Semolina
- Shredded coconut
- Soy flour
- Spices
- Wheat powder
- Wheat starch
- Whey powder
- and other baking agents

### Liquids

- Butter
- Chocolate mass
- Cocoa butter
- Cocoa mass
- Condensed milk
- Honey
- Hot soaked grains
- Invert sugar
- Lecithin
- Liquid egg
- Liquid fat
- Liquid sponge
- Liquid sugar
- Liquid yeast
- Oil
- Salt solution
- Syrup
- Soaked grains
- Sourdough
- etc.

### Welcome to the jet set

The fully automatic jet venting filter continuously filters the conveyed air from pneumatically loaded containers and silos in continuous operation and distinguishes itself through a high degree of filtration with constant filter resistance.

The compressed air unit is designed to be absolutely hygienic. All parts coming into contact with the product are certified according to Regulation (EU) 1935/2004 or Regulation (EU) 10/2011. For maintenance, cartridges are removed from the raw gas side (product area).



### Sifting is a quality feature

The vibration sifting machine is used as a protective or control sieve between the tanker truck and the silo.

## PROVIDING ASSISTANCE

Zeppelin has developed several components for the application of hard to handle bulk material.



Silo discharge



### Vibratory bottoms, cones and fluidizing bed systems

Vibratory bottoms and cones, as well as fluidizing bed systems, ease product conveying to the outlet. In order to activate the product flow and the conveying of hard to handle bulk material, an eccentric motor is used with the vibratory bottoms to create horizontal, circular vibrations, which are transmitted to the product column. The product outlet is directly connected to the subsequent dosing or conveying device, resulting in a closed system.

Fluidizing beds are suitable for all fluidizable materials for discharge from silos and containers. In the process, the air is directed through a semi-permeable fluidizing bed and the materials to be conveyed are fluidized.

### Rotary feeders

Rotary feeders serve to dose and discharge bulk materials below silos and containers. The feeders are suitable for all kinds of powdered and granular products. Difficult media can also be handled easily.

### Discharge and dosing units KOKEISL KA/KAD

The secure discharge of bulk material with problematic flow properties is possible with the discharge and dosing unit, even with varying throughput quantities. Discharge can be seamlessly controlled with an infinitely variable valve. The units are easy to clean; all surfaces in contact with product are of stainless steel. Thanks to in-house developed self-optimizing controls, very accurate dosing into a system can be realized with a capacity of more than 30 t/h.

### Multi-screw discharge system SPAS

Space saving, cost effective, and faster than previous systems, the multi-screw discharge system efficiently discharges from the silo to pneumatic vacuum transfer system. This compact device has up to five conveying screws that are extremely versatile and, for example, can be used to operate five conveying lines. This compact system is easy to access and provides considerable advantages in regards to cleaning and maintenance.



# PRODUCT-SPECIFIC CONVEYING

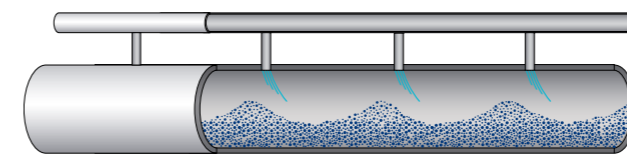


Product-specific conveying is of decisive importance for an optimal final result. We have various conveying systems for the transport of abrasive or fragile bulk material, such as granulated sugar, cappuccino powder and infant milk formula.

We always use the most suitable conveying process, techniques such as dilute phase conveying in excess pressure and low pressure operation, extending to pneumatics overlaid with shielding

gas. An especially gentle method of conveying is secondary air conveying. Here the conveying speed is extremely reduced. The product forms plugs which are repeatedly loosened by additional air and are regularly pushed through the line.

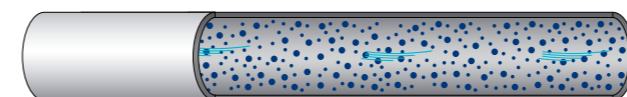
We convey liquid raw material with the most varied pump systems, such as centrifugal, eccentric rotor or piston dosing pumps.



Secondary air conveying



Plug conveying

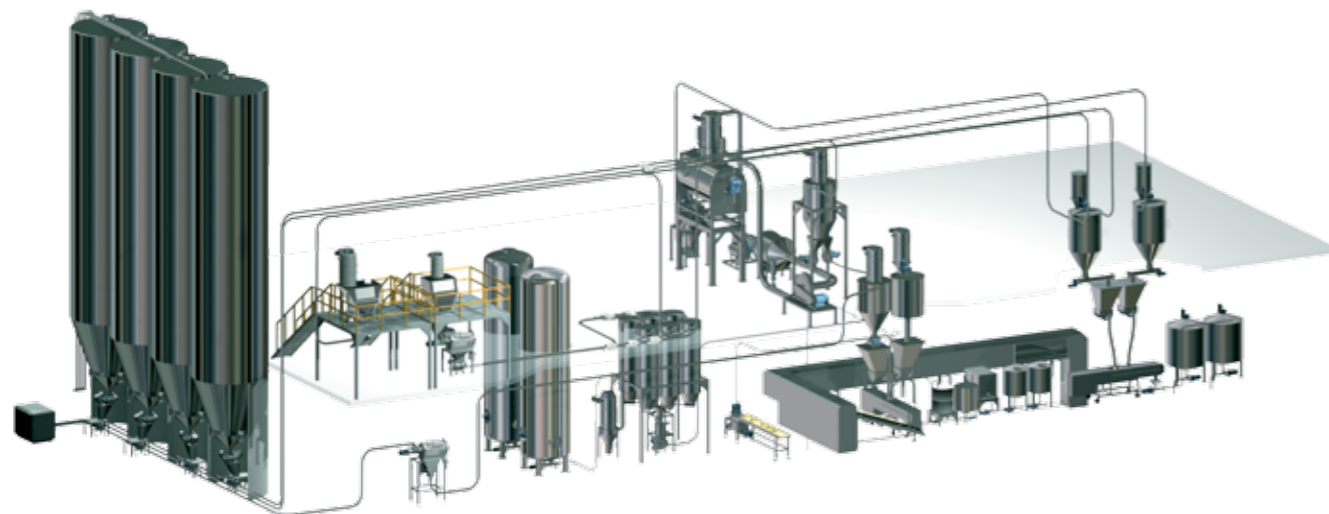


Dilute phase conveying



THE IMPORTANT THING IS  
WHAT YOU MAKE FROM THEM

Temperature control, drying and moistening, homogenization, sifting, mixing, grinding or recrystallization: there are many possibilities for preparing raw material. Our system solutions cover the full range.



Continuous production of chocolate cookies



Rotary sifters



Flour cooling system

### Heating – drying – cooling

Consistent product quality depends to a great extent on the temperature of the complete product and of the corresponding individual raw materials. With the PneumoTherm fluidizing bed heat exchanger it is possible, for example, to cool or heat flour to the required temperature. PneumoTherm is also used for drying liquefiable products.

### Sifting is a must

The rotation sifter is used as a preliminary sieve in front of silos or in dumping stations and serves as a final sieve underneath containers or is available as an inline sifting machine for pressure-tight operation in pneumatic conveying lines.

Coarse materials can be easily removed; the sifter drum of polyester or stainless steel is exchangeable. Our rotary sieves serve to sift out foreign matters and impurities, as well as protect the downstream processing machinery. The frame, containers and all parts coming into contact with the product are manufactured hygienically from stainless steel 1.4301.

### Sugar grinding and recrystallization

We have developed a system concept for sugar grinding that is adapted to the different requirements for variously fine grinds. Conditioning is possible during processing. Recrystallization is controlled with our know-how and the powdered sugar is provided at the desired temperature and can be stored, lump-free, without additional treatment or anti-caking agents.



Plant for liquids



Plant for sourdough



Plant for hot soaked grains



## KNOW-HOW

**The handling of liquids requires profound knowledge of the properties of viscous and compressible media.**

The dissolving or suspension of raw materials such as sugar, salt and yeast, the melting of fat or the temperature-controlled storage of low viscosity products such as malt, glucose and glycerin are no problem for us.

The storage tanks are double-wall insulated depending on the requirements, are equipped with stainless steel agitators or a cooling function, and work extremely gently. Like with all storage tanks, we pay particular attention to optimal cleaning possibilities and suitable temperature control.

### Biotechnology for better quality

For the continuous liquid sponge production, water, wheat flour and yeast suspension are gravimetrically dosed into the continuous mixer and immediately mixed together. The process for manufacturing wheat liquid sponge can also be carried out in batches. The dough mass is then placed in the fermentation tank and is pumped into the storage tank upon completion of fermentation. The dough is cooled in transit in order to stop the fermentation process.

Sourdough can be produced with our systems either in batch operation or continuously. In both cases you can be sure of receiving an impeccably hygienic product at a consistently high level of quality.

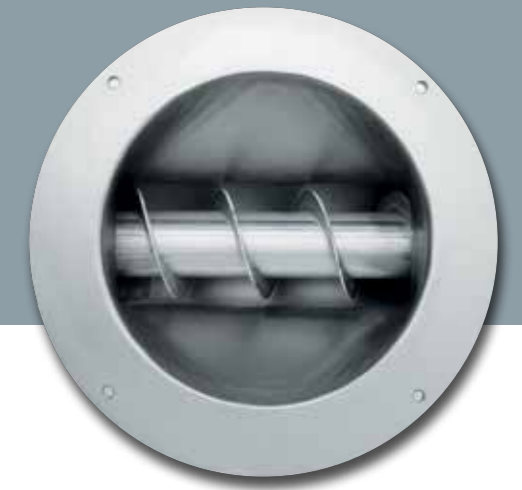
Cracked or whole grains are used for the manufacture of hot soaked grains. The starting materials are coarse grain, whole meal grain, spelt or rice. The grains are steeped in hot water (60°C), heated to 90°C, and then cooled down to 35°C. 10%-30% of hot soaked grains are integrated into the end product. The end product develops a more aromatic flavor and is moister due to the water proportion.

Soaked grains consist of raw materials such as coarse grain, cereals, bran, linseed, sunflower seeds, pumpkin seeds, millet or sesame. The grains are soaked with water and possibly with syrup additives and used in a recipe in proportions of 20%-30%.



Discharge and dosing unit KOKEISL KA/KAD

Dosing and conveying screw



Minor ingredients system  
MicDos with KOKEISL

## KNOW-HOW IN HIGH DOSING ACCURACY

When precision is important, we are in our element. From components for batch weighing to differential dosing scales, including control system, you receive everything from one single source.

### For any eventuality

Depending on the requirements, we have various possibilities for efficiently storing and dispensing free-flowing and hard-to-handle substances, from the manual, semi and fully automatic minor ingredients system MicDos, to the medium ingredients system MinDos to the fully automatic, high performance system MacDos.

### Dosing liquids

We also offer a selection of suitable methods for dosing liquids and temperature-controlled masses, such as volumetric and gravimetric dosing systems.

### Dosing bulk material

Dosing and conveying screws with direct drive are available for the dosing of bulk material and the precise filling of scales. These also fulfill strict hygiene requirements.

### KOKEISL rather than screw

The KOKEISL technology offers several advantages compared to a conventional dosing screw. The KAD component does not require an additional end cap to prevent trickling at the end of a dosage procedure. The product is gently discharged by the curved agitator, preventing damage to sensitive products such as chocolate chips or chunks during dosing. There is considerably less space required for the same performance, as well as an overall enormous savings potential due to the omission of costs for assembly and control technology.



THE RIGHT MIXER ALWAYS AT HAND

We naturally occupy a pioneering role in mixing technology. We mix everything, from powder to dough.



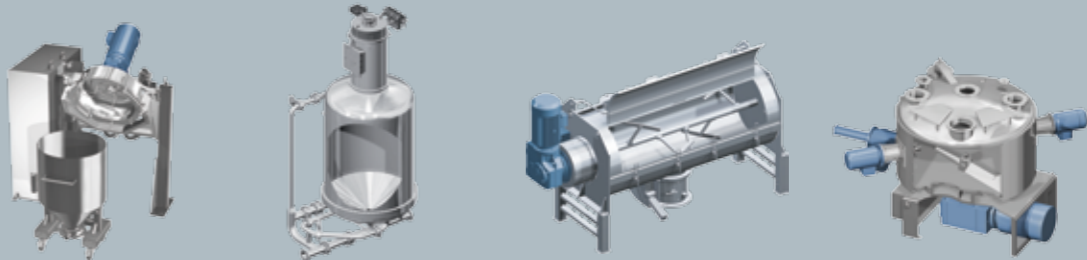
Codos® mixer

Designed for dry mixes



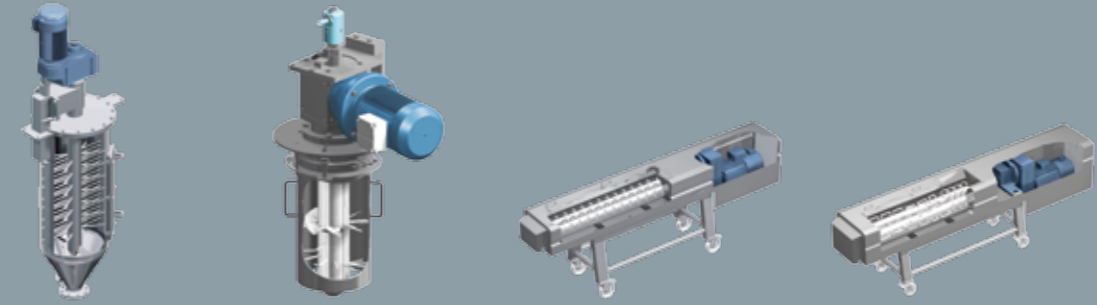
Screw belt mixer      Conical screw belt mixer      Paddle mixer

Designed for dry mixes with addition of liquids



Container mixer      Pneumatic mixer      Horizontal universal mixer      Vertical universal mixer

Designed for the production of doughs and masses



ShearDos      DymoMix      Codos® mixer      Codos® kneader



# CONTINUOUS MIXING AND KNEADING WITH THE CODOS® SYSTEM



Throughput: 500 – 8,000 kg dough/h

## Examples of applications

### Fresh baked goods

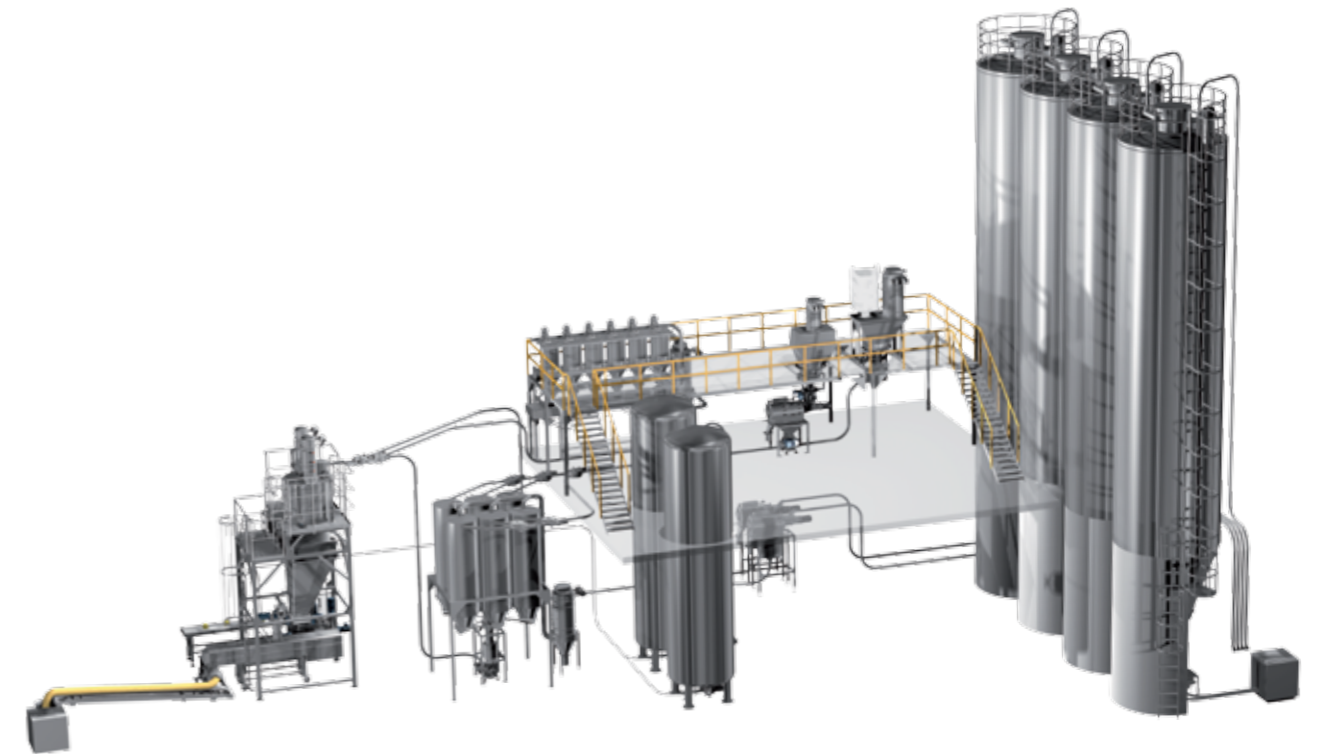
- Bread, rolls & baguettes
- Hamburger buns
- Sliced bread
- Croissants
- and many more

### Extended shelf-life baked goods

- Cookies
- Crackers
- Salty snacks
- and many more

### Confectionery

- Chocolate cream
- Sugar masses
- Cereal bars
- and many more



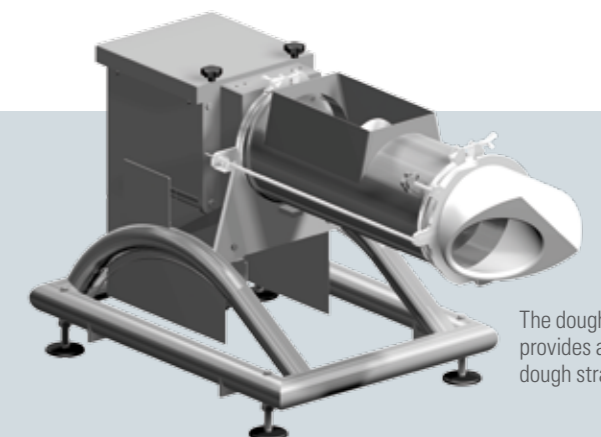
Continuous dough production

**16,000 pretzels per hour, 2 million rolls daily, 275,000 cookies per hour: the Codos® system is designed for large jobs.**

The continuous mixing and kneading system provides consistent dough quality around the clock. This means that the same optimal results are achieved at all times. The Codos® system comprises the complete dry material and liquid dosing, as well as the mixer and kneader. Perfectly designed controls complete the system.

The benefits in comparison to batch kneaders are convincing:

- Continuous optimal product quality
- Constant dough temperature
- Energy savings of up to approx. 30%
- Increased line efficiency
- Fully automatic operation
- Simple operation



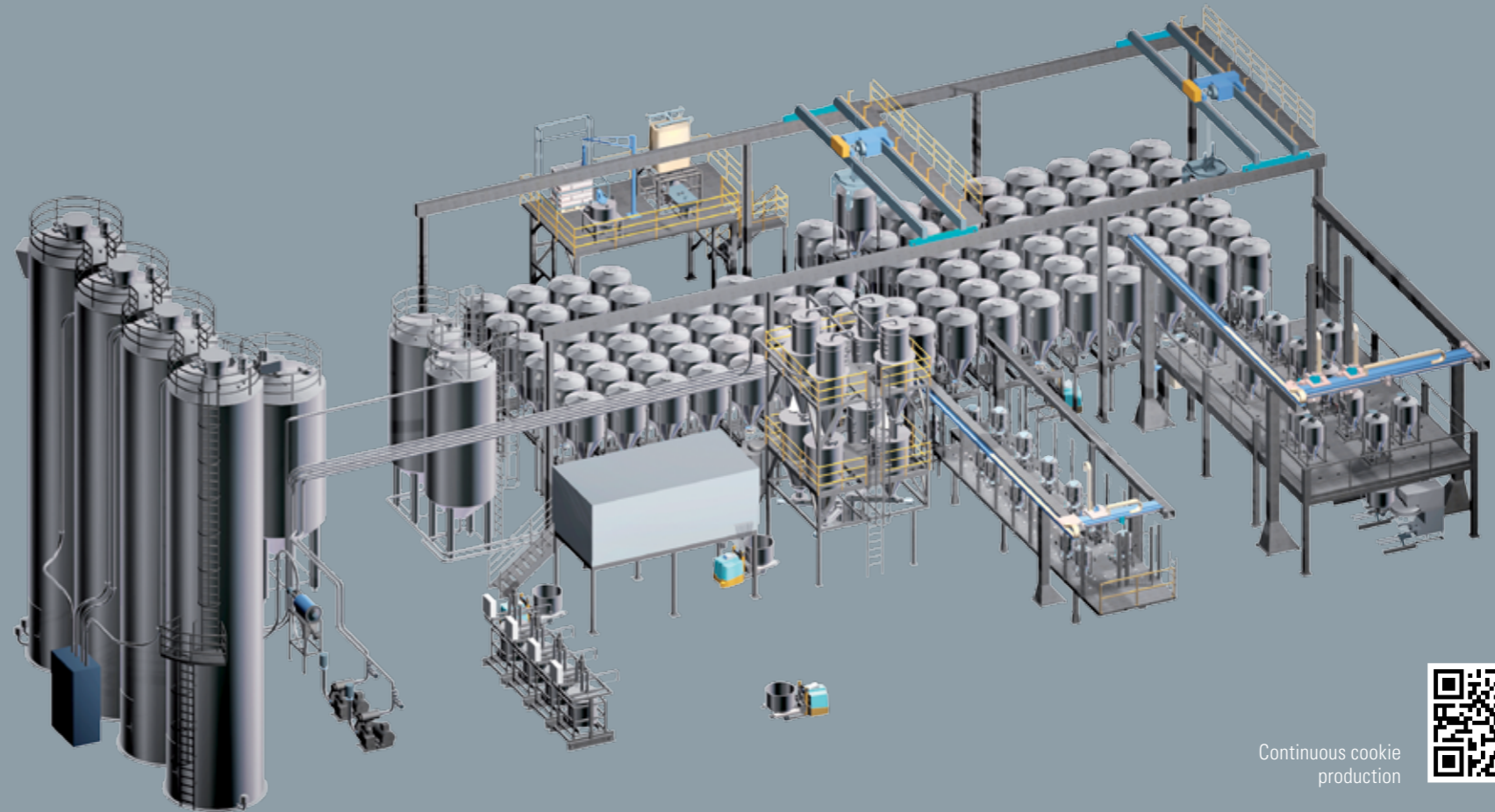
The dough guide provides a consistent dough strand

# RECIPURE® SYSTEM

no cross-contamination thanks to mobile batch containers



Container filling with KAD – KOKEISL



Continuous cookie production



Container mixer

### Zeppelin has developed an innovative system to eliminate cross-contamination of raw materials.

Instead of classic pipe lines, with ReciPure® we use mobile containers assigned to the recipes. The batch containers are transported on automatically guided transport vehicles or on rail systems with integrated weighing beneath the storage container.

When all required recipe ingredients have been collected, the containers are transported to the mixers or kneaders. The agile, computer-controlled transport systems also enable the simultaneous collection of different recipes.

The advantages are obvious:

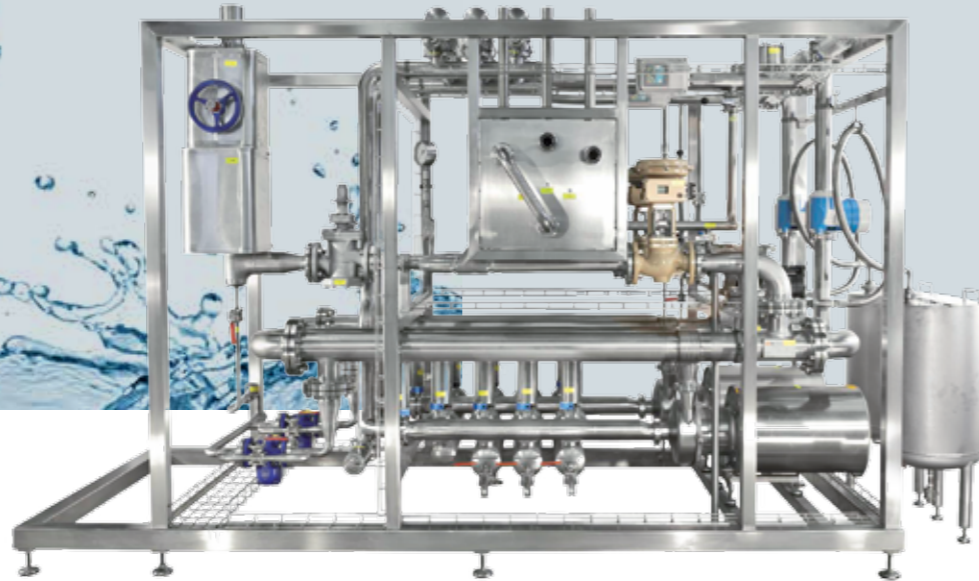
- No cross-contamination
- Consistent product quality
- Secure batch tracing
- Automatic control over the entire process
- Easy cleaning without production interruption
- Parallel production of different recipes
- Fast recipe change possible
- Flexible conversion for seasonal products

### Applications for a contamination-free production

- Fresh and long-life bakery products
- Mixtures, e.g. baby food, baking mixes, spices, soups, sauces
- Confectionery
- Applications other than food industry: e.g. plastics, compounding and pharmaceutical industries



# MORE THAN JUST CLEAN



Pump and thermoblock



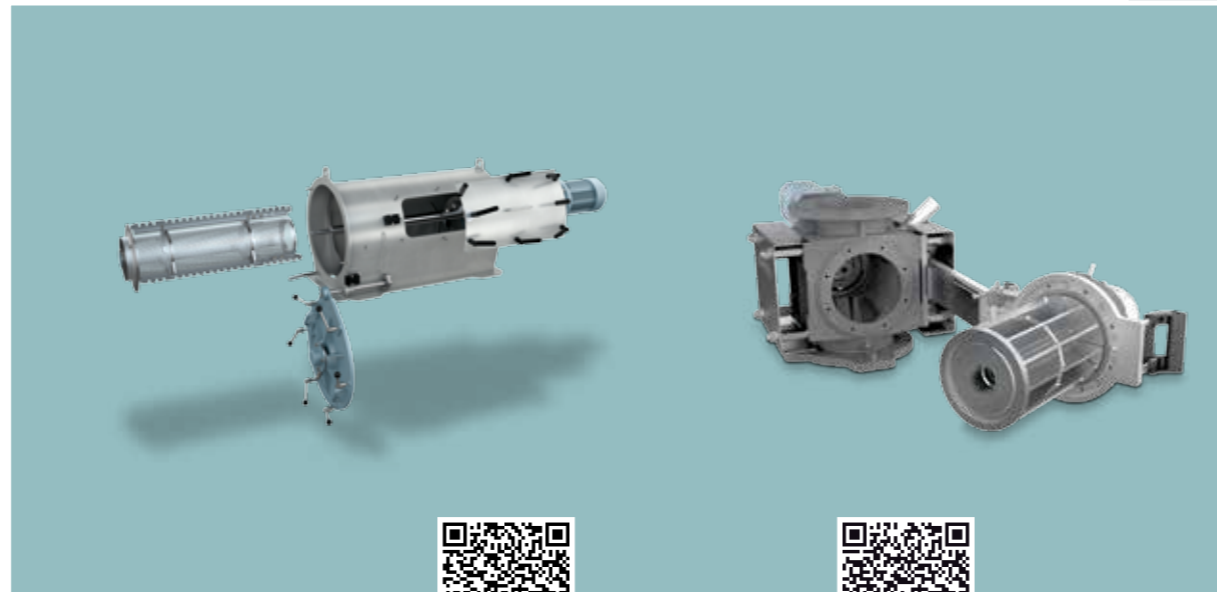
Automatic WIP cleaning

Our Cleaning In Place (CIP) solutions contribute to efficient cleaning of modern production plants. The cleaning agents circulate through the production cycle without the need to dismantle the piping or the tank systems. Cleaning results are always the same thanks to a recipe-controlled and automatic cleaning process. Hygiene can therefore be ensured, even for sensitive process areas, such as liquid yeast, wheat sponge or liquid egg, and a high level of food safety is maintained.

In addition to developing intelligent cleaning systems, we give thought to every system component we develop in order to ensure a simple, yet thorough, cleaning takes place, including the easy dismantling of parts, easy access, and even the use of stainless steel for screws, etc. With our intelligent designs we try to minimize impurities by, for example, avoiding dead spaces or by developing systems with residue-free discharge.



CIP cleaning tanks



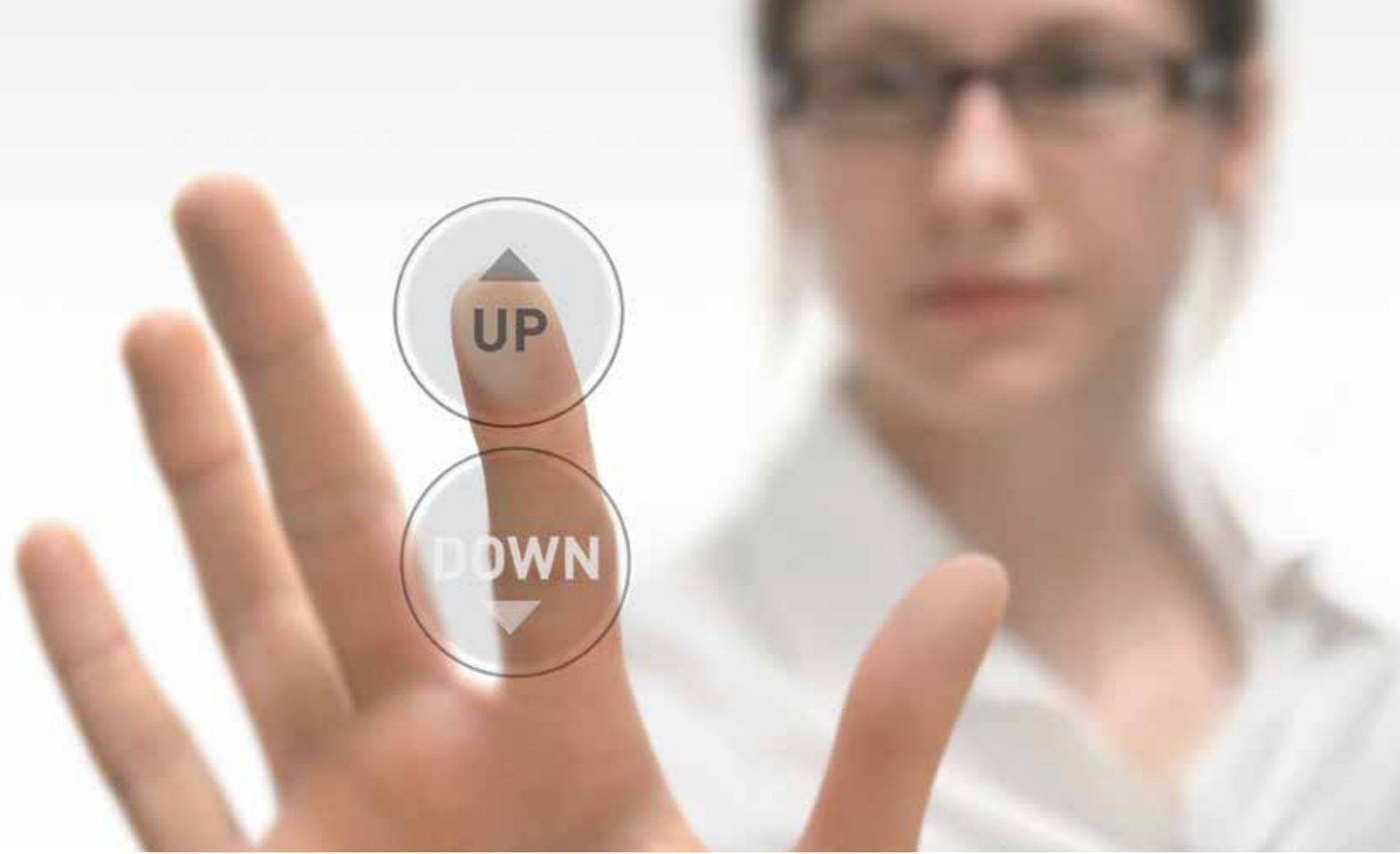
Easy access



Hygienic design



Complete discharge



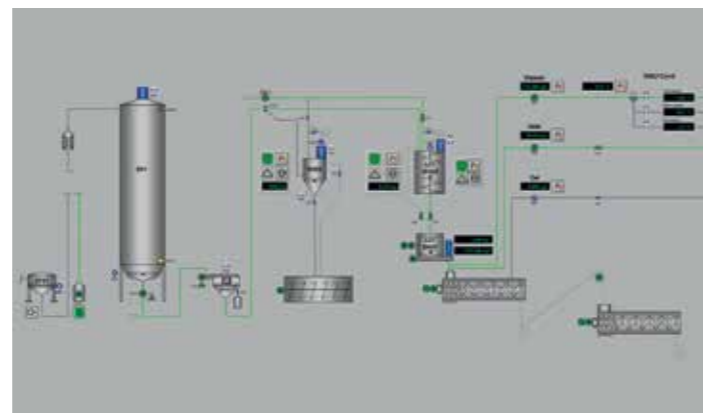
Control of the system processes

## EVERYTHING UNDER CONTROL

Modern control system technology helps avoid errors, guarantee consistent quality, ensure product safety, more effectively control materials management and optimally plan the production process. Software developments in keeping with your requirements are our strength.



Machine control



Visualization

## IT'S ALL POSSIBLE: BATCH AND CONTINUOUS OPERATION

### Process management system

You maintain absolute control with our process management system PrismaWEB<sup>2</sup>. Each change to the recipe is protocolled. All supplied batches and incoming raw materials can be traced. This makes a quick reaction possible when required.

Logistics and warehouse management functions are available, and connections to various ERP systems are possible.

All incidents, production data, batch protocols, etc. are archived and can be reviewed at any time. User management regulates the access of authorized persons for defined functions. Unauthorized persons will not be able to make any changes.

### Dosing control

We cover the process control level with recipe dosing controls and compact water mixing and dosing units, which are suitable for batch and continuous operation.

At the production level, our scale value digitizer and compact measurement and evaluation units for measuring and regulating conveyor apparatus are used, among others.

### Recipe dosing control

The user-friendly recipe dosing control systems MINC 8000 and MINT 99 were specially developed for small and medium-sized operations. They serve the purpose of weighing and administering dry and liquid ingredients in strict accordance with the recipe.





## Presented by:

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For the complete Zeppelin Systems range please visit our website at  
www.zeppelin-systems.com

## Global presence

- Belgium
- Brazil
- China
- France
- Germany
- India
- Italy
- Korea
- Russia
- Saudi Arabia
- Singapore
- United Kingdom
- USA