

PERFECT SOLUTIONS FOR THE FOOD INDUSTRY

EFFICIENT PROCESSES EXPERTISE

FOOD TECHNOLOGY



ZEPPELIN[®]
WE CREATE SOLUTIONS

zeppelin-systems.com



ENGINEERING YOUR SUCCESS

ABOUT ZEPPELIN SYSTEMS

Zeppelin Systems specializes in the design, construction and technological upgrading of industrial plants for storing, conveying, mixing, dosing, and weighing high-quality bulk materials and raw materials. From plant planning and project implementation to after-sales service including process optimization. As an integrated solution provider, Zeppelin Systems delivers complete solutions from a single source.

WE ARE EXPERTS IN PLANT ENGINEERING

Our experience guarantees your success!

Zeppelin Systems individually develops and manufactures every plant. It goes without saying that, in doing so, we address the needs and challenges of our customers. We develop tailored solutions using innovative processes, smart technologies, high-performance components and efficient services, depending on the industry and sector.

Zeppelin Systems draws on many years of cross-industry experience and is a professional in the handling of high-quality bulk materials. The wide-ranging portfolio is rounded off by the unique worldwide network of technology centers, which performs trials and tests on an industrial scale. This ensures one thing: Your success! **We Create Solutions!**

Zeppelin Systems' business segments

FOOD INDUSTRY
PLASTICS INDUSTRY
RUBBER AND TIRE INDUSTRY
BATTERY INDUSTRY
CHEMICAL INDUSTRY
HIGH-INTENSITY MIXERS AND MIXING SYSTEMS
SILOS
COMPONENTS
SERVICE
PLANT MODERNIZATION

FOOD IS OUR PASSION

No other company can draw on such extensive and long-standing experience in constructing modern food technology plants.

As a globally active company, we serve the most important international markets, know the various technical requirements and the respective legal provisions, and adapt these to our engineering concept.

Our engineering specialists are ready to assist you with dedicated consulting services as early as during system planning. We can optimize processes in advance using computer simulations and then subject the processes to extensive practical tests in our Technology Center. It allows us to maximize the security of your investment.

Our customers value our extensive know-how in the entire raw material handling process. From the receipt of raw material to its processing, we control every step of the process and the respective process technology. We develop holistic, seamlessly coordinated solutions – all from one source. This naturally also includes optimal control and worldwide customer service.

ALL THE KNOWLEDGE YOU NEED FROM ONE SOURCE

Raw material receipt, storage, discharge, conveying, processing, dosing, mixing, control, and commissioning: Zeppelin Systems develops extraordinary solutions in all areas. That is also why we are the ideal partner for upgrading and modernizing existing plants: All key components are designed and manufactured in-house, and some are patented, which enables us to guarantee a reliable supply of spare parts for many years. The equipment, manufactured to the highest standard, is designed for continuous operation around the clock. It meets the strict hygiene standards prevalent in the industry and is intended to be easy to clean.

OUR EXPERTISE

BAKED GOODS

CONFECTIONERY

PASTA

STARCH AND STARCH DERIVATIVES

PETFOOD

SPICES

INSTANT PRODUCTS

MALT PROCESSING

CEREALS

SNACKS

DRINKS AND BEVERAGES



STORAGE & DISCHARGING

- Silos and containers
- Bag, big bag and container handling
- Vibrating hoppers and floors
- Fluidized bed discharge
- Discharge and blow-through airlocks
- Dosing and conveying screws
- Discharge and dosing modules
- Closing flaps
- Multi-screw discharge (SPAS)

CONVEYING

- Technologies for:
 - Secondary air conveying (pressure, suction)
 - Plug conveying
 - Air conveying
- Screw conveyors
- Rotary feeder
- Two-way distributor

FILTERING & SEPARATING

- Separators
- Screening machines (with monitoring)
- Filter
- Sampler

WEIGHING & DOSING

- Automated weighing systems
- Flow meter
- Water mixing dosing units
- Differential dosing scales

MIXING & KNEADING

- Mixers
- Kneading & dough systems
- Homogenizing systems
- Agitator tank

PREPARATION

- Fermentation systems
- Suspension and solution systems
- Product conditioning systems:
 - Cooling and heating systems
 - Recrystallization systems
 - Humidification systems

CLEANING

- CIP systems (hygienic design)
- Quick-cleaning systems

CONTROL

- Measurement and evaluation units
- Recipe dosing control
- Recipe and material management
 - with batch tracing
- Automated processes
- Process management systems



100% COMPETENCE

We are the global leader in handling valuable bulk materials for the food industry.

With Zeppelin Systems, you can rely on comprehensive support during all project phases. Our engineering teams develop tailor-made production solutions that precisely meet our customers' requirements—from the design and layout of components to the process design and creation of function descriptions, right up to the development of software for controlling processes and recipes.

OPTIMIZE PLANNING PROCESSES

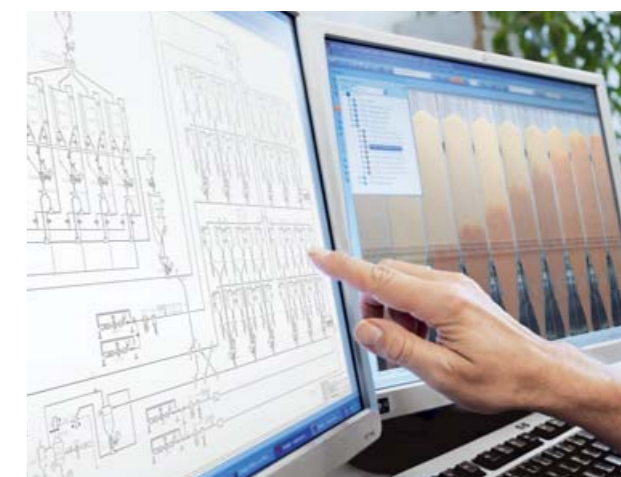
Thanks to the global expertise of our engineering teams, extensive knowledge is incorporated into optimizing planning processes. The result is innovative con-

cepts that save both time and costs. Our teams ensure that customer requirements are fully met per product requirement documents.

A particular focus is on planning and implementing bulk food production processes. We aim to implement standardized processes without neglecting the need for customized solutions. Interfaces are also defined, and function descriptions developed, which we discuss in close consultation with you. If complex requirements go beyond the standard configuration, rest assured that we will be at your side with guidance, training, and instruction.

COMPREHENSIVE SERVICE

Our services range from product testing and performance studies to designing process vessels and expanding existing logistics and dust collection facilities. We also conduct risk analyses for bulk material systems and develop solutions for bulk material handling. Last but not least, excellent, internationally recognized project management ensures the success of your projects.



Modular plant system
at the Zeppelin Systems
Technology Center in
Rödermark

TESTING



Extensive analysis options in the Technology Center laboratory

TESTING FOR PERFECT PRODUCTS

Know what works earlier.

Our customers invest considerable sums in their plants and want to be sure that everything works exactly as they want it to. That is why we invest heavily in the latest technologies to ensure our customers get the most out of their investment.

Zeppelin Systems uses computer simulations, for example, to ensure the economic efficiency of production processes and optimal dimensioning. Several hours or days of production can be displayed and analyzed in real-time or time-lapse.



Zeppelin Systems
Technology Center

EXTENSIVE ANALYSIS OPTIONS IN THE TECHNOLOGY CENTER LABORATORY

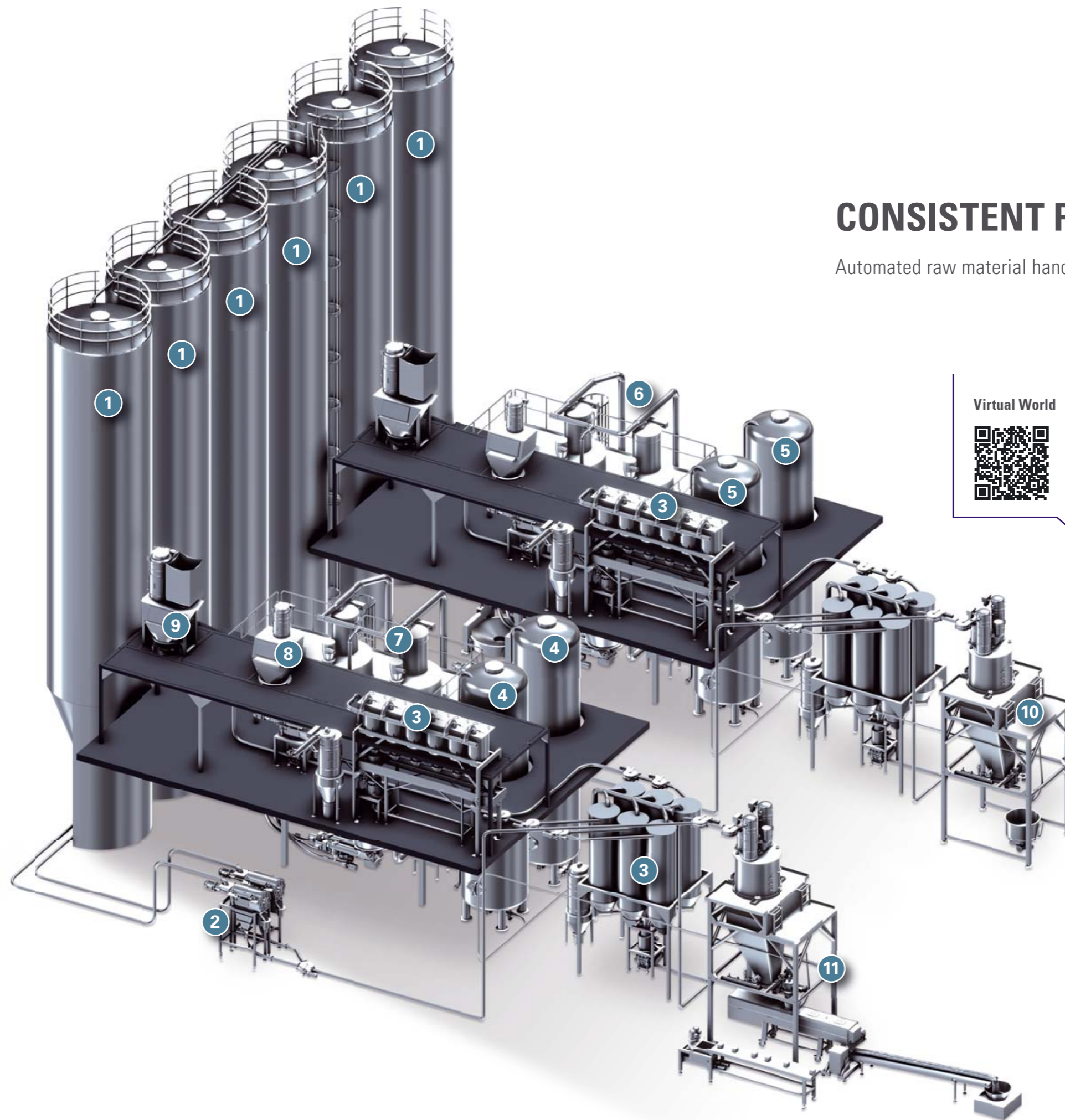
Blockages and bottlenecks are identified, and the potential for simplification is displayed. Optimizing the results can save investment costs. We can also demonstrate the necessary process steps in practice or develop them together with you at the Technology Center at the Rödermark site.

FROM THEORY TO PRACTICAL TESTING

Do you want to know how continuous kneading can optimize your dough, how chocolate flakes will be-

have in your new recipe during mixing, which type of conveying will produce the least abrasion for one of your raw materials, or how to keep your agglomerates intact? Then simply use our Technology Center.

We provide you with all the necessary industrial-scale experimental equipment for kneading, dosing, conveying, weighing, sifting, and mixing your recipe. Our qualified specialist staff and development engineers will be happy to assist you. In the adjacent laboratory, we can evaluate your experiments, analyze them, and discuss them afterwards.



CONSISTENT PRODUCT QUALITY:

Automated raw material handling around the clock.

Virtual World



- 1 Outdoor storage silos
- 2 Inline sifting station
- 3 Small component system
- 4 Oil reservoir
- 5 Yeast plant
- 6 Malt plant
- 7 Residual bread plant
- 8 Bag discharger
- 9 Big-bag discharger
- 10 DymoMix® Tower with batch feeding
(pre mixer also possible with continuous further processing)
- 11 Codos® Tower with Konti Kneader
(Codos® NT)



Outdoor storage silos



Big-bag emptying



Small component system



Filter system

STORAGE

WELLNESS FOR RAW MATERIALS

We treat raw materials with particular care, as they are crucial for the quality of the end product.

Zeppelin Systems relies on the “first in – first out” principle. Both liquid and powdered raw materials are treated particularly gently. We develop customized storage solutions depending on the product characteristics, from cooling, insulation, and dehumidified air supply to ATEX explosion protection.

We ensure optimal cleaning options, oxidation-free storage, and suitable temperature control for our silos and storage tanks.

WE ACCEPT ALL TYPES OF DELIVERIES

We can prepare our systems for any type of raw material delivery:

- In containers or tanks, as standard or special version with heating, insulation, agitator, etc.
- In bags with or without inliner
- In plastic big bags with or without inliner, as disposable or reusable containers
- In tankers with gravimetric, pneumatic or pump discharge



WE CREATE SOLUTIONS FOR

DRYING AGENTS

- Ascorbic acid
- Dextrose
- Egg powder
- Emulsifier
- Fillers
- Gelatin
- Spices
- Semolina
- Oat flakes
- Coffee powder
- Coffee creamer
- Kaolin
- Cocoa
- Cocoa beans
- Potato flakes
- Potato starch
- Casein
- Clay
- Grated coconut
- Granulated sugar
- Lactose
- Corn starch
- Flour (all types)
- Milk powder
- Whey powder
- Nuts
- Powdered sugar
- Dry yeast
- Salt
- Chocolate chips

- Mustard seed
- Soybean meal
- Wheat powder
- Wheat starch
- Other baking materials
- and much more

LIQUIDS

- Scald soak
- Butter
- Liquid egg
- Liquid grease
- Liquid yeast
- Liquid sugar
- Honey
- Invert sugar
- Cocoa butter
- Cocoa mass
- Condensed milk
- Lecithin
- Malt
- Oil
- Cold soak
- Saline solution
- Sourdough
- Chocolate mass
- Syrup
- Pre-ferment
- and much more

WELCOME TO THE JET SET

The fully automatic jet ventilation filter is used for continuous filtration of the conveyed air from pneumatically fed tanks and silos in continuous operation. It is characterized by a high degree of separation with constant filter resistance.

The compressed air unit is designed to be completely hygienic. All parts in contact with the product are certified according to conformity of the relevant market. Cartridges are removed via the raw gas side (product compartment) for maintenance purposes.

SCREENING IS A QUALITY FEATURE

The vibratory screening machine is used as a protective or control screen between the tanker and the silo.





EVERYTHING FLOWS

Zeppelin Systems has developed several components for discharging bulk materials that do not flow easily.

VIBRATING FLOORS, HOPPERS, AND FLUID BED SYSTEMS



Vibrating floors, hoppers, and fluid bed systems facilitate product conveyance to the outlet. To activate the product flow and convey slow-flowing bulk materials, horizontal, circular vibrations are generated in the vibrating floors via an unbalanced motor, which is transmitted to the product column. The product outlet is connected directly to the downstream dosing or conveying unit, creating a closed system.



Fluid beds are suitable for all fluidizable goods to be discharged from silos and containers. The air is guided through a semi-permeable fluid bed, and the material to be conveyed is fluidized.

ROTARY VALVES



Rotary valves are used to dose and discharge bulk materials from under silos and containers. The valves are suitable for all types of powdered and granular products.

KOKEISL KA/KAD DISCHARGE AND DOSING MODULE



The discharge and dosing module makes it possible to reliably discharge bulk material with problematic flow characteristics even at varying throughput rates. The removal can be continuously regulated via a slide gate valve. The module is easy to clean, and all product contact surfaces are made of stainless steel. Thanks to a specially developed self-optimizing control system, dosages can be achieved to the gram with capacities of over 30 t/h in one system.

SPAS SCREW POOL DISCHARGE SYSTEM



Space-saving, cost-effective, and faster than previous systems: for efficient transport of flour from the silo into pneumatic suction lines. A compact unit with up to five screw conveyors that can be used in a wide variety of applications. For example, it is possible to operate five conveyor lines. The compact system is easy to access, offering significant advantages in cleaning and maintenance.



TAKEN FROM THE AIR

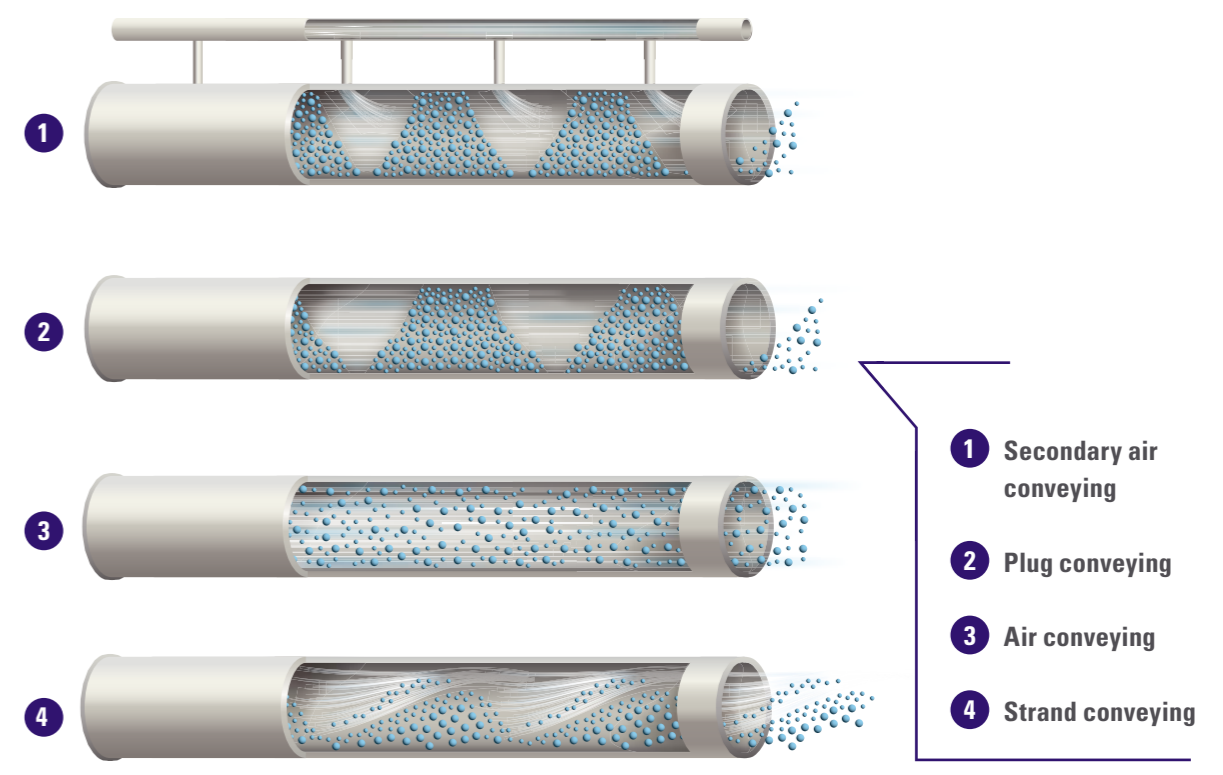
Our product-specific conveying ensures that all raw materials are handled with care.

Product-specific conveying is crucial for an optimal result. Zeppelin Systems offers a selection of unique conveying systems for transporting abrasive or fragile bulk materials such as granulated sugar, cappuccino, kibbles, and potato flakes.

In doing so, we always use the most suitable conveying method: Depending on the application, technologies such as air conveying in overpressure and vacuum operation through to pneumatic

tank blanketing are used. Secondary air conveying is a particularly gentle conveying method. It reduces the conveying speed considerably. As a result, the product forms plugs, which are constantly pushed through the line – continually loosened by additional air.

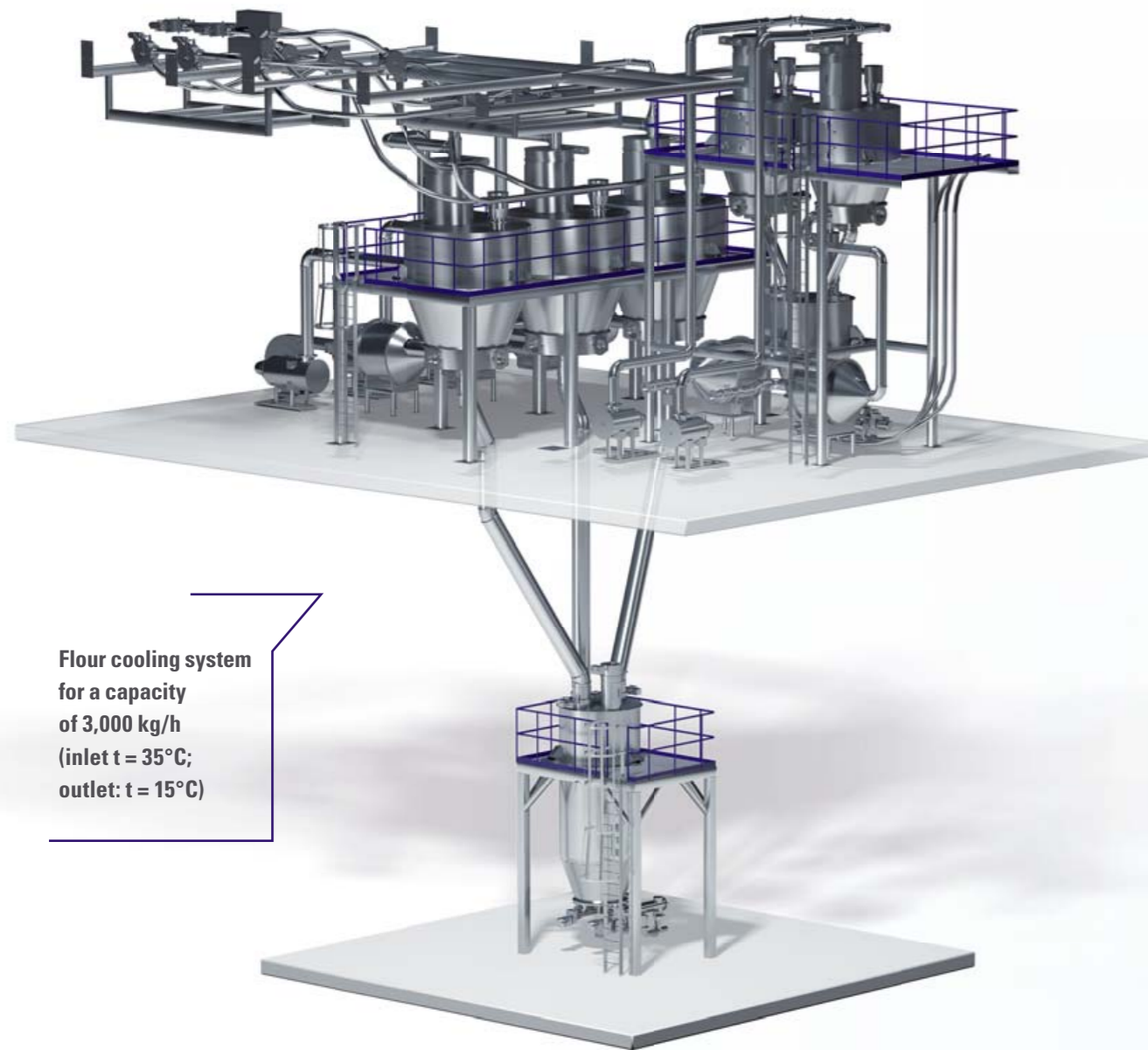
We convey liquid raw materials with a wide range of pump systems such as twin screw, centrifugal, rotary, or piston dosing pumps.



THIS IS WHERE RAW MATERIALS COME INTO THEIR OWN

Get the most out of your raw materials – we have the technology.

Temperature control, drying and humidifying, homogenizing, sifting, mixing, grinding, or recrystallizing: There are many ways to process raw materials. Zeppelin Systems' system solutions cover the entire spectrum.



Flour cooling system for a capacity of 3,000 kg/h (inlet $t = 35^{\circ}\text{C}$; outlet: $t = 15^{\circ}\text{C}$)



Flour cooling system



Sifting machines

HEATING. DRYING. COOLING.

Consistent product quality is highly dependent on the temperature of the overall product and the respective raw materials. For example, the PneumoTherm fluidized bed heat exchanger can cool or heat flour to the required temperature. PneumoTherm is also used to dry fluidizable products.

SCREENING IS A MUST

The rotary screening machine is used as a pre-screen in front of silos or depositing stations, serves as a post-screen under containers, or is available as an in-line screening machine for pressure-tight operation in pneumatic conveying lines. The coarse material can

be easily removed, and the polyester or stainless steel sieve basket is replaceable. Our rotary screens screen out foreign bodies and impurities and protect downstream processing machines. The frame, container, and all parts in contact with the product are hygienically manufactured stainless steel.

SUGAR MILLING AND RECRYSTALLIZATION

We have developed a plant concept for sugar grinding tailored to the specific requirements of the various fine grindings. Conditioning is possible during the processing process. Recrystallization is controlled with our expertise, and the powdered sugar is provided at the desired temperature. It can then be stored clump-free without further treatment or adding flow additives.

Scald soak plant



Liquid plant

FOR THE BEST DOUGHS IN THE WORLD

We improve your dough quality – with biotechnology.

In the continuous pre-ferment production process, water, wheat flour, and yeast suspension are dosed gravimetrically into the continuous mixer and immediately mixed together. The wheat pre-ferment production process can also be carried out in batches. The dough is then moved to the fermentation tank; once fermentation is complete, it is later pumped into a storage tank, at which point the dough is cooled to stop the fermentation process.

Sourdough can be produced in batch operation or continuously with our plants. In both cases, you have ensured a hygienically flawless product of consistently high quality.

Broken or whole grains are used to make a scald soak. The raw materials are grain meal, grains, spelt, or rice. The grains are prepared with hot water (60°C), heated to 90°C, and then cooled to 35°C. A 10–30% scald soak portion is incorporated into the final product as a recipe component. Due to the water content, the end product has a more aromatic flavor and is moister.

Cold soakers consist of raw materials such as cereal meal, cereal flakes, bran, flaxseed, sunflower seeds, pumpkin seeds, millet, or sesame. The grains are soaked with water and possibly syrup additives and used in a recipe in proportions of 20–30%.

KNOW-HOW

Handling liquids requires in-depth knowledge of viscous and compressible media properties.

Zeppelin Systems can easily dissolve or suspend raw materials such as sugar, salt, and yeast, melt fat, or store low-viscosity products such as malt, glucose, and glycerine at the right temperature.

Depending on requirements, our storage tanks are double-walled insulated, have stainless steel agitators or a cooling function, and work extremely gently. We ensure optimal cleaning options and suitable temperature control for all storage tanks.



Continuous fermentation plant



WE LOVE PRECISION

We take great care when it comes to dosing and weighing.

When it comes to precision, we are in our element. From components for batch weighing to loss-in-weight feeders complete with control systems, we are a one-stop source for everything you need.

FOR ALL OCCASIONS

Depending on your needs, we offer a wide range of solutions for efficient storage and dosing of free-flowing and slow-flowing substances. From the manual, semi-automatic, and fully automatic MicDos small component system to the MinDos middle component system and the fully automatic MacDos high-performance system – we have the right solution for every requirement.



Small component system
MicDos with KOKEISL

DOSING



DISPENSING OF LIQUIDS

Zeppelin Systems also offers a selection of suitable methods for dosing liquids and temperature-controlled masses, such as volumetric or gravimetric measuring systems.

BULK MATERIAL DOSING

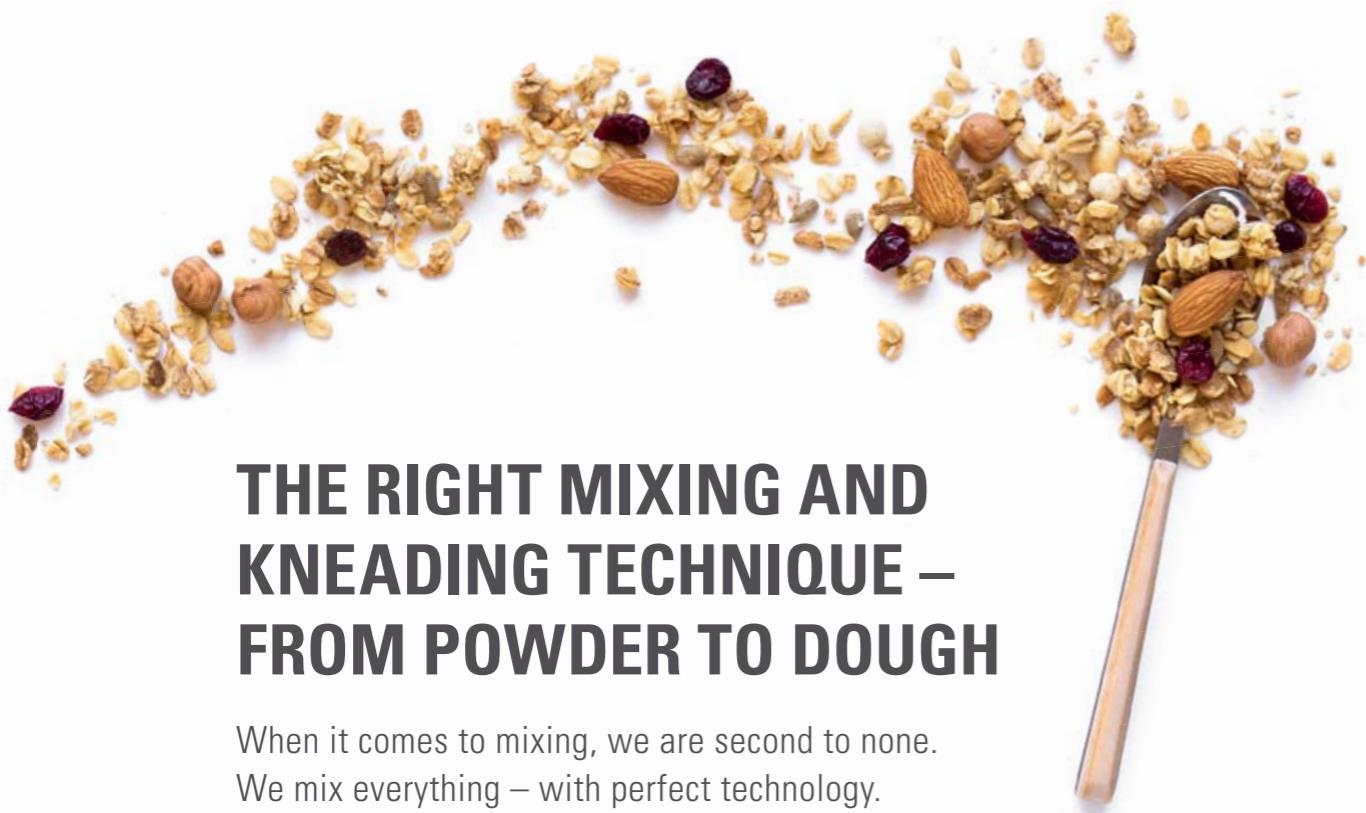
Direct-driven dosing and screw conveyors are available for dosing bulk materials as well as precise scale filling, which also meet high hygienic requirements.

KOKEISL INSTEAD OF SCREW

Compared to a conventional dosing screw conveyor, KOKEISL technology offers various advantages. The KAD component does not require an additional end cap to prevent dripping at the end of the dosing process. The curved stirrer gently discharges the product so that even sensitive products, such as chocolate drops or pieces, can be dispensed without damage. The space needed is considerably less while providing the same performance. Overall, enormous savings can be made by eliminating assembly and control technology costs.



Dosing and
screw conveyor



THE RIGHT MIXING AND KNEADING TECHNIQUE – FROM POWDER TO DOUGH

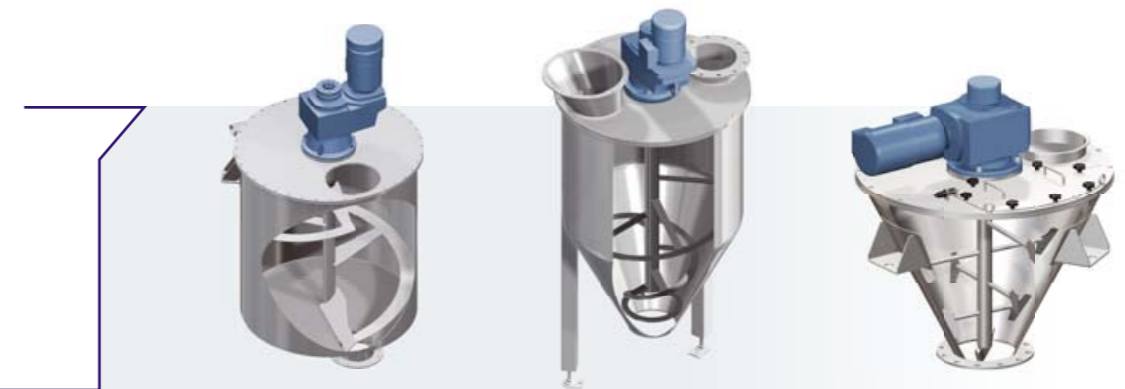
When it comes to mixing, we are second to none. We mix everything – with perfect technology.

Efficient production lines with high availability and reproducible product quality can only be achieved with optimal system technology and a process designed to meet the specific requirements of the respective product.

Our mixers guarantee this in both continuous and batch system solutions. Product manufacturing necessitates a wide range of mixing solutions, which is where Zeppelin Systems mixers in various designs come into their own.



FOR DRY
SUBSTANCE
MIXTURES



Screw conveyor mixer

Conical screw conveyor mixer

Paddle mixer

FOR DRY
SUBSTANCE
MIXTURES WITH
ADDED LIQUID



Pneumatic mixer

Horizontal universal mixer

FOR THE
PRODUCTION OF
DOUGHS AND
MASSES



DymoMix®

Codos® mixer



CODOS® SYSTEM

Continuous mixing and kneading – our recipe for success in industrial baking.

Well over 16,000 pretzels per hour, two million bread rolls per day, 275,000 cookies per hour: The Codos® system is made for big jobs.

The continuous mixing and kneading system delivers consistent dough quality around the clock, ensuring the same optimal result at all times. The Codos® system includes complete dry matter and liquid dosing, a mixer, and a kneader. A matching control system completes the system.

The advantages over batch kneaders are impressive:

- Consistent, optimal product quality
- Constant dough temperature
- Energy savings of approx. 30%
- Increased line efficiency
- Fully automatic operation
- User-friendly

FRESHLY BAKED GOODS

- Bread, rolls and baguettes
- Hamburger buns
- Toast bread
- Croissants
- and much more

LONG-LIFE BAKERY PRODUCTS

- Cookies
- Crackers
- Salty snacks
- and much more

CONFECTIONERY

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



Continuous dough production

Codos® System





CIP cleaning tank

NOT JUST CLEAN, BUT PRISTINE

Cleaning in place: Our concept for uncompromising hygiene.

Our cleaning-in-place (CIP) solutions assist with efficiently cleaning modern production plants. The cleaning solutions circulate in the production cycle without needing pipe systems or tanks to be cleaned manually. A formula-controlled and automatic cleaning process ensures reproducible cleaning results. This guarantees hygiene even in higher-risk processing areas such as liquid yeast, wheaten pre-ferments, and liquid egg,

thus ensuring high food safety. Zeppelin Systems' automated CIP processes are optimally adapted to our liquid systems. Target jet cleaning heads remove dirt and wall adhesions without leaving any residue. Other intelligent designs by our engineers, such as eliminating dead spaces or developing systems for residue-free emptying, minimize the contamination of production plants.





Control of plant processes

TAXES

EVERYTHING UNDER CONTROL

Control technology from Zeppelin Systems keeps you well-informed.

We specialize in tailor-made software development that meets your requirements. We automate your processes in storage, conveying, weighing, dosing, and mixing. Together with you, we refine our solutions to minimize equipment downtime and optimize predictive quality and maintenance for your production. We rely on state-of-the-art AI and machine learning methods. Contact us!

CONNECTED DIGITAL PRODUCTION

Take advantage of our broad product portfolio of control, automation, and digitalization solutions. The modules' architecture is easy to integrate into existing systems and enables networking with other systems and IoT devices—both at the same site and across sites. Connections to ERP or MES systems are possible.

FOCUS ON EFFICIENCY AND SUSTAINABILITY

Digital networking of production and your systems provides a wide range of data. With Zeppelin Systems, you can get the most out of your plant and produce more efficiently and sustainably. Whether you choose our on-premises or cloud-based solutions, you will always have the most critical information at your fingertips: Material consumption and inventory, system availability, quality, performance, system failures and their prevention, etc.

RECIPE AND BATCH MANAGEMENT SYSTEM

Put your trust in our decades of experience in recipe and batch management. With our user-friendly, intuitive system, you can create raw materials, define their storage location, create recipes, and plan your fully automated production – with the proper process for your product, whether batch or continuous. All production data is logged and can be viewed anytime to trace a batch.

WE ARE AT HOME IN ALL MARKETS

... and produce there, too.

Our global network of subsidiaries worldwide includes project management capacities and suppliers as well as production facilities in the most important economic regions of Europe, America and Asia. This means that if you want to establish or expand a new site, we are usually already there.

CLOSE TO CUSTOMERS WORLDWIDE.

Take advantage of the benefits of a global plant engineering expert: We are familiar with the local conditions, national regulations and standards and legal provisions and seamlessly integrate them into our plant concepts. We offer you personal support on-site in the respective

national language and always in the right time zone. And thanks to a dense supplier network at every location in the world, you benefit from a high degree of localization, shorter delivery times and competitive pricing. Invoicing is done in the local currency, offering added convenience.

Compared to small, local providers, you will benefit from Zeppelin Systems' global know-how and the experience of interdisciplinary engineers who truly understand your business. We always develop the plant concept, design and calculations in close collaboration with the customer, therefore providing a one-stop service. This makes us your competent solution provider with a full service guarantee.



ABOUT ZEPPELIN SYSTEMS

TECHNOLOGY IS NOT EVERYTHING

The people behind Zeppelin Systems.

Whether as a partner, supplier or employer – what truly matters is people. At Zeppelin Systems, we value teamwork. This principle applies across our global network, in collaboration with our customers, and within the many project teams working every day to achieve shared success. To be internationally successful in plant engineering, you need to offer more than just outstanding technology – you need outstanding employees who understand customer needs, implement local requirements and put together the best plant package based on these factors. This is another reason why Zeppelin Systems can be found wherever the highest value is placed on functionality and process reliability: that is, all over the world.



ALWAYS BY YOUR SIDE

With our 360° services, you benefit from a powerful service package.

At Zeppelin Systems, you can rely on first-class service. For us, the work is far from over once your plant has been designed. We provide assembly and commissioning services – worldwide. We train your employees – in everything from the competent instruction in process engineering workflows and how to properly maintain the plant to how to operate it safely. Additionally, we support you in developing safety stan-

dards. Maintenance work, carrying out inspections and repairs, and a spare parts delivery service are all part of our comprehensive offering.

To ensure your plant operates smoothly, we offer preventive maintenance that detects and eliminates any malfunctions at an early stage. If an unexpected error still occurs, use our remote maintenance.

ZEPPELIN SYSTEMS 360° SERVICES

Professional support at every stage of your project

Zeppelin offers service with real added value. That's because we supply turnkey plants as well as complete systems, mixers, silos and components - and stand by your side throughout the execution of your project. This applies not only to the construction of new plants, but also to modernization projects. In this way we provide professional support and a smooth project flow, individually tailored to your requirements.

Choose from practical modules for all activities on your project. You can book the modules on a daily basis or as a package. We will be happy to put together optimally designed service solutions for your plant.

FASTER TO YOUR GOAL: YOUR ADVANTAGES AT A GLANCE

- No trouble with incomplete deliveries:
We check every package
- Optimal project coordination:
We know how your plant must be constructed
- Safety through technical competence:
Nobody knows our plants better than we do
- Accelerated workflow: We work as one team
- Assured start of production:
We ensure reliable deadlines through clear planning
- Optimal production output/performance:
We provide continuous support

PERFECTLY SUPPORTED!

THE PACKAGE FOR YOUR PROJECT SUCCESS

- 1 INCOMING GOODS INSPECTION
- 2 ASSEMBLY / INSTALLATION
- 3 COMMISSIONING
- 4 PERFORMANCE TEST
- 5 TRAINING
- 6 SPARE PARTS SUPPLY
- 7 SERVICE CONTRACTS



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