

# Automation, flexibility and safety

TWO GLOBAL LEADERS IN RAW MATERIAL STORAGE AND SUPPLY APPLICATIONS FROM GERMANY, ZEPPELIN SILOS & SYSTEMS GMBH AND REIMELT HENSCHEL GMBH, SUCCESSFULLY MERGED LAST YEAR



**++ figure 1**  
Silos for liquid components

**++ figure 2**  
Silo for bulk materials

**++ figure 3**  
Silos for minor components

**+** As of June 2010, the two have been represented under the name Zeppelin: Zeppelin Systems GmbH, Friedrichshafen and Zeppelin Reimelt GmbH, Rödermark.

The automation of raw material supply plays a central role everywhere in the world where bakeries are modernized or newly constructed. At the same time, the flexibility of the sourcing process needs to be maintained that allows for the integration of the raw materials delivered by tanker truck and those coming in as bagged goods or in big bags. The planning of equipment as performed by Zeppelin Reimelt comprises much more than

the mere receiving and storage of raw materials. The concept includes all dry raw materials, the metering of liquid components such as water and

## Zeppelin Reimelt GmbH

Food Technology Division  
Messenhäuser Straße 37-45  
63322 Rödermark, Germany

Phone: +49 6074 691-0

Fax: +49 6074 691-208

E-mail: [foodtechnology@zeppelin.com](mailto:foodtechnology@zeppelin.com)

Website: [www.zeppelin-reimelt.com](http://www.zeppelin-reimelt.com)



yeast, the production, storage and metering of pre-dough (liquid sponge), sourdough, hot and cold soaked grains and increasingly also the metering of solid pre-dough, excess remaining dough, fats and oils. With these extensive raw material logistics, the company cannot only react to fluctuations in the raw materials markets, but also to changes in recipes and production quantities.

The system controls are the bridge between the increasing demand for automation, largely due to economic necessities and the flexibility necessary to allow for fast reactions to markets and customer requests. It is the network that embraces the entire structure of the plant and makes sure that any centrally modified information is transported to every piece of equipment, each valve, etc. At the same time, the network assumes the task of linking the data from the raw materials, receiving and quality control with the process data in order to ensure a logical traceability of all raw materials and the compliance with recipe and processing parameters.

Today, superior production management systems are indispensable for small and larger companies because the requirements in terms of traceability, food safety, quality and flexibility in production are high. However, it is also important that all these systems are supplied with the production data as soon as possible. With its batch management system PrismaWEB, Zeppelin Reimelt offers a control system for production planning, control and documentation that can easily be tied to production management systems and different IT environments.

Equipment suppliers must increasingly have process engineering expertise because of the growing demand for continuously operating mixing plants and their supply. For these lines, the raw materials must also be continuously scaled and metered. These are challenging demands, in particular, in the field of baked goods where minor ingredients have to be included into the production. This can hardly be handled with common technology. The bakery ingredients are mixed and blended with flour as a carrier ►

++ figure 2



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++ figure 3



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++ figure 4

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++ figure 5

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in special mixing devices that are located upstream of the metering units. This mixing technology originating from Zeppelin Reimelt is continuously being improved. A similar process is the handling of very sticky, fat-containing or hygroscopic raw materials that are not fed, as such, into the dough preparation process but rather need preliminary processing into pre-mixes or slurries.

Thus, it was a logical step based on the experience gained with international installations, when Zeppelin Reimelt with its Codos® System entered the dough preparation arena. This continuously operating mixing and kneading system promises enhanced quality of the baked goods with up to 30 % lower energy consumption and a higher dough-yield. It is mainly used for single lines operating on a 24/7 basis where modifications of the recipes can be done online.

The separation of the dough preparation stages of mixing and kneading make it possible to optimize each of these processes individually. Due to the continuous and largely automated operation, the dough quality is remarkably uniform. There are no deviations due to different dough batches and idle times between processes. The core components of these compact lines are the Codos® Mixer and the Codos® Kneader. Upstream of the mixer is a dry ingredients mixer that produces a premix. A gravimetric weighing unit (loss-in-weight principle) controls the continuous addition of all recipe components including liquids. Interlacing spiral tools in the mixer ensure a gentle but thorough blending of all dough components including proper wetting as this triggers the biochemical process. At the end, the Codos® Mixer feeds the homogenized raw materials via a transfer belt to the Codos® Kneader.

This kneader allows a targeted introduction of energy that is controlled by the speed of the tools. The helical kneading tools gently treat the dough without



shear. The kneading trough has a double jacket so that the preset temperature can be kept within narrow limits without affecting the dough by directly acting thermal media. The open design of the system allows flakes or fruit added at the end of the kneading stage to be integrated almost degradation-free.

There are only a very few movable parts in the Codos® System providing for low maintenance and wear. The cleaning – whether as a routine operation or upon product change – can be done quickly and easily. Of course, controls are in place for monitoring and documenting all processes. The experts at Zeppelin Reimelt design tailor-made equipment according to individual requirements. In the case of hard-to-handle products, the functioning of the design can be verified in a trial run.

#### Intelligent design: Modular silos from Friedrichshafen

Zeppelin Systems offers novel silos that are transported in modules and assembled together at the customer's site. The segments can be packed and shipped in a container which is much cheaper than shipping an entire silo on a 'wide load' truck.

On site, the individual segments are assembled by the client's own staff or by Zeppelin's technicians. The only way the modules can be put together is with bolted connections. With a novel, pre-stressed flange connection with internal sealing, the result is an almost air-tight and gap-free silo with properties comparable to the ones of a welded silo. After assembly, Zeppelin technicians will install the discharge equipment, the conveying pipes and the controls. +++

#### ++ figure 4

Silos for medium components

#### ++ figure 5

Weighing

#### ++ figure 6

Codos® system