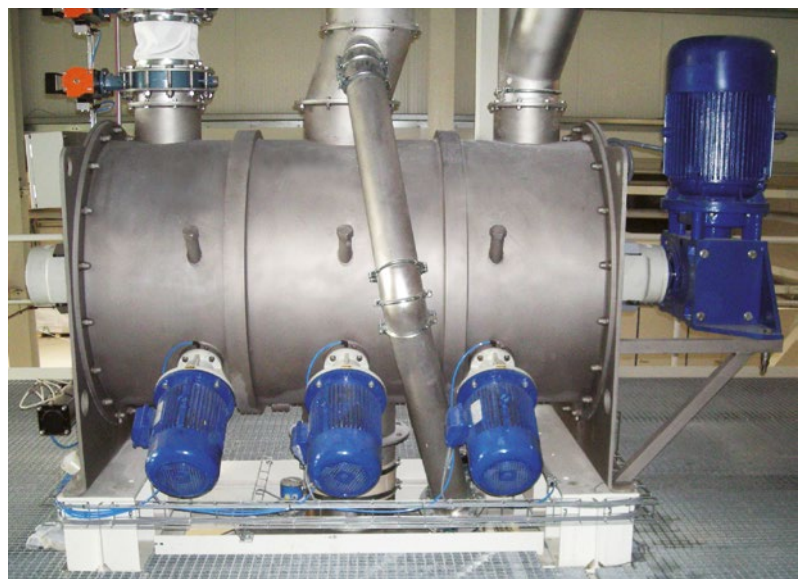


# Product and process engineering in harmony

## A HIGHLY EFFECTIVE MIXING SYSTEM

**We all have them in our immediate vicinity, but only specialists have a word for them: special additives and agents for ready-made plasters and mortars. These highly effective substances increase the frost resistance of plasters and mortars, ease their processing and prevent cracking. They are manufactured by the Berolan company in Arbing, Austria. Here, literally on a “green field”, a mixing system arose within just 10 months from the beginning of the planning stage, which perfectly meets the demanding requirements of the product.**

The mixer enables a quick and consistent distribution of the components



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Special additives and agents for ready-made plasters and mortars are effective even in small doses:

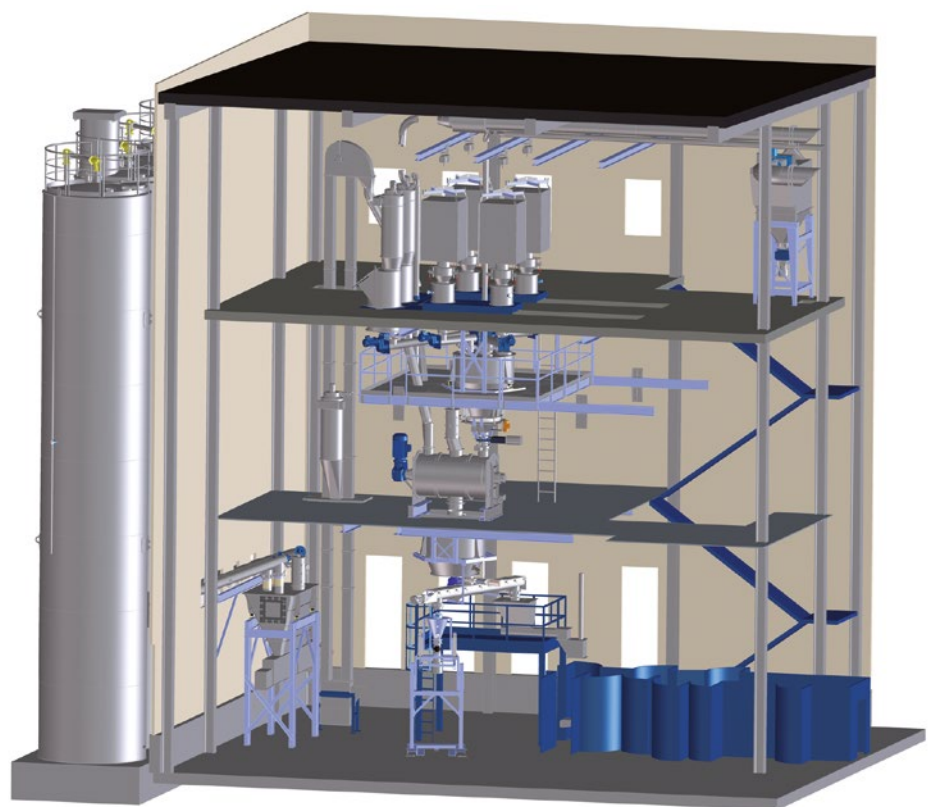
10 to 200 grams per kilo of dry mixture are enough to create a very fine, stable system of small air holes. The great effectiveness of the product is also demanded of its production. This is because the white-grey powder mixtures consist only partially of a few critical, large components, such as rock meal and various additives. These are added to products of extreme fineness, such as aluminium stearate, and those with a very low bulk density, such as silicic acid at only 50 grams per litre.

**The decisive factor: Solution expertise**

For this challenge, CEO Roman Engelbrechtsmüller and mineralogist Horst Röhr of Berolan found the right partner in Daxner, Austria. The specialist in bulk solids technology delivered a concept that integrated storage, dosing, weighing and mixing of large, medium, small and micro components into a single harmonious production process. "We were incredibly lucky that we got the chance to incorporate our expertise into the planning process of the building construction. That let us implement the project in a 15-metre-high mixing tower which enables a gravimetric free-fall production process from top to bottom," states company owner Johann Daxner in

describing the individual process which stands apart from instant solutions. A 3D CAD visualization of the plant design allowed the finished system to be viewed from any perspective before the first shovel hit the dirt. This secure planning laid the cornerstone of mutual trust between Berolan and Daxner.

Just 10 months after their first meeting, the system was ready to run. If one looks at the former "green field" today, one sees a mixing tower in which a premium, stainless-steel system ranges over three levels.



Designing a system with 3D CAD makes planning more secure by offering a flexible view of the system from many perspectives.

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**A multi-functional plant design**

The explicit focus was on producing special additives and agents for ready-made plasters and mortars, but the system adds value in another significant way. That is the flexibility to produce outside mixing orders. Due to the original challenge, extremely fine product characteristics were considered, but

also products with poor flow characteristics, such as micro silica, can also be dosed well. Added to this was a very high throughput at low energy cost. Furthermore every opportunity to mix external products requires an essential condition: All containers and conveying lines must be almost residue-free,

especially of the critical medium and small components. "During our initial years, 2001 to 2007, we were bound to the capabilities of outside mixing orders, nowadays we can produce mixtures that solely consist of organic additives. Therewith the system has significantly contributed to the company's success in recent years," says CEO Roman Engelbrechtsmüller.



The feeding station for bags and big-bags is at the highest level of the mixing tower

**The mixer as the centerpiece**

All components run together to a central point of the system, where they are fed to a fast-operating mixer. Despite varying bulk density, granulation and fineness of the substance, this fluidized bed mixer achieves high mixing precision within short mixing times. One batch consists of up to 1,400 litres of product additives. The product can immediately be emptied from the mixer into a post-bin, so the mixer is available for the next batch right away.

**High-precision dosing and weighing**

The basis for a consistent, high-quality product is laid before the mixing process ever begins: the precise dosing and weighing of raw materials, which take place both inside and outside the building of Berolan. In three external sto-

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rage silos – each with 60 cubic metres capacity – large components like rock meal and various additives are stored. They are first conveyed into a dosing screw and then directly to a hopper scale. Afterwards a bucket conveyor transports the large components to the batch mixer. This conveyor solution is very efficient, and at the same time it is low in residue and saves energy.

The production process indoors is even more meticulous, because here the critical medium and small components are handled, of which no residue is tolerated. A hoist transports the raw materials in bags and big-bags to the highest level of the mixing tower, where precise dosing and weighing takes place. Particularly small quantities are added manually using a table scale.

### Highly automated and easy to clean

An especially important effect of a sophisticated process technology is a high level of automation. Thanks to that, two operators are sufficient to run the system in Arbing. By using a fully automated

CONCETTI packaging system with palletizers, the finished products can be filled into bags respectively weighed by means of a big-bag filling station.

Cleanliness is an important goal in every plant and quick, easy cleaning is an absolute requirement. Considering this while designing the overall system, Daxner planned appropriate cleaning lids with easy access in the machines and made sure there were no hidden corners. A central extraction system with a large jet filter ensures a dust-free environment. The whole system is certified with the ATEX-VEXAT certificate.

### A proven control design

In regards to controls, Daxner relies on its long-time partner ESA. With an integrated Siemens-based design and the best process visualization, the ESA control system guarantees precise traceability of every batch, all the way back to the raw material supplier. Operator-controlled manual dosing stations with touch terminals and scanning systems

for checking components and containers ensure product safety and complete process documentation.

### The best prospects for the future

“In the meantime, we have been able to extend our scope of supply considerably. Moreover, the achieved dosing accuracy enables our additive mixtures to be certified according to the European standards for concrete additives,” explains CEO Röhr. “We can certainly say that our expert partner Daxner has implemented our ideas successfully.”