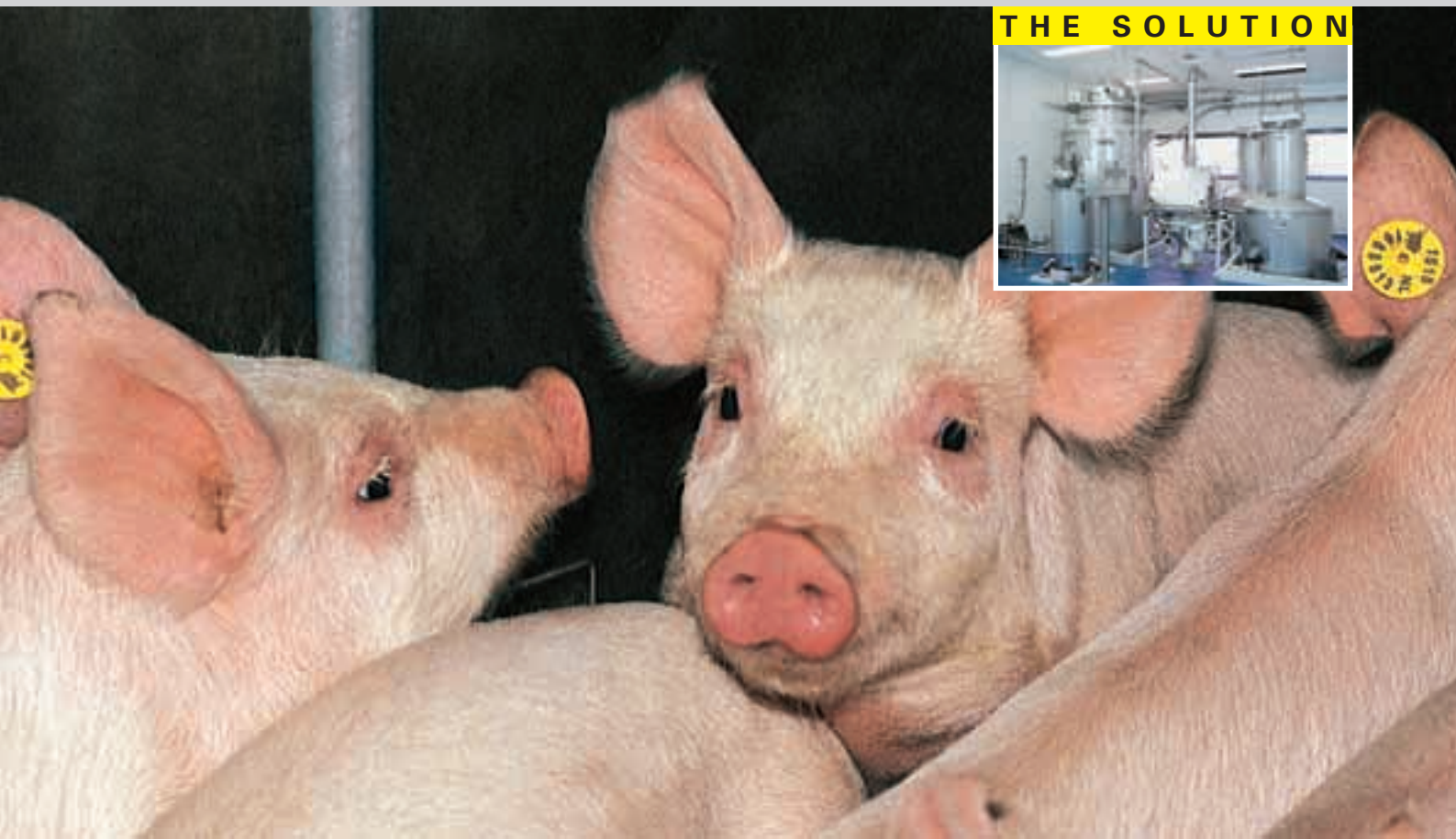


Highly-automated manufacturing of veterinary drugs to GMP standards



The Customer



Market leader with high production volume

Vetimex Animal Health (Bladel) is one of the leading manufacturers of veterinary drugs in the Netherlands. Part of the A.U.V. group (co-operative for vets), this innovative company ranks as one of Europe's market leaders as it sells products in 50 countries in Europe, the Middle East, Asia, Latin America, and Africa. Vetimex produces 30,000 bottles, 10,000 cans, 30,000 bags, 3,500 medicine bottles and 2,500 tins as well as 10 tons of premix (active ingredients and carrying agents) daily. This volume requires modern, automated production lines.

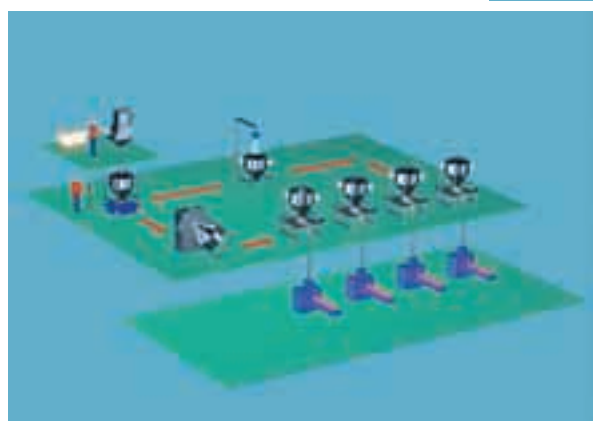
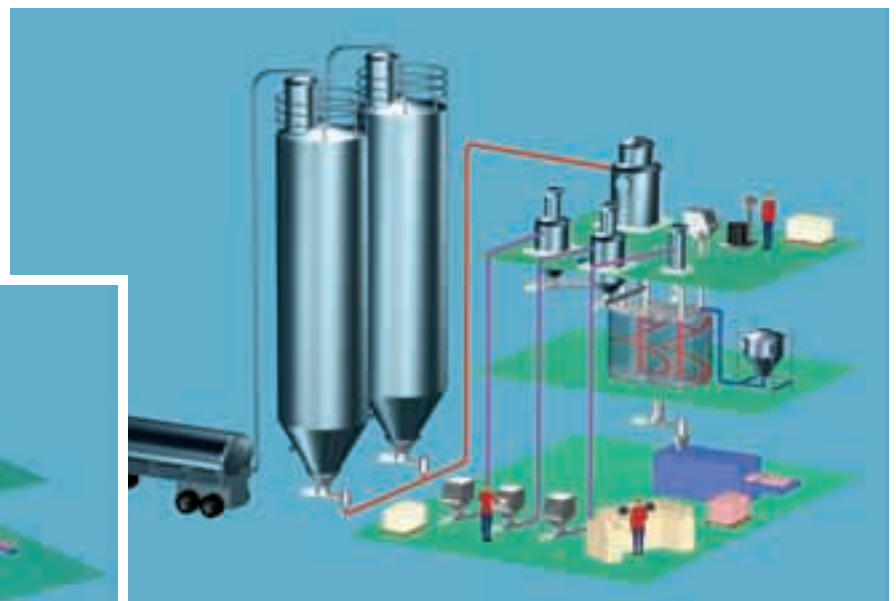
Tailor-made automation

AZO was selected as the partner for the automation project. Internationally renowned for its efficient, tailor-made, customer solutions, AZO offers the entire spectrum of ingredient automation systems and is thus eminently qualified to provide objective advice.



Paul Meeussen:

"The competent advice from AZO enabled us – on a basis of close cooperation – to develop and realize two concepts exactly tailored to our needs and resulting in quality to GMP standards. A truly remarkable piece of engineering."



The Task

Two lines, two solutions and one goal

The challenge was to automate the manufacture of premix from carrier agents and auxiliary ingredients and the production of special mixtures from active agents and auxiliary ingredients. The solutions developed by AZO show how similar requirements can lead to the optimum achievement of an objective in thoroughly different ways.

Premix manufacture with vertical twin-shaft precision mixers

The task here was to charge the 141 cu. ft. twin-shaft mixers used with up to 5 batches of carrier agents and active ingredients daily – not only fully automatically but with a high degree of recipe accuracy.



Vertical twin-shaft precision mixers



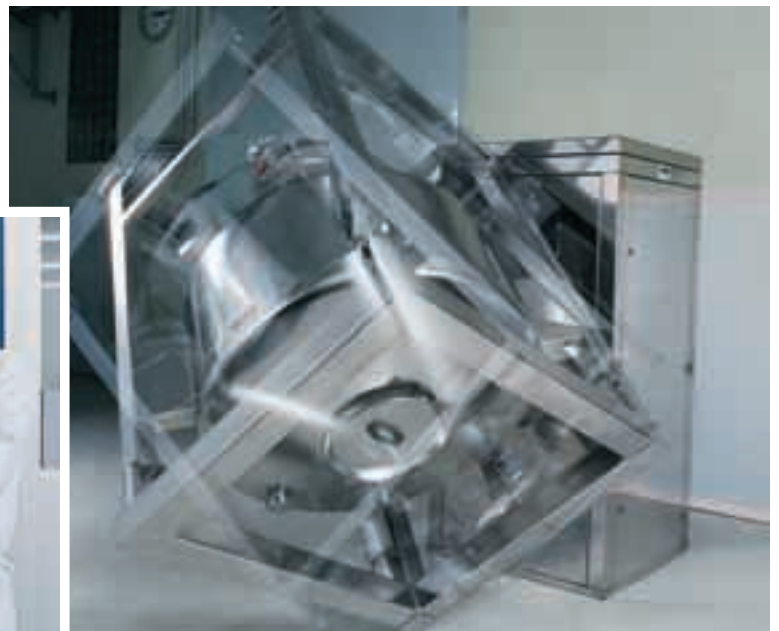
Process control console, feed hopper in the background

Special mixtures

Vetimex uses more than 100 recipes consisting in some cases of up to 10 components – and a production schedule that necessitates frequent recipe changes.

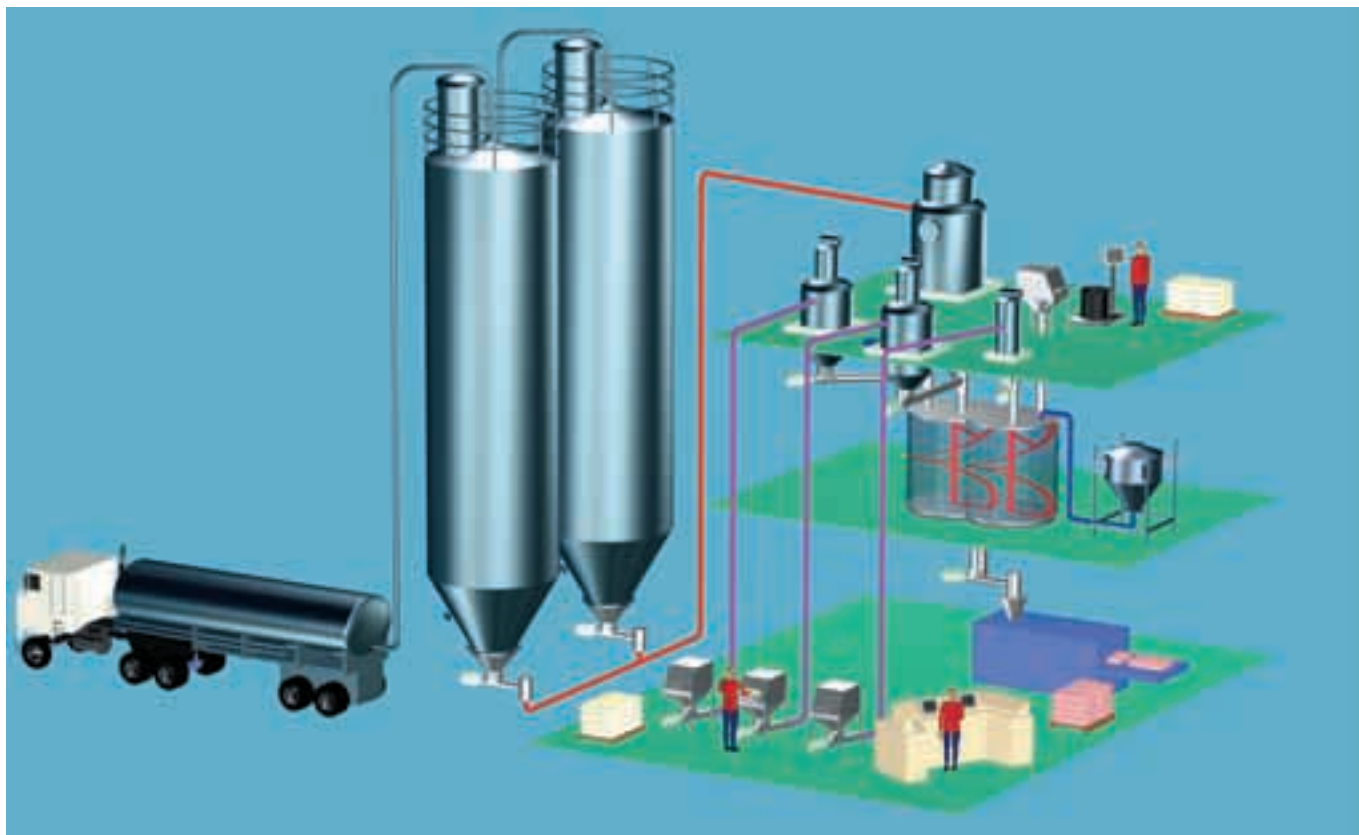


Production Managers Paul Meeussen and Gerrit A. J. Daanen



AZO container mixers

The AZO Solution for Premix Manufacture



Storage, dosing, weighing and feeding

The carrier agents such as corn grit and corn flour, are delivered in tank trucks and transferred pneumatically to indoor silos each with a capacity of 1590 cu. ft. These silos feature appropriate filters, fill level measuring systems and pressure/vacuum valves as standard equipment.

A vibratory hopper and dosing screw with integrated screening ensure reliable discharge and consistent feeding of product into the pneumatic vacuum weighing system.



Top of silo with venting filter

From here, the carrier agents are conveyed by vacuum into the 141 cu. ft. capacity conveying scale above the mixer. The coarse/fine modes on the product valve enable extremely high dosing and weighing accuracy and constant adherence to the recipe, even with these large batches. After the weighing operation, the batch is then ready for the mixer.

Dust-free product feeding of active ingredients

For the feeding of active ingredients delivered in sacks, three feed hopper stations with filters and exhaust system for dust-free sack feeding are provided. One vibrating sieve per hopper sifts out coarse impurities and carefully breaks up agglomerations. Active ingredients are pneumatically conveyed to the mixer by three vacuum weighing systems with different weighing ranges: 110 lb., 550 lb., and 1100 lb.

Paul Meeussen:

“Thanks to the weighing area assignment we have succeeded in achieving an extremely high level of dosing and weighing accuracy. Logical and consistent line separation ensures that contamination is reliably prevented.”



MCS operating terminal

Weighing accuracy and freedom from contamination

As these active ingredients are poor-flowing bulk materials in some cases, the three conveying scales used in the system were designed as negative weighing systems. That means that the weighed batches remain in the conveying scales and are evenly metered into the mixer when it signals a requirement. The division into different weight ranges results in very accurate dosing and weighing results, which in turn have an extremely beneficial effect on the quality of the mixtures. Contamination is prevented by means of logical and consistent line assignment.

Adding of micro quantities

Micro quantities are weighed at an operator-controlled weighing station and can then be added as per specification at the right time and in batch-optimized form by the Modular Control System (MCS).



Conveyor scales

Different bulk material characteristics

A vertical twin-shaft precision mixer was selected for this area since the components involved in the recipe exhibit widely varying bulk material densities and particle sizes. Also, oil as the binding medium and micro quantities of active ingredients have to be mixed in. In all, 3 – 5 batches each of 4400 lbs. are manufactured, with a maximum mixing time per batch of six minutes. The circumferential speed of the agitators is only 3.2 ft/sec. In this mixing principle, an ideal distribution of the mixed material is guaranteed by the use of two synchronously rotating screw-type ribbon agitators that are supported on bearings at the top only. Overall, the mixer is built without joints and designed to be absolutely safe from microbiological contamination.

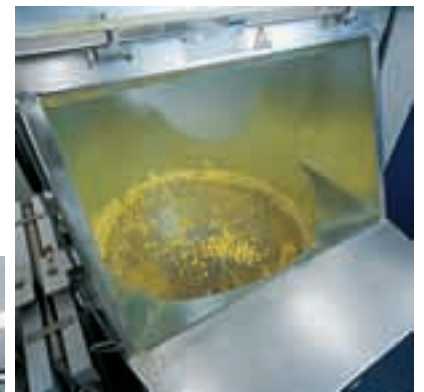


Filter with sliding arrangement for maintenance ease

Quality assurance

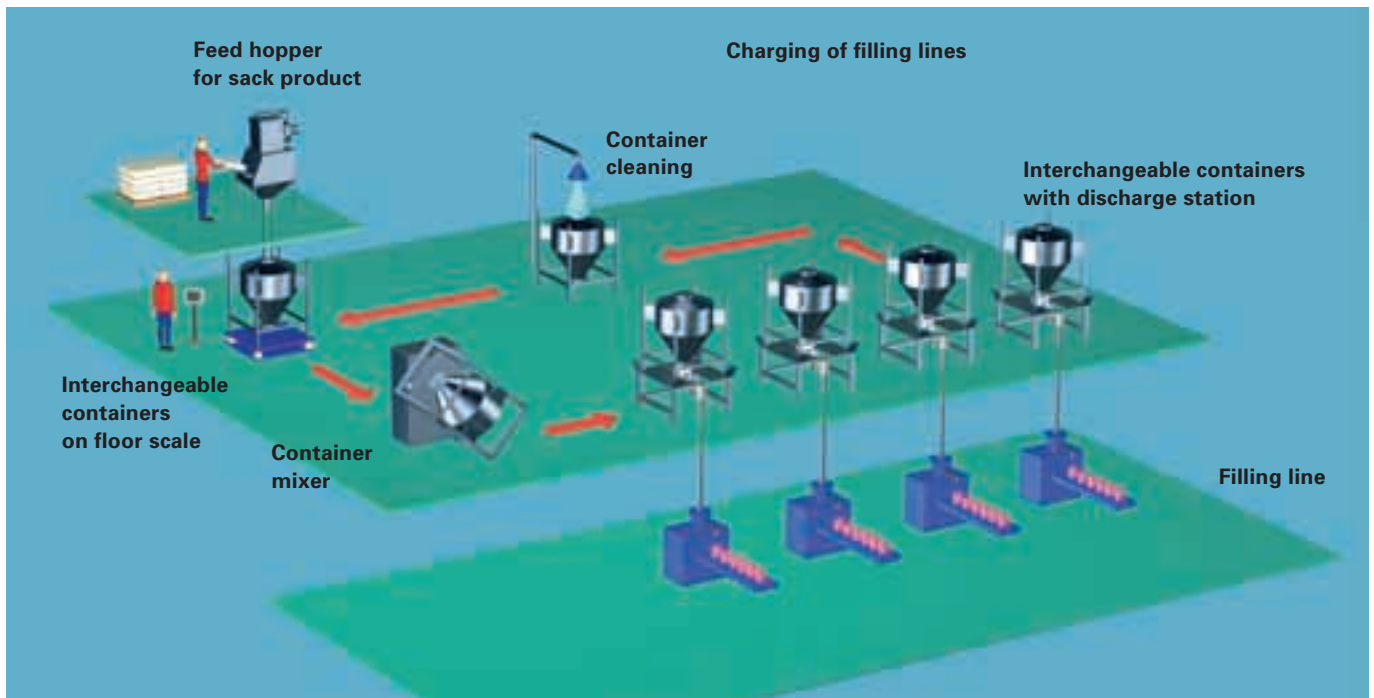
A sample is taken from every batch and analyzed very closely. After three days of residence time, the manufactured mixture is released for sale. 13 recipes are presently being run with production changeovers possible several times a day. Despite the large volume, it is possible to clean the mixer quickly. In view of the efficiency with which residual product is discharged from the mixer – 99.97% – cross-contamination is not an issue. The frequency control of the mixer reduces energy consumption by up to 8%.

Feed hopper with integrated vibrating sieve



Dust-free feeding of active ingredients

The AZO Solution for Special Mixtures: Fully Refined Containment



Dust-free container filling

Reconfiguration from bagged product into round containers

The pre-weighed sack product is fed into a round interchangeable container with butterfly valve by means of an ergonomically designed feed hopper with large-capacity filter and exhaust system. Here too, a vibrating sieve prevents coarse impurities from getting into the container.

In addition, micro quantities of active ingredients are accurately weighed under operator control at a manual weighing station and likewise added to the container. For control purposes, the interchangeable container stands on a floor scale. After filling, it is sealed tight with a lid.

Paul Meeussen:

"We are especially pleased about the high degree of flexibility that we now have within production. And this with minimal cleaning outlay."



Containers on floor scale during filling

Container mixers

To ensure the efficient manufacture of over 100 recipes with up to 10 components each and frequent recipe changes, the company invested in a containment system with container mixers. The active and auxiliary ingredients used here have good flow characteristics, are of similar bulk density, and are consequently highly suitable for this mixing technique. The container is brought to the container mixer with a forklift, and pneumatically fixed to the holding device. Because rotary speed and mixing time can be adjusted individually, high mixing quality can be achieved even when the materials to be mixed have different parameters (properties). The round container design guarantees high stability and is ideally suited to container mixing processes. No additional static mixing aids whatsoever are required in the container.

Charging of four filling lines

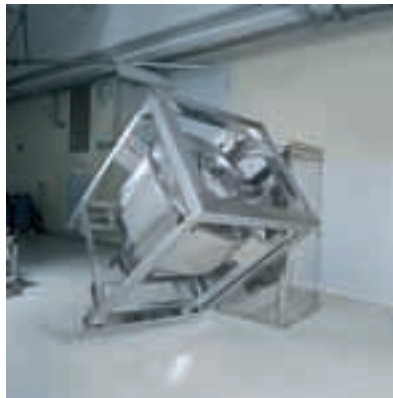
The interchangeable containers with butterfly valves are placed on container discharge stations over the filling machines, and docked in place with an expanding collar to ensure dust-free operation. After opening the butterfly valve, the homogenous mixture is ready for the filling process. The round interchangeable containers provide optimal discharge geometry and can be fitted at any time with vibrating equipment to assist the discharge of poor-flowing bulk ingredients. The dosing screw integrated in the container discharge station receives a signal from the filling machine's request probe and commences constant dosing into the filling machine.



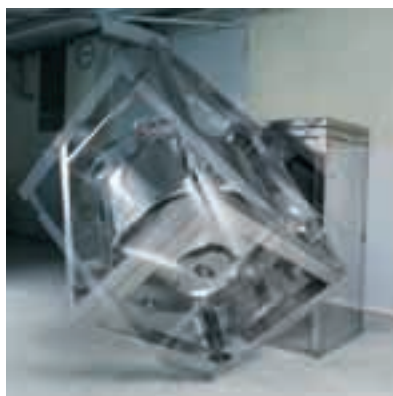
Container next to mixer



Container in holder



Start of mixing



Special mixing procedure

Once the interchangeable container is empty, it is removed from the filling machine and thoroughly cleaned. Its round shape proves the best design for this too. After the intensive cleaning process, the container is ready for filling again. By using several such containers, a high degree of flexibility is attained with minimum cleaning outlay.

Paul Meeussen:

"The two solutions that AZO came up with prove that similar requirements can be optimally solved in entirely different ways. We are now able to place our full trust in a highly automated, production process to GMP standards and at the same time ensure validation in accordance with the regulations. This allows us to look to the future with confidence."



Interchangeable container over filling machine



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