

# Process & Control

SEPTEMBER 2011

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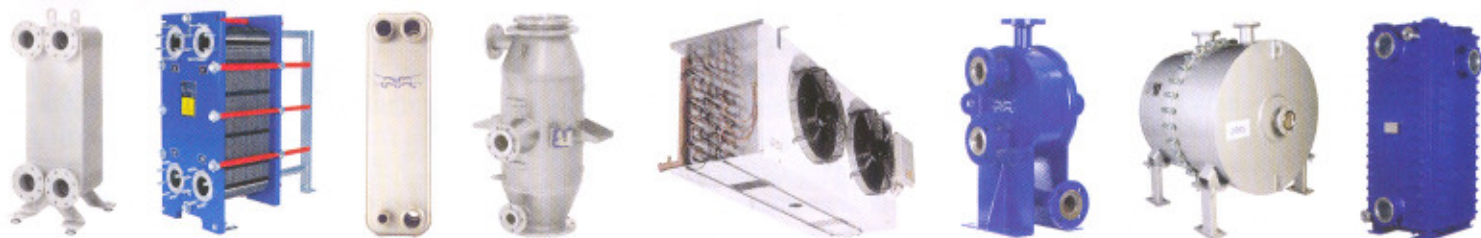
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# Mixture of reliability and consistency

Reliable operation of its rotary mixer supplied by **Munson Machinery** is critical for Spain's largest toll manufacturer of insecticides and herbicides and with expected growth, Indalva plans to invest in another

**A**t the heart of Indalva's operation is a 51 cu m capacity rotary mixer that processes all the company's granular insecticides for soil application (the major product line). Built by Munson Machinery, the Model 700-TSC-180 mixes liquid chemicals with the microgranules until evenly impregnated. Since the rotary mixer is the only one used for insecticides, its reliable operation is critical to Indalva's business.

"If anything goes wrong with the mixing operation it is a big problem for us," explains chief executive officer Cayetano Valero. "Fortunately, the mixer has proven reliable."

In service since 1988 and operating up to 10-12 hours a day during the sowing season, the mixer has rarely been offline except for its scheduled annual maintenance when it is shut down for two or three days. Other than that, oil and grease needs are checked every two weeks.

Indalva puts raw clay through a hammer mill to obtain granules of 1-2 mm. This is carried out in a different facility than the formulation plant to

with a discharge gate at the other. Mixing flights (baffles) tumble the batch in a multi-directional manner, imparting minimal energy and intensity to the product. A product may consist of one or several chemicals which are weighed, dissolved in water and added to the batch as it rotates.

The premixed solution is pumped from a storage tank through a tube that runs along the centre or axis of the mixer from which it is sprayed into the carrier material through nozzles. Indalva uses several different sizes of nozzles for different liquids which can be set for the appropriate spray pattern. Clay microgranules absorb the chemicals; in the case of quartz an adhesive is included in the aqueous mixture for coating the granule.

Although the mixer can achieve batch uniformity in approximately three minutes, the company runs it from 1-2 hours to condition the material. At the end of the cycle the discharge gate is opened and the product goes to the packaging line where it is loaded into 1 tonne bulk bags or small bags of 1-20 kg.

*"We have rarely had to carry out repairs between scheduled shutdowns"*

which the granules are transferred in 1,000 kg bags. Chemicals are received as powders or liquid in 25 kg bags or 200 kg drums.

At the beginning of the formulation line, bags of clay or quartz are lifted by a crane and emptied into a 10 tonne hopper. The material drops through a port in the hopper into a bucket elevator which transports it to a 10 tonne hopper located on a platform above the mixer. The hopper that feeds the mixer is set on load cells and when the preset batch weight is reached the conveyor automatically stops and the batch is discharged into the mixer. Batch sizes range from 3 to 5 tonnes.

## Consistent high quality

The Munson mixer is a horizontal drum that rotates on trunnion rings and rollers located at each end of the vessel, eliminating the need for an internal shaft with bearings exposed to material. The mixer has a stationary inlet at one end and a stationary outlet

Over the years the mixer has consistently produced a homogeneous, high-quality product. The machine discharges each batch thoroughly, leaving no residual material that needs to be removed.

## Preventing cross-contamination

Due to the toxic nature of Indalva's products, cleaning the machine



Workers package insecticide after it has been mixed by the 700-TSC-180

between batches of different insecticides can take from four hours to an entire day.

"These are dangerous products and we have to clean the machine thoroughly to prevent cross-contamination," says Valero.

Since the avoidance of contamination is critical, Indalva uses no chemicals for cleaning. Also, employees cannot enter the machine because of the toxic atmosphere. Instead, the company uses an inert material - usually quartz which is loaded into the mixer and scrapes all internal surfaces clean while the machine rotates.

## Routine maintenance

"As for maintenance, most of this work has been during the annual shutdown", says Valero. "We have rarely had to carry out repairs between scheduled shutdowns."

Indalva's phytosanitary business has grown rapidly over the years but it peaked at 10,000 tonnes/yr about five years ago when the EU promulgated new environmental regulations that restricted or banned the use of some traditional chemicals. In response, the company reformulated its products and sales have been growing again for the past two years.

Anticipating continued growth, Indalva is now considering an additional Munson rotary batch mixer.

"We have been happy with this machine," says Valero, "but need one that has additional capacity."

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The rotary mixer evenly impregnates microgranules with liquid chemicals to produce insecticides