Littleford Day

Where Processing Ideas Become Reality

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Costa Rica Firm - E.A. Euroamerica - Uses Littleford Mixers To Process Line of Fiber Compound

Application: A Littleford Model FKM-600-D (2z) and a Littleford Model FKM-2000-D (4z) Batch Mixers are used to blend a joint compound at the Caldera, Costa Rica Plant of E.A. Euroamerica S.A. a subsidiary of Grupo Pujol, San Jose, Costa Rica.

Grupo Pojul, San Jose, Costa Rica, is one of the largest manufacturers and suppliers of construction materials in Central America and the Caribbean. It operates several companies, each specializing in the line of construction products. These include steel bars for reinforcing concrete (rebar), galvanized and PVC pipe, structural tubing, medium-density fiberboard, gypsum fiberboard, and cementitious mixtures. Grupo Pujol also operates retail outlets that sell the products.

Problem: Joint compound is a plaster-like paste that fills the seams, or joints, between the sheets of fiberboard after installation. It also covers the heads of screws or nails used to mount the fiberboard. After the joint compound dries and hardens, the builder smoothes it using a screen, sandpaper, or other abrasive. The process is repeated once or twice more until the wall is completely flat and smooth.

To perform correctly, the joint compound must incorporate all the minor and major ingredients into a homogeneous mixture with the correct consistency. Improperly mixed, the joint compound may not adhere as intended or the application may be uneven. Finding the right mixer was thus an important aspect of building the joint compound plant.

Solution: Euroamerica evaluated several mixers before selecting a Model FKM-600-D (2z) batch mixer from Littleford Day, Florence, KY USA. "We did some testing, and our engineering team selected the mixer based on performance and how homogenous the mix was. Of course price, delivery, and many other factors were considerations," Fishel, Vice President of Euroamerica, said.

The mixer has a horizontal single shaft equipped with ploughshare-type mixing tools. Two high-speed choppers are installed through the wall of the mixing vessel. They create high shear that disperses liquid quickly and prevents the formation of lumps. Compressed air is injected through the air purge seals on the main and chopper shafts to prevent the joint compound from entering the seal area.

The main drive is 40 horsepower (30 kilowatts), and each chopper drive is 10 horsepower (746 watts). Other features include 304 stainless steel construction in all product contact areas, two built-in nozzles for injecting liquid ingredients, ports for loading and unloading the mixer, and a port for venting displaced air. Two contoured doors (equipped with limit switches) give workers access for cleaning and inspection. Hard surfacing covers the ploughshare-type mixing tools and the choppers to prolong service life.

As the mixer's horizontal shaft rotates, it rapidly projects and hurls the ingredients away from the mixer walls into free space. The mixing action is thus a crisscross of material, first away from the vessel walls and then back again. A high volume of material also moves back and forth across the length of the vessel. There is little particle-to-particle impact and thus little degradation, even of fragile materials.

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The 600-liter mixer (left) launched Euroamerica's production of joint compound in 2000. The addition of products and high customer demand required the company to install a second, larger mixer in 2001.

The larger mixer (right) has a capacity of 2,000 liters. Like the first unit, it uses ploughshare-type mixing tools and choppers that aid dispersion and prevent lumps.

The mixing experience

German Gomez is Euroamerica's technical director. He helped to establish several of the company's manufacturing operations, including the mixing process at the mortar and admixtures plant. That is where the company makes its JPM joint compound. It also makes more than a dozen other products there, such as masonry mortars, adhesives, thin-set mortars, and grouts.

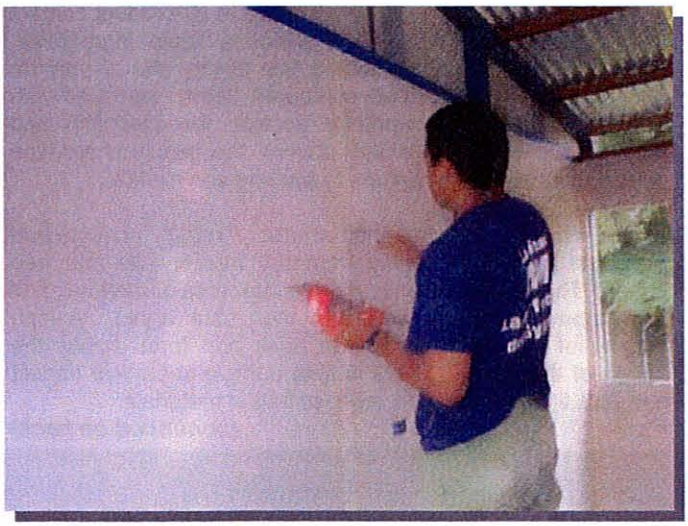
"We have obtained a very versatile machine," Gomez said. "The dispersion of the chopper system enables us to process lots of kinds of products, even those with high viscosity."

The two main ingredients in joint compound are calcium carbonate (60 percent) and water (up to 30 percent). Other ingredients are latex admixtures (less than 4 percent), filler (less than 4 percent), preservatives (less than 0.5 percent), and cellulose ethers (less than 0.5 percent). The dry ingredients are weighed, pre-mixed, and put into bags at the company's laboratory. Workers then empty the bags into the mixer. Pumps deliver the liquid ingredients.

Production of joint compound began in early 2000. Since that time, demand for the product has grown, and Euroamerica has added mortars, admixtures, and finishing compounds to its product line. To handle the higher volumes, the company installed a second mixer, also from Littleford Day, in 2001. It is an FKM-2000-D (4z), a larger version of the first mixer. It uses a 75 horsepower (56 kilowatt) drive and four choppers. Capacity is 2,000 liters.

The mixers have plenty of power to handle high-viscosity products.

In either mixer, mixing time is 15 to 22 minutes. "We just put in the ingredients, start mixing, and approximately 20 minutes later, we have ready-to-package products." Gomez said.



To empty products from the mixers, a worker opens the discharge port while the machine is still running, allowing the ploughshare-type mixing tools to propel the mixture toward the central outlet. It then flows to the packaging area, where compressed air forces it into 4– or 20-liter plastic containers. These are capped and readied for shipment. To ensure quality, each batch is sampled and tested for viscosity, putrefaction, and other properties.

Conclusion: The mortar and admixtures plant employs eight workers to produce and package the company's joint compound and other products. Over one shift, the workers typically operate the mixers for 5 hours, producing up to eight batches. The plant makes only one product during each day's production run, which eliminates the need to clean the mixers between batches. Instead, they are cleaned at day's end with pressure washers. That takes 30 minutes to 1 hour. Products for exterior use take more time to clean because they contain more latex and adhesives, Gomez said.

The only other maintenance item was the replacement of O-rings in the air-purged seals. Such reliability is critical to the success of the plant, Gomez said.

"The mixers are the heart of the production."

CUSTOMER:
E.A. Euroamerica S.A.
Caldera, Costa Rica

INDUSTRY:
Construction Materials

APPLICATION:
Joint Compound

LITTLEFORD EQUIPMENT:
FKM-600-D (2z) and FKM-2000-D (4z)

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