

SPECIAL REPORTS

Mixing, Blending & Size Reduction

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Mixer Uses Cost-Effective Coating Process For "Uniformly Blended Product," & Easy Cleaning!

Agriculture Warehouse, Inc. of Ennis, TX manufactures herbicides, insecticides and fungicides for the top 30 major agricultural chemical companies in the United States and Europe. The requirement to accommodate many customer's various needs posed great challenges for Agriculture Warehouse.

Typically, a customer will order five million pounds of a granular clay carrier coated or impregnated with a costly insecticide. Once this campaign has been formulated, packaged and warehoused for shipment, production personnel must flush all processing equipment and be prepared to blend another customer's three million pounds

of stone granules coated with expensive fungicide. This wide range of products requires stringent quality assurance procedures.

Agriculture Warehouse previously manufactured their customer's coated products with a 120 cubic foot capacity, trunion mounted, rotary drum mixer. Inconsistent finished products created additional labor costs to rework the material to customer specifications. Changeover between campaigns required the dis-assembly of internal mixing flights, inside and outside hot water flush, and re-assembly of certain flights depending on the density of the carrier. These ongoing production problems prompted Gene Hodges, general manager of Agricultural Warehouse, to research and develop a cost-effective alternative.

In April of 1987, Hodges contacted Continental Products Corp. of Milwaukee, WI, to arrange a series of coating and impregnating tests. Featuring their proprietary Mark V "ROLLO-MIXER," Continental operates a Test/Blend Center in Wisconsin. Continental simulates production-like conditions to match the customer's specific needs, utilizing the customer's own products to be blended.

Agriculture Warehouse's plant manager, Ron Jones, flew to Wisconsin to witness the coating of three of their carriers in the Continental "ROLLO-MIXER" System. These three separate tests consisted of: 1.) 1000 pounds of corn-cob granules with insecticide, 2.) 1000 pounds of limestone with herbicide and 3.) 1000 pounds of clay granules with fungicide. In each case, the liquid chemical was applied to the dry carrier via Continental's unique Free-Fall Impregnation System. This advanced coating and impregnating technology creates a consistent, uniform application of a (pre-measured) atomized spray pattern of liquids onto a free-falling curtain of dry particles. All three tests were concluded in one day and the coated product was shipped back to Texas for in-house laboratory analysis. The results proved that each carrier was uniformly coated with its given liquid, and the clean-up between batches was simple, without changing internal mixing flights for the different carrier densities.

In September, Agriculture Warehouse purchased a Continental "ROLLO-MIXER," Mark V, No. 86-200 designed for 24-hour continuous duty. This model provides a total batch size of 200 cubic feet, or 18,000 pounds. The carrier densities vary from corn-cob at 28 pounds/cubic foot to sand at 120

pounds/cubic foot, and the particle size ranges from - 50 mesh to as coarse as - 4 mesh. The liquid percentage to be sprayed on the carrier varies from 0.5 to 30 percent. This highly efficient mixer, arranged in a gravity-flo Vertical Blend System, allows Agriculture Warehouse to formulate and package products with consistent uniformity at lower operational costs.

Mix action in the Continental "ROLLO-MIXER" is likened to continuous rivers of material that course into and flow through one another in a random confluence that moves back and forth approximately three times in every revolution. This mixing action is one of positive displacement causing product to flow by gravity. Mixing action is continuous through all phases of the blend cycle, maintaining uniformity throughout discharge. Once the formula is mixed, it stays mixed, and will not over-mix or un-mix.

The batch blending system employed by Agriculture Warehouse consists of an 18,000 pound capacity Scale Hopper that is mounted directly above the Top Charging Hopper of the "ROLLO-MIXER." Once the carrier fills the Weigh-Hopper, the Hopper slide-gate will open and unload its contents into the mixer in a matter of seconds. The "ROLLO-MIXER" is fitted with a multiple tip Spray Lance Assembly. After the spray and post-mix phases are completed, the discharge chute automatically opens to unload the coated product into the bucket elevator. Coincidentally, during the spray, mix and discharge phases of the blend cycle, the scale-hopper will have been charged with the next batch of carrier to be coated, thus providing the ability to produce multiple batches each hour. The heavy-duty drive system allows the operator to stop and start the mixer while still under full load.

Jones noted that the "ROLLO-MIXER" offers them a two-fold advantage that they could not realize previously: inside visibility during the spray and mix phases, and easy access during the clean-up phase.

Citing increased demand for his latest coating technology and growing demand per customer sales projections, Hodges has ordered a second Continental "ROLLO-MIXER", Mark V, for delivery in 1991. Hodges feels that the second Model 86-200 will improve his productivity by helping him to isolate his herbicide products from the insecticide and fungicide production lines, providing even greater flexibility in meeting their customers' needs.



Unique free-fall impregnation coating process utilized by the Mark V "ROLLO-MIXER".



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