



New Compounding System Stores, Meters, Feeds and Weighs 14 Different Materials

The Company

Sigmaform Corp., Santa Clara, CA, manufacturers of heat-shrink products.

The Application

Various proprietary compounds require up to 14 different dry-bulk materials. Quantities of each are relatively small, the typical full batch weighing 100 lbs. or so. The materials are brought together in a single batch bucket, which is emptied into a mixer and then into process.

The Need

Most compounding was performed by an outside contractor; internal capabilities were limited to labor-intensive hand work. With demand growing for its custom compounds, Sigmaform decided to develop its own storage, handling and weigh system and to make it as fully automated as possible within the constraints of budget.

The Problem

With so many different materials, handling characteristics varied widely. Unaided gravity flow proved impossible. Further, the limited space available for equipment installation required special engineering design to accommodate the many components. None of the established equipment manufacturers in the compounding industry showed much interest in developing the Sigmaform system; none would guarantee that its design and components would perform satisfactorily.

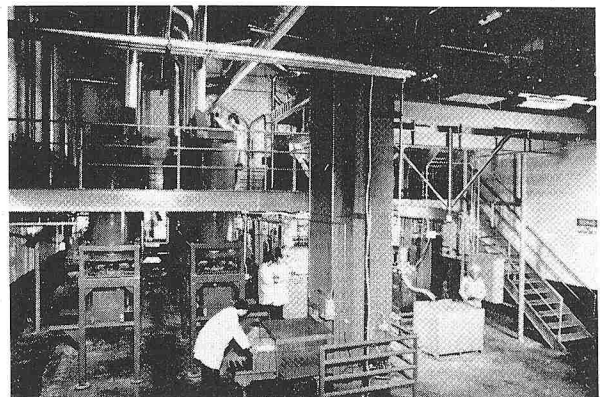
The Solution

An engineering review by Vibra Screw resulted in a decision that the problems were solvable and that a guarantee of satisfaction could be offered. Laboratory tests were conducted on all 14 materials to determine their handling and flow characteristics; full-scale tests were run on three of the most difficult-to-handle materials. Out of this research came a preliminary, and then a second, design. The latter met all of Sigmaform's criteria on cost, space, accuracy, reliability and expandability.

The system consists of 14 Live Bottom Bins, three vibrating screw feeders with integral hoppers, and a single weigh scale. The thrust of each bin gyrator is fine-tuned in accordance with the flow characteristics of the material. The feeders are fixed under the three most-often-used bins. The scale, on a wheeled platform, is moved under each feeder in turn and elevated to accept the full weight of the feeder and contents. The electronic control activates the gyrator, cut-off valve and feeder, and the loss-in-weight system achieves an accuracy of $\pm 1\%$. The process is repeated at the other two feeders. The remaining 11 bins are fitted with enclosed hoppers and, as required, materials are weighed and added to the batch by hand.

The Result

Sigmaform is now compounding almost all of its formulations internally, and meeting its increased schedule in timely fashion. With the addition of a dust-collection system, the company is operating in a clean, task-oriented environment. As growth requires, the Vibra Screw loss-in-weight system may be fully automated with additional feeders and a central conveying belt.



Two rows of Vibra Screw bins and batching equipment dominate the left side of Sigmaform compounding floor.