

How do I choose a batching system that will handle multiple product formulas?

SUPPLIERS' TIPS

When choosing a batching system to handle multiple product formulas, it's critical to choose a supplier that not only has all the hardware to physically handle the bulk and minor ingredients in an efficient and reliable manner but also one that can successfully design, build, and install the electronic controls and recipe-driven software to meet your specifications.

Control equipment is required to measure the quantity of material delivered (called *batch control*) and control the delivery system. The batch control device is normally selected as part of the ingredient delivery system because the supplier will have programs written for various PLC and weight controllers that are specific to their equipment's operation. During the concept phase, the supplier will select a suitable device based on your batch size, number of ingredients per batch, number of recipes, ingredient

quantities per recipe, batch cycle time, ingredient properties, location and environment, existing equipment, and other specification or criteria such as communication protocols with existing systems. Any PLC-based controls should be stand-alone and connected to a printer to generate batch record labels and production history or integrated into a larger control system that covers the whole production facility.

Mechanical equipment, such as conveyors, valves, and feeders, is required to deliver the ingredients. The control concept, ingredient delivery time, and quantity determine mechanical equipment selection. During the design phase, you and the supplier must consider the required ingredient accuracy per batch and batch repeatable accuracy. Weighing equipment selection is very important to achieve the required accuracy. This means the resolution of the weighing sys-

tem must equal the system capacity divided by its sensitivity. In simpler terms, choose an appropriately sized measuring system that provides the required accuracy. You should also consider suitably sized feed devices for major and minor ingredients, suitability of the selected devices for the working conditions, equipment layout and geometry, site location, and ingredient delivery logistics.

These are general considerations, since equipment and control device selection is typically budget-driven and the return on investment provides the justification for both supplier and equipment selection. There's a large variety of equipment to choose from in the marketplace, so you should also consider a supplier's previous experience and capabilities.

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What kind of testing should I expect my supplier to provide when I select an automated batching system?

Thorough testing is essential to determine which equipment configuration best meets your automated batching requirement. First, it's critical that the supplier's test facility contains a diverse equipment selection, even if you don't plan on purchasing an entire system. For example, your supplier should offer both mechanical and pneumatic conveying systems, ensuring that equipment recommendation is based on the most efficient solution for your specific application and not based on the limited equipment a supplier may offer. Similarly, if your system will incorporate bulk bag unloaders, the supplier should offer numerous types of unloaders, again ensuring that a limited equipment selection won't influence the recommendation.

Second, the test lab should be equipped with production-scale equipment, not miniature lab versions, and production-scale tests should be run on this equipment using your actual materials for a realistic simulation.

Third, the supplier should be thoroughly experienced in engineering and installing the equipment and systems upstream and downstream of your automated batching system, since its performance is often dependent on receiving uninterrupted volumes of source material as well as on blending and transporting weighed batches to other processes, storage facilities, or packaging lines.

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The type of testing will depend on the type of automated batching system you're considering. For instance, when selecting a loss-in-weight batch feeding system, a typical material test will consist of 30 individual batch samples measured from a check scale. The test samples compare the batch setpoint to the actual amount batched onto the check scale. This batch amount is measured and compared at 2 sigma for accuracy.

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Equipment suppliers are a valuable source of information about equipment and processes. In light of this, we occasionally ask suppliers a question of concern to our readers. Answers reflect the suppliers' general expertise and don't promote the suppliers' equipment. If you have a question you'd like suppliers to answer, send it to Alicia Tyznik, Associate Editor, Powder and Bulk Engineering, 1155 Northland Drive, St. Paul, MN 55120; fax 651-287-5650 (atyznik@cscpub.com).