

Suppliers' Tips

How can I evaluate whether to switch from manual to automatic batching in my process?

To evaluate whether to switch from manual to automatic batching requires a full review of several key factors, including:

Current manual process time. This includes the total time currently dedicated to the manual material transfer to the weigh station and the time required to manually weigh the batches. For example, when evaluating a system where bags are loaded to a process in a specific weight, the engineer must look at not only how long it takes to weigh the precise amount to go into the process, but also how long it takes for the operators to transfer and open the bags from their point of origin. An automated system with a type of pneumatic transfer device moving the material directly to a weigh station above the process could significantly decrease overall batch times, allowing additional batches to be run in a shift and increasing production efficiency.

Ingredient costs. A manual system can also include a high degree of error in actual batch accuracy, which creates added ingredient costs and variations in product quality. Integrating automatic batch weighing devices such as loss-in-weight (LIW) feeding devices or gain-in-weight hoppers on load cells in conjunction with volumetric feeding devices can help to improve overall batching accuracies considerably, saving on ingredient costs and increasing product quality.

Overall labor costs. In addition to the time requirements above, manual material transfer and ingredient weighing can be very labor intensive. Automation can reduce this labor cost significantly.

Recipe complexity. For recipes that require a large number of ingredients and many microingredients it may be more cost efficient to combine automated and manual batching. I recommend automated material handling and batching for the major and minor ingredients, with manual batch weighing of the microingredients. However, you should evaluate your application's ingredient costs, because some high-value microingredients can be batched using LIW feeders with very high accuracies, resulting in better ingredient cost savings.

Product and process safety requirements. Product and process safety and product quality can be improved with an automated batching system. A typical automated system transfers material from an unloading station to a batch weighing station. Various material containment design options can be easily integrated into this system to prevent product contamination or powder leakage into the plant environment. It's important to discuss the options available with your supplier when evaluating any automated batching system design.

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To evaluate whether to switch from manual bag dumping to automated weigh batching from bulk bags, determine how important the following improvements would be in your operation:

1. Purchasing bulk materials at lower cost in bulk bags than in hand-held sacks.
2. Fully containing dust during bulk bag hook-up, discharge, and disconnection.
3. Reducing or eliminating empty bag waste and disposal costs.
4. Reducing labor costs associated with manual bag handling.
5. Eliminating potential injury associated with manual bag handling.
6. Improving batch-to-batch and lot-to-lot weigh batching accuracy by eliminating manual counting, weighing, and other potential human error.
7. Programming batch weights and batching cycles locally or remotely.
8. Monitoring and documenting batching functions for traceability and quality control.

Similar advantages can be realized when converting from manual weighing and counting to automated batching systems that source ingredients from silos, day bins, and upstream processes.

You can also learn from the experience of other processors by searching online for articles on plants in your industry that have converted from manual to automated weigh batching of materials similar to yours.

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Automatic batching can be used when a fill time is very fast (a second or two), very slow (minutes or even hours), or is repetitive and can be unattended. Automated batching systems are ideal for filling ingredients to specified weight values, dispensing ingredients from weight-monitored supplies, and measuring large quantities of received material. These systems offer increased speed, eliminate the possibility of human error, and produce consistent results under repetitive conditions.

Manual batching can be difficult to automate if each batch being created is unique in weight or mix, or if the ingredients have varying or inconsistent flowrates. In these cases, a human can quickly adjust for changing requirements whereas a machine needs time to compensate for varying conditions — by using variable-speed gates, jog functions, or learning preact for example.

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