

The Benefits of Receiving Ingredients in Bulk Bags

Receiving ingredients in bulk bags rather than small bags can improve your plant's bottom line. This article gives practical, step-by-step advice on how your plant can make the switch. Sections cover exploring bulk bag handling; planning to convert your plant to handling bulk bags; meeting to establish the bulk bag spec, filled bag quality, bag rejection procedure, and whether the bags can be reused; as well as organizing your plant to handle bulk bags.

If you're receiving dry bulk ingredients in 55- or 100-pound bags, you've probably considered receiving the ingredients in bulk bags to save money. The easy part is calculating how much money you'll save per ingredient-pound based on annual usage. The hard part is determining how to handle bulk bags in your plant.

Bulk bags require different equipment for emptying the bags, as well as different handling procedures to ensure worker safety, to control dust, and to reuse or discard the bags. But if you want to make the switch, you're probably prepared to explore these differences further.

Exploring bulk bag handling

To start, you need to find someone who can help you select the correct bulk bag and work with you to determine how to receive, handle, store, empty, and discard the bags. A bulk bag manufacturer is typically knowledgeable about bulk bag capacity (for your ingredient weight), fabric strength, bag construction, and handling. Contact several bulk bag manufacturers, and inspect the literature and sample bags they send you.

But recommending equipment for emptying the bag is typically not the bulk bag manufacturer's strength. For this information, contact one or more bulk bag discharger manufacturers.

Also visit one or more installations that discharge bulk bags so you can see how the bulk bags are handled. In the process, you might discover that many companies that use bulk bags are discouraged. Perhaps the bags coming into the plant are unstable and can't be stacked. Possibly the bags don't discharge properly because the liner was folded over the outlet when the bag was filled and needs to be cut to empty the bag, spreading dust over the floor and workers. Or maybe the bags require more headroom than is available at the discharger location.

If sticking with small bags doesn't look so bad at this point, press on! Besides saving money with bulk bags, your competitors are probably switching to them and even your ingredient supplier is probably emphasizing their advantages. And you can keep the bulk bag problems that plague other plants from affecting your own by carefully planning your plant conversion.

Planning to convert your plant to handling bulk bags

Three planning steps are critical to a successful plant conversion.

Step 1. Once you've received literature and sample bags from the bulk bag manufacturers you've contacted, and you've also visited installations that discharge bulk bags, examine literature and any videotaped discharger demonstrations from the bulk bag discharger manufacturers.

Step 2. Some bulk bag discharger manufacturers also offer test center demonstrations. Plan to attend a manufacturer's demonstration, which typically lasts a full day. The manufacturer will charge for the demonstration, but the money will be well spent because you'll learn much about discharging bulk bags and receive hands-on training.

Before the visit, ship one or two bulk bags filled with your ingredient (or ingredients) to the manufacturer's test center, along with details of your discharging requirements (such as rate and dust containment). If your ingredient is a food, pharmaceutical, or hygroscopic material and requires a bulk bag with a polyethylene liner, ask the test center to demonstrate discharging with two or more discharges and bags that have different liners. Then you can see how each type of liner and discharger works as the liner is secured, punctured, and removed at discharge. (If your ingredient is toxic, ship a nontoxic simulant because a test center isn't equipped to handle toxic materials).

At the demonstration, the test center will discharge your ingredient from different bulk bags using various dischargers. You'll see first-hand how the equipment works, how dust is controlled, and how the bulk bags are handled and emptied. Ask the test center to refill your ingredient into bulk bags and ship them back to you after the demonstration.

Step 3. When you're comfortable with your bulk bag knowledge, determine how feasible it is to handle bulk bags in your plant. Consider these points: what bag size is right for your ingredient weight, whether your plant can handle stacked bulk bags, how the bulk bags will be lifted and moved, whether there's enough headroom at the discharge location, and what type of bulk bag outlet and discharge technique you need.

What bag size (height and base) is right for your ingredient weight? To contain about 1 ton of ingredient, typical bulk bag height (measured as side-seam height) ranges from 30 to 70 inches, and the base size (measured as base-seam dimensions) is commonly either 35 inches square or 35 by 41 inches. Ensure the bag height is tall enough to contain your ingredient weight but not so tall that it makes the bag unstable. Select a base size as large as possible for safely stacking the filled bags, and ensure the base size will permit press-fitting the filled bags on pallets into your truck or shipping container.

Can your plant handle stacked bulk bags? As long as the bulk bags are filled correctly – with straight sides, with the ingredient compacted to its highest bulk density, and with no more than 2 inches of fabric above the ingredient surface – the bags can be stacked two or three high on pallets. Three high is most efficient, but isn't always possible, depending on available headroom in your handling area and on the bag stability.

How will the bulk bags be lifted and moved in your plant? A bulk bag can be moved either by a forklift truck (with or without pallets) or by a hoist (without pallets). When placed on a pallet, the bag is lifted from its bottom. Without a pallet, the bag is lifted from its corner lifting loops.

Is there enough headroom at the discharge location? You'll need about 12 feet of headroom so a forklift truck or hoist can lift a bulk bag above the discharger's top (4 to 6 feet above the floor) without touching the ceiling. If you locate your discharger above downstream equipment, you'll need more headroom. If you lack sufficient headroom, you can locate the discharger to one side of the downstream equipment and use an inclined conveyor to move the discharged ingredient above the downstream equipment.

What type of bulk bag outlet and discharge technique will provide the production rate and dust containment you need? A bulk bag outlet is tied, and a bulk bag discharger has an access door that permits the operator to reach the bag bottom to untie the outlet. The outlet style varies, depending on whether the bag is lined. If you must contain dust, you'll need a lined bag and, at discharge, you must untie the outlet and seal the liner to the downstream process piping. This step takes extra time when readying the bulk bag for discharge.

Meeting to establish the bulk bag spec, filled bag quality, bag rejection procedure, and whether the bags can be reused

Now that you've established whether using bulk bags is feasible, meet jointly with your ingredient suppliers, their bulk bag suppliers, a bulk bag discharger sales engineer, and perhaps a sales engineer from a bulk bag filler manufacturer.

Bulk bag spec. At the meeting, establish your bulk bag spec. The spec may reflect a compromise between what you want and what your ingredient supplier is prepared to use. But if you're a valued customer, the supplier will probably use the bags you want. And if your bag spec improves the supplier's current spec, satisfying your request will upgrade the supplier's filled bag quality.

Filled bag quality. Establish the quality of the filled bulk bag you expect to receive. If a bag doesn't meet the quality you've agreed on, you can reject it. Points to agree on include the pallet size, type, and quality; filled bag stability; filling weight precision; and liner conditioning.

Pallet size, type and quality. Pallet choice is limited to which pallets are readily available and how well the pallet suits your bulk bag size. A close-slatted pallet top prevents a bag from sagging between the slats, where it can be punctured by forklift truck tines. And if the pallet will be stacked on another bag on a pallet, the pallet bottom should also be close-slatted to prevent the forklift truck tines from skewering the top of the bag under the pallet. Wood for constructing pallets is expensive, and by stacking more than one bag on a pallet your ingredient supplier can reduce pallet use.

Filled bag stability. The filling process and the care taken in loading the filled bag determine how stable and erect the bag will be. You can decide not to accept a bag that has been improperly filled or loaded and has fallen over inside the truck or shipping container. Trying to right such a bag can be dangerous.

Filling weight precision. Typically, the bulk bag filler determines filling weight precision. However, if a fine powder is shipped in an unlined, old or punctured bag, the powder can leak from the seams, the fabric weave, or the puncture.

Liner conditioning. If your ingredient supplier doesn't properly place the liner in the bulk bag, the liner can fold over itself in the bag bottom and severely restrict proper discharge. This can require you to cut the liner with a knife, which is unsafe and unsanitary, exposes the operator to the ingredient, and can leave liner fragments or even a knife in the ingredient.

Procedure for rejecting nonspec bags. Establish the procedure you'll use to reject any filled bag that doesn't meet your spec or quality requirements. To reject a bag, leave it on the truck or shipping container and return it to the ingredient supplier. This is costly for the ingredient supplier, who has to pay extra freight costs for the returned bag and may have to refill the bag. However, the International Standards Organization (ISO) 9000 quality standards designate that a bulk bag shipped internationally and transferred between countries can be rejected at transfer points before the bag reaches the customer, which can the freight costs for returned bags.

Determine if the bags can be reused and establish reuse requirements. If your emptied bulk bags are clean enough to meet your reuse requirements (which is especially important if you handle a toxic or sanitary ingredient), you can consider reusing the bags. One bulk bag typically costs between \$12 and \$20, and reusing the bag for several ingredient deliveries cuts the costs per delivery.

However, be aware that a bulk bag is guaranteed for only the first shipment discharge. Each refill and discharge weakens the bag. The lifting loops are critical to bag safety and are typically rated at 5:1 safety factor. If you plan to reuse the bag, specify lifting loops with a 6:1 safety factor.

Ensure any used bag returned for refill is free of punctures and is as clean as possible inside and outside. To return the bag, collapse it (ensuring dusty air is exhausted), fold it (manually or with bag-folding equipment), strap it onto a pallet (typically with 10 to 15 other bags), and return it to your ingredient supplier.

Organizing your plant to handle bulk bags

If your meeting was productive, you can now begin to organize your plant and order the necessary equipment to receive bulk bags. Organizing the plant primarily requires selecting the staging areas for receiving and storing the bulk bags, for transferring the bags to the dischargers, and for handling the empty bags and liners. The equipment you'll need includes the dischargers, transfer conveyors (if required to move discharged ingredient to downstream equipment), lifting equipment such as forklift trucks or hoists, dust collectors, optional bag-folding equipment, and any structures required to support this equipment.

In conclusion

Bringing all parties together at the outset will help you properly plan and design your bulk bag handling and discharge operation. In this way you'll not only avoid the financial pitfalls faced by other plants with less well-planned bulk bag handling operations, you'll also achieve several benefits. Using bulk bags will save money per ingredient-pound and reduce labor costs. And as long as you select the right discharger, each bulk bag will empty completely, providing more usable ingredient than small bags, which can retain ingredient and thus add cost. Finally, you can contain dust during bulk bag discharge and reuse the bulk bags, which are two more advantages over using small bags.

Control and Metering Ltd

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