The Case for Bulk Glass Conversion

A number of business reasons drive the decision to move from re-shipper to bulk glass, which is becoming more widely accepted. While cost savings is usually not the primary driving factor for bulk glass conversion, savings are indeed realized over time in the areas of higher throughput, shipping efficiency, less corrugate waste, and workforce efficiency. Building the business case for bulk glass conversion may include multiple factors:

- Improvements in Overall Equipment Effectiveness (OEE)
- Flexibility in production scheduling (enabling customer-driven production and mass customization)
- Higher efficiency production equipment and conveyor systems
- Increased bottle accumulation and space management
- Improved packaging efficiency to meet demand of new production lines
- Increased cost savings (usually last consideration)
- Changes in supply chain; re-shipper begins to offer bulk
- Reduction of costs related to damage in packaging, cost of operating conveyor systems for empty carton handling, and labor costs for manual packaging processes

According to the latest Packaging Machinery Manufacturing Institute (PMMI) report of 2010, shipments for packaging equipment have increased by 12 percent over 2009. Beverages accounted for the second largest market for machinery purchases trailing only food for investments made in packaging machinery. This trend is being driven by the challenge to meet the growing and quickly changing demands of the customer.

Solutions to resolve these issues are also included in the overall business case and include goals such as reducing the complexity in the case packer and sealing system, eliminating the de-caser and bottle picker, and eliminating carton damage during case handling or bottle picking.

Key Benefits in the Manufacturing Process

While direct cost savings and measurable ROI are not always the driving factors in bulk glass conversions, manufacturers who have converted from case shipper to bulk have reported benefits throughout the manufacturing process. The benefits realized are best viewed end-to-end as multiple processes are impacted by bulk glass conversion. Several of the benefits and the related production points include:

- Reduction in inbound freight costs due to ability to receive almost 50 percent more bottles in bulk versus the case shipper method
- Savings by elimination of re-shipper upcharge to set up cases and fill with empty bottles
- Savings in reduction of “pay-to-convey” of empty cases while bottles are on the line
- Savings in labor costs due to increased automation allowing for better utilization of labor resources between lines or even workforce reduction on production line
- Higher/faster production with the ability to run more cases per day to meet customer demand in less time
- Less downtime during case repacking with upgraded packing equipment for bulk glass systems
- Reduction in waste from obsolete packaging materials for test products, market tests, seasonal promotions, etc.
- Flexibility to mass produce and custom label product on the same line

- Better use and reduction of corrugate (ability to use lighter weight due to less handling); some manufacturers report approximately 15% less corrugate usage after bulk glass conversions.

Sustainability

Bulk glass may even help manufacturers attain sustainability goals. Manufacturers may realize a reduction in fuel usage and packaging materials, as bulk glass requires less transport to deliver a higher number of bottles per shipment (incoming/outgoing).

Conversion in packaging also reduces production waste, a key factor particularly in Europe where bulk glass has been used since the early 1990s. This is primarily due to Directive 99/31/EC, enacted by the European Union to reduce environmental waste and pollution. Violation fines and fees levied by the European Union have driven technological and process changes designed to reduce waste in all areas of European manufacturing. The same environmental initiatives are in place in many locations across the United States.

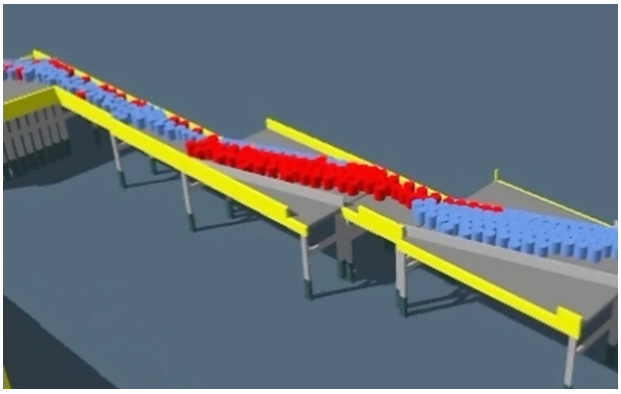
Questions to Ask

Manufacturers who have successfully converted to bulk glass recommend that others considering the move to bulk glass conduct an end-to-end process review before making a decision to convert. Among the questions to consider are the following:

- Do you have high volume production lines?
- Do you have the space for bulk glass storage and handling, and case forming machinery?
- Do all of your cases need to be pre-printed and customized for each product?
- Are you having bottle case packing issues?
- Do you experience case damage due to bottle picking and excessive case handling?

Simulation

The use of a simulation tool in conversion planning allows the manufacturer to visualize and actually run the new production process with the bulk glass packaging process from end-to-end. Simulation provides the ability to address multiple variables and scenarios without impacting cost or production. Ultimately, simulation helps to inform decisions in space utilization, equipment placement, transportation considerations and overall production efficiency.



Case Study

This case study reviews the steps a world-class bottling facility took in converting to bulk glass. The very nature of the manufacturing challenge suggested bulk glass as a viable solution, but the manufacturer carefully weighed all the options.

The Challenge. A bottling facility was running nearly 20 lines and continually increasing production capacity. Its existing re-shipper system could not effectively meet future production rates. The goal was to convert facility-integrated, vertical glass plants to bulk glass as existing production lines were converted and new lines were added. The manufacturer anticipated substantial savings in the reduction of labor through new automation in the packaging area. (It's important to note that this manufacturer currently runs both re-shipper and bulk glass systems, as there are reasons to maintain this flexibility in their supply chain.)

Project Considerations. As with most bulk glass conversions, determining the right space and location for the new bulk glass operation without impacting the existing production facility or other existing operations such as maintenance and storage was one of the biggest challenges. Evaluations included relocation and space requirements for equipment, power, better location of material supply in relation to the production area, and short-term and long-term expansion of production lines. The manufacturer had multiple material sourcing (glass plant) centers to be converted to bulk glass shops.

Key business drivers for this bulk glass conversion were:

- Lower the cost of goods sold
- Create higher density storage
- Reduce corrugate needs (cases and inserts)
- Automate the unloading function reducing steps in the process

Impact on Strategic Growth. Bulk glass production was integrated into the design and operating philosophy of new lines within the plant. Existing lines were evaluated and converted where a decrease in production costs paid for capital investment. With a conversion to bulk from re-shipper cases, the bottler was able to maximize the value of each bottling line and facilitate future expansion within the facility.

Outcomes. By careful planning in the preliminary stages of the project, the bottling manufacturer was able to identify a number of areas of benefit and cost savings.

Because a bulk glass conversion impacts the entire production process, the discovery of the outcome often only becomes apparent over time.

- Increase in end-to-end throughput due to the automation of glass depalletizer which is faster and less complicated than case unloader/packer
- Improved quality and lighter weight corrugate due to less handling
- Reduction in corrugate material by move to partition-less packaging
- Decrease in glass storage space by almost 33%
- Decrease in rework for labeling and elimination of obsolete materials
- Decrease in the time to market for new or special product
- Conversion of material sourcing centers provided the ability to shift workforce resources between glass shops creating labor resource savings

An Unexpected Challenge. Due to specialized packaging materials required for palletized bulk glass, the amount of dunnage– empty pallets, straps, plastic wrap, slip sheets, top cap and frame – was greater than anticipated. Given the rate of the production line, dunnage easily accumulated at five to six pallets of material per hour. This process required dedicated resources to forklift and remove dunnage from the depalletizing and bottling areas.

Lessons Learned. The bottler continues to convert existing lines to bulk glass in accordance with its long-range plan. Through careful planning, the conversions have been successful with recognizable benefits and cost savings to the manufacturer. For manufacturing facilities considering a bulk glass conversion, this bottler offers some words of advice.

- Keep it simple when planning. Don't overcomplicate the process and convert only when it really makes sense.
- Approach the conversion as a long-term capital plan.
- Plan for the whole process end-to-end, not just the bottling line.
- Modifications on a line do not necessarily dictate a conversion to bulk glass.
- Evaluate other bulk glass operations and make the trip yourself to see the process live. European bottlers have been running bulk glass and trying bulk handling innovations longer than US operations.