

**BRIEF:** Shipping bulk liquids from point A to point B while ensuring product integrity and keeping costs down can be a challenge. With numerous shipping container options available, it's not always easy to discern quickly which system will prove to be the most efficient and cost-effective in the long run. Add in the increasing customer demand to reduce your environmental impact while ensuring supply chain efficiency, and there's much to consider.

Hygiene concerns also play a key role when it comes to handling, shipping and storing food and beverage products. A Food Logistics article by Maria Hoffman notes that, "according to the Centers for Disease Control and Prevention, in 2011 contaminated food caused 47.8 million cases of illness throughout the U.S. Therefore, regulations such as the federal Food Safety Modernization Act (FSMA) can positively impact the safety of food products throughout the supply chain."<sup>1</sup> As a result of ongoing public safety concerns, regulations like FSMA will continue to significantly impact the food industry for years to come.

In order to meet these regulatory and environmental demands, there is a growing trend toward the utilization of reusable packaging which ultimately allows users to "Cut Cost, Eliminate Waste and Mitigate Risk™."

## Bulk Liquid Shipping Containers: One Size Does Not Fit All

So, how do you choose a shipping container to meet the needs and various requirements of all your supply chain partners? When it comes to shipping bulk food, beverage and other liquids, consider these factors:

- What's the nature of the product you're shipping?
  - Viscosity – If product is thick or highly-viscous, it may be difficult to completely empty from some containers
  - Hazardous – Any hazardous-rated liquid products need to be transported in distinctive UN-Rated containers
  - Exposure – Some fluids are sensitive to oxygen exposure and require special considerations
- What volume of product are you shipping?
- If you're shipping more than 3,000 gallons or 30,000 lbs of product per month, an IBC may be optimal, however for some extremely high volumes, a bulk tanker truck may be the best option. Conversely, manufacturers with very low volumes might consider 5-gallon pails or smaller bag-in-box options for their liquids.
- What if your end-user's processing equipment requires you ship in specified batch sizes? You'll need to limit your container to the required batch amount.
- How does your facility's equipment impact your options?
- Would modifying your filling or decanting equipment allow your company or customer to save money or become more streamlined? Evaluate whether changes to your equipment will reduce costs or improve profits down the road.
- Keeping in mind the type and volume of product you're shipping, as well as your current operational setup, will be critical as you evaluate your bulk packaging options.



## WHAT ARE THE OPTIONS?

After answering the above questions, assume you have determined an IBC (intermediate bulk container) ranging in size from 55-gallons to 330-gallons is the appropriate size for your transport and storage needs. You can now compare the most common packaging options in this category.

### 55-Gallon Drum -

The Old Standard May Be Starting to Show Its Age

There are many different types of shipping drums, including steel, plastic, and fiber.

For the most part however they are all very similar in that they typically require a liner or coating for food hygiene safety and a pallet and strapping for safe movement.



Shipping drums have been around for generations and have certainly proved their value over the years, but come with

### CHALLENGES:

- *Non-collapsible*
- *Limited stackability*
- *Hygiene concerns*
- *Safety hazards*
- *Product waste = lost profit*
- *Capital intensive*

Challenges	Strengths
Significant space is required to store empty drums	Products limited to 55 gallon batch sizes
Expensive & Unsustainable <ul style="list-style-type: none"> <li>• Empty drums require 4 times as many trucks as collapsible containers for return delivery, consuming more fuel and generating more gas emissions</li> <li>• Pallets and strapping are additional costs and hassle</li> </ul>	Hazardous products (drums are available as UN-Rated containers, but not all drums are UN-Rated)
Labor intensive <ul style="list-style-type: none"> <li>• 1 tote = 5.5 drums for the same product volume - greatly increasing labor required to fill/decant drums as well as move them in facilities and on/off of transport vehicles</li> </ul>	Smaller, inconsistent volumes
Safety issues with drums include rolling to move, pinched fingers from drum lids and limited/unstable stackability in facilities	Customers limited in their ability to handle larger containers
Requires sourcing materials from multiple vendors	
Warehouse Clean-Up & Disposal <ul style="list-style-type: none"> <li>• Wood chips, strapping and pallets can leave a mess, causing hygiene concerns and requiring disposal</li> </ul>	

concerns in terms of maneuverability, safety and storage.

## Corrugated Containers:

A Lightweight Solution That Can Fold Under Pressure

Corrugated containers typically have a 275-gallon capacity, but are available in several other sizes as well. Similar to drums, corrugated totes require additional components, including a liner, separate pallet and strapping to secure the tote in transit.



As the *Food Logistics* article by Hoffman explains, “food companies are looking for accountability from their suppliers and they want to ensure that the equipment used when shipping product is compliant with state and federal regulations.”<sup>2</sup>

Corrugated containers are easy to ship when empty and good for inconsistent or low volume products, however they can easily be damaged and are prone to hygiene issues.

### CHALLENGES:

- Large storage space required
- More expensive
- Less sustainable
- Labor intensive
- Safety hazards

Challenges	Strengths
Limited Stackability - Typically stack 2-high when full, requiring more warehouse floor space and can't be stacked in transit, requiring more trucks	Good for international shipments
Less durable and secure than other options, risking product protection	Good for inconsistent volumes
Safety issues include hazardous strapping removal and precarious stackability	Delivered set-up or collapsed
Hygiene Concerns – If cardboard gets too wet, bacteria can form. Additionally, corrugate dust, strapping and pallets mean additional cleanup and disposal after use.	
Not So Green - Corrugate material utilizes more trees than alternatives, working against initiatives to become more environmentally friendly	
Added cost with requirement of pallets, strapping and disposal	

Consider the strengths and challenges below:

## Non-Collapsible Containers:

Not All They're Stacked up To Be

Typical non-collapsible container options include Bottle-In-Cage (BIC), Stainless Steel and Plastic Rigid totes. More sophisticated than either drums or corrugated containers, these options each have a built-in pallet. Additionally, the BIC & Stainless Steel containers can be approved for shipping UN-Rated materials, while the Plastic Rigid tote offers an insulated wall to effectively maintain product temperature. While valuable, the trade-off with these containers is that their inability to collapse requires more storage space and additional trucks to transport, resulting in added cost and waste.

Like all the options presented in this white paper, non-collapsible IBCs have strengths and challenges to consider. Built-in pallets and durability are favorable, while wasted product, heavy payload & transport inefficiency are tradeoffs.

### CHALLENGES:

- *Require significant storage space with lack of collapsibility and stackability when empty*
- *Lack of tamper evidency features cause safety concerns*
- *Hygiene concern - Cross-contamination from food or mold hiding in harborage areas*
- *Capital Intensive & Expensive -*
  - » *Often leave residual product, resulting in lost profits*
  - » *Containers are costly to purchase and draw funds away from core business*
  - » *Owned fleets are costly to maintain due to in-house cleaning, repairs, tracking*
- *Requires significantly more transportation to ship when empty compared to a collapsible container, resulting in increased costs, fuel consumption and harmful fuel emissions*

			
<b>About</b>	BIC is a plastic container with a protective steel or aluminum cage, offered typically in 275-gallon capacity, with other sizes also available	Stainless Steel containers feature heavy-duty construction and are most commonly used in 330-gallon capacity	Rigid-walled plastic containers have insulated walls and typically hold 260-gallons
<b>Stackability</b>	3-High when empty; Not always stable	3-High when empty	2 High
<b>Freight</b>	3.5 Times as many trucks required for return freight	3 Times as many trucks required for return freight	3 Times as many trucks required for return freight
<b>Unique Challenges</b>	<ul style="list-style-type: none"> <li>• Triple rinse wash requirements waste large amounts of water</li> <li>• A layer of product skin forms when exposed to air, resulting in wasted product and lost profits</li> </ul>	Heavy container tare weight reduces truck payload efficiency	<ul style="list-style-type: none"> <li>• Must often be discarded when just a part of the container is damaged</li> <li>• Not all components are recyclable at end of life</li> </ul>

## Plastic Collapsible Totes:

The Future, Here Today

Plastic collapsible totes, such as CHEP 315-gallon containers with built-in pallets, are constructed of high-density polypropylene for durability and utilize a new sanitary liner for every trip. These containers offer significant efficiencies in labor, storage and transport while reducing overall costs and minimizing environmental waste when compared to alternatives. Reusability and collapsibility enable users to significantly reduce their overall carbon footprint, while translating into savings over the life of the container.



In Hoffman's article, CHEP's VP of Sales & Marketing, Drew Merrill, explains that "reusable shipping containers require 39 percent less total energy."<sup>3</sup>

### STRENGTHS:

- *Collapsible*
- *Optimize freight and storage*
- *Hygienic and safe*
- *Eliminates product waste*
- *All-Inclusive Container Management*

Plastic Collapsible Containers	Good For:
Safely stack 5-high when full or 12-high when collapsed to save space	Consistent Volumes
1 Plastic Collapsible truckload = 3-4 Trucks required for the same volume of many non-collapsible alternatives	Saving capital for core business
Set-up container in 30 seconds for labor efficiency	Optimizing freight
Integrated pallet and no strapping required	Reducing carbon gas emissions
CHEP components are 100% recyclable	Cutting Cost, Eliminating Waste, Mitigating Risk™
Hygienic, smooth walls = Easy cleaning/reduced cross-contamination potential	
Center sump to ensure maximum product is emptied at end user, every time	
All-inclusive Trip option includes container rental, empty container delivery/pickup, liner, tracking (24/7 fleet visibility), cleaning, repair and offsite storage	
Rental allows you to save capital for your core business	

*For assistance with this selection process, [contact CHEP](#) to receive a complimentary footprint analysis.*

As a result of its hygienic design, larger capacity, collapsibility and lower costs, plastic collapsible containers, like the CHEP-315, are among the primary packaging choices for manufacturers today.

## CHOOSING THE BEST IBC FOR YOUR SUPPLY CHAIN

Keeping in mind the strengths and challenges associated with all of the above bulk container options, you must also consider your unique supply chain needs. Using the questions in the first section of this article as a guide, you will be able to easily determine which packaging solution is ideal for your business.

Once you've decided which container is right for your business, check out the next white paper in this series, [Pooling Drives Demand Curve](#), to evaluate whether purchasing or renting IBCs will work best for you!

### References:

1 – 3 from “Advances In Liquid Bulk Equipment Include Bulk Liquid Storage Containers from CHEP,” by Maria Hoffman, Food Logistics, May 17, 2012