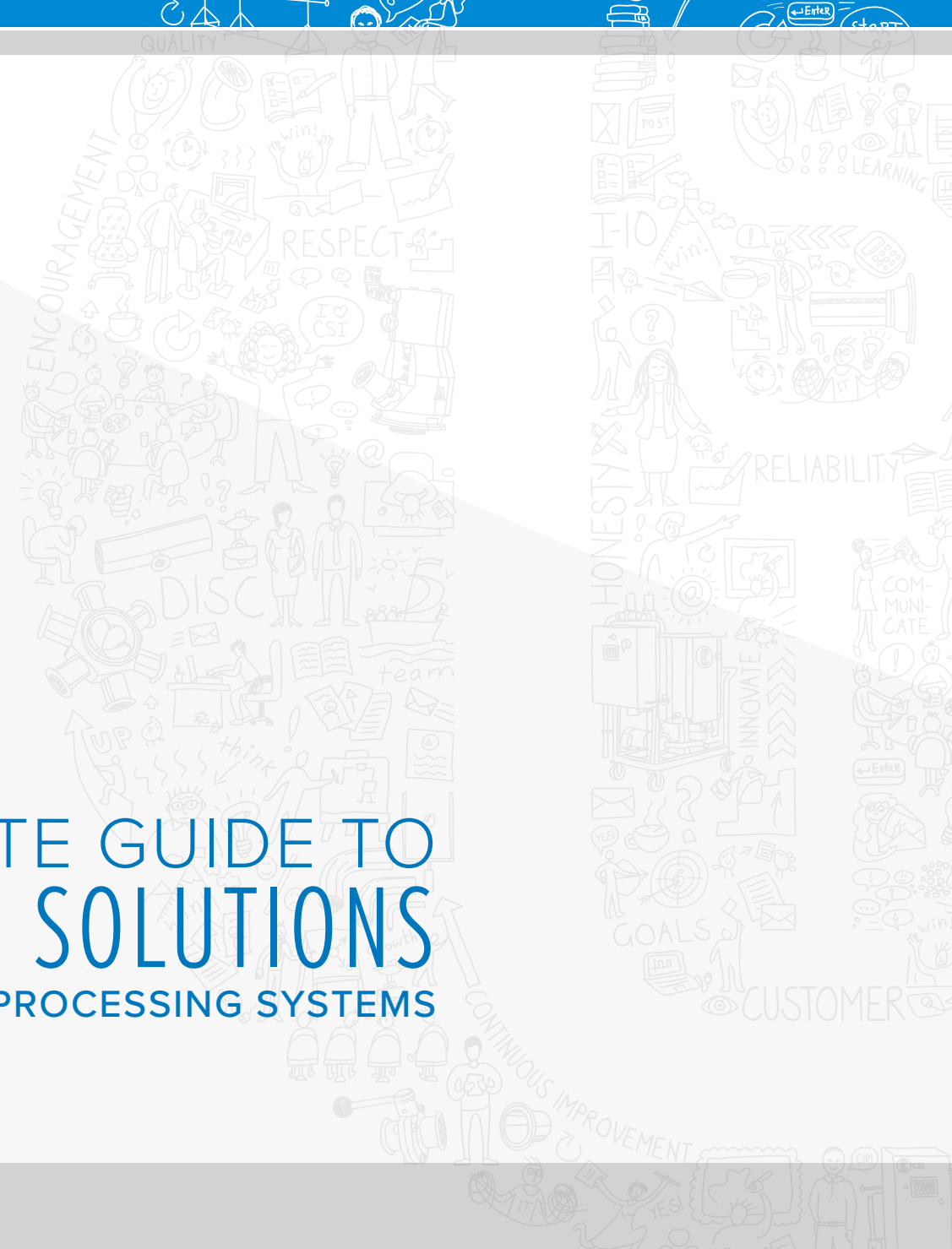




CSI

eBOOK



COMPLETE GUIDE TO IBC TOTE SOLUTIONS FOR HYGIENIC PROCESSING SYSTEMS

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INTRODUCTION

This guide is focused on a relatively specialized subject in the world of processing systems— industrial-grade reusable containers, and how to care for and maintain them. We will focus on a particular type of industrial reusable container called an intermediate bulk container, or IBC, which is widely used in both the hygienic processing industries and other industrial applications for moving and storing bulk liquid ingredients. We will provide, an overview of the range of products in the marketplace that have been introduced for the maintenance of these unique containers, both for hygienic and for non-hygienic applications. IBCs provide for a more efficient solution than standard drums for the storage and movement of materials used in the processing industries.

This guide is intended for processing plant operations personnel who are responsible for the safe and efficient movement and storage of bulk materials and ingredients used in production. The proper use and maintenance of IBCs will ensure that these products retain their hygienic nature, if required, and will maximize their efficiency in daily operations.



OVERVIEW OF IBC'S

As previously mentioned, IBCs are used in the processing industries for storing and transporting bulk liquids, pastes, and powders used in the production of [food products](#), and [health and beauty products](#), as well as in other non-sanitary chemical processing applications. They are also known as IBC totes, IBC tanks, or IBC pallets (note that IBCs can also come in stainless steel styles). Regardless of the name, these containers come in both flexible and rigid configurations. Rigid IBC totes are stackable, reusable vessels with an integrated pallet base mount that provides for forklift and/or pallet jack maneuverability. Flexible IBC totes, in turn, feature sides that fold inward when the unit is empty, allowing it to collapse into a much smaller package for return shipment or storage.

IBC totes are manufactured from various materials, including high density plastic (e.g., polyethylene), compound materials (e.g., galvanized steel frames surrounding a plastic container), carbon steel, and stainless steel (both 304 and 316/316L grades). For sanitary product storage and transport in the food & [beverage](#) industries, the preferred tote is rigid polyethylene with a stainless steel frame.

The term “intermediate” in the IBC name comes from the volume that these containers can carry, which falls in-between the capacities of large storage tanks and traditional 55-gallon drums. The two most common rigid IBC tanks used in sanitary processing operations come in either 275-gallon or 330-gallon sizes.

In comparison to other methods of product storage and transportation, IBCs offer several significant advantages:

- Most IBCs are cube-shaped, and this engineered design contributes to the packaging, storing, shipping, and overall space efficiency of these vessels.
- Rigid IBCs feature integrated pallet bases that

are designed for easy maneuvering via forklift or pallet jack. Most are also designed so that they may be stacked vertically on top of one another to minimize storage footprints. IBCs also generally feature a built-in tap (valve, spigot, or faucet) at the bottom of the container to which hoses can be attached, or through which the contents may be poured or pumped into smaller containers. A larger opening located on the top of the tote may also be used for filling or emptying the container.

- Most importantly, in comparison to pallets of 55-gallon drums, IBCs are capable of carrying equivalent volumes of product in less shipping space, and with fewer logistical steps involved. For example, four 330-gallon IBC pallets would contain the volumetric equivalent of twenty-four 55-gallon drums occupying six pallets, effectively saving two pallet spaces. And, unlike the case with standard 55-gallon drums, IBCs may be manufactured in a variety of heights yielding various container volumes (although the base dimensions are fixed for standardized moving and shipping purposes).



CARE AND CLEANING

IBCs are used to ship, handle, and store a variety of materials, including but not limited to the following:

- Liquid food ingredients.
- Food syrups such as corn syrup, maple syrup, or molasses
- In vineyards, wine fermentation and spirits production

The IBCs used for these purposes are designed for reuse, and hence must be cleaned every time they're used. Since totes are portable vessels, and not integrated into a process line, they are generally cleaned using clean-out-of-place (COP) methods, not [clean-in-place \(CIP\)](#).

A number of best practices have been developed for the proper maintenance of IBC totes, including the following:

- Meet regular inspection requirements. The U.S. government mandates that all IBCs must be inspected after manufacturing, and then every 2.5 years after that. In these inspections, totes must pass a leak test to ensure that they are keeping liquids and solids contained. And after every five years, totes must be inspected internally to look for any damage to the liner.
- Use professional cleaning services. If unsure about how to properly clean an IBC tote, or if unlicensed to do so, hire a professional cleaning service to clean these vessels. For commercial businesses in the processing industries which must clean totes frequently (if not daily), later sections of this guide will provide an overview of the specialized products that allow process plant operators to clean and maintain totes both thoroughly and safely.

- Use caution when moving or lifting totes. Totes come with a discharge valve for draining products, and care must be exercised when moving or lifting totes to ensure that this valve isn't damaged. Totes can be lifted from any side, however, more commonly from the front or the back. Operators should avoid coming into contact with the valve when lifting. Proceed slowly, and try to keep the contents as steady as possible to avoid any sudden shifts in weight.
- Remove lids slowly. Contents inside a tote may build up pressure during moving and storage, and especially so if the tote contains liquids. Slowly release the bung on the tote's lid to let pressure out gradually. If this precaution is not taken, the bung may fly off, or the contents may burst out of the container.
- Finally, avoid overfilling the container. When filled, ensure that the tank valve is closed tightly and that a second closure has been installed prior to moving the IBC.

SPECIALIZED PRODUCTS FOR IBC MAINTENANCE

Processing plant operators who plan on cleaning and maintaining IBCs themselves can rely on a number of specialized IBC tote products available from [CSI](#) to assist them, including the following:

Cleaning Spray Devices

[These products](#) are used to clean the interior walls of totes and tanks to remove product residues in-between uses. There are two basic types of spray devices. [Rotary spray cleaners](#) use a revolving flat spray under medium pressure (15-40 PSI) and flow rates (12-75 GPM) to penetrate films and dislodge soils. They are best used for the low-impact cleaning of water-soluble products such as powders and other easy-to-clean residues. In contrast, [rotary spray jets](#) use a revolving, multiple-arm jet spray device operating under high pressure (30-800 PSI) and flow rates (12-20 GPM) to thoroughly clean all interior surfaces of totes and tanks, covering 360° of the vessel's surface. To improve cleaning efficiencies or aid in sterilization, the cleaning fluids used with rotary spray jets can be heated to high temperatures.

Jet Spray Cleaners

CSI is a master distributor of [Alfa Laval](#) sanitary equipment featuring a full line of rotary jet spray cleaners for cleaning drums, tanks, and IBC totes used in both hygienic and industrial applications. These are a self-cleaning, self-draining spray jet that affords easy installation, disassembly, and inspection. Product users report up to an 85% reduction in time spent on tote and tank cleaning, and an 80% reduction in water and solvent usage.



Alfa Laval GJ9
Rotary Jet Cleaner



Alfa Laval SaniMidget
Rotary Spray Cleaner

TrueClean® ToteCleaner™

CSI is a master distributor of the TrueClean® line of products, including the [ToteCleaner™](#), which provides process plant operators with a compact, mobile system for cleaning IBC totes. This cart-mounted system is the only tote-cleaning product on the market that's designed to be hygienic, making it a perfect fit for food, beverage, and dairy operations. [Designed to clean both 275 and 330-gallon totes](#), the ToteCleaner is capable of removing a variety of residues from IBC totes, including dried-on materials.

The ToteCleaner draws from an open water source, and pumps the fluid at high pressure into a spray device mounted inside the tote. This powerful spray impinges the tote's walls to remove product residues, which then flow from the tote to a drain. Similar to [common CIP practices](#), a caustic wash may also be run in the ToteCleaner by opening a recirculation valve on the cart. After the caustic wash is complete, a fluid rinse cycle is run by closing the recirculation valve and opening the main valve to the drain.



Spray assembly shown mounted inside IBC tote, with Alfa Laval MultiMidget device.



TrueClean® ToteTilter™

The [ToteTilter™](#) available from CSI is an unloading system for use with IBC totes. [Its platform automatically raises](#) on one side as an IBC empties, helping to evacuate materials to prevent product loss and aids for a more thorough cleaning. The ToteTilter is designed to be mobile, with easy forklift loading and unloading, and requires only a small compressed air supply for operation. Tilt options include 5° or 10° maximum lift, with either foot pedal or hand valve controls as needed.



TrueClean® ToteStand™

[The ToteStand™](#) is a tote delivery system developed by [TrueClean®](#) that takes the mess (and product loss) out of loading and unloading totes. ToteStands are engineered-to-order (i.e., custom built) products available from CSI that allow a tote to feed its contents into a reservoir under gravity. From there, a pump in the ToteStand draws in the product and distributes it to one or more end-use points in the process plant. When the tote is empty, an inline level switch on the ToteStand sends a signal to a PLC or local indicator, telling the operator to replace the empty tote with a new one while the system continues to pull product from the reservoir.

[The ToteStand](#) works with a variety of ingredients, colorants, and flavorings, and can also be used

with processes that call for coatings, pre-mixes, sweeteners, oils, and fats. The hygienic design of this product makes cleaning its stainless steel components easy and efficient. Tote operating safety is improved as well due to the ToteStand's low deck height, stable base, and automatic level monitoring.



There are a number of options available with the ToteStand, including the following:

- Manual, semi-, or fully automatic product delivery, in either batch or continuous modes. Automatic tilting is also available.
- Level indication, metering, or weighing
- Various controls integration options
- Drum unloading option
- Mobility and CIP configurations
- Multiple [pump options](#)
- Various product-contact surface materials and finishes available

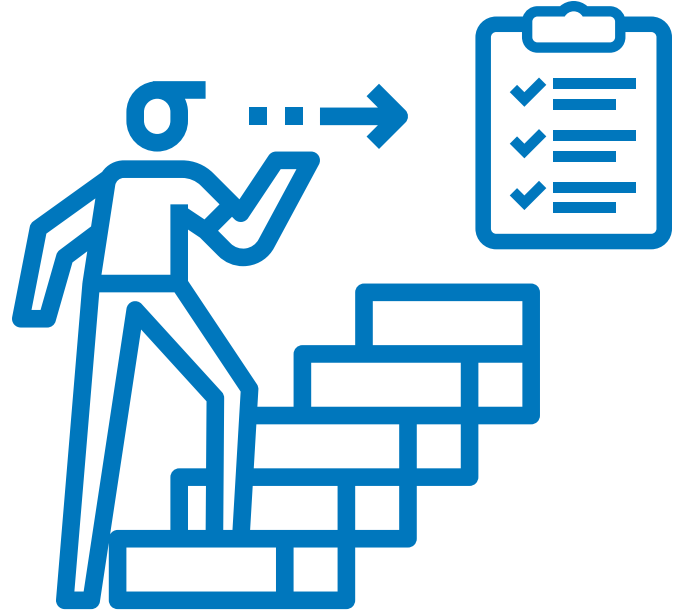
The ToteStand works with a variety of tote sizes, with reservoir capabilities of up to 45 gallons.

NEXT STEPS

In summary, IBC totes are unique product storage and transportation vessels that when properly used offer significant operating efficiencies in comparison to 55-gallon drums. Their maintenance and operation do require, though, the use of specialized products that are designed for use with IBC containers, and which will ensure that these vessels meet sanitary standards for hygienic processing applications.

CSI is proud to offer the Alfa Laval and TrueClean brands for use in IBC operations. The unique products offered from these two suppliers will ensure that processing plant operators get the most out of their IBCs.

To speak with a product expert, call [417.831.1411](tel:417.831.1411) or email sales@csidesigns.com



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