



# Charging Using the Individual DoverPac® System



## SYSTEM DESCRIPTION

This easy-to-use powder transfer system has been proven effective in containing active pharmaceutical ingredients and other hazardous compounds to assure a safe and effective transfer of powders, an operational requirement that cannot be achieved with a standard FIBC or big bag. The DoverPac® contained powder transfer system includes a flexible ArmorFlex® liner, a restraint for containing powders and a set of hardware that fits the flange of a vessel.

While specific powders react differently due to their particle size, OEB 5 (<1.0 µg/m<sup>3</sup>) levels have been demonstrated on a task basis with results in the nanogram range. This is based on proven applications, third party testing to the "SMEPAC" protocols on similar designs, and the 100% inflation tests performed on the delivered systems.

- Contained processing to protect the operators
- cGMP processing in a completely closed operation to protect the product
- Available in sizes ranging from 20L to 2000L
- 100% inflation dwell tested
- CE Marked
- Significant capital cost savings over multiple rigid isolation systems
- Significant reduction in cleaning time, waste, and validation expenses
- Static dissipative film with groundable restraint (type c)

*DoverPac, ArmorFlex, FlexLoc, CrimpLoc are trademarks of ILC Dover*

# Charging Using the Individual DoverPac® System

Basic Process Flow of a Contained, Flexible Charging System



Lift over vessel



Attach liner then bag out stub



Empty



Crimp

## Materials

ArmorFlex® is ILC Dover's proprietary family of films used flexible containment products. Technical details are available in a databook upon request.

## Charging Canister and Transition Adapter

The canister pictured at the right is set up on a straight transition adapter at ILC's test facility. While canisters typically are 316L stainless steel, Hastelloy® canisters also are available. This unit has an initial groove for the canister end cap, additional grooves for liner attachment (typically 5 or 10 grooves depending on process requirements and available height), and 1 groove for the cleaning sleeve or clean-in-place (CIP) sleeve attachment.

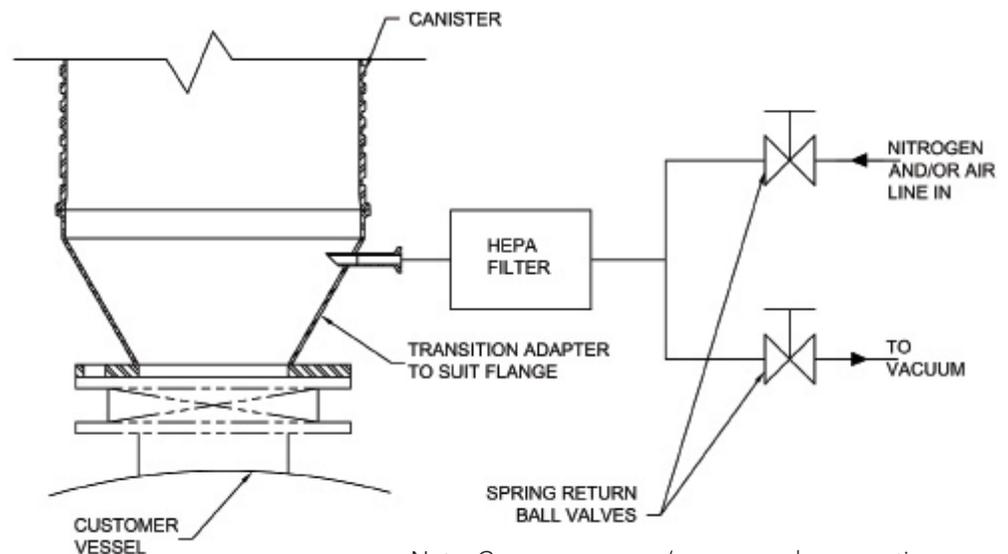


Canister Attached to ILC Dover Test Rig

The canister is supplied with a 12" sanitary flange on each end. This allows for a common design for attachment to vessel specific transition adapters.

The custom transition adapter is fitted with a flange on one end that interfaces with the vessel flange (or valve that is in-line on the vessel flange). The opposite end is a 12" sanitary flange that interfaces with the canister. For flanges smaller than 12", a conical transition adapter is used to allow powder flow directly into the vessel without accumulation on the hardware. The adapter also is fitted with a vacuum flange port with a 1/2" sanitary flange for attachment to the vacuum and nitrogen sources to allow inert processing.

## Purge/Vacuum Arrangement



Note: Common vacuum/purge supply connection to HEPA filter provides backwash function to extend filter life.

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The canister is supplied with a 240 grit (15 RA) internal finish and a 180 grit (32 RA) external finish. (Other materials and finishes also can be provided.)

Please note that for vessels that normally operate under pressure, a valve is required to isolate the liner from the vessel while the vessel is under pressure. This pressure-rated valve is normally supplied by the customer and installed between the vessel and the transition adapter.

## FlexLoc™ Clamp

The FlexLoc clamp is used to secure the neck of the liner to the canister. Construction of the molded clamp is of FDA compliant elastomer with integrated stainless steel band clamp. The clamp has a molded ridge along one surface to help install it in the correct orientation.

The FlexLoc clamp functions to prevent powder from going between the inside of the liner and the outside of the canister to minimize cleaning operations. The clamp is designed to operate in the offloading and the charging operations.

## Crimp Separation Kit

Contained separation between vessels and DoverPac® containment system is achieved through a Crimp Separation Kit, using ILC's uniquely designed crimp system.

Crimps are color coded to assure that the right crimp is selected for the right product. Red crimps are used for the 14" necks on the DoverPacs®.

### A Crimp Separation Kit includes:

- 200 Crimps
- 1 CrimpLoc tool
- 1 Cutter
- 100 Cable Ties (7" Nylon)
- 1 User's Manual

Additional spare items can be ordered separately by their individual model/part numbers.

After filling, the liner is twisted and crimped closed. The hand tool applies two crimps at once. The cutter is used to cut between the two crimps, and then the cap is slid onto the closed crimp body.



FlexLoc Clamp

ILC crimps have been designed and tested to compress standard diameter liners made with ArmorFlex® film



Load crimp into installation tool



Position crimp



Squeeze tool until crimps are engaged—then release tool



Cut and separate



Install crimp cap on crimp body

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## Use of Lifting Bar



Attaching the restraint to lifting bar



Securing the liner neck

## Other System Components and Accessories

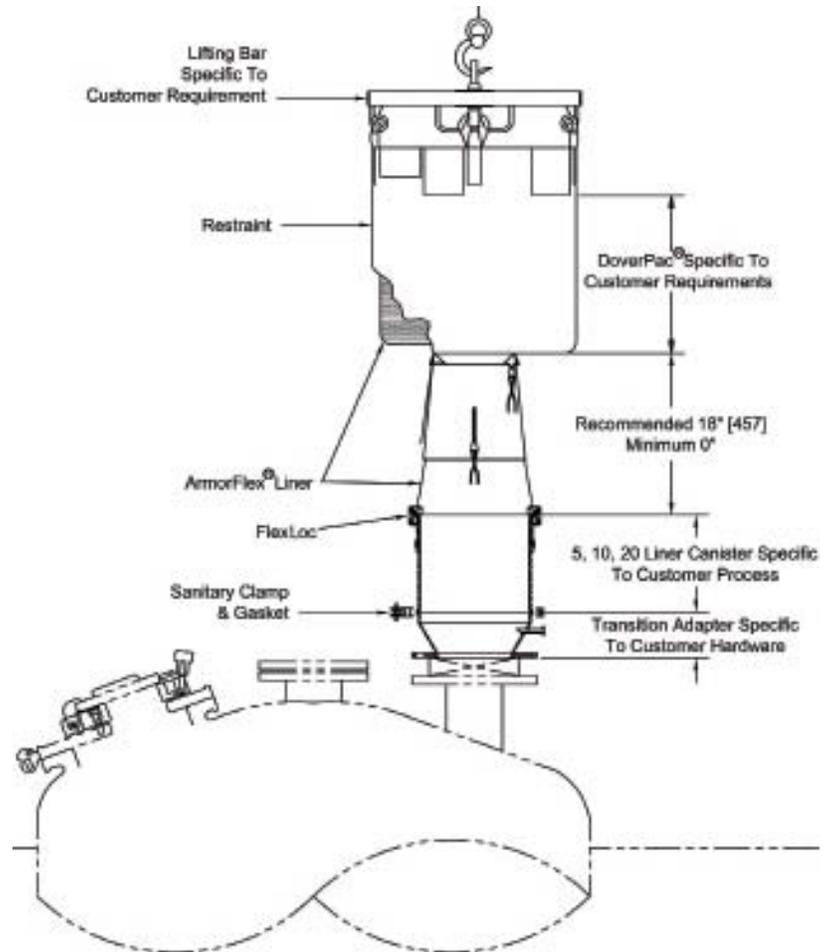
Other system components and accessories developed by ILC Dover to support contained pharmaceutical ingredient processing include:

- Wash In Place Enclosure
- Clean In Place System
- In Line Filter Kit

## Lifting Bars

A lifting bar and hoist are used in order to position the DoverPac® restraints over the vessel interface for charging. The lifting bar comes in two sizes to accommodate DoverPac® sizes. Hoists typically are supplied by the customer.

## Typical DoverPac® Charging Arrangement



Beyond Boundaries™.

Innovators at our core, we develop engineered solutions for our customers' complex problems. Recognized globally for our flexible containment solutions, ILC Dover serves customers in a diverse range of industries, including pharmaceutical and biopharmaceutical manufacturing, personal care, food and beverage, chemical, aerospace, healthcare and government agencies. At ILC Dover, quality is a culture, not a measurement. Our customers will tell you that we cater to their every need and that we're highly innovative, responsive, dedicated and competitive. We have been innovating since 1947. ILC Dover's visionary solutions improve efficiency, safeguard workers and product, and prevent disasters – proof that we are on the front line of business excellence. Engineering evolution beyond boundaries.



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