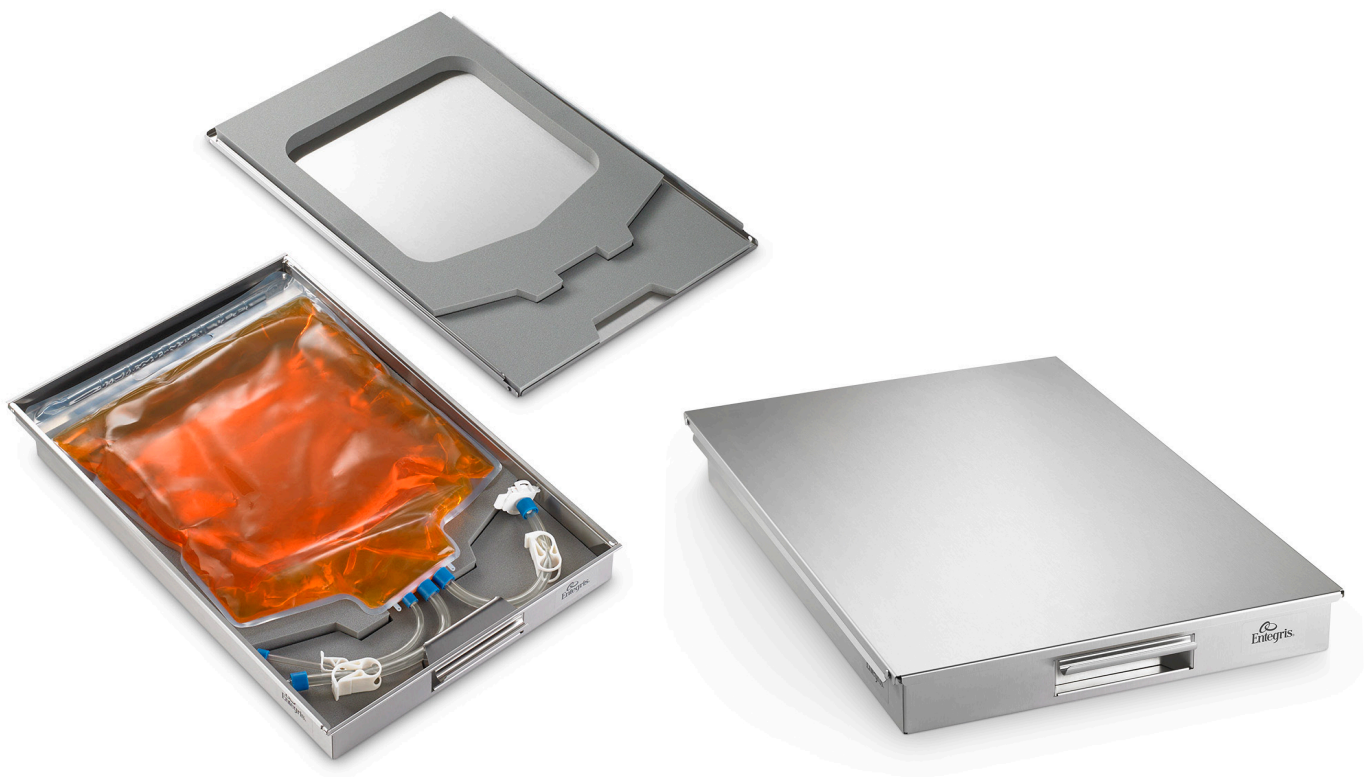


# Plate Freezing Shell

*User guide*



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## 1. OVERVIEW

Aramus™ single-use 2D bags, combined with the Entegris plate freezing shells, provide an easy-to-use, ergonomic, and reusable secondary container for high throughput plate freezer systems to enable rapid freeze-thaw workflows. The plate freezing shells are provided double bagged and are boxed in quantities of 2. This document explains how to most effectively handle and reuse the Entegris plate freezing shells in cold-chain applications.



*Aramus single-use 2D bag assembly and Entegris plate freezing shell.*

## 2. SAFETY

Before using the Entegris plate freezing shell please read, understand, and follow the instructions in this user guide.

### ARAMUS BAG ASSEMBLY

- Do not handle or carry the bag by the tubing.
- Do not overfill or over pressurize the bag.
- Regularly inspect for leaks and other damage.
- Ensure tubing and components are secure within the plate freezing shell before use.
- Do not use in a manner that is inconsistent with the intended use of the plate freezing shell.
- Bags are not intended to be used on a rocking platform. Contact your Entegris account manager for support on rocking bags in plate freezing shells.

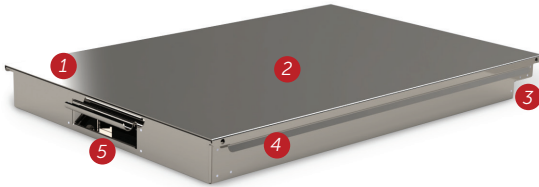
### ENTEGRIS PLATE FREEZING SHELL

- Always wear appropriate personal protective equipment when handling the plate freezing shell.
- Avoid scratching stainless-steel surface.
- Do not store in direct contact with non-stainless-steel metals to prevent corrosion of surface protective layer.
- Do not use the shell if the original packaging appears damaged or tampered with.
- Only transport shell using the metal handle and recessed edge.
- Store, stack and handle only in a horizontal position.
- Do not exceed the recommended stack height of five shells.
- Follow recommended assembly and handling guidelines.
- Plate shells are not recommended for freezing in blast freezers. Contact your Entegris account manager for support.

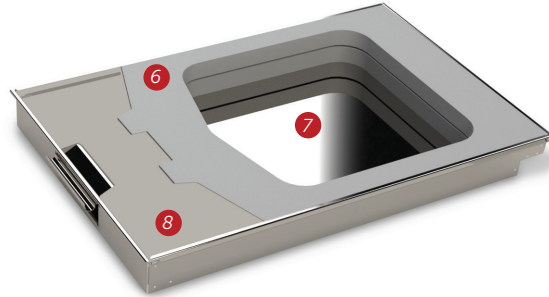
### 3. MATERIALS OF CONSTRUCTION

The Entegris plate freezing shell consists of a 304 stainless-steel frame and polyurethane foam inserts. The estimated operating range for the plate freezing shell is between -80° to 40°C (-112° to 104°F). The shell materials are designed to perform at ultra-low temperatures. The frame acts as a robust barrier, while the foam surrounds and protects the Aramus bag. The shell frame is compatible with common cleaning products including IPA and Spor-Klenz. Pins (sold separately) are zinc plated carbon steel.

### 4. SHELL FEATURES



- 1 Stackable for compact storage and shipping
- 2 Robust stainless-steel design optimized for performance in plate freezers
- 3 Shelf-style handle for easy handling and storage efficiency
- 4 Snap-on lid
- 5 Ergonomic handle for pushing, pulling, and lifting



- 6 Polyurethane foam to support and protect the Aramus bag
- 7 Large surface area for optimized freeze-thaw performance
- 8 Optimized space for tubing and connectors

**NOTE:** Shells are validated to be filled at 100% and 50% of rated fill volume. Contact your Entegris account manager for questions regarding partial fill.

### 5. SHELL ASSEMBLY GUIDELINES

All materials should be wiped down thoroughly per standard cleanroom procedure prior to use.

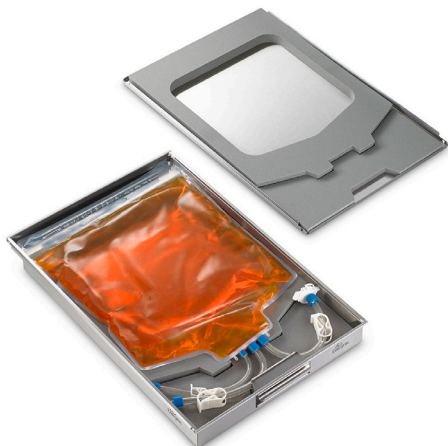
**NOTE:** The Entegris plate freezing shells are not supplied with a sterility claim. Refer to the Entegris Plate Freezing Shell Validation Guide for more information regarding gamma irradiation and autoclave capabilities.

#### 100% fill assembly steps:

1. Place bag in shell –Install the filled Aramus bag on top of one foam layer as shown below

**NOTE:** Avoid air bubbles during filling as they may affect freeze rates.

2. **Secure the tubing** – Tuck the tubing and connectors into the shell. Ensure all tubing and connectors are within the tubing foam area, and the tubing is not kinked.



3. **Place foam** – Insert the second layer of foam above the bag as shown below.



4. **Position** – Place the lid on top of the shell with the edge of the lid pressed against the back of the shell. Press down on the lid to snap into place. Ensure the lid fully covers the base of the shell on the front and the back.



5. **Install the pins** – Push the pins (sold separately) into the four corners of the shell until they snap into place. It may help to lightly push down on the lid in the corners to align the holes while inserting the pins.



#### Partial fill assembly steps:

1. Fill the Aramus bag to 50% of the rated fill volume.
2. Open the plate freezing shell and remove the top layer of foam, leaving only the two-piece bottom layer.
3. Insert one of the partial fill foam blocks into the center cutout of the bottom layer. Push the foam to the backside so that it conforms to the geometry of the bottom layer.

**NOTE: Partial fill foam is sold separately.**

4. Place the Aramus bag into the shell with one layer of foam (as previously described).
5. Insert the two-piece top layer of foam on top of the Aramus bag (as previously described).
6. Insert the second partial fill foam block into the top layer of foam aligning with the block in the bottom layer.
7. Close the plate freezing shell with the lid and pins.

## 6. SHELL DISASSEMBLY GUIDELINES

### Disassembly steps:

1. Remove all four pins from the corners of the shell. Entegris does not supply any pin-removal tools but recommends part number 97576A500 from McMaster-Carr. Contact your Entegris account manager for additional recommendations on pin-removal tools.
2. Remove the lid.  
**NOTE: It is easiest to grab a corner of the lid and pull it up. Repeat for adjacent corner of the lid.**
3. Remove the top layer of foam.
4. Remove the Aramus bag from the shell.  
**NOTE: Any foam that has been subject to a freeze-thaw cycle should be discarded. Replacement foam is sold separately if reuse of the metal frame is desired.**

## 7. SHIPPING

Entegris views product damage during shipping as low risk when using the plate freezing shell with Aramus bags. Please refer to the Entegris Plate Freezing Shell Validation Guide for more information.

Please contact your Entegris account manager for support in configuring the best solution for your logistics and cold-chain requirements.

## 8. SHELF LIFE AND REUSE

Entegris has assessed information provided by component manufacturers of the plate freezing shells and therefore recommends a 5 year shelf life from date of receipt or after 3x reuse, whichever comes first. Entegris plate freezing shells should be stored at ambient conditions in original, unopened packaging until initial use.

Stainless-steel is a durable material and does not limit the shelf life of the Entegris plate freezing shell. The manufacturer of the polyurethane foam suggests that product stored at ambient conditions can facilitate a shelf life that exceeds 5 years. Polyurethane foam stored for long periods of time may experience discoloration or yellowing, therefore Entegris recommends discarding any foam with observable discoloration or yellowing. Replacement foam is available for purchase.

Entegris has successfully qualified the plate freezing shell for 3x reuse. End-users are advised to utilize the information available in this guide when considering how reuse should be validated for their freeze-thaw workflows. In addition, Entegris strongly recommends that end-users who reuse the plate freezing shells follow the inspection criteria outlined below, and remove any shells from service that do not meet the established inspection criteria.

## 9. INSPECTION CRITERIA

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- Remove from service any foam that has been subjected to a freeze-thaw cycle or that has been shipped.
- Inspect the metal frame and remove from service any shell with dents, deformities, sharp edges, embedded particulate, or other surface blemishes.
- Perform an assembly test: visually check that the cover sits flat on the shell base and remains in place. Remove from service any shell that is uneven or requires excessive force to assemble. Insert pins and remove from service any shell where pins cannot be inserted or removed.
- Wipe down the shell and pins prior to reuse.

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