

Blast Freezing Shell

User guide



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1. OVERVIEW

Aramus™ single-use 2D bags, combined with the Entegris blast freezing shells, provide an easy-to-use, lightweight, and reusable secondary container solution for use with controlled rate convection or standard lab cold-wall freezers. The blast freezing shells are provided double bagged and are boxed in quantities of 10 (2 L shells) or 5 (5 L shells). This document explains how to most effectively handle and reuse the Entegris blast freezing shells in cold-chain applications.



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

2. SAFETY

Before using the Entegris blast 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 overpressurize the bag.
- Regularly inspect for leaks and other damage.
- Ensure tubing and components are secure within the blast freezing shell before use.
- Do not use in a manner that is inconsistent with the intended use of the blast 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.

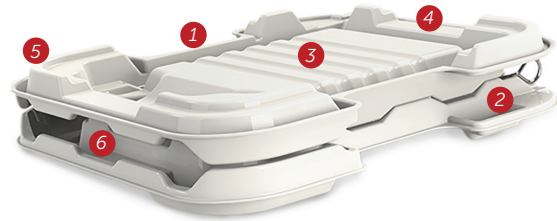
ENTEGRIS BLAST FREEZING SHELL

- Always wear appropriate personal protective equipment when handling the blast freezing shells.
- Do not use the shell if the original packaging appears damaged or tampered with.
- 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.

3. MATERIALS OF CONSTRUCTION

The Entegris blast freezing shell consists of two polycarbonate halves and two 304 stainless-steel rod-locking pins. The estimated operating range for the blast freezing shell is between -80° to 40°C (-112° to 104°F). The polycarbonate is durable and maintains strength at ultra-low temperatures as it flexes with ice expansion. The shell is designed to maximize fill volume without compromising robustness or the ability to stack. The smooth surfaces are easy to clean and compatible with common cleaning products including IPA and Spor-Klenz.

4. SHELL FEATURES



- 1 Identical top and bottom halves allow for compact storage and shipping
- 2 Rod-locking pins for easy assembly
- 3 Ribbed design increases strength and prevents movement of bag during use
- 4 Ergonomic hand-holds for easy handling
- 5 Designed to interlock while stacked and absorb shock upon impact
- 6 Accommodate up to 12" of tubing with most standard connectors and allows for filling and draining in multiple configurations



- | | |
|----|---|
| 7 | Designed specifically for Aramus bag assemblies and doubles as a tray for improved process ergonomics |
| 8 | Designed to direct airflow around the bag, optimizing performance in forced air convection freezers |
| 9 | Designed with added space for ice expansion, without compromising the integrity of stacked shells |
| 10 | Shell walls retain and protect tubing and connectors |
| 11 | Designed to guide rod-locking pins into place |

5. SHELL ASSEMBLY GUIDELINES

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

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



- 1. Place bag in shell** – Install the filled Aramus bag in a half-shell as shown below. Make sure the bag handle is aligned with ridge for a natural fit. Keep shell flat during use.



- 2. Secure the tubing** – Tuck the tubing into the tubing cavities.

3. **Position the top half** – Place the other half-shell over the bag, ensuring the inner cavity faces the bag. Align the grooves on the sides of the shell, as shown below.



4. **Install the rod-locking pins** – Insert the two rod-locking pins in the back of the shell. On the left, the rod-locking pin will sit on the bottom half-shell; on the right, the rod-locking pin will sit on the top half-shell, as shown below. Ensure the rod-locking pins are fully inserted.



5. **Install cable ties (recommended)** – Install cable ties through the ring in the rod-locking pin and then through the hole at the edge of the shell. Cable tie should sit in the groove on the side of the shell as shown below.

NOTE: cable ties not included.



6. SHELL DISASSEMBLY GUIDELINES

1. Remove both cable ties and pull the two rod-locking pins out of the shell.
2. Remove the top half-shell.
3. Remove the Aramus bag.

7. FILLING OPTIONS

The following are recommended for filling:

OPTION 1 – FILL PRIOR TO SHELL ASSEMBLY

Fill an empty Aramus bag to the desired volume. Place the filled bag in the half-shell. Assemble shell per section 5.

OPTION 2- FILL IN HALF-SHELL

Place an empty Aramus bag in a half-shell. The half-shell may be used as a tray if a transport step is required. Fill the Aramus bag to the desired volume. Assemble the shell per section 5.

OPTION 3 – FILL IN FULLY ASSEMBLED SHELL

Place an empty Aramus bag in a half-shell and assemble per section 5. When ready to fill, tubing can be accessed from the front of the shell. Post filling, tubing must be tucked back into the shell.

8. SHIPPING

Entegris views product damage during shipping as low risk when using the blast freezing shell with Aramus bags. Please refer to the Entegris Blast 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.

9. SHELF LIFE AND REUSE

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

Entegris has successfully qualified the blast 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 blast freezing shells follow the inspection criteria outlined below, and remove any shells from service that do not meet the established inspection criteria.

10. INSPECTION CRITERIA

- Inspect and remove from service any shell with cracks or dents, appear warped, have embedded particles, discoloration, or any other surface blemishes.
- Inspect the rod-locking pins and remove from service rod-locking pins that are bent.
- Perform an assembly test: visually check that the top shell-half sits flat on the bottom half-shell and remove from service any shell that is uneven. Insert the rod-locking pins and remove from service any shell where the rod-locking pins cannot be inserted or require excessive force to assemble.
- Wipe down the shell and rod-locking pins prior to reuse.

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