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CORNING

Corning® CoolCell® FTS30 Freezing Container

Instructions for Use

Introduction

The Corning CoolCell FTS30 container is a 30-well high-capacity 1.0 mL or 2.0 mL cryogenic vial freezing system. Freezing clustered vials without the aid of an expensive computer-controlled freezing unit presents a unique challenge as the freezing rate of the vials toward the middle of the cluster will be influenced by the thermal barrier created by the surrounding vials. The CoolCell FTS30 container solves this problem by introducing a regulated micro-convection ventilation system into the freezing module. The warmer and less dense air inside the CoolCell® FTS30 chamber rises and exits through the top vent choke while drawing cold environmental air in through the lower vent. The cold air is mixed in the lower chamber and then rises, taking up thermal energy as it passes over the vials. As the air takes up thermal energy, it decreases in density and continues to rise and to exit the top vent choke. The top vent choke restriction regulates the rate of air passage and controls the freezing rate (Figure 1). The continuous flow of cold air in combination with conductive heat loss through the surrounding chamber insulation provides the ideal temperature reduction profile of -1°C per minute.

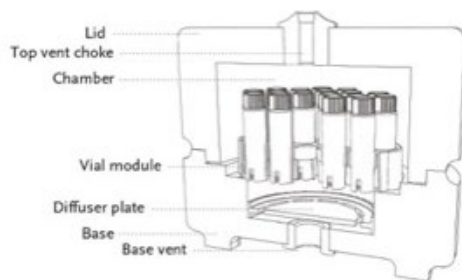


Figure 1

Instructions for Use

- ▶ Locate and reserve a clear space in a -70°C to -80°C freezer that is at least 9 inches in diameter. Make sure there is not an accumulation of frost on the shelf space, as this may interfere with the proper airflow during the freezing process. The freezer will need to remain closed for at least 3 hours during the freezing process. Check with associates to ensure that temporary restricted access will not conflict with their requirements.
- ▶ If the CoolCell FTS30 container has been recently used, it is recommended that the parts be disassembled to check for accumulated moisture. The bottom vent can easily be removed from the base. Insert a finger through the base vent hole, push out the alloy diffuser plate and thoroughly dry the plate and inner base chamber. Make sure the base vent is dry.
- ▶ Insert the base vent into the foam base from the underside. **IMPORTANT: the vent flange should be on the outside of the CoolCell FTS30 container (Figures 2 and 3).**

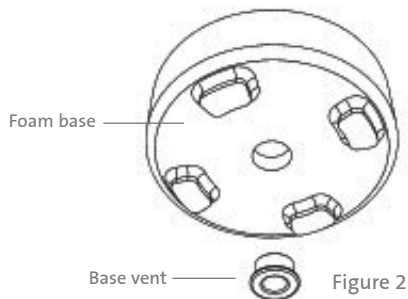


Figure 2



Figure 3

- ▶ Insert the top vent choke into the foam lid from the top side of the lid. **IMPORTANT: The tapered flange should be on the outside of the Corning® CoolCell® FTS30 container (Figures 4 and 5).**

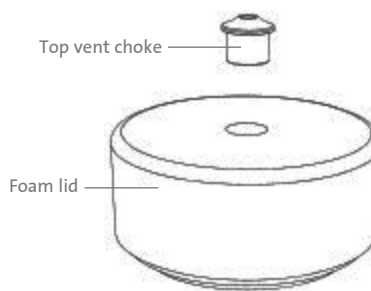


Figure 4



Figure 5

- ▶ Insert the alloy diffuser plate into the base cavity. The diffuser plate is reversible and cannot be inserted incorrectly. Ensure that the plate is all the way at the base of the chamber (Figures 6 and 7).

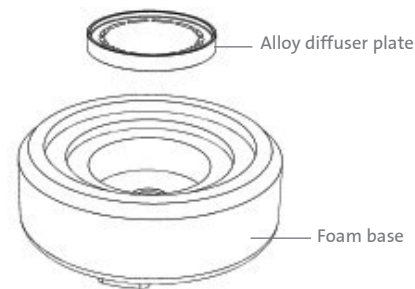


Figure 6

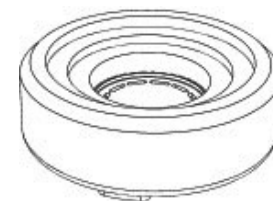


Figure 7

- ▶ Insert the plastic FTS Vial Module into the base and make sure the skirt of the module is evenly seated on the foam shelf. Place 30 cryogenic vials containing 1.0 mL of freezing medium into the module. Alternatively, the FTS Vial Module may be filled with vials remotely and then placed into the CoolCell FTS30 base. **IMPORTANT: Do not place a vial in the center hole of the vial module. The center hole is part of the ventilation pathway and must not be blocked (Figures 8 and 9).**

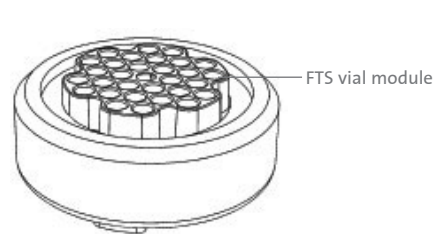


Figure 8

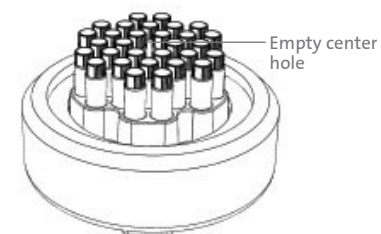


Figure 9

Additional Notes

- ▶ The Corning® CoolCell® FTS30 container is designed to achieve the ideal freezing rate when loaded with 30 cryogenic vials, each containing 1.0 mL of freezing media. If less than 30 vials are to be frozen, fill the remaining positions with a Corning CoolCell Filler Vial (2 mL vial, Cat. No. 432076) or similar vial containing 1.0 mL of freezing medium.
- ▶ Some freezing protocols require the cells to be chilled prior to freezing. The CoolCell FTS30 container may be used with cells beginning at any temperature between 0° and 4°C. However, it is recommended that the entire CoolCell FTS30 container be pre-equilibrated to the vial temperature to prevent a rise in vial temperature.
- ▶ Place the lid onto the CoolCell FTS30 base making sure the mating surfaces form a complete closure.
- ▶ While supporting the CoolCell FTS30 base, transfer the unit to the freezer space previously selected for the freezing process. Make sure that nothing is sitting on top of or can fall onto the top of the CoolCell FTS30 module. Close and latch the freezer door. **IMPORTANT: Do not stack the CoolCell FTS30 containers on top of each other. Each unit needs to be free of any overhead obstructions to ensure proper ventilation.**
- ▶ It is recommended that a notice be placed on the freezer door requesting that the door not be opened during the freezing process, as opening the door during the freezing process may cause a deviation in the highly repeatable freezing profile. Allow a minimum of 3 hours for the freezing process. The CoolCell FTS30 container will approach the final equilibrium temperature within 4 hours.

Transferring Frozen Samples to Archive Storage

- ▶ Remove the CoolCell FTS30 container from the freezer, being sure to support the base. Transport the closed CoolCell FTS30 container to the cryogenic storage area and select the storage box intended for the vials. Carefully open the CoolCell FTS30 container and transfer the FTS Vial Module with frozen vials to a storage box. Place the lid on the cryogenic storage box and return it to cryogenic storage.

Alternate Method

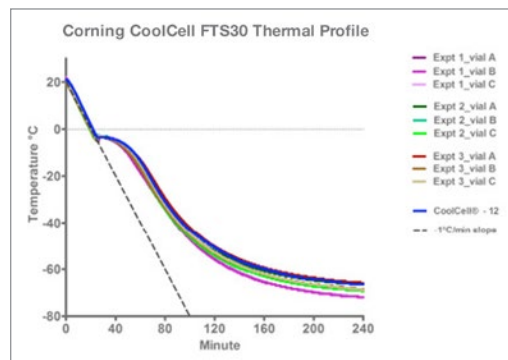
- ▶ Prepare an insulated pan or container with a 1 inch (2.5 cm) layer of pulverized or pellet dry ice.
- ▶ Remove the CoolCell FTS30 container from the freezer, being careful to support the base. Carefully open the CoolCell FTS30 container and transfer the FTS Vial Module with the frozen vials to the dry ice. Individually transfer the vials to cryogenic storage.

Special Notes

- ▶ Cryogenic vial contents can rise from -80°C to over -50°C in less than one minute when exposed to room temperature air. Use dry ice for vial transfer.
- ▶ It is strongly recommended that all frozen cell cultures be checked for viability before the stock culture is terminated.

Corning CoolCell FTS30 Freezing Performance

The Corning CoolCell FTS30 container will freeze 30 cryogenic vials, each containing 1.0 mL of cell suspension, at -1°C per minute when placed in a -80°C environment (mechanical freezer or dry ice locker). The graph (right) shows the consistency of freezing profiles of three cryogenic vials over three consecutive freeze runs.



Recycling the Corning® CoolCell® FTS30 Container to Room Temperature

The Corning CoolCell FTS30 with the lid removed will quickly readjust to room temperature, typically in 15 to 20 minutes. Follow the disassembly instructions and make sure all components are dry before reassembly. Be sure to use gloves when touching the cold alloy diffuser plate to prevent freezing injury.

About the CoolCell FTS30 Container

The CoolCell FTS30 container in combination with a -70°C to -80°C freezer will provide a freezing rate of -1°C/minute that is ideal for cryopreservation of most cell lines. The regulated micro-convection ventilation features of the CoolCell FTS30 container provide a previously unachievable degree of clustered vial freezing profile consistency. The vial-to-vial and cycle-to-cycle thermal profiles are highly repeatable when the same vial load and freezer temperature is applied. Due to the low thermal mass of the CoolCell FTS30 container, freezing can be conducted without a rise in local freezer temperature, thereby protecting nearby samples.

Troubleshooting

Problem	Solution
The lid appears to be stuck.	Most likely the CoolCell FTS30 base and/or lid was not fully dry when assembled. Plug the top vent to prevent back flow of warm air through the CoolCell FTS30 container. Wait a few moments to allow the foam to warm up while applying gentle finger pressure to separate the base and lid. The seal should release within 1 to 2 minutes.

Care and Cleaning

The CoolCell FTS30 container is constructed from closed-cell, cross-linked, high density polyethylene foam. It is compatible with prolonged cryogenic temperature exposure. The foam may be cleaned with water and mild soap. Rinse and dry thoroughly. The CoolCell FTS30 container is resistant to alcohols and 10% bleach solutions. Do not autoclave. Maximum temperature exposure is 60°C. Avoid prolonged exposure to ultraviolet (UV) light sources.

Ordering Information

Cat. No.	Description
432006	Corning CoolCell FTS30, purple
432007	Corning CoolCell FTS30, orange
432008	Corning CoolCell FTS30, green
432009	Corning CoolCell FTS30, pink

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