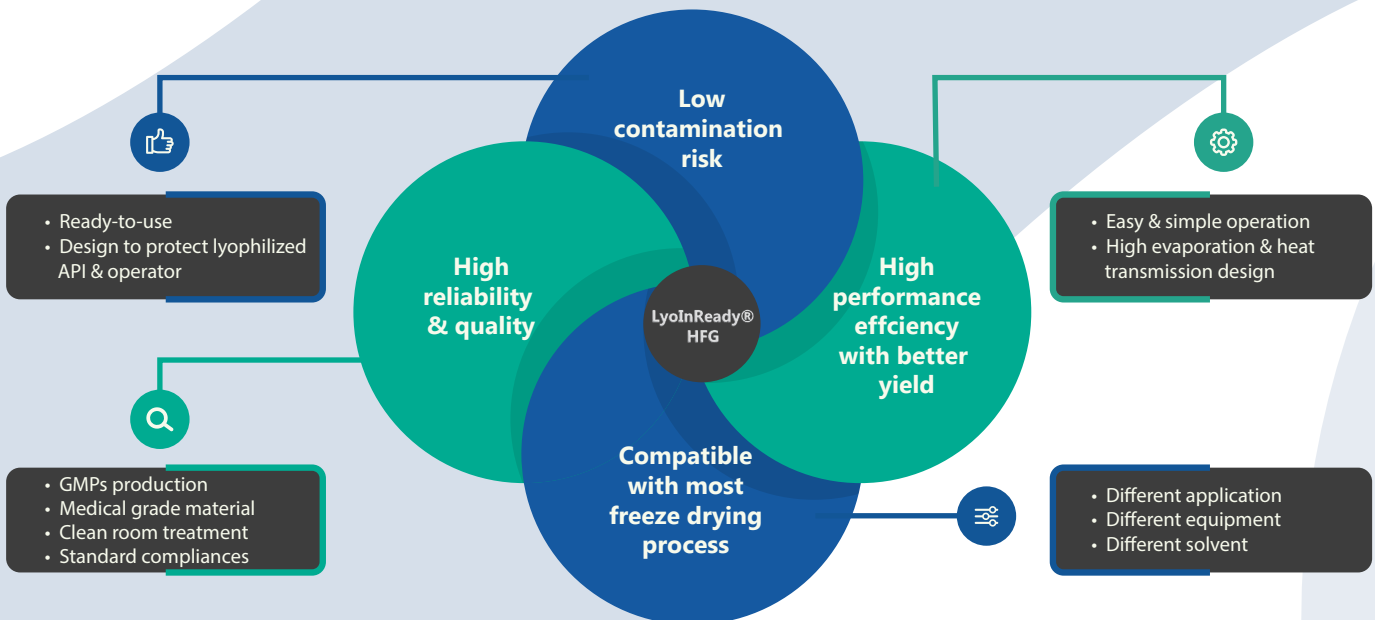
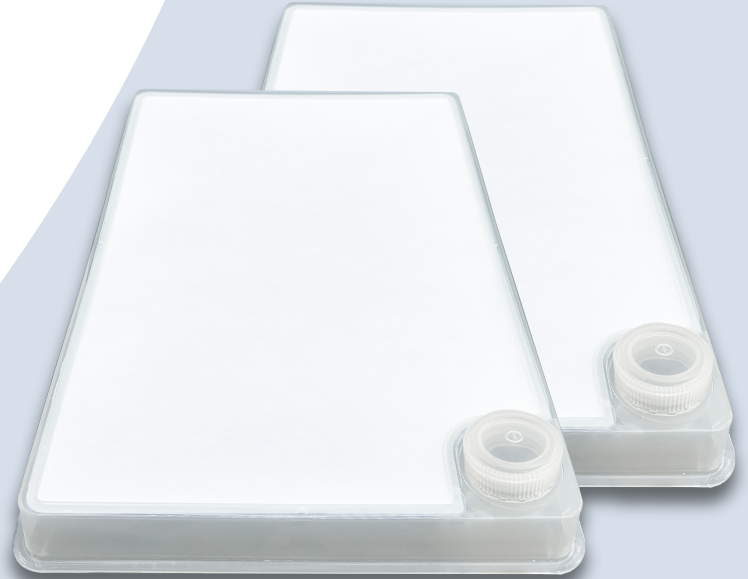


Introduction

In lyophilisation process, some experts may miss to review and chose a better type of freeze drying tray which can has big influence to lyophilisation process efficiency. In consideration of selecting the appropriate tray, there are key concerns to be considered such as material compatibility, operation efficiency including cleaning and maintenance, sterilization requirement, contamination risks, heat transfer efficiency, temperature uniformity and of course cost and reliability.

LyoInReady® High efficiency Freeze-drying Guard tray is a **ready-to-use freeze drying tray** with unique design to make lyophilization processes easier, and more efficient with better yield. It can reduce significantly operation time and complication as well as contamination risk while optimize process efficiency. It is for the direct replacement of either any traditional open stainless-steel trays, or any other disposable trays without high performance efficiency.

LyoInReady® HFG tray is ideal bulk freeze drying container because:



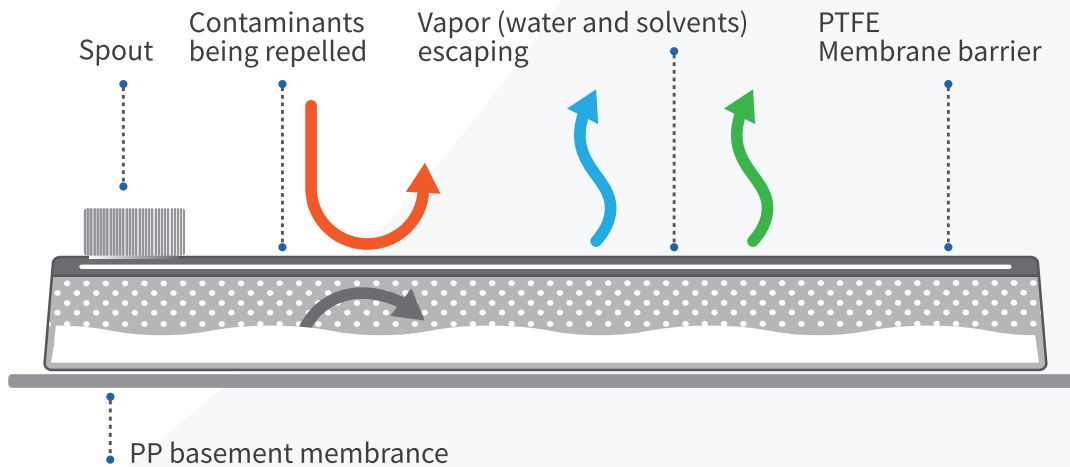
Production Description

LyoInReady® High Efficiency Freeze-Drying Guard tray is ready to use, disposable, fully enclosed container that use PTFE membrane technology to contain and protect lyophilized active pharmaceutical ingredient (API) during the entire freeze drying process. It is compatible with most of the freeze-drying processes and equipment and significantly reducing cleaning time and verification costs. The tray's bottom features a flexible PP flexible bottom film maintains close contact with shelf, ensuring efficient and uniform heat transfer. Utilizing PTFE membrane technology, the breathable membrane combines excellent high vapor transmission rates with effective prevention of product splashing or overflow, eliminating cross-contamination risks while enhancing product recovery rates.



Product Key Features and Advantage

LyoInReady® High Efficiency Freeze-Drying Guard tray has unique design engineered in supporting high heat transmission efficiency and maintaining temperature uniformity while providing excellent barrier protection and reducing fly out of lyophilized liquid API. With the key features design, LyoInReady® HFG tray has superior combination of performance advantages in efficiency and reliability.



KEY FEATURE	DESIGN	ADVANTAGES
Spout	Fill-port with threaded cap made with medical-grade Polypropylene (PP)	Make tray-filling easy and convenient.
Tray top PTFE membrane	Membrane integrated with fill-port and made with medical-grade Polytetrafluoroethylene (PTFE). It has material property of lightweight, high breathability, chemical inertness, thermal stability and non-particulating properties	Ensure seal integrity while maintaining exceptional vapor transmission rate. The membrane keeps API cake contained, traps dust and reduces chance of fly-out risk as well as product contamination risk
Tray bottom	Flexible bottom thin film made with medical-grade Polypropylene (PP) which has high thermal transmission rate, thermal stability and inertness properties	Maximizes contact with shelf plates, minimizing air gaps and optimizing heat transfer for efficient, uniform thermal conduction.
Sterilization treatment & packing	Employs radiation sterilization method with sterilization standards compliance	Offer convenient, safety, and ready to use tray which can be used directly for yophilization

Applications

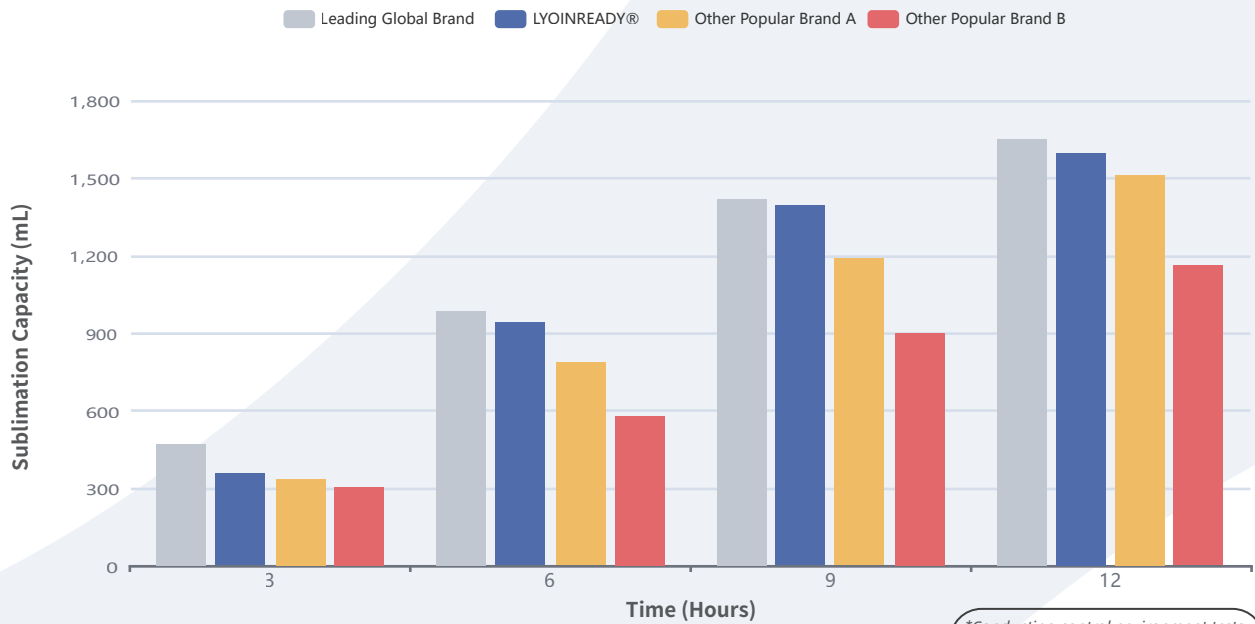
LyoInReady® High Efficiency Freeze-Drying Guard tray is designed to eliminate a lot of cleaning operation and reduce chances of lyophilized API fly-out risk and contamination risk. And does enable greater safety in lyophilization process and improve process efficiency. Basically, the tray is suitable to different kind of batch freeze-drying and freeze-drying process development but especially worthy to clinical staging and large-scale production of biological agents such as peptides, oligonucleotides, proteins, drug intermediates, polysaccharides, strains and other active pharmaceutical ingredients and HPAPI. Also, it supports formulations for nanoparticles lyophilisation and free-drying of bacteria because of its unique features.



Quality & Reliability

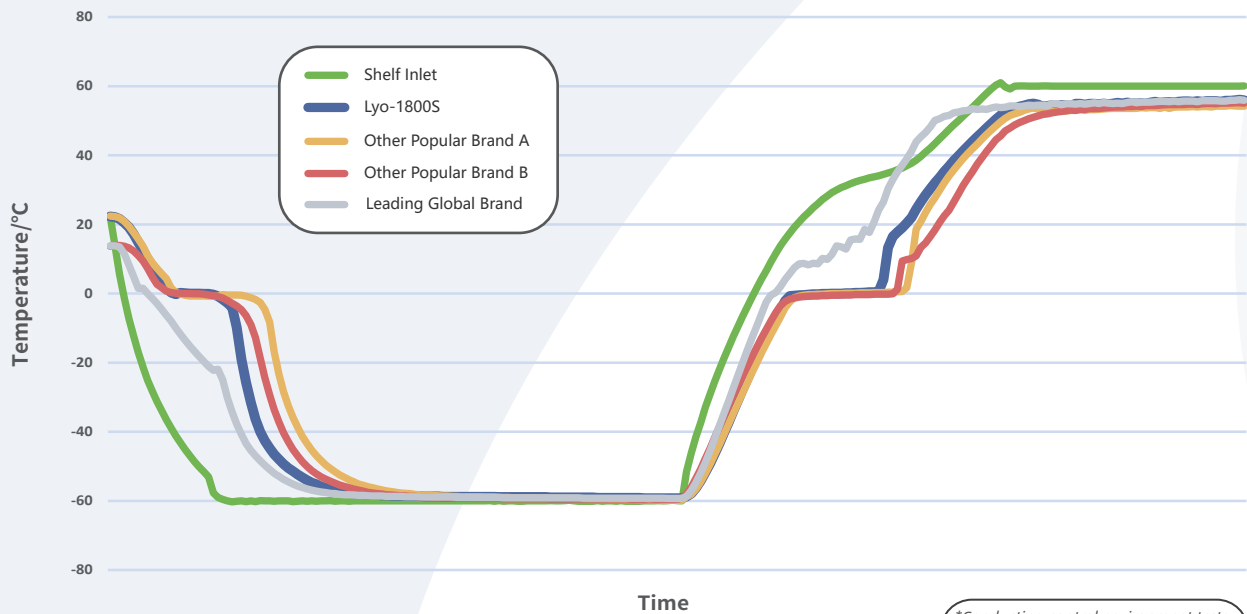
LLyoInReady® High Efficiency Freeze-Drying Guard tray is leading in performance efficiency in freeze-drying tray market. LyoInReady® HFG tray shows compelling performance quality in lyophilisation efficiency test as below:

Sublimation Efficiency



*Conducting control environment tests under the Freeze Dryer equipment (ATS SP Scientific Lyostar 4.0)

Heat Transfer

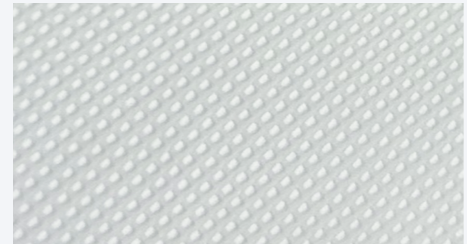


*Conducting control environment tests under the Freeze Dryer equipment (ATS SP Scientific Lyostar 4.0)

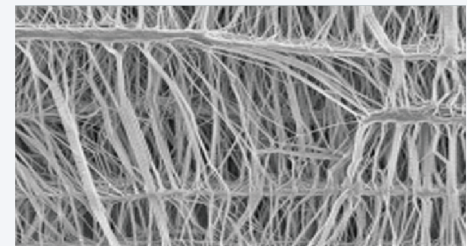
Product Standards Compliance

LyoInReady® HFG tray quality is assured as it is produced under relevant Good Manufacturing Practices (GMPs) and core materials are medical grade. Also product packaging, sterilization and final inspection are conducted in a clean room environment. Moreover, product reliability is guaranteed with standard compliance as below:

Test Standard Category	Standard Specification Compliance
In Vivo Biological Tests	<ul style="list-style-type: none"> • Subcutaneous Implantation - USP 43 <88> • Muscle Implantation - USP 43 <88> • Muscle Implantation - USP 43 <88> • Muscle Implantation - USP 43 <88>
Bacterial Endotoxins	• Muscle Implantation - USP 43 <88>
Sterility Testing	ChP 2020 Part IV 1101
Insoluble Particulates	USP 788
Material Performance	• Water Vapor Transmission: GB/T 1037-2021
Material Performance	<ul style="list-style-type: none"> • Solvent Compatibility: - (99%) Acetonitrile - USP 43 <88> - (90%) Acetonitrile - USP 43 <88> - (80%) Acetonitrile - USP 43 <88>



PTFE membrane enlarge image



Micrograph of respiratory membrane

Technical Parameters

Model Number	Lyo-1800S
Dimensions	392 × 267 × 32 mm (Height with lid: 47mm)
Capacity	1.8 L
Recommended Fill Volume	100-1800 mL
Operating Temperature	-70°C to +125°C
Packaging	5 units per carton
Material	<ul style="list-style-type: none"> • Main Body & Bottom Film: Medical-grade Polypropylene (PP) • Breathable Membrane: Medical-grade Polytetrafluoroethylene (PTFE)

Maximum: 2800ML
Suggestion: ≤1800ML

Storage Conditions

Storage Temperature: Room temperature
Storage Humidity: <65% RH
Shelf Life: 3 years

