

# Compounding Pharmacy Equipment



# Table of Contents

- Welcome to Esco ..... 2
- Global Network ..... 2
- Products and Application ..... 3
- Know about your Pharmacy Compounding Standards and Guidelines ..... 4
- Pharmacy Compounding Equipment Questionnaire ..... 5
- Unidirectional vs Turbulent Airflow: Which is best for Sterile Pharmacy Compounding? ..... 6
- Why isolators are better? ..... 6
- Pressure Regimes and Isolators ..... 7
- Manual Compounding PEC Decision Chart ..... 8
- Product Overview ..... 10
- Ventilated Balance Enclosure ..... 12
- Streamline® Compounding Isolators .....
  - Compounding Aseptic Isolator (SCI-P) ..... 16
  - Compounding Aseptic Containment Isolator - Recirculating (SCI-N) ..... 18
  - Compounding Aseptic Containment Isolator - Total Exhaust (SCI-TE) ..... 19
- Isoclean® Healthcare Platform Isolators .....
  - WITHOUT filter below workzone ..... 22
  - WITH filter below workzone ..... 24
- Maintenance Checks for Isolators ..... 28
- Containment Barrier Isolator ..... 29
- General Processing Platform Isolator ..... 33

# Welcome to Esco



PT Esco Bintan Indonesia  
Cert. No: 651333/E

Esco Micro Pte Ltd  
Cert. No: 651076

PT Esco Bintan Indonesia  
Cert. No: Q2N130383797001

Esco's Vision is to provide enabling technologies for scientific discoveries to make human lives healthier and safer.

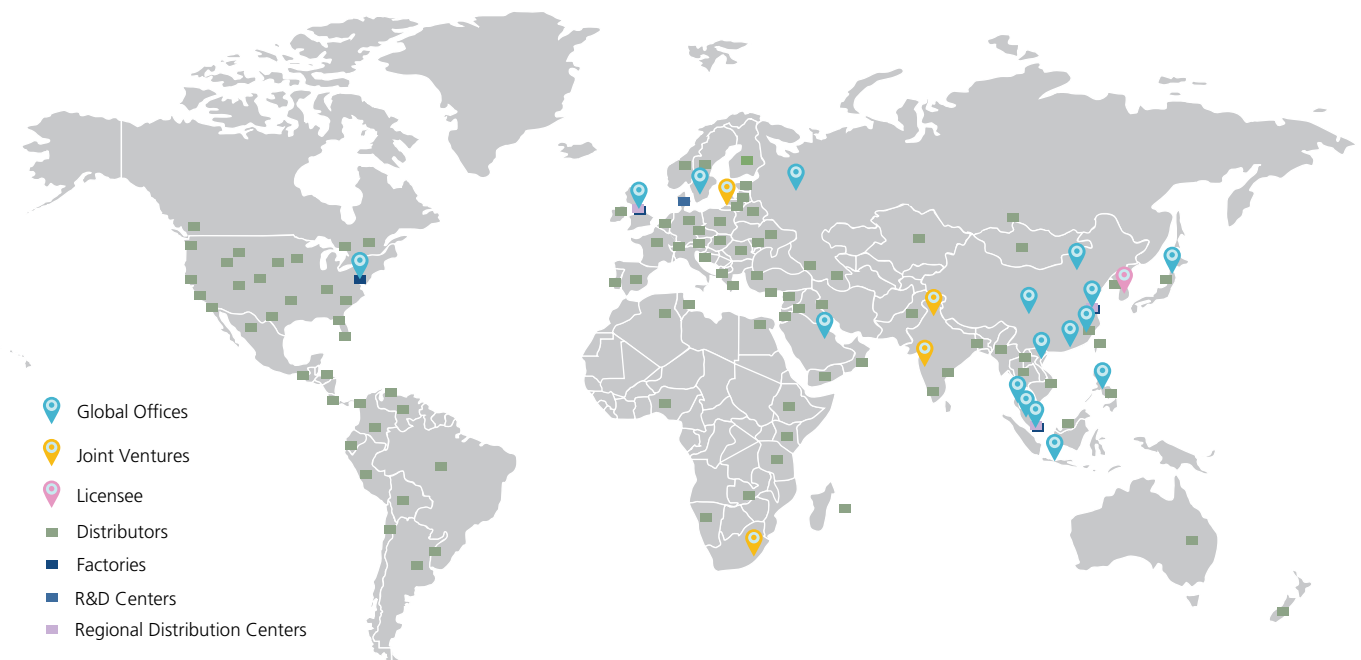
Since Esco was founded in 1978, our company has earned a reputation for innovations in laboratory equipment and pharmaceutical industry worldwide. Today, Esco has emerged as a market leader in containment, clean air, pharmaceutical, and laboratory equipment technologies with active sales in more than 100 countries and direct company offices in the top ten geospecific markets.

From our headquarters in Singapore, Esco directs a highly efficient research, product development, manufacturing, and customer service program. We are the only company in the market that is completely configured to export most of what we manufacture. Our many languages and cultures, customs and traditions, and modern business management techniques blend into a single effort focusing on customer service, one customer at a time. As you learn more about Esco, you will understand why World Class. Worldwide. is more than a phrase. It's part of who we are, where we are from and where we are going.

**Watch Esco's Corporate Video!**



## GLOBAL NETWORK



# Products and Application

## Life Sciences Laboratory Equipment

### Sample Preparation

- Class I Biological Safety Cabinets
- Class II Type A2 Biological Safety Cabinets
- Class II Type B1 Biological Safety Cabinets
- Class II Type B2 Biological Safety Cabinets
- Class III Biological Safety Cabinets
- Horizontal Laminar Flow Clean Benches
- Vertical Laminar Flow Clean Benches
- Laboratory Animal Research Workstations
- Freeze Dryers
- Laboratory Centrifuges

### Sample Cultivation

- CO<sub>2</sub> Incubators, Direct Heat Air-Jacketed
- CO<sub>2</sub> Incubators with Cooling System
- CO<sub>2</sub> Incubators with Stainless Steel Exterior
- CO<sub>2</sub> Incubators (Water Jacketed)
- Laboratory Shakers

### Sample Analysis

#### PCR Thermal Cyclers

- Conventional Thermal Cyclers
- Real-time PCR Systems

#### PCR Sample Handling

- Microplate Shakers
- PCR Cabinets

#### Sample Storage & Sample Protection Solutions

- Ultra-low Temperature Freezers
- Lab Refrigerators and Freezers
- Sample Database Management Software
- Intelligent Remote Monitoring Application Protocol
- Remote Monitoring, Datalogging, Programming Software
- Wireless Monitoring System

### Chemical Research

- Ductless Fume Hoods
- Laboratory Fume Hoods
- Fume Hood Airflow Monitors
- Exhaust Blowers
- Powder Weighing Balance Enclosures

### General Equipment

#### Laboratory Thermostatic Products

- Laboratory Oven
- Laboratory Incubator
- Refrigerated Incubator
- Natural Convection Incubator

## Medical / IVF Equipment

### Controlled Embryo Handling

- IVF Workstation
  - Stereo Zoom Microscope
- Anti-vibration Table

### Safe Embryo Culture

- Benchtop Multi-room Embryo Incubators
- CO<sub>2</sub> Incubators

### Innovative Time Lapse Imaging

- Time-Lapse Embryo Incubator

### Accurate Quality Control

- CO<sub>2</sub> / O<sub>2</sub> Temperature Validation Unit

## Healthcare

### Esco Pharma Products

#### Airflow Containment Products

- Pharmacon® Downflow Booths
- Ceiling Laminar Airflow Units
- Laminar Flow Horizontal Trolley
- Laminar Flow Vertical Trolley
- Enterprise® Laminar Flow Straddle Units
- Garment Storage Cabinet

#### Isolation Containment

- Aseptic Containment Isolator (ACTI)
- Weighing and Dispensing Containment Isolator (WDCI)
- General Processing Platform Isolator (GPPI)
- Containment Barrier Isolator (CBI)
- IsoClean® Healthcare Platform Isolator (HPI)
- Streamline® Compounding Isolators (SCI)
- Technetium Dispensing Isolators
- Blood Cell Labeling Isolators
- Open and Closed Restricted Barrier Access Systems (RABS)

#### Cross Contamination Facility Integrated Barrier

- Cleanroom Air Showers
- Infinity® Air Shower Pass Box
- Infinity® Cleanroom Transfer Hatch
- Infinity® Pass Boxes
- Soft Capsule® Soft Wall Cleanroom
- Dynamic Passboxes and Dynamic Floor Label Hatches
- Esco BioPass™ Pass Through

#### Ventilation Containment

- Ventilated Balance Enclosure
- Extraction Hoods/Enclosures
- Local Exhaust Ventilation Systems
- Cytotoxic Safety Cabinets

### VacciXcell Products

#### Bioreactors and Fermenters

- CelCradle™
- TideCell®
- StirCradle™
- StirCradle™-Pro
- VXL Hybrid Bioreactor

#### Cell Culture Monitoring, Media and Consumables

- Super Plus™
- Plus™ Vero
- Plus™ MDCK
- Plus™ MDCK II
- BioNOC™ II macrocarriers
- GlucCell® Glucose Monitoring System
- CVD Kit

#### Filling Line Equipment

- AseptiCell®
- Traditional Filling Line

#### Integrated Solutions

- Cell Processing Isolator
- Cell Processing Center

#### TaPestle Rx Products and Services

#### Pharmacy Solutions

- Compounding Pharmacy
  - Automated IV Compounding System
  - Isolators
  - Safety Cabinets and Enclosures

### Radiopharmacy

- Technetium Dispensing Isolator
- Blood Cell Labeling Isolator
- Lead-shielded hoods and safety cabinets
- Cross Contamination Facility Integrated Barrier
  - Dynamic Pass Box
  - Air Showers
- Cold Chain Storage
  - Laboratory freezers and refrigerators
  - Walk-in Chiller
  - Ultra-Low Temperature Freezer
- Filling Lines
  - Aseptic Filling Stoppering Machine
  - Capping Machine
  - Sterilization Tunnels
  - Trayloaders
  - Vial Washers

#### Hospital and Medical Center Construction Components

- Pre-fabricated Walls (Airecell)
- Series Ceiling Systems
- Hygienic / Hermetic Door Systems
- Surgical Scrub Sinks
- Laboratory Fitouts
- Vinyl Tiles and Epoxy
- ART/IVF Equipment

#### Services

- Conceptualization
- Planning
- Procurement
- Installation

# Know about your Pharmacy Compounding Standards and Guidelines

Pharmacy compounding has been present since the beginning of time. It is essential in cases such as limited dosage strengths and dosage forms, drug allergies to certain ingredients, paediatrics, chemotherapy and veterinary medicine.

Despite the importance of compounding, there are risks associated with this practice. Compounded preparations are not FDA-approved, and there are cases that preparations are compounded under unsanitary conditions. These contaminated preparations expose the patients to even greater risks.

With this, standards are developed to provide us guidance in pharmacy compounding. These standards are continuously evolving, and it is our responsibility to stay current on the knowledge regarding this field.

## About USP



United States Pharmacopeia (USP) was established in 1820. It is an official public standards-setting authority for all prescription and over-the-counter medicines and other health care products manufactured or sold in the US. The following are some of the chapters related to pharmacy compounding:

- a. Pharmaceutical Compounding – Nonsterile Preparations (USP 795)
- b. Pharmaceutical Compounding – Sterile Preparations (USP 797)
- c. Hazardous Drugs – Handling in Healthcare Settings (USP 800)

## About PIC/S



PIC/S is the abbreviation used to describe both the Pharmaceutical Inspection Convention (PIC) and the Pharmaceutical Inspection Co-operation Scheme (PIC Scheme) operating together in parallel. The objective of PIC/S is to harmonize inspection procedures worldwide by developing common standards in the field of GMP and by providing training opportunities to inspectors. PE 010-4 PIC/S Guide to Good Practices for the Preparation of Medicinal Products in Healthcare Establishments was published to provide guidance on Good Practices on the preparation of medicinal products for human use.

## About EU GMP



EU GMP defines the rules governing medicinal products in the European Union. Volume 4 of this standard pertains to the EU Guidelines to Good Manufacturing Practice for Medicinal Products for Human and Veterinary Use. Moreover, Annex 1 of this standard discusses on the Manufacture of Sterile Medicinal Products.

## About FDA cGMP



Food and Drug Administration Current Good Manufacturing Practices (FDA cGMP) provides the interim guidance for pharmacy compounding of human drug products both under sections 503 (A) and 503 (B) of the FDC Act.

## About Guidelines on Compounding of Medicines



This guideline was published by Pharmacy Board of Australia to provide guidance to registered pharmacists or those seeking to become registered pharmacists in Australia.

## About NIOSH List of Antineoplastic and other Hazardous Drugs in Healthcare Settings



The National Institute for Occupational Safety and Health (NIOSH) identified a sample list of major hazardous drugs. The current update (2016) adds 34 drugs and includes a review of the 2004 list.

# Pharmacy Compounding Equipment Questionnaire

Name : \_\_\_\_\_

Designation : \_\_\_\_\_

Address : \_\_\_\_\_

Company : \_\_\_\_\_

Contact No. : \_\_\_\_\_

Email Address : \_\_\_\_\_

## Please answer the questions accordingly:

1. Is sterile environment required?  YES  NO

2. Do you compound hazardous drugs?  YES  NO

If YES, do you handle the following?

- Carmustine  YES  NO

- Ifosfamide  YES  NO

- Cyclophamide  YES  NO

- Mechlorethamine  YES  NO

- Doxorubicin  YES  NO

- Thiotepa  YES  NO

- Others, Pls. specify: \_\_\_\_\_

3. Do you have an existing cleanroom?  YES  NO

4. What standards do you follow?

a. USP

b. EU GMP

c. FDA cGMP

d. PIC/S

e. Others, Pls. specify: \_\_\_\_\_

5. What are the dimensions of the room?

6. What is the height clearance of the room?

7. What is your budget for the equipment?

8. Would you prefer a turnkey solution?  YES  NO

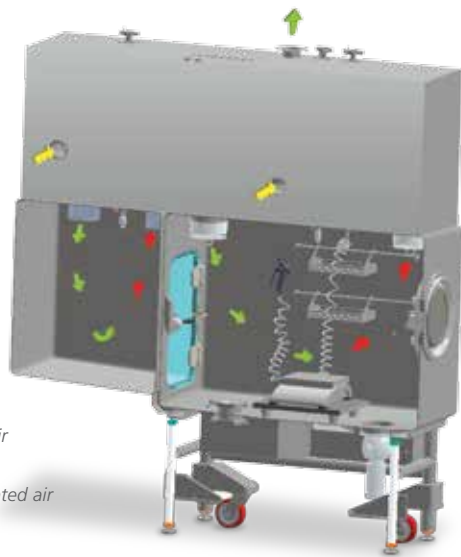
# Unidirectional or Turbulent Airflow: Which is best for Sterile Pharmacy Compounding?

## Different Airflow Regimes in Isolators

There are two airflow regimes usually encountered for isolators – 1. Turbulent Airflow and 2. Unidirectional Airflow

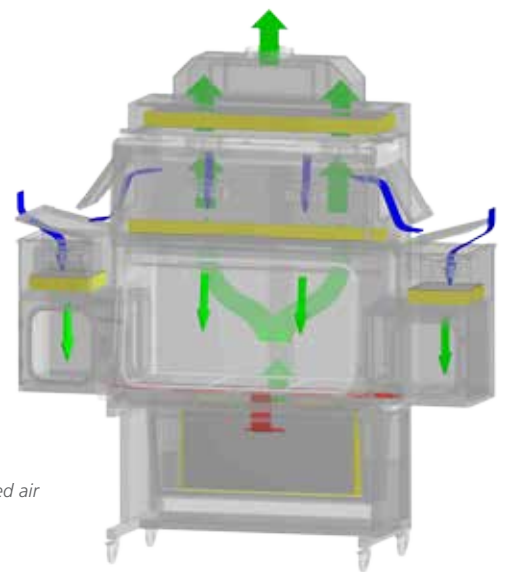
### Turbulent Airflow

Turbulent Airflow is the process of introducing a supply of filtered air that mixes with and dilutes airborne contaminants, thus reducing the concentration within the environment. Most contaminants are ultimately removed from the environment through the air exhaust system. (CETA, 2005)



### Unidirectional Airflow

Unidirectional Airflow provides the work zone with a continuous supply of filtered air. This mass airflow effect serves to sweep contaminants past and away from the preparation and out of the isolator environment. (CETA, 2005)



## What do the standards say?

“The airflow in the primary engineering control (PEC) shall be unidirectional (laminar flow).” – USP 797, USA

“Compounding aseptic containment isolator (CACI) is designed to provide worker protection from exposure to hazardous drugs. It provides an aseptic environment with unidirectional airflow for compounding sterile preparations.” – USP 800, USA

“All aseptic manipulations, including processing of sterile materials, filling, and closing (e.g. placement and sealing of stoppers on vials) should be performed under unidirectional airflow that is ISO 5 or better.” – FDA cGMP, USA

“Handling and filling of aseptically prepared products (open and closed procedures) should be performed in a grade A environment.” – PIC/S

Note: Grade A environment is easier to achieve when air flow is unidirectional.

“A unidirectional airflow and lower velocities may be used in closed isolators and glove boxes.” – EU GMP, Europe

“Supply air to the controlled work space shall be unidirectional and shall not induce turbulence within the work site.” – AS 4273, Australia

## Why isolators are better?

International standards like USP and PIC/S recommend the use of primary engineering controls (PECs) in pharmacy compounding applications.

There are several PECs mentioned in these standards; i.e. BSCs, LFCs, RABS and Isolators. However, isolators provide better protection compared to “open front” cabinets. Hospital pharmacy isolators utilize an airtight glove/glove port design that allows the user to perform hands-on tasks inside the isolator without compromising the intended performance of the isolator.



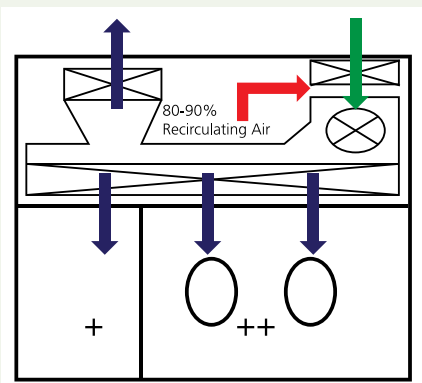
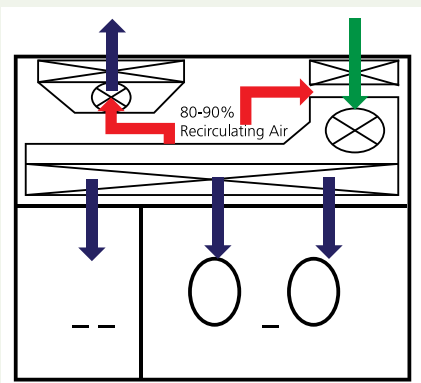
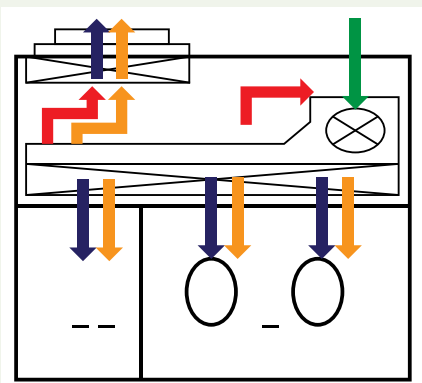
Factors which influence sterility of the work zone	"Open Front" Unidirectional Airflow eg, Class II BSC	Air Tight Isolators eg, Hospital Pharmacy Isolators
Cabinet Placements (ie, away from draughts)	Heavily Dependent	Independent
Operator Technique (ie, aseptic)	Heavily Dependent	Always essential
Environmental Factors (ie, room air cleanliness)	Heavily Dependent	Less dependent

Working through isolators reduces the chances for contaminants from the operator and the surrounding environment to enter the aseptic work zone and vice versa. It also requires lower background environment (Grade D or ISO Class 8); hence, less running costs in PPE, utilities, consumables and monitoring.

## Pressure Regimes and Isolators

In choosing an isolator, it is important to check the pressure regime. Pressure regimes differ depending on your application.

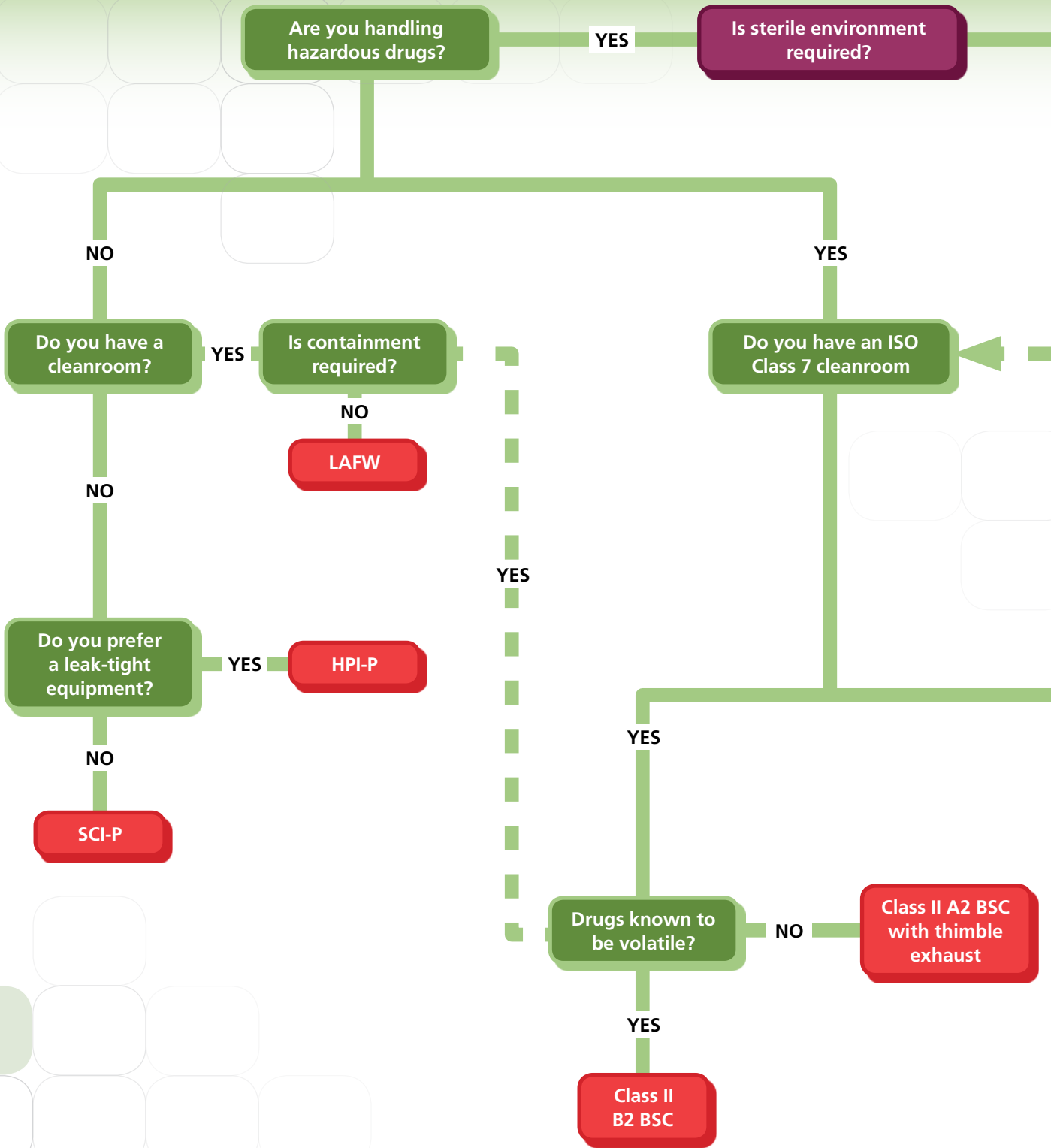
So what are the different pressure regimes?

Positive	Negative (Recirculating)	Negative (Total Exhaust)
Positive pressure inside the workzone maintains sterility even in a case of a breach in the barrier.	Negative pressure inside the workzone maintains operator's safety even in a case of a breach in the barrier.	Negative pressure inside the workzone ensures operator's safety even in a case of a breach in the barrier.
Suitable for non-hazardous compounding applications: Total Parenteral Nutrition, Ophthalmic Preparations, Infusions, Syringes	Suitable for hazardous drugs which will not volatilize	Suitable for hazardous drugs which may volatilize
5-10% (exhaust back to the room)	10%-20% (exhaust back to the room)	Connected to Exhaust 100% exhaust
		

Pressure Regime	Applications		
	Non-hazardous Drug Compounding	Non-volatile Hazardous Drug Compounding	Volatile Hazardous Drug Compounding
Positive	Yes	No	No
Negative (Recirculating)	No	Yes	No
Negative (Total Exhaust)	No	Yes	Yes

Note: Hazardous drug compounding should NOT be done in the equipment used for non-hazardous applications and vice versa.

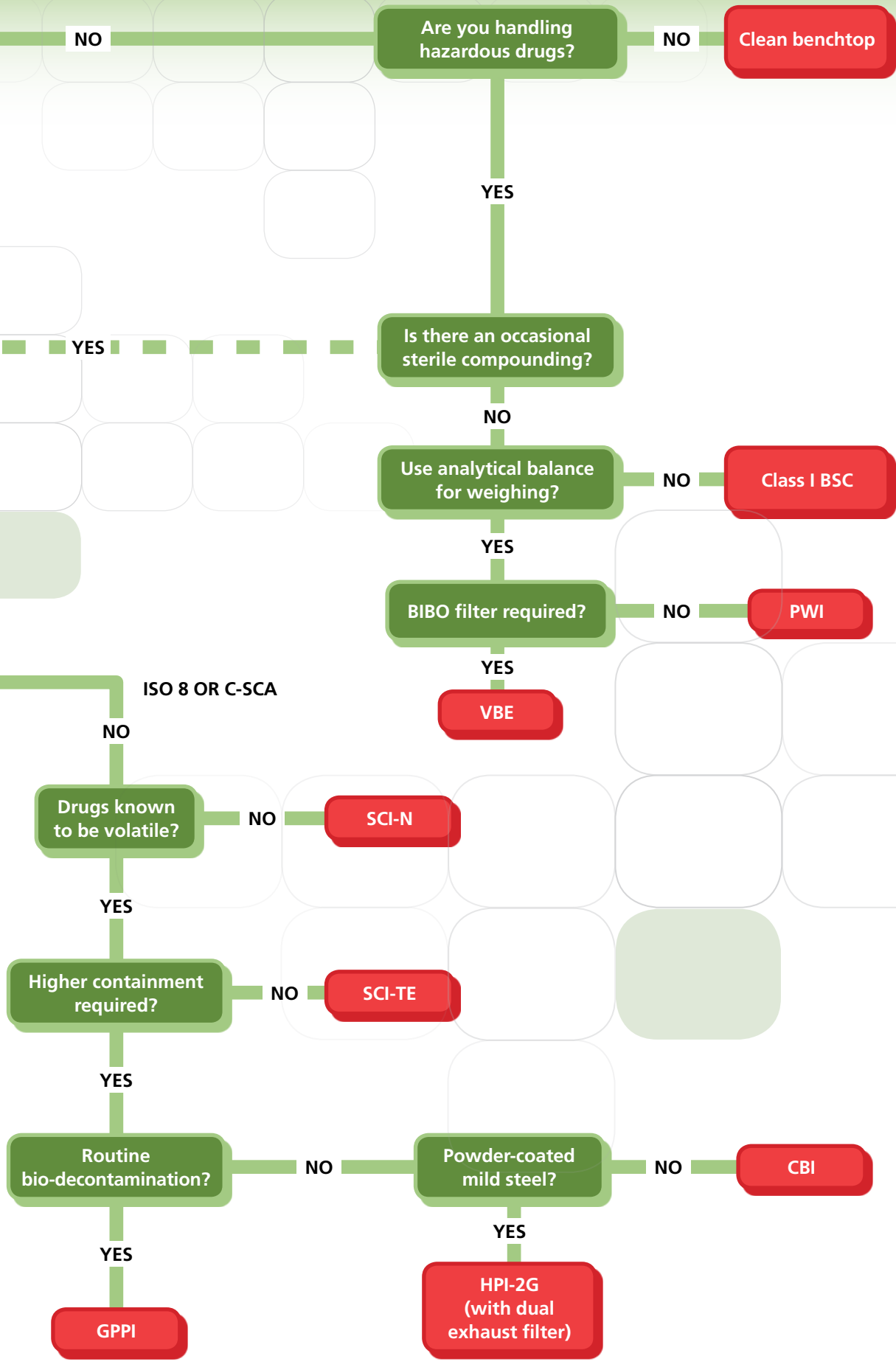
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# Manual Compounding: PEC Decision Chart





## PRODUCT OVERVIEW

### Ventilated Balance Enclosure

- For non-sterile hazardous drug application
- Provides high level of containment and protection during manipulation of hazardous drugs
- Modular design
- Bag-In Bag-Out Filters
- Available sizes: 2, 3, 4, 5, 6, 7, 8 ft



### Streamline® Compounding Isolators (CAI and CACI)

- Robust dual-wall construction
- Provides a safe and clean environment for compounding sterile non-hazardous and hazardous drug preparations
- Available as positive or negative (recirculating) isolators
- USP 797/800 compliant
- Available sizes: 2G, 3G



### Streamline® Compounding Isolators (Total Exhaust)

- 100% full exhaust negative isolator
- Provides a safe and clean environment for compounding sterile hazardous drug preparations
- 3 exhaust options: Top BIBO filter, Bottom low contamination change, or both
- USP 797/800 compliant
- Available sizes: 2G, 3G



## Isoclean® Healthcare Platform Isolator

- Available as positive or negative isolator, recirculating or 100% full exhaust
- Provides a safe and clean environment for compounding sterile non-hazardous and hazardous drug preparations
- Class 2 containment enclosure as per ISO 10648-2
- USP 797/800 compliant
- Available sizes: 2G, 3G, 4G



## Containment Barrier Isolator

- Available as positive or negative isolator, 100% full exhaust
- Facilitates isolation of a product or process while providing required conditions for aseptic environment
- Class 2 containment enclosure as per ISO 10648-2
- USP 797/800 and cGMP-compliant
- Available sizes: 2G, 3G, 4G

## General Processing Platform Isolator

- Highly adaptable, unidirectional airflow isolator
- User-selectable positive or negative chamber, recirculating or single pass airflow regime
- Class 2 containment enclosure as per ISO 10648-2
- Standard design incorporates cGMP and GAMP features
- Available sizes: 2G, 3G, 4G



## Ventilated Balance Enclosure

**Delivering Stability, Accuracy, Safety in Powder Weighing Applications**

### Description:

Ventilated Balance Enclosure (VBE) is designed specifically for stability and accuracy while maintaining a high level of operator protection by containing hazardous airborne powder. Through our aerodynamic design sash and armrest, and sectionalized baffle, the airborne particles are well contained inside the enclosure and exhausted through a HEPA filter or direct to the pharmacy exhaust. Esco VBE is your trusted partner in providing protection when handling non-sterile hazardous compounds.

### Applications:

- Powder weighing
- Non-sterile hazardous drug compounding

### Unique Filter Mounting System

- Eliminates bypass leaks inherent in conventional clamping systems by utilizing a special seal for H14 Filters
- Bag-In, Bag-Out filter change design for added protection during filter change

### Disposal Port

- Equipped with O-ring to secure trash bag for additional powder containment solution

### Worktop Options

- Solid epoxy, 316L stainless steel, and Granite

### Ergonomic Design

- Angled front frame improves viewing on the workspace
- Instant start-up fluorescent lamp
- Optimized side panels provide more light inside

### Model

Guide to Ventilated Balance Enclosure (VBE) Models

VBE-2 A 8- 03 S A

MODEL	CODE	INTERNAL WIDTH (mm)	CODE	CONFIGURATION	CODE	ELECTRICAL CODE	CODE	ENCLOSURE MODULE	CODE	FILTER MODULE
Ventilated Balance Enclosure	VBE	610	2	Standard	A	100V 50/60Hz	7	No filter, No blower	01	No filter
		915	3	Tall	B	230V 50/60Hz	8	With filter, No blower	02	Single Filtration
		1220	4	Tall & Deep	C	115V 50/60Hz	9	With filter and blower	03	Double Filtration
		1525	5							
		1830	6							
		2135	7							
		2440	8							



## Sentinel™ Microprocessor

- Supervises functions, visual monitoring and alarm system

## Aerodynamic sectionalized baffle

- Draws most contaminants back in a single pass displacement of air
- Removable into the work zone for easy cleaning

## Sash and Arm Rest

- Aerodynamically designed to provide optimized airflow inside the enclosure

## Base comes in different options:

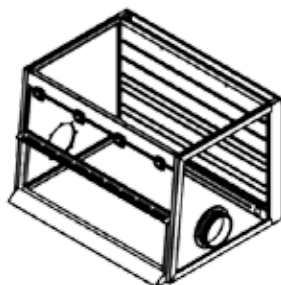
- Base cabinet, Support stand with casters or leveling feet
- Support stand with drum lift access is available for 5, 6, 7, 8ft cabinets

### Modules

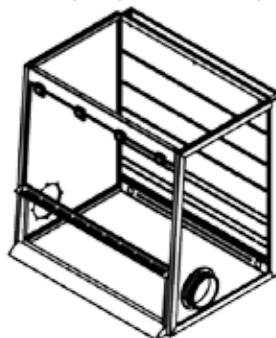
Modular design: Esco VBE comes as standard design in a single filtration, blower, and ducted configuration. Modular designs are also available to meet requirements for different applications.

#### a. Enclosure Module

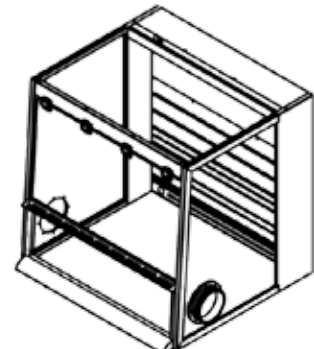
VBE covers a wide range of powder weighing and handling options and requirements: SMALL, MEDIUM, and LARGE models.



Small Model is perfect for small spaces. Portable filter options can be added to save much of the ceiling space.



Medium Model is perfect for using high equipment for powder weighing.



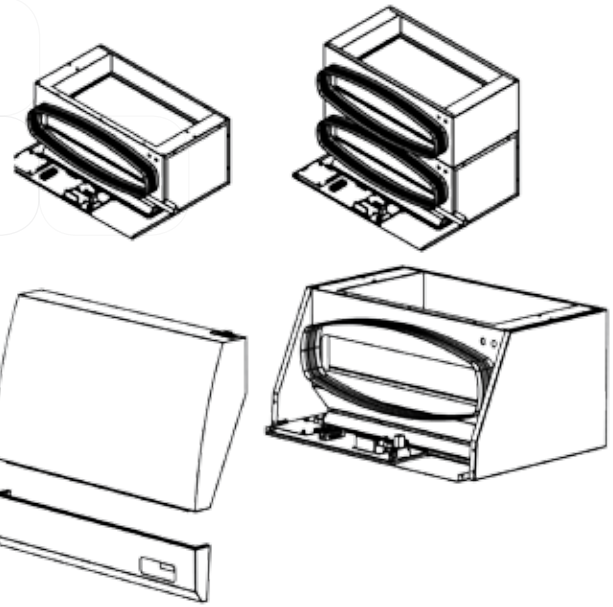
Large Model is perfect for large-scale powder handling. It can be combined with work top with drum access.

CODE	EXHAUST TYPE	CODE
N	Ducted	A
S	Ductless	B
D	Portable	C

## b. Filter Module

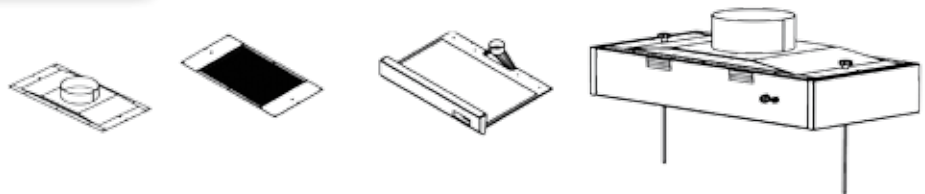
Filter module can be configured as Single or Dual filtration. Additional carbon filter may be supplied for odor control

CFB - 2V		
CARBON FILTER	CARBON TYPE	SIZE
CF	A - Organic	2
	B - Acid	3
	C - Mercury	4
	D - Sulphur	
	E - Halogen	
	F - Aldehyde	
	G - Ammonia/Amine	
	H - Chloroform /Ethers	



## c. Exhaust Module

VBE has 3 options for exhausting filter air: DUCTED, DUCTLESS, and PORTABLE



## d. Worktop

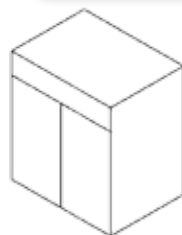
3 types of worktop material are available: SOLID EPOXY, 316L STAINLESS STEEL, and GRANITE.

WT - 2 6 A			
CARBON FILTER	SIZE	MATERIAL	CONFIGURATION
WT	2	E - Epoxy	A - Standard
	3	6 - 316 L Stainless Steel	C - Tall & Deep
	4	G - Granite	
	5		
	6		
	7		
	8		
	9		

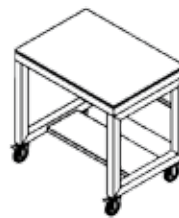
## e. Base Option

Base options can be CABINET type, standard SUPPORT STAND, and SUPPORT STAND with DRUM ACCESS\*. In addition to this, CASTER WHEEL or LEVELING FEET can be selected for footing options

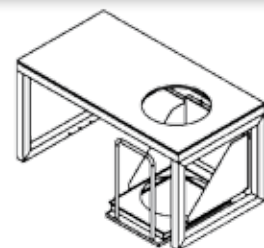
\*Available for sizes 5 to 8 with tall & deep enclosures only.



Cabinet Type



Standard Support Stand

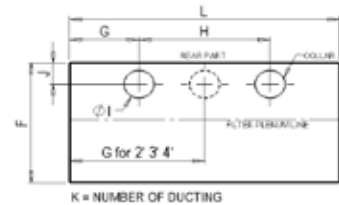
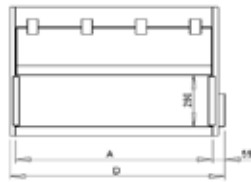


Support Stand with Drum Access

SPL - 8 A V			SSD - 5 CER - 9*		
BASE	SIZE	CONFIGURATION	MATERIAL	CUTOUT HOLE	ELECTRICAL CODE
CAB - Cabinet	2	A - Standard			7 -
SPL - Support stand leveling feet	3	C - Tall and Deep			
SPC - Support stand Caster wheel	4				
SPD - Support stand with drum access	5		E - Epoxy	L - Left	8 - 230V 50/60 Hz 9 - 115V 50/60 Hz
	6		6 - 316L Stainless Steel	R - Right	
	7			C - Center	
	8				

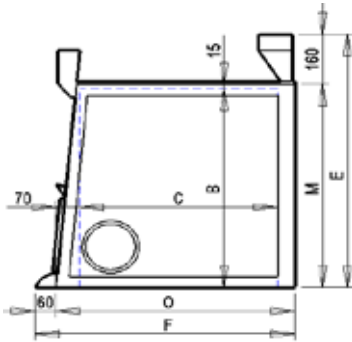
Only applicable for 5, 6, 7, 8 ft - deep enclosures

\* When SSD is chosen, select worktop material, cutout hole location, and applicable electrical rating

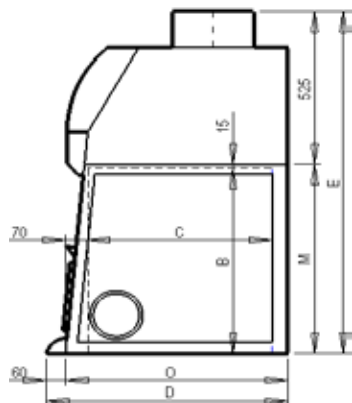


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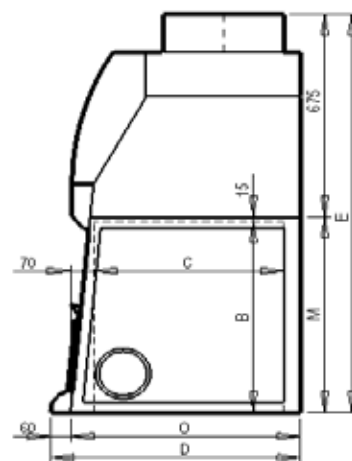
**01 Series**



**02 Series**



**03 Series**



CONFIG	SIZE	WORK SPACE			EXTERNAL			TOP LAYOUT					BASE SIZE		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	2	610	635	630	665	810	760	330	-	4"	50	1	660	650	700
	3	915	635	630	970	810	760	483	-	4"	50	1	965	650	700
	4	1220	635	630	1275	810	760	635	-	4"	50	1	1270	650	700
	5	1525	635	630	1580	810	760	483	610	4"	50	2	1575	650	700
	6	1830	635	630	1885	810	760	483	915	4"	50	2	1880	650	700
	7	2135	635	630	2190	810	760	483	915	4"	50	2	2185	650	700
	8	2440	635	630	2495	810	760	483	635	4"	50	2	2490	650	700
	8	2440	940	630	2495	1115	760	330	-	4"	50	1	660	955	700
B (TALL)	2	610	940	630	665	1115	760	330	-	4"	50	1	660	955	700
	3	915	940	630	970	1115	760	483	-	4"	50	1	965	955	700
	4	1220	940	630	1275	1115	760	635	-	4"	50	1	1270	955	700
	5	1525	940	630	1580	1115	760	483	610	4"	50	2	1575	955	700
	6	1830	940	630	1885	1115	760	483	915	4"	50	2	1880	955	700
	7	2135	940	630	2190	1115	760	635	915	4"	50	2	2185	955	700
	8	2440	940	630	2495	1115	760	635	1220	4"	50	2	2490	955	700
	8	2440	940	780	2495	1115	910	635	1220	4"	200	2	2490	955	850
C (TALL & DEEP)	2	610	940	780	665	1115	910	330	-	4"	200	1	660	955	850
	3	915	940	780	970	1115	910	483	-	4"	200	1	965	955	850
	4	1220	940	780	1275	1115	910	635	-	4"	200	1	1270	955	850
	5	1525	940	780	1580	1115	910	483	610	4"	200	2	1575	955	850
	6	1830	940	780	1885	1115	910	483	915	4"	200	2	1880	955	850
	7	2135	940	780	2190	1115	910	635	915	4"	200	2	2185	955	850
	8	2440	940	780	2495	1115	910	635	1220	4"	200	2	2490	955	850
	8	2440	940	780	2495	1115	910	635	1220	4"	200	2	2490	955	850
A	2	610	635	630	665	1175	760	330	-	10"	235	1	660	650	700
	3	915	635	630	970	1175	760	483	-	10"	235	1	965	650	700
	4	1220	635	630	1275	1175	760	635	-	10"	235	1	1270	650	700
	5	1525	635	630	1580	1175	760	483	610	10"	235	2	1575	650	700
	6	1830	635	630	1885	1175	760	483	915	10"	235	2	1880	650	700
	7	2135	635	630	2190	1175	760	635	915	10"	235	2	2185	650	700
	8	2440	635	630	2495	1175	760	635	1220	10"	235	2	2490	650	700
	8	2440	940	630	2495	1480	760	330	-	10"	235	1	660	955	700
B (TALL)	2	610	940	630	665	1480	760	330	-	10"	235	1	660	955	700
	3	915	940	630	970	1480	760	483	-	10"	235	1	965	955	700
	4	1220	940	630	1275	1480	760	635	-	10"	235	1	1270	955	700
	5	1525	940	630	1580	1480	760	483	610	10"	235	2	1575	955	700
	6	1830	940	630	1885	1480	760	483	915	10"	235	2	1880	955	700
	7	2135	940	630	2190	1480	760	635	915	10"	235	2	2185	955	700
	8	2440	940	630	2495	1480	760	635	1220	10"	235	2	2490	955	700
	8	2440	940	780	2495	1480	910	330	-	10"	385	1	660	955	850
C (TALL & DEEP)	2	610	940	780	665	1480	910	330	-	10"	385	1	660	955	850
	3	915	940	780	970	1480	910	483	-	10"	385	1	965	955	850
	4	1220	940	780	1275	1480	910	635	-	10"	385	1	1270	955	850
	5	1525	940	780	1580	1480	910	483	610	10"	385	2	1575	955	850
	6	1830	940	780	1885	1480	910	483	915	10"	385	2	1880	955	850
	7	2135	940	780	2190	1480	910	635	915	10"	385	2	2185	955	850
	8	2440	940	780	2495	1480	910	635	1220	10"	385	2	2490	955	850
	8	2440	940	780	2495	1480	910	635	1220	10"	385	2	2490	955	850
A	2	610	635	630	665	1325	760	330	-	10"	235	1	660	650	700
	3	915	635	630	970	1325	760	483	-	10"	235	1	965	650	700
	4	1220	635	630	1275	1325	760	635	-	10"	235	1	1270	650	700
	5	1525	635	630	1580	1325	760	483	610	10"	235	2	1575	650	700
	6	1830	635	630	1885	1325	760	483	915	10"	235	2	1880	650	700
	7	2135	635	630	2190	1325	760	635	915	10"	235	2	2185	650	700
	8	2440	635	630	2495	1325	760	635	1220	10"	235	2	2490	650	700
	8	2440	940	630	2495	1630	760	330	-	10"	235	1	660	955	700
B (TALL)	2	610	940	630	665	1630	760	330	-	10"	235	1	660	955	700
	3	915	940	630	970	1630	760	483	-	10"	235	1	965	955	700
	4	1220	940	630	1275	1630	760	635	-	10"	235	1	1270	955	700
	5	1525	940	630	1580	1630	760	483	610	10"	235	2	1575	955	700
	6	1830	940	630	1885	1630	760	483	915	10"	235	2	1880	955	700
	7	2135	940	630	2190	1630	760	635	915	10"	235	2	2185	955	700
	8	2440	940	630	2495	1630	760	635	1220	10"	235	2	2490	955	700
	8	2440	940	780	2495	1630	910	330	-	10"	385	1	660	955	850
C (TALL & DEEP)	2	610	940	780	665	1630	910	330	-	10"	385	1	660	955	850
	3	915	940	780	970	1630	910	483	-	10"	385	1	965	955	850
	4	1220	940	780	1275	1630	910	635	-	10"	385	1	1270	955	850
	5	1525	940	780	1580	1630	910	483	610	10"	385	2	1575	955	850
	6	1830	940	780	1885	1630	910	483	915	10"	385	2	1880	955	850
	7	2135	940	780	2190	1630	910	635	915	10"	385	2	2185	955	850
	8	2440	940	780	2495	1630	910	635	1220	10"	385	2	2490	955	850
	8	2440	940	780	2495	1630	910	635	1220	10"	385	2	2490	955	850



# Streamline® Compounding Isolators

## Premium Solution for Sterile Compounding Applications

Esco Streamline® Compounding Isolators provide a safe and clean environment for compounding of sterile drug preparations in compliance to USP 797 and 800 criteria.

Barrier isolation system provides inherently superior sterility compared to open fronted clean air devices such as laminar flow clean benches and Class II biological safety cabinets.

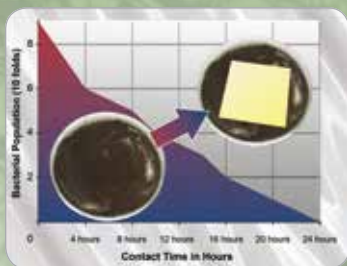
When used as part of a system that includes operator aseptic technique training, process validation, expiration setting and product quality maintenance after the CSP leaves the pharmacy, isolators are an effective solution especially for lower volume-pharmacies. They reduce operating and renovation costs, take up less space, and easier to maintain.

### ULPA Filters

- ULPA filters with a typical efficiency of >99.999% at 0.1 to 0.3 microns provide superior ISO Class 3 air cleanliness, 100 times better than competing products

### ISOCIDE™

- Esco Isocide™ antimicrobial coating on all painted surfaces minimizes contamination



### Safe-change cuff rings

- Permit glove changes with zero risk of contaminating the work zone or pharmacy environment

### Easy-to-clean work zone

- One-piece work zone liner with no crevices is easy to clean

### Options

- Sharps disposal system
- Hydraulic height-adjustable stand



### Sentinel™ Microprocessor

- Supervises functions, visual monitoring and alarm system



### Ergonomic design

- Angled front and oval glove ports improve reach and comfort

### Work Zone and Pass-through

- Positive for sterile, non-hazardous pharmacy compounding
- Negative for sterile, hazardous pharmacy compounding

## Guide to Streamline® Compounding Aseptic Isolator Models

**SCI - 4 P 3 - S**

ISOLATOR	CODE	NOMINAL WIDTH	CODE	ELECTRICAL CODE	CODE	SHARPS PROVISIONS	CODE
Streamline® Compounding Isolator	SCI	4 ft (1.2 m)	4	220-240 V, AC, 50 Hz, 1Ø	1	No sharps provision	0
		6 ft (1.8 m)	6	110-120 V, AC, 50 Hz, 1Ø	2	With sharps provision	S
				220-240 V, AC, 60 Hz, 1Ø	3		

## GENERAL SPECIFICATIONS

Streamline® Compounding Isolators

		SCI-4P _ _	SCI-6P _ _
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)	Without Base Stand	1340 x 820 x 1320 mm (52.8" x 32.3" x 51.9")	1950 x 820 x 1320 mm (76.8" x 32.3" x 51.9")
	With Base Stand (Min)	1522 x 820 x 1995 mm (59.9" x 32.3" x 78.5")	2132 x 820 x 1995 mm (83.9" x 32.3" x 78.5")
	With Base Stand (Max)	1522 x 820 x 2250 mm (59.9" x 32.3" x 88.6")	2132 x 820 x 2250 mm (83.9" x 32.3" x 88.6")
Main Chamber Work Zone (W x D x H)		840 x 610 x 670 mm (33.1" x 24.0" x 26.4")	1450 x 610 x 670 mm (57.1" x 24.0" x 26.4")
Pass Through (W x D x H)		355 x 610 x 670 mm (13.9" x 24.0" x 26.4")	355 x 610 x 670 mm (13.9" x 24.0" x 26.4")
Work Zone and Interchange Chamber Performance		ISO Class 3 (Class 1, Federal Standard 209E)	
Inlet Filter Type		80% efficiency pre-filter	
Downflow and Exhaust Filter Type		ULPA filter with integral metal guards and filter frame gaskets; fully compliant with EN 1822 (H14) and IEST-RP-CC001.3 requirements (each cabinet has individual downflow and exhaust filters)	
Typical Filter Efficiency		>99.999% for particle size between 0.1 to 0.3 micron	
Fluorescent Lamp Intensity		> 950 Lux (> 88 foot candles)	
Isolator Construction	Main Body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester antimicrobial powder-coated finish	
	Work Tray	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish	
	Side Walls	1.2 mm (0.05") 18 gauge stainless steel, type 304, with 4B finish	
Electrical	220-240V, AC, 50Hz, 1Ø	SCI-4P1 _ _	SCI-6P1 _ _
	Cabinet Full Load Amps (FLA)	2 A	2 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	301 W	345 W
	Cabinet BTU	1027	1177
	110-120V, AC, 60Hz, 1Ø	SCI-4P2 _ _	SCI-6P2 _ _
	Cabinet Full Load Amps (FLA)	4 A	7 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	264 W	456 W
	Cabinet BTU	901	1556
	220-240V, AC, 60Hz, 1Ø	SCI-4P3 _ _	SCI-6P3 _ _
	Cabinet Full Load Amps (FLA)	2 A	2 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	301 W	345 W
	Cabinet BTU	1027	1177
	Shipping Dimensions, Maximum (W x D x H)*		1590 x 990 x 2210 mm (62.6" x 39.0" x 87.0")
Shipping Volume, Maximum *		3.48 m <sup>3</sup> (122.9 cu.ft)	4.51 m <sup>3</sup> (159.3 cu.ft)

# Streamline® Compounding Isolators

## Compounding Aseptic Containment Isolator - Recirculating (SCI-N)

The Streamline® Compounding Aseptic Containment Isolator – Recirculating (SCI-N) is suitable for work involving hazardous drugs that are not known to be volatile. The work zone and pass-thru interchange are under negative pressure to the room in order to maintain containment in case of a breach in the barrier isolation system.

### Guide to Streamline® Compounding Aseptic Containment Isolator - Recirculating Models

SCI - 4 N 3 - S

ISOLATOR	CODE	NOMINAL WIDTH	CODE	ELECTRICAL CODE	CODE	SHARPS PROVISIONS	CODE
Streamline® Compounding Isolator	SCI	4 ft (1.2 m)	4	220-240 V, AC, 50 Hz, 1Ø	1	No sharps provision	0
		6 ft (1.8 m)	6	110-120 V, AC, 50 Hz, 1Ø	2	With sharps provision	S
				220-240 V, AC, 60 Hz, 1Ø	3		

## GENERAL SPECIFICATIONS

Compounding Aseptic Containment Isolator (Recirculating)

		SCI-4N _ _	SCI-6N _ _
Nominal Size		1.2 meters (4')	1.8 meters (6')
External Dimensions (W x D x H)	Without Base Stand	1340 x 820 x 1320 mm (52.8" x 32.3" x 51.9")	1950 x 820 x 1320 mm (76.8" x 32.3" x 51.9")
	With Base Stand (Min)	1522 x 820 x 1995 mm (59.9" x 32.3" x 78.5")	2132 x 820 x 1995 mm (83.9" x 32.3" x 78.5")
	With Base Stand (Max)	1522 x 820 x 2250 mm (59.9" x 32.3" x 88.6")	2132 x 820 x 2250 mm (83.9" x 32.3" x 88.6")
Main Chamber Work Zone (W x D x H)		840 x 610 x 670 mm (33.1" x 24.0" x 26.4")	1450 x 610 x 670 mm (57.1" x 24.0" x 26.4")
Pass Through (W x D x H)		355 x 610 x 670 mm (13.9" x 24.0" x 26.4")	355 x 610 x 670 mm (13.9" x 24.0" x 26.4")
Work Zone and Interchange Chamber Performance		ISO Class 3 (Class 1, Federal Standard 209E)	
Downflow and Exhaust Filter and Inlet Filter Type		ULPA filter with integral metal guards and filter frame gaskets; fully compliant with EN 1822 (H14) and IEST-RP-CC001.3 requirements (each cabinet has individual downflow, exhaust filters and inlet filters.)	
Typical Filter Efficiency		>99.999% for particle size between 0.1 to 0.3 micron	
Airflow Volume	Required Exhaust With Optional Hard Ducting	190 m³/h (112 cfm)	286 m³/h (168 cfm)
	Static Pressure For Optional Hard Ducting	27 Pa / 0.10 in H <sub>2</sub> O	30 Pa / 0.12 in H <sub>2</sub> O
Fluorescent Lamp Intensity		> 950 Lux (> 88 foot candles)	
Isolator Construction	Main Body	1.2 mm (0.05") 18 gauge electro-galvanized steel with white oven-baked epoxy-polyester antimicrobial powder-coated finish	
	Work Tray	1.5 mm (0.06") 16 gauge stainless steel, type 304, with 4B finish	
	Side Walls	1.2 mm (0.05") 18 gauge stainless steel, type 304, with 4B finish	
Electrical	220-240V, AC, 50Hz, 1Ø	SCI-4N1 _ _	SCI-6N1 _ _
	Cabinet Full Load Amps (FLA)	2.1 A	2.5 A
	Optional Outlets FLA	5 A	5 A
	Cabinet Nominal Power	295 W	440 W
	Cabinet BTU	1007	1501
	110-120V, AC, 60Hz, 1Ø	SCI-4N2 _ _	SCI-6N2 _ _
	Cabinet Full Load Amps (FLA) **	6 A	8.2 A
	Optional Outlets FLA **	5 A	5 A
	Cabinet Nominal Power	410 W	600 W
	Cabinet BTU	1399	2047
	220-240V, AC, 60Hz, 1Ø	SCI-4N3 _ _	SCI-6N3 _ _
	Cabinet Full Load Amps (FLA)	2.1 A	2.5 A
Optional Outlets FLA	5 A	5 A	
Cabinet Nominal Power	295 W	440 W	
Cabinet BTU	1007	1501	
Net Weight*		326.5 kg (720 lbs)	395 kg (871 lbs)
Shipping Weight*		392.5 kg (865 lbs)	476.5 kg (1051 lbs)
Shipping Dimensions, Maximum (W x D x H)*		1590 x 990 x 2210 mm (62.6" x 39.0" x 87.0")	2150 x 950 x 2210 mm (84.6" x 37.4" x 87.0")
Shipping Volume, Maximum *		3.48 m <sup>3</sup> (122.9 cu.ft)	4.51 m <sup>3</sup> (159.3 cu.ft)

# Streamline® Compounding Isolators

## Compounding Aseptic Containment Isolator – Total Exhaust (SCI-TE)

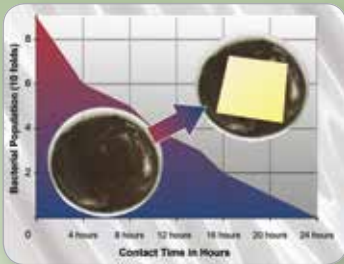
Streamline® Compounding Isolator (Total Exhaust) provides a sterile environment for handling hazardous drugs. Configured to operate at negative pressure to provide user, product, environment, and cross-contamination protection against exposure to hazards. The negative pressure, total exhaust isolator is suitable for work involving volatile cytotoxic drugs and other hazardous drugs in the healthcare setting.

### H14 HEPA Filters

- H14 filters with a typical efficiency of >99.995% at 0.3 microns provide superior ISO Class 5 air cleanliness, 100 times better than competing products

### ISOCIDE™

- Esco Isocide™ antimicrobial coating on all painted surfaces minimizes contamination



### Airlock Pass Chamber

- Ensures work zone remains sterile during insertion and removal of items
- Equipped with electromagnetic interlock doors which can be facilitated by foot switch for the inner door

### Easy-to-clean work zone

- One-piece work zone liner with no crevices is easy to clean

### Options

- Sharps disposal system
- Hydraulic height-adjustable stand



### BIBO Exhaust Filter

- Bag-In Bag-Out Exhaust Filter at the top allows for safe and convenient filter change

### Exhaust Types

- Comes with 3 different exhaust configurations:
  1. Double Exhaust (Top/Bottom)
  2. Single Exhaust – Top
  3. Single Exhaust – Bottom

### Sentinel™ Gold Microprocessor

- Supervises all functions, visual monitoring and alarm system



### Work Zone and Pass-through

- Negative for sterile, hazardous pharmacy compounding

### Ergonomic design

- Angled front and oval glove ports improve reach and comfort

### Safe-change cuff rings

- Permit glove changes with zero risk of contaminating the work zone or pharmacy environment



## Guide to Streamline® Compounding Aseptic Containment Isolator (Total Exhaust) Models

**SCI - 2G 8 NS L - 1 0**

ISOLATOR	CODE	NOMINAL WIDTH	NO. OF GLOVEPORTS	ELECTRICAL CODE	CODE	PASS-THROUGH CHAMBER	CODE	EXHAUST TYPE	CODE	SHARPS CONTAINER*	CODE
Streamline® Compounding Isolator	SCI	4 ft (1.2 m)	<b>2G</b>	220-240 V, AC, 50/60 Hz, 1Ø	<b>8</b>	Left	<b>L</b>	Double Exhaust (Top & Bottom)	<b>1</b>	No	<b>0</b>
		6 ft (1.8 m)	<b>3G</b>	110-120 V, AC, 50/60 Hz, 1Ø	<b>9</b>	Right	<b>R</b>	Single Exhaust (Top)	<b>2</b>	Yes	<b>S</b>
								Single Exhaust (Bottom)	<b>3</b>		

Note: \*Sharps container option is not available for Double Exhaust Filter Type

### GENERAL SPECIFICATIONS

Streamline® Compounding Aseptic Containment Isolator (Total Exhaust)

		SCI-2G_-NS	SCI-3G_-NS
External Dimensions W x D x H (mm)	With Adjustable Stand (Min)	1645 x 845 x 2360 mm (64.8" x 33.3" x 92.9")	1950 x 845 x 2360 mm (76.8" x 33.3" x 92.9")
	With Adjustable Stand (Max)	1645 x 845 x 2600 mm (64.8" x 33.3" x 102.4")	1950 x 845 x 2600 mm (76.8" x 33.3" x 102.4")
Process Chamber Internal Dimension - W x D x H (mm)		915 x 560 x 615 mm (36.0" x 22.0" x 24.2")	1220 x 560 x 615 mm (48.0" x 22.0" x 24.2")
Pass-through Chamber Internal Dimension - W x D x H (mm)		480 x 560 x 615 mm (18.9" x 22.0" x 24.2")	480 x 560 x 615 mm (18.9" x 22.0" x 24.2")
Glove Port Quantity		2	3
Chamber Environment		ISO Class 5 all Chambers (Grade A)	
Pre-filter		G4, panel, polyester fiber media	
Downflow and Exhaust Filter Type		HEPA H14 Filter with Integral Mesh Guards and Gaskets, fully compliant with EN 1822	
Bag-In Bag-Out Filter		HEPA H14 Filter with Integral Mesh Guards and Gaskets, fully compliant with EN 1822	
Filter Efficiency		>99.995% for particle size between 0.1 to 0.3 microns	
Lighting Level		>800 Lux	
Sound Level		TBD	TBD
Downflow Velocity (m/s)	Process Chamber	0.3 ±20%	0.4 ±20%
	Pass Chamber	0.12 ±20%	0.12 ±20%
Air Change Per Hour	Process Chamber	1577	1577
	Pass Chamber	631	631
Air Volume (m³/h)	Process Chamber	548	731
	Pass Chamber	115	115
Isolator Construction	Main Body	1.2 mm (0.05") 18 Gauge Electro-Galvanized Steel with White Oven-Baked Epoxy-Polyester Isocide Antimicrobial Powder Coated Finish	
	Work Tray	1.5 mm (0.06") 16 Gauge Stainless Steel, Type 316, with 4B Finish	
	Inner Side Wall	1.5 mm (0.06") 18 Gauge Stainless Steel, Type 316, with 4B Finish	
Building Exhaust Requirement	Double Exhaust (Top/Bottom)	450 Pa @ 800 cmh	450 Pa @ 850 cmh
	Single Exhaust Top	450 Pa @ 670 cmh	300 Pa @ 850 cmh
	Single Exhaust Bottom	450 Pa @ 800 cmh	300 Pa @ 850 cmh

# Isoclean® Healthcare Platform Isolators

## Optimized Solution for Sterile/Aseptic Applications

The Isoclean® Healthcare Platform Isolator (HPI-G3) facilitates the isolation of a product or process while providing the required sterile/aseptic environment. It is configured to operate at positive or negative pressure in single or recirculating airflow. This equipment provides a comprehensive range of personnel and product protection in addition to the surrounding work areas and the environment.

### Applications:

- Pharmacy compounding (Sterile)
  - Non-hazardous
  - Hazardous
- Small-scale Potent Material Handling
- Aseptic Processing
- Research and Development
- Cell Processing



## BioVap™ | Biodecontamination System

Esco BioVap™ is an effective hydrogen peroxide based biodecontamination system capable of achieving a 6-log reduction in bioburden. This system can be integrated into the HPI-G3 as our approach to a cost-effective biodecontamination.

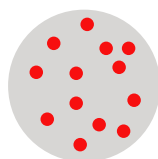
### Science Behind the Process

The Esco BioVap™ system employs a process of atomizing the hydrogen peroxide sterilant creating a dry fog after it is injected into the space. This unique system (patent pending) creates a charge on the atomized droplets as it pass through the nozzle.

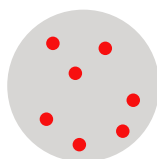
Each droplet of the sterilant contains billions of reactive antimicrobials to effect a microbial kill. Through a mutual repulsion, the charged droplets repel each other and distribute through the space and are attracted to the negative charged surfaces. This causes the droplets to crash and burst on to the surfaces instead of gently settling.

This revolutionary biodecontamination system is not affected by temperature or relative humidity therefore there is no pre-conditioning requirement to the chamber before use leading to reduced cycle.

### Levels of Biodecontamination



**SANITIZATION**  
Two log-10<sup>-2</sup>



**DISINFECTION**  
Five log-10<sup>-5</sup>



**STERILIZATION**  
Six log-10<sup>-6</sup>

### Control System

BioVap™ is controlled by PLC with operator interface via a touchscreen HMI terminal giving operator log on security and real-time display of cycle parameters.



Specifications	
Air Injection Pressure	4 bar ±10%
Air Injection Flow rate	32 lpm ±10%
Injection Time	30 sec – 5 min
Dwell Time	30 min
Aeration Time	20 min
Total Decon Time	45 min – 1 hr
Sterilant Used in One Cycle	10 – 30 mL
Sterilant Injection Flow Rate	200 – 300 µL/sec
Sterilant	30% Hydrogen Peroxide

# Isoclean® Healthcare Platform Isolator (HPI-G3) WITHOUT filter below work zone

Inbuilt **dampers** to allow pressure testing without having to use cover plates, tape & silicone

Centrifugal, direct-drive **blowers** designed for maximum energy efficiency and minimal maintenance

**Sentinel™ Gold Microprocessor Control System** supervises all functions and monitors airflow and pressures in real-time.

Airlock **Pass Chamber** ensures work zone remains sterile during insertion and removal of items.

Horizontal **sliding tray** prevents operator fatigue during transfer procedures

**Electromagnetic Interlocking Doors** with time delay effect ensures safety and containment between the Pass Chamber and the Process Chamber.

Optional **sharps disposal system** enables smoother work flow and minimizes transfers in order to enhance patient protection and sterility

**Foot switch** provides hands-free access to opening and closing of the magnetic interlock minimizing operator fatigue during transfer procedures

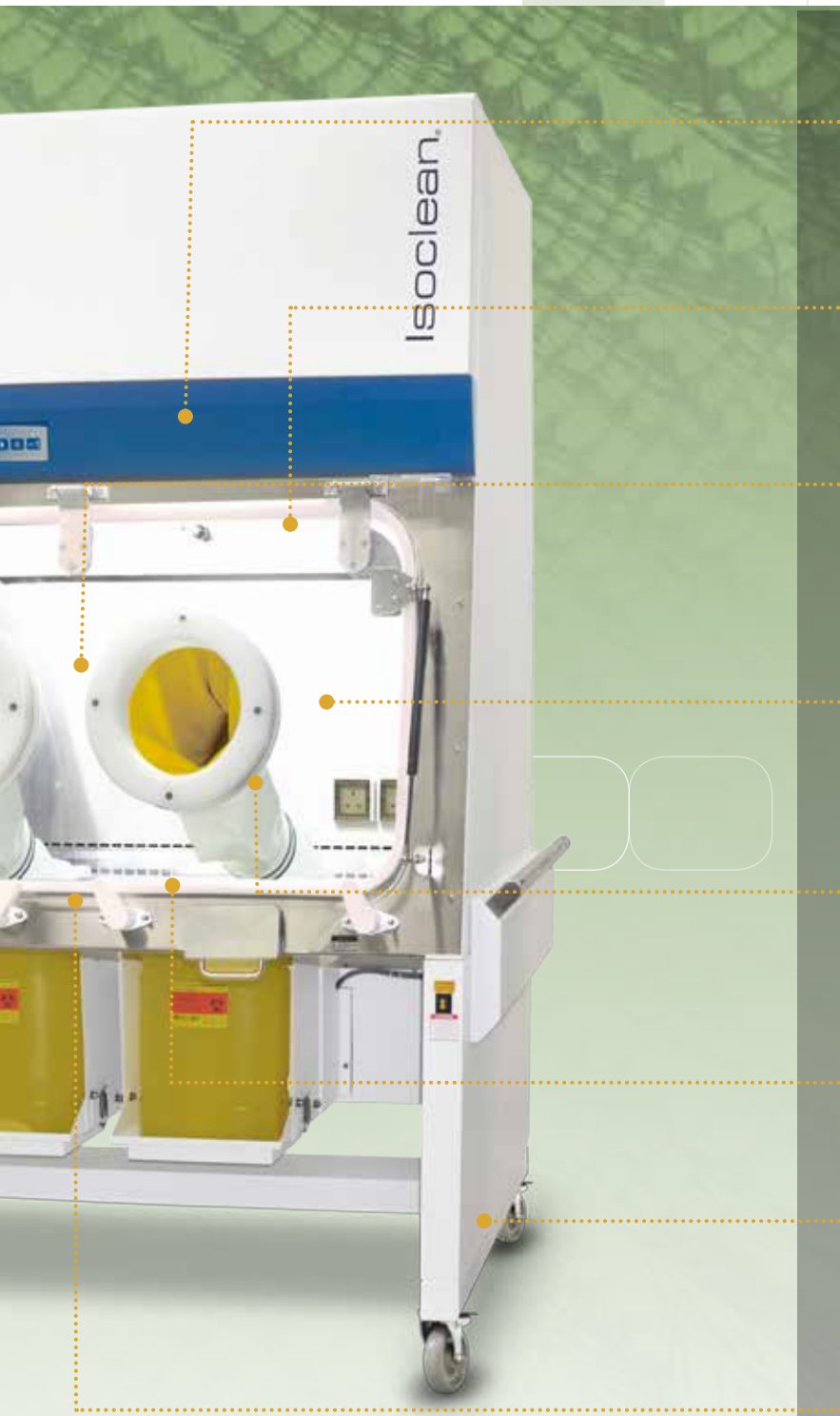


## Guide To Isoclean® Healthcare Platform Isolator - Without Filter Below Work Zone

**HPI-4 P 1-G3-0**

MODEL	PROCESS CHAMBER INTERNAL WIDTH (MM)	CODE	PRESSURE	CODE	VOLTAGE	CODE	SHARPS CONTAINER	CODE
HPI-G3	1130	4	Positive	P	220-240 VAC, 50 Hz	1	No	0
	1360	6	Negative	N	110-120 VAC, 60 Hz	2	Yes	S
					220-240 VAC, 60 Hz	3		





**ULPA filters (H14)** with a typical efficiency of >99.999% at 0.1 to 0.3 microns provide superior ISO Class 5 air cleanliness, 100 times better than competing products.

**Fluorescent lamps (optional LED)** deliver >800 Lux to the work surface for superior overall illumination.

With ISO Class 5 environment, the **Process Chamber** facilitates aseptic processing in an EU GMP Grade A condition

Frameless **front visor panel** with highly rounded edges to minimize crevices and maximize door vision panel

Circular **glove ports** with minimal crevices, no exposed bolts and nuts

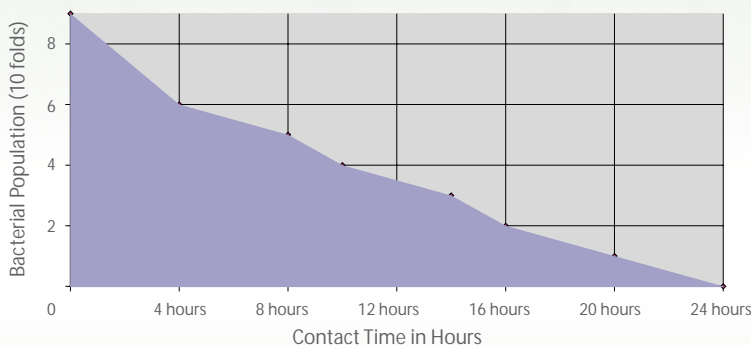
Single-piece stainless steel **work surface** with raised edges on all sides contain spillages.

Optional adjustable **hydraulic stand**, with casters, elevates to accommodate user preference for sitting or standing work surface height

Angled drain pan for easy cleaning

Esco Isoclean® Healthcare Platform Isolator, Model HPI-4P\_

**ISOCIDE™ Antimicrobial Powder-Coating**



All exterior painted surfaces are powder-coated with Esco Isocide™, an antimicrobial inhibitor to minimize contamination. Isocide™ is integrated into the coating substrate and cannot wash out or diminish by repeated cleaning. Performance results are available upon request. Contact Esco or your Esco Sales Representative for details.

# Isoclean® Healthcare Platform Isolator (HPI-G3) WITH filter below work zone

- Inbuilt **dampers** (option for manual or automated) to allow pressure testing without having to use cover plates, tape & silicone
- Centrifugal, direct-drive **blowers** designed for maximum energy efficiency and minimal maintenance
- **Sentinel™ Gold Microprocessor Control System** supervises all functions and monitors airflow and pressures in real-time.
- **Type D Pass Chamber** with interlocked doors, adjustable purged duration, and time-delayed ingress/egress control allowing sufficient time for surface decontamination to minimize transfer of contamination.
- Removable **sliding tray** (option for perforated or non-perforated) prevents operator fatigue during transfer procedures
- **Electromagnetic Interlocking Doors** with time delay effect ensures safety and containment between the Pass Chamber and the Process Chamber.
- **Return Filter** (option to upgrade to safe change BIBO) below work zone filters the contaminated air immediately to minimize possibility of airborne contamination
- **Foot switch** provides hands-free access to opening and closing of the magnetic interlock minimizing operator fatigue during transfer procedures

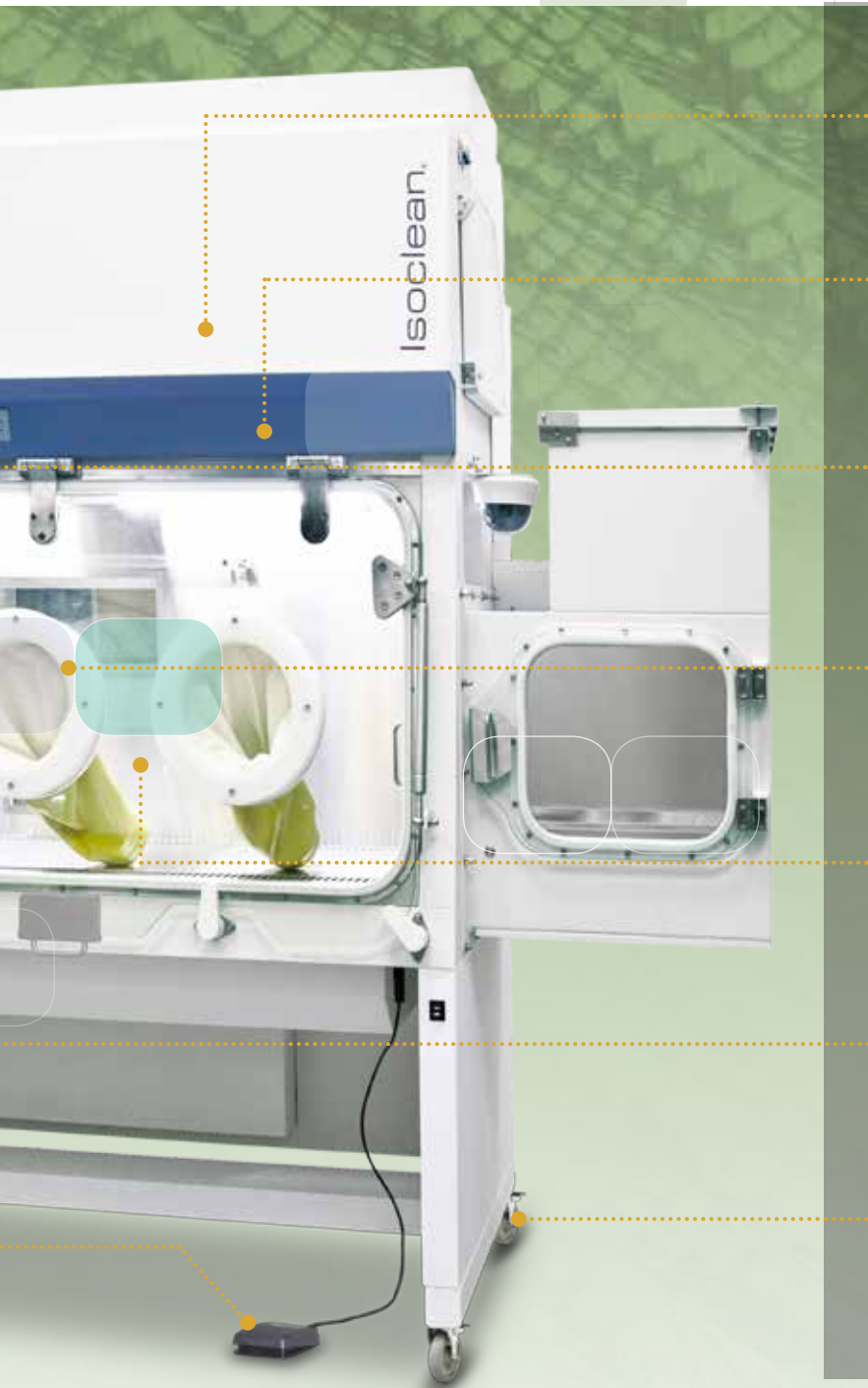


Esco Isoclean® Healthcare Platform Isolator, Model HPI-4G\_

## Guide To Isoclean® Healthcare Platform Isolator - With Filter Below Work Zone

**HPI-4G 8-P S 2-0**

MODEL	PROCESS CHAMBER INTERNAL WIDTH (MM)	NO. OF GLOVES	VOLTAGE	CODE	PRESSURE	CODE	AIRFLOW	CODE	PASS-THROUGH CHAMBER	C
HPI-G3	1215	2G	220-240 VAC, 50/60 Hz	8	Positive	P	Single Pass	S	None	
	1520	3G	110-120 VAC, 50/60 Hz	9	Negative	N	Recirculating	R	Left of Right	L
	1825	4G							Both Sides	



- **HEPA H14 filters** with a typical efficiency of >99.995% at 0.3 microns provide superior ISO Class 5 air cleanliness, 100 times better than competing products.
- **Fluorescent lamps (optional LED)** deliver >800 Lux to the work surface for superior overall illumination.
- With ISO Class 5 environment, the **Process Chamber** facilitates aseptic processing in an EU GMP Grade A condition
- Circular **glove ports** with minimal crevices, no exposed bolts and nuts
- Frameless **front visor panel** with highly rounded edges to minimize crevices and maximize door vision panel
- Single or multiple, removable **work trays** for easy surface cleaning and decontamination.
- Optional adjustable **hydraulic stand**, with casters, elevates to accommodate user preference for sitting or standing work surface height

CODE	SHARPS CONTAINER	CODE
0	No	0
or R	Yes	S
2		

HPI-G3 SC+
Safe change BIBO filters
Esco HMI / PLC controller
Standard Integration of BioVap™
Sliding vertical inner pass chamber door
Larger pass chamber (single or dual)



## GENERAL SPECIFICATIONS

Isoclean® Healthcare Platform Isolator WITHOUT filter below work zone

		HPI-4__-G3	HPI-6__-G3
Main Chamber Nominal Size (mm)		1130	1360
Process Chamber Internal Dimension - W x D x H (mm)		1130 x 570 x 670	1360 x 570 x 670
Pass Chamber Internal Dimension - W x D x H (mm)		318 x 570 x 670	318 x 570 x 670
Pass Chamber Door Opening - W x H (mm)	Inner Door	270 x 560	
	Outer Door	270 x 560	
External Dimensions - W x D x H (mm)	With Adjustable Stand (min)	1714 x 864 x 2200	1950 x 864 x 2200
	With Adjustable Stand (max)	1714 x 864 x 2450	1950 x 864 x 2450
Glove Port Diameter (mm)		200	
Glove Port Quantity		2	3
Chamber Environment		ISO Class 5 all Chambers (Grade A)	
Inlet, Downflow, and Exhaust Filter Type		ULPA Filter with Integral Metal Guards and Filter Frame Gaskets; Fully Compliant With EN 1822 (H14) and IEST-RPCC001.3 Requirements	
Filter Efficiency		> 99.999% for particle size between 0.1 to 0.3 microns	
Lighting Level		> 800	
Sound Level		TBD	TBD
Isolator Construction	Main Body	1.2 mm (0.05") 18 Gauge Electro-Galvanized Steel with White Oven-Baked Epoxy-Polyester Isocide Antimicrobial Powder Coated Finish	
	Work Tray	1.5 mm (0.06") 16 Gauge Stainless Steel, with 4B Finish	
	Inner Side Wall	1.5 mm (0.06") 16 Gauge Stainless Steel, with 4B Finish	
Electrical Requirements (by Client)	220-240 VAC, 50 Hz, 1Ø	HPI-4_1-G3	HPI-6_1-G3
	110-120 VAC, 60 Hz, 1Ø	HPI-4_2-G3	HPI-6_2-G3
	220-240 VAC, 60 Hz, 1Ø	HPI-4_3-G3	HPI-6_3-G3
Compressed Air Requirement (by Client)	2 Bar-g Pressure at 5 L/sec	2 Bar	
General Options/Accessories	Hydraulic Stand Control	✓	✓
	IV Bars with hooks	✓	✓
	UV lamp	✓	✓
	Electrical Outlet	✓	✓
	Glove Leak Tester	✓	✓
	Electrical Outlet	✓	✓
Work Surface Options	Single-piece Trays	✓	✓
	Multiple-piece Trays	✓	✓
Transfer Options	Sharps Disposal	✓	✓
	Continuous Liners for Bag In or Bag Out (BIBO)	✓	✓
	Bag Welder for Continuous Liner System	✓	✓



## GENERAL SPECIFICATIONS

Isoclean® Healthcare Platform Isolator WITH filter below work zone

		HPI-2G	HPI-3G	HPI-4G
Main Chamber Nominal Size (mm)		1215	1520	1825
Process Chamber Internal Dimension - W x D x H (mm)		1215 x 624 x 616	1520 x 624 x 616	1825 x 624 x 616
Pass Chamber Internal Dimension - W x D x H (mm)		577 x 427 x 320	577 x 427 x 320	577 x 427 x 320
Pass Chamber Door Opening - W x H (mm)	Indoor Door	300 x 287		
	Outer Door	350 x 300		
External Dimensions with 2 Pass Chambers and Exhaust Collar - W x D x H (mm)	With Adjustable Stand (min)	2420 x 830 x 2430	2725 x 830 x 2430	3030 x 830 x 2430
	With Adjustable Stand (max)	2420 x 830 x 2680	2725 x 830 x 2680	3030 x 830 x 2680
Glove Port Diameter (mm)		250		
Glove Port Quantity		2	3	4
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Pre-filter		G4, panel, polyester fiber media		
Downflow and Exhaust Filter Type		HEPA H14 with Integral Mesh Guard and Gasket Seal, fully compliant with EN 1822		
Filter Efficiency		99.995%		
Lighting Level		> 800		
Sound Level		TBD	TBD	TBD
Isolator Construction	Main Body	1.2 mm (0.05") 18 Gauge Electro-Galvanized Steel with White Oven-Baked Epoxy-Polyester Isocide Antimicrobial Powder Coated Finish		
	Internal Chamber	1.5 mm (0.06") 16 Gauge Stainless Steel, Type 316, with 4B Finish		
Electrical Requirements (by Client)	<b>220-240 VAC, 50/60 Hz, 1Ø</b>	<b>HPI-2G8-_-_-_-</b>	<b>HPI-3G8-_-_-_-</b>	<b>HPI-4G8-_-_-_-</b>
	Cabinet Full Load Amps	15 A	16 A	17 A
	Optional Outlets FLA	5A per outlet	5A per outlet	5A per outlet
	Cabinet Nominal Power	3.45 KW	3.68 KW	3.91 KW
	Cabinet BTU	11,772 BTU/hr	12,557 BTU/hr	13,341 BTU/hr
	<b>110-120 VAC, 50/60 Hz, 1Ø</b>	<b>HPI-2G9-_-_-_-</b>	<b>HPI-3G9-_-_-_-</b>	<b>HPI-4G9-_-_-_-</b>
	Cabinet Full Load Amps	15 A	16 A	17 A
	Optional Outlets FLA	5A per outlet	5A per outlet	5A per outlet
	Cabinet Nominal Power	1.725 A	1.84 A	1.95 KW
	Cabinet BTU	5,886 BTU/hr	6,278.34 BTU/hr	6,6670 BTU/hr
Compressed Air Requirement (by Client)	2 Bar-g Pressure at 5 L/sec	2 Bar		
General Options/Accessories	Hydraulic Stand Control	✓	✓	✓
	IV Bars with hooks	✓	✓	✓
	UV lamp	✓	✓	✓
	Electrical Outlet	✓	✓	✓
	Rear View Screen Adaptation	✓	✓	✓
	CCTV	✓	✓	✓
	Glove Leak Tester	✓	✓	✓
	Carbon VOC Filter with Housing	✓	✓	✓
	Hard Ducting with Anti-Blowback Valve	✓	✓	✓
Work Surface Options	Single Piece Trays	✓	✓	✓
	Multiple Piece Trays	✓	✓	✓
Transfer Options	Sharps Disposal	✓	✓	✓
	Continuous Liners for Bag In or Bag Out (BIBO)	✓	✓	✓
	Bag Welder for Continuous Liner System	✓	✓	✓

## Maintenance Checks for Isolators

To ensure your containment system performs in the manner for which it was designed, it will require routine maintenance. The table below gives details of the maintenance required and time intervals this should be carried out.

No.	Check Items	Maintenance Schedule				
		Daily	Weekly	Monthly	Quarterly	Annually
1.	Check that any control devices on the local operator panel are not damaged.	✓				
2.	Ensure that lights are properly operating	✓				
3.	Check that the glass is not cracked or damaged	✓				
4.	Cleaning and disinfecting surfaces	✓				
5.	Decontaminate the isolator	✓				
6.	Clean the exterior surface of the unit			✓		
7.	Check all service fixtures for proper operation			✓		
8.	Inspect seals for damage/wear			✓		
9.	Inspect gloves for leaks and replace if necessary			✓		
10.	Check and replace pre-filter (if necessary)				✓	
11.	Clean up surface stainless steel with MEK				✓	
12.	Re-certification <ul style="list-style-type: none"> <li>• Airflow velocity</li> <li>• Pressure leak test</li> <li>• Chamber pressure test (static/dynamic)</li> <li>• Filter integrity test</li> <li>• Particle count test</li> <li>• Airflow smoke pattern test</li> <li>• Product ingress and egress test</li> <li>• Gauntlet breach test</li> <li>• Recovery time test</li> <li>• Operator comfort test (noise, light, vibration)</li> </ul>					✓
13.	Calibration of all instruments: sensors/transmitters, modulating actuators					✓
14.	Revalidation of bio decontamination cycle. Run full cycle again with CI and BI and verify decon settings. Change if necessary					✓

# Containment Barrier Isolator

## Pharmacy Isolator Solution to cGMP Compliance

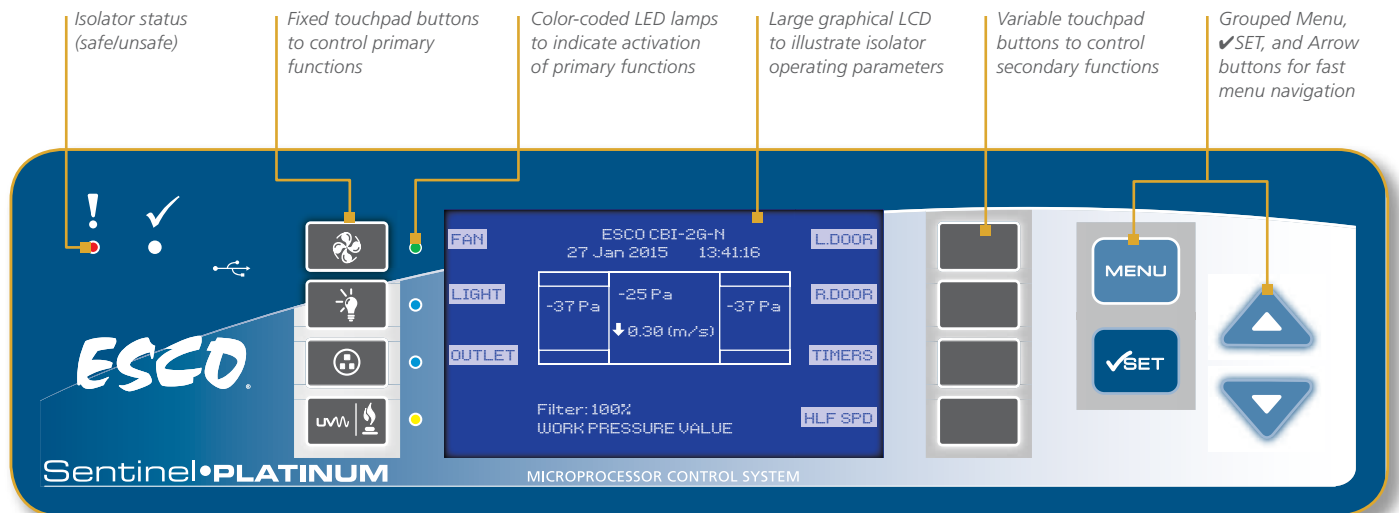
Containment Barrier Isolator (CBI) facilitates the isolation of a product or process while providing the required conditions for a sterile/aseptic environment. This equipment provides a comprehensive range of personnel and product protection in addition to protection for the surrounding work areas and the environment.

CBI is designed in complete compliance with PIC/s and international cGMP standards, with its 19 mm radius covered internal corners in a single piece chamber (no perforations or grilles for contaminants to be trapped on all 4 corners). Its rear return filter ensures that ducts are not contaminated.

Facilitated with a breach protection such that if there is a loss of a glove there will be an inrush or outrush of air to maintain operator or product protection, respectively.



## CONTROL SYSTEM



The Escó Sentinel microprocessor-based control system our intelligent human interface that monitors and controls functions of the isolator.

Features of the main control panel include:

- Pressure controls for Process and Pass chambers
- Fan controls
- Differential pressure drop across filters and chamber pressures are monitored and displayed
- Continuous monitoring and display of downflow velocity is displayed
- Closed loop controls to maintain constant pressure with EBM ECM fans
- Options for Automated Pressure Testing to close dampers

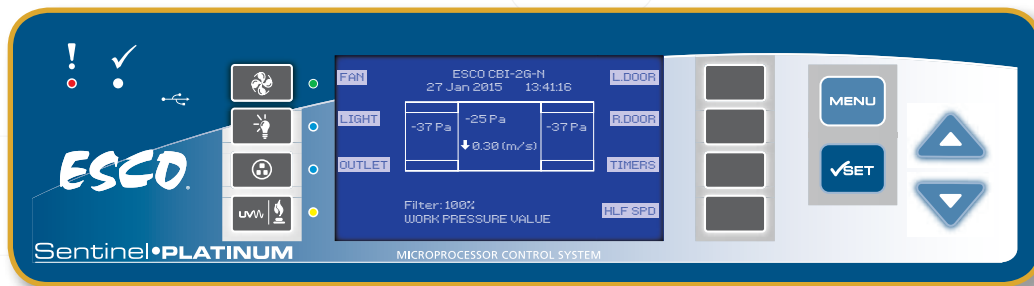
## Control System

The Escó Sentinel™ Platinum microprocessor-based control system supervises operation of all cabinet functions. Controls are configurable to meet user requirements:

Features of the main control panel include:

- Work zone and pass-through pressures are monitored and displayed
- Continuous monitoring and display of cabinet airflow on large, easy-to-read LCD display
- Inner door timeout and display units, pressure injection buttons, emergency stop button
- Work zone and pass-through pressures are monitored and displayed
- Continuous monitoring and display of cabinet airflow on large, easy-to-read LCD display
- Inner door timeout and display units, pressure injection buttons, emergency stop button





## Damper

- Inbuilt dampers to allow pressure testing without having to use cover plates, tape & silicone
- Close or open the isolator chambers from the external room environment

## Sentinel™ Platinum Microprocessor Controller

- Supervises all functions and monitors airflow and pressure in real time
- Large graphical LCD to illustrate isolator operating parameters



### Process Chamber

- Perform work operation. Environmental conditions are being monitored, regulated and maintained.
- Chamber supply and Return ULPA filters complying with EN1822 having an MPPS efficiency of 99.9995%
- ISO 5 environment facilitating aseptic processing in an EU GMP grade A condition



### Sliding Tray

- Prevents operator fatigue during transfer procedures
- Removable, for easy cleaning



### Magnetic InterLock

- Ensures safety and containment between the Pass Chamber and the Process Chamber
- Time delay effect from closing one door before opening the opposite door



### Tempered Glass

- Toughened safety glass for increased protection
- Frameless with highly polished rounded edges to increase cleanliness and maximize door vision panel for ergonomic comfort



### Foot Switch

- Provides hands-free access to opening and closing of the magnetic interlock minimizing operator fatigue during transfer procedures





### EC Centrifugal Fan

- Minimized noise and vibration, energy efficient, compact design, minimal maintenance
- Controlled in a closed loop to ensure correct airflow and correct internal pressure



### Emergency Stop Button (E-Stop)

- Easy access for manual electrical power turn off and equipment shutdown during emergencies



### Pressure Injection Buttons

- Facilitate the injection of air into the chambers during manual pressure decay test



### Relative Humidity and Temperature Sensor

- Monitors relative humidity and temperature of the chambers
- Formed in a single unit with only one measuring probe installed at the chamber work area



### Pass Chamber

- Gateway for materials entering and exiting the Process chamber
- Furnished with electromagnetic interlocked doors
- Biodecontaminated and purged to ensure removal of contaminants before entering Process Chamber



### Clean Design Work Area

- Coved corners for easy cleaning
- Constructed with non-corrosive 316 L stainless steel



## Guide to Containment Barrier Isolator Models

### CBI - U - 2G 2PTC

ISOLATOR	CODE	AIRFLOW REGIME	CODE	INTERNAL WIDTH	NO. OF GLOVEPORTS	PASS-THROUGH CHAMBER	CODE	ELECTRICAL CODE
Containment Barrier Isolator	CBI	Unidirectional	U	1200 mm	2G	1 Pass-through chamber	1PTC	220-240 V, AC, 50 Hz, 1Ø
				1600 mm	3G	2 Pass-through chamber	2PTC	110-120 V, AC, 50 Hz, 1Ø
				2000 mm	4G			

## GENERAL SPECIFICATIONS

Containment Barrier Isolator

		CBI-2G	CBI-3G	CBI-4G
Main Chamber Nominal Size (Width)		1.2 m	1.6 m	2.0 m
Working Chamber Dimensions - Min (L x W x H)		1.2 m x 0.55 m x 0.77 m	1.6 m x 0.55 m x 0.77 m	2.0 m x 0.55 m x 0.77 m
Working Chamber Dimensions - Max (L x W x H)		1.2 m x 0.63 m x 0.84 m	1.6 m x 0.63 m x 0.84 m	2.0 m x 0.63 m x 0.84 m
External Dimension (with one Pass Chamber) (L x W x H)	With Adjustable Base Stand (Min)	1.82 m x 0.92 m x 2.26 m	2.22 m x 0.92 m x 2.26 m	2.62 m x 0.92 m x 2.26 m
	With Adjustable Base Stand (Max)	1.82 m x 0.92 m x 2.56 m	2.22 m x 0.92 m x 2.56 m	2.62 m x 0.92 m x 2.56 m
Glove Port Height (Min)		1000 mm	1000 mm	1000 mm
Glove Port Height (Max)		1300 mm	1300 mm	1300 mm
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Filter Type - Chamber Inlet		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Inlet		99.9998%		
Filter Type - Chamber Exhaust		HEPA H14 with Integral Mesh Guard and Gasket Seal		
Filter Efficiency - Chamber Exhaust		99.995%		
Lighting Level		≥ 700 Lux		
Sound Level		TBA		
Isolator Construction	Chamber	SS316L		
	Service Housing	SS304L		
	Support Frame	SS304L		
Isolator Finish	Chamber Internal	≤0.4 Ra		
	Chamber External	≤0.6 Ra		
	Service Housing External	≤0.6 Ra		
	Support Frame	≤1.0 Ra		
Electrical Requirements (by Client)	220-240 VAC, 50/60 Hz, 1Ø	✓	✓	✓
	110-120 VAC, 50/60 Hz, 1Ø	✓	✓	✓
Compressed Air Requirement (by Client) if no on-board compressor	2 Bar-g Pressure at 5 L/sec	✓	✓	✓
Exhaust Duct Requirements (by Client) unless Integral Catalytic Convertor is Included		10" Duct from Isolator to Outside		



# General Processing Platform Isolator

## Your Advanced Solution for Sterile/Aseptic Applications

The Esco General Processing Platform Isolator (GPPI) is a highly adaptable, unidirectional airflow isolator that can be used for sterility testing or other processes that require an ISO Class 5 (Grade A) aseptic environment. The GPPI's advanced control system allows the operator to select either positive or negative chamber pressure as well as single pass or recirculating airflow patterns. These features, along with the ability to perform safe change procedures on the supply and return ULPA filters, make the GPPI a highly versatile isolator that can be used for potent or non-potent aseptic material handling.

In addition, the Esco GPPI's design offers 20 standard options and configurations ensuring that Esco can provide a standard solution to fit your specific process and facility requirements. Should a standard option does not fit your requirements, Esco can offer customized solutions as well.



## Advanced Control System

1. The HMI screen consists of the following:

The **Header** shows the user account logged-in, and the date and time.

The **Content Pane** displays the required elements for navigating through screens or for executing a specific task (e.g. machine start/stop).

The **Quick Action Pane** provides quick access to common screens and tasks. Below are the buttons that may appear in the Quick Action Pane:

- **Home** – returns the screen to the Main Menu
- **Back** – returns to the previously opened screen
- **Lamp** – turns the lamp on/off
- **Power On/Off Button** – allows the user to switch the system on or off
- **Alarm View** – opens the Alarm View Screen
- **Logon/Logout Button** – allows the user to log in and out

**Header**

**Content Pane**



**Quick Action Pane**

# General Processing Platform Isolator

Your Advanced Solution for Sterile/Aseptic Applications

## ULPA Filters

- ULPA filters with a typical efficiency of >99.999% at 0.1 to 0.3 microns provide superior ISO Class 3 air cleanliness, 100 times better than competing products

## cGMP compliance

- Standard design incorporates cGMP-compliant features; with the inclusion of an optional chart recorder or printer
- GPPI meets the data handling requirements for 21 CFR Part 11
- Fully welded 316L SS internal chambers with covered corners

## BioVap™ compatible

- Optional BioVap™ automated biodecontamination system provides 6 log reduction in viable contaminants

## Integrated Hydraulic Raise

- Integrated hydraulic raise/lower mechanism facilitates delivery to fit through a standard doorway

## Work Zone and Pass-through

- User-selectable positive or negative chamber pressures and single pass or recirculating airflow regimes

## HMI Screen

- Supervises all functions, visual monitoring and alarm system

## Ergonomic design

- Angled front and oval glove ports improve reach and comfort

## Low Contamination Filter Change

- Filter change is done inside the closed isolator, through the glove ports
- Provides minimal exposure to the maintenance personnel and environment

## Options

- On-board exhaust catalytic convertor allows exhaust into the surrounding room without modifications to the facility and fitted with an interlocked external H<sub>2</sub>O<sub>2</sub> sensor for safety
- On-board air compressor eliminates the requirement for a site supplied compressed air connection allowing a simple electrical power plug in installation



## Guide to General Processing Platform Isolator Models

### GPPI-4G

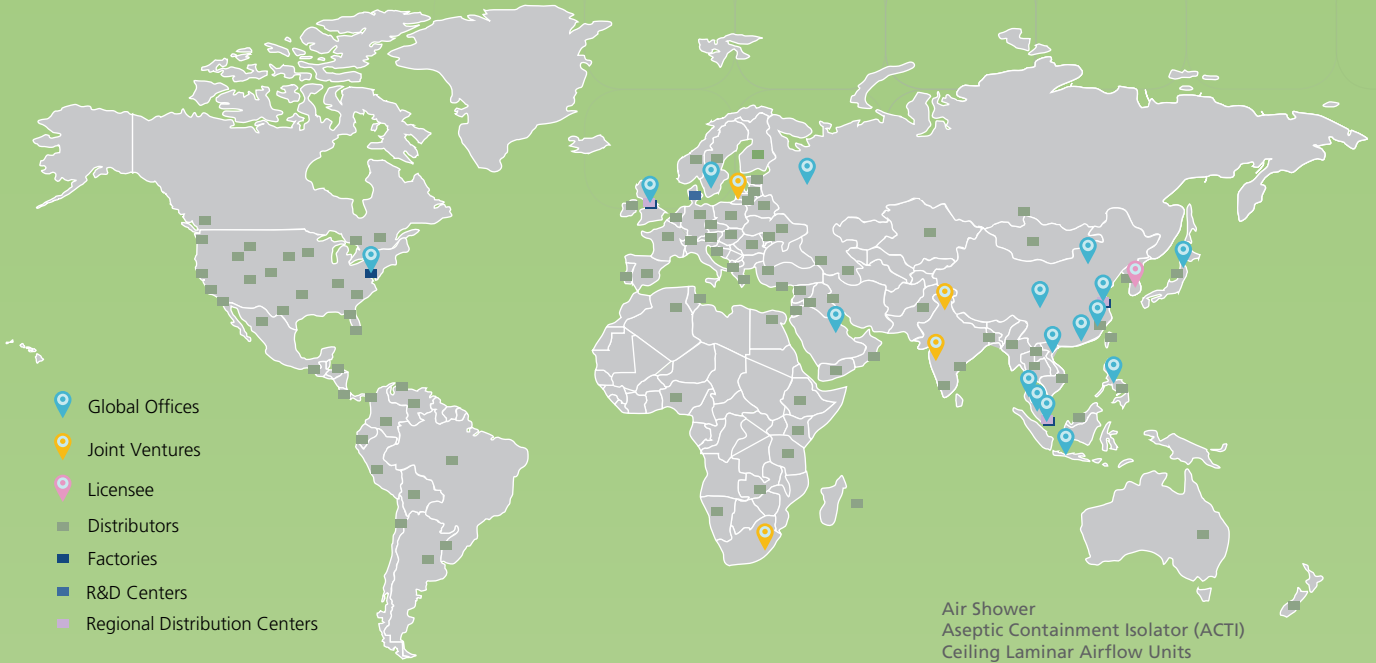
ISOLATOR	CODE	INTERNAL WIDTH	NO. OF GLOVEPORTS
General Processing Platform Isolator	GPPI	1200 mm	2G
		1600 mm	3G
		2000 mm	4G

## GENERAL SPECIFICATIONS

General Processing Platform Isolator (GPPI)

		GPPI-2G	GPPI-3G	GPPI-4G
Nominal Size Main Chamber (Width)		1.2 m	1.6 m	2.0 m
Working Chamber Dimensions (L x W x H)	1.2 m x .0.61 m x 0.72 m	✓	✓	✓
	1.2 m x .0.72 m x 0.72 m	✓	✓	✓
External Dimensions (L x W x H)	With Adjustable Base Stand (Min)	1.92 m x 1.03 m x 2.2 m	2.32 m x 0.92 m x 2.2 m	2.72 m x 0.92 m x 2.2 m
	With Adjustable Base Stand (Max)	1.92 m x 1.03 m x 2.5 m	2.32 m x 0.92 m x 2.5 m	2.72 m x 0.92 m x 2.5 m
Glove Port Height Min (mm)		1055	1055	1055
Glove Port Height Max (mm)		1355	1355	1355
Chamber Environment		ISO Class 5 all Chambers (Grade A)		
Filter Type -Chamber Inlet		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Inlet		99.9998%	99.9998%	99.9998%
Filter Type -Chamber Exhaust		ULPA U15 with Integral Mesh Guard and Knife Edge Gel Seal		
Filter Efficiency - Chamber Exhaust		99.9998%	99.9998%	99.9998%
Lighting Level		≥ 600 Lux		
Sound Level		68 dBA		
Isolator Construction	Chamber	SS316L		
	Service Housing	SS304L		
	Support Frame	SS304L		
Isolator Finish	Chamber Internal	≤ 0.4Ra		
	Chamber External	≤ 0.6Ra		
	Service Housing External	≤ 0.6Ra		
	Support Frame	≤ 1.0Ra		
Electrical Requirements (By Client)	220-240V, AC, 50Hz, 1Ø	✓	✓	✓
	110-120V, AC, 60Hz, 1Ø	✓	✓	✓
	220-240V, AC, 60Hz, 1Ø	✓	✓	✓
Compressed Air Requirement (By Client) (If no on-board compressor)	2 Bar-g Pressure at 5 L/sec	✓	✓	✓
Exhaust Duct Requirements (By Client) (Unless Integral Catalytic Convertor is Included)		10" Duct from Isolator to Outside		
Options	Pass Chamber	✓	✓	✓
	Bio-Decontamination Steris	✓	✓	✓
	Bio-Decontamination Bioquell	✓	✓	✓
	Non-Viable Air Sampler	✓	✓	✓
	Viable Air Sampler	✓	✓	✓
	Sterility Test Pump	✓	✓	✓
	Glove Tester	✓	✓	✓
	Waste Bag Grommet	✓	✓	✓
	Sterile Continuous Liner	✓	✓	✓
	Bag Welder with Table	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Alpha	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Beta Canister	✓	✓	✓
	RTPØ105, 190, 270, 350, 460 - Beta Liner	✓	✓	✓
	Weigh Scale	✓	✓	✓
	Spray Gun	✓	✓	✓
	Temperature and RH Monitoring	✓	✓	✓
	H <sub>2</sub> O <sub>2</sub> Monitoring	✓	✓	✓
	Product Waste Entry / Exit Ports	✓	✓	✓
	Liquid Water Entry / Exit Ports	✓	✓	✓
	Integral Catalytic Convertor	✓	✓	✓
On-board Air Compressor	✓	✓	✓	

# ESCO GLOBAL NETWORK



- Air Shower
- Aseptic Containment Isolator (ACTI)
- Ceiling Laminar Airflow Units
- Cleanroom Transfer Hatch
- Containment Barrier Isolator (CBI)
- Compounding Aseptic Isolator
- Compounding Aseptic Containment Isolator
- Downflow Booth (DFB)
- Dynamic Floor Label Hatch
- Dynamic Pass Box
- Evidence Drying Cabinet
- Garment Storage Cabinet
- General Processing Platform Isolator (GPPI)
- Healthcare Platform isolator
- Laminar Flow Horizontal Trolley
- Laminar Flow Straddle Units, Single and Double Laminar
- Flow Vertical Trolley
- Pass Box
- Soft Wall Cleanroom
- Sputum Booth
- Ventilated Balance Enclosure (VBE)
- Weighing and Dispensing Containment Isolator (WDCI)

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