

Weighing and Dispensing Containment Isolator (WDCI)



Introduction

Engineered for Containment. Designed for Confidence

In pharmaceutical and chemical environments where weighing accuracy and operator safety are non-negotiable, the Esco Weighing and Dispensing Containment Isolator (WDCI) delivers uncompromised performance through advanced engineering control and robust design.

The Esco WDCI creates a fully enclosed, negative-pressure environment designed to provide maximum containment and personnel protection when handling highly potent compounds during weighing and dispensing operations. Equipped with integrated airflow control, HEPA filtration, and real-time monitoring of critical parameters, the WDCI ensures both process integrity and compliance with international containment and GMP standards.

Available in configurable designs, Esco WDCI can be tailored to support a wide range of applications, from precise milligram-scale micro-dosing to bulk raw material dispensing. Each unit is engineered to accommodate various analytical balances, weighing scales, and process equipment, while ensuring ergonomic access, cleaning efficiency, and operational reliability.

Whether for batch compounding, sample preparation, or in-process material handling, the WDCI is the trusted solution for safe and accurate performance in high-containment environments.

Standard Features

- **Negatively Pressurized Chambers**

Ensures enhanced containment for potent compounds by maintaining negative pressure throughout the weighing and dispensing zones.

- **Turbulent Airflow System (>30 ACH)**

Delivers effective containment with over 30 air changes per hour (ACH), balancing operator safety with energy efficiency.

- **Fully Welded Internal Chamber**

Constructed from single-piece SS316L (4.0 mm) stainless steel with coved, rounded corners for cleanability and long term durability.

- **Containment-Class Pressure Integrity**

Compliant with ISO 10648-2, Class 2 standard, with pressure leak rate < 0.25% volume loss/hour, ensuring high-containment reliability.

- **Inflatable Gasket Sealing System**

Equipped with USP Class VI-compliant inflatable gaskets for both proactive (during decon) and reactive (during operation) sealing.

- **Anti-Vibration Granite Weighing Platform (Optional)**

Integrated granite slab with SS316L frame and leveling feet to minimize passive vibration, ensuring accurate micro-dosing and weighing.

- **Automated Pressure Decay Test**

Built-in automated integrity test before each operation cycle, verifying isolator leak-tightness and system readiness.

- **GMP-Optimized Finishing**

Interior and exterior finished to low surface roughness, facilitating easy cleaning and minimizing particle retention.

- **Safe-Change HEPA Filter Configuration**

Process-side filters with push-push safe-change design, minimizing operator and environmental exposure during replacement.

- **Externally Mounted LED Lighting**

High-illumination lighting mounted outside the chamber, reducing internal surface contamination and simplifying maintenance.

- **Fixed-Height SS304 Support Stand**

Supplied with a stable stainless-steel base, equipped with caster wheels and leveling feet for easy relocation and installation.

- **21 CFR Part 11 Compliant HMI/PLC Controller System**

Data integration-ready for the client's Building Management System with compliance to Electronic Records and Signature to maintain data integrity.

Applications

- Weighing and dispensing of active pharmaceutical ingredients (API) and HPAPI
- Batch preparation and formulation during solid oral dosage manufacturing
- Handling toxic or sensitizing compounds under safe, enclosed conditions
- Dispensing of hazardous powders, catalysts, or corrosive reagents
- Safe handling of toxic, irritant, or allergenic substances
- Applications requiring strict control of operator exposure to substances with low occupational exposure limits (OEL)

Weighing and Dispensing Containment Isolator (WDCI) for Advanced Containment Solution for Potent Powder Handling

Engineered with robust construction and customizable configurations, WDCI delivers reliable containment performance tailored to your Standard Operating Procedures (SOPs) and containment target, whether you're working under OEB 4 or higher classification.

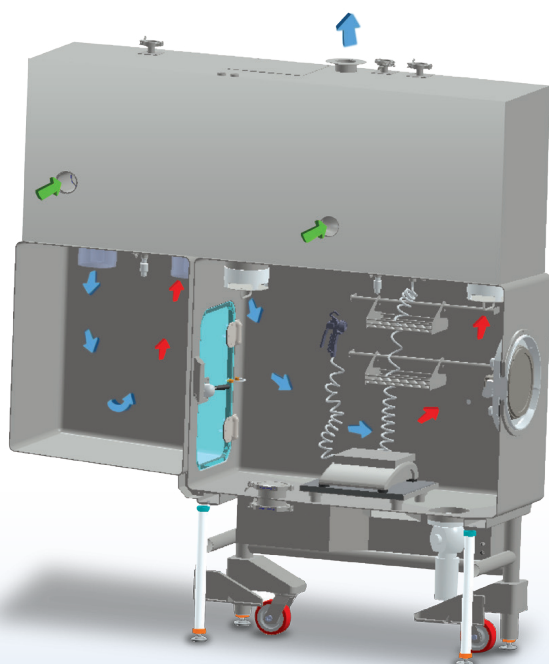
Scan the QR code to explore how Esco can support your potent compound handling needs with proven solutions and global expertise.



<https://www.esco-pharma.com/solutions/oel-oeb>



Airflow Regimes



Ambient air is drawn into the system through the air inlet located at the front of the technical housing and initially filtered using a G4 pre-filter. It is then directed through an internal air channel where it undergoes high-efficiency filtration via an H14 HEPA filter (>99.995% efficiency), before being introduced into the chamber.

The filtered air is delivered vertically into the chamber to create a turbulent airflow pattern, providing effective mixing and dilution of airborne High Potent Active Pharmaceutical Ingredients (HPAPI). This airflow ensures a minimum of 30 air changes per hour (ACPH) within the chamber.

Exhaust air is extracted through a double-stage H14 HEPA "push-push" filter system, ensuring containment integrity. The system is designed to support either ducted operation via a 3" (DN80) exhaust connection or non-ducted operation, depending on installation requirements.

General Specification		2-glove	3-glove	4-glove	5-glove	Pass Chamber
Nominal Size Process Chamber		1200 mm	1600 mm	2000 mm	2400 mm	680 mm
External Dimension (WxDxH) - with 1 pass chambers		1990 x 924 x 2275 mm	2390 x 924 x 2275 mm	2790 x 924 x 2275 mm	3190 x 924 x 2275 mm	N/A
Chamber Internal Dimension (WxDxH)		1200 x 633 x 842 mm	1600 x 633 x 842 mm	2000 x 633 x 842 mm	2400 x 633 x 842 mm	682 x 532 x 842 mm
Chamber Pressure		Negative Pressure				
Airflow Type		Turbulent Flow				
Filter Type and Efficiency	Inlet	Push-push 99.995% @ 0.3µm MPPS				Cartridge 99.98% @ 0.3µm MPPS
	Exhaust	Push-push 99.995% @ 0.3µm MPPS				Cartridge 99.98% @ 0.3µm MPPS
Exhaust Volume (cmh)	During normal run	20cmh @300Pa	30cmh @300Pa	40cmh @300Pa	50cmh @300Pa	15cmh @250Pa
	During breach	100cmh @900Pa	100cmh @900Pa	100cmh @900Pa	100cmh @900Pa	100cmh @900Pa
Lighting Level		≥ 500 Lux				N/A
Sound Level		≤ 75 dBA				
Isolator Material and Finish	Internal Chamber	SS316L, 4.0mm, Ra: ≤ 0.40 µm				
	External Chamber	SS304, 4.0mm, Ra: ≤ 0.60 µm				
	Service Housing External	SS304, 2.0mm, Ra: ≤ 0.60 µm				
	Door Seals	Silicone, Inflatable Seals, 21 CFR 177.2600 Compliant				
	Support Frame	SS304, 2.0mm, Ra: ≤ 1.20 µm				
Electrical Requirements		110-120V, AC, 50Hz/60Hz, 1Ø				
		220-240V, AC, 50Hz/60Hz, 1Ø				
		480V, AC, 50Hz/60Hz, 3Ø				
Compressed Air Requirements		6 Bar g Minimum, 12 Bar g maximum, @ ≥50L/min flow capacity				
Exhaust Duct Requirements (by Client)		3" (DN 80)				
Chamber Cleanliness		ISO Class 7				
Process Chamber Air Change per Hour		> 30 ACH				
Water supply for Spray Gun		5 m3/hr (83L/min) @ 4.0 bar gauge or more				
Glove Port		Oval, 200 x 300 mm				
Glove		Single-piece, glove-sleeve system, with Chlorosulfonated Polyethylene material				
Control System		HMI 12" as Standard with PLC (Industrial PC Upgrade with SCADA Integration is available as an Optional)				

Options

- Pass chamber left and right
- Automated or manual drain valve
- Sloped working zone
- Wet-in-place with spray gun using purified water and compressed dry air supply
- Wet-in-place with spray ball using purified water with compressed dry air supply
- Split butterfly valve (4")
- Rapid transfer port alpha: Ø105, Ø190, Ø270, Ø350
- Rapid transfer port beta container, polyethylene or stainless steel: Ø105, Ø190, Ø270, Ø350
- Rapid transfer port beta continuous liner
- Bag-out port: Ø170, Ø200, Ø300
- Integrated glove leak tester
- CCTV provision
- Raise and lower adjustable height support stand
- Electrical outlets (IP-54, IP-65 rated)
- Nitrogen purge system to lower chamber relative humidity
- Integrated oxygen sensors
- Amber or yellow light for light sensitive materials

Customizable Configuration:

Esco's Weighing and Dispensing Containment Isolator (WDCI) is designed with flexibility at its core. Whether you're working with highly potent APIs, integrating multiple unit operations, or meeting unique facility constraints, the WDCI can be tailored to your specific process requirements.



We offer a range of **customizable configurations**, including:

Process Integration Options

- Integration with chemical fume hoods or downflow booths for combined containment and exhaust management
- Direct integration with lyophilizers (freeze dryers) for closed and contained sample transfer
- Connection to intermediate bulk containers (IBC/Bin) for upstream or downstream material flow
- Split butterfly valve (SBV) or other closed transfer systems for high-containment material transfer
- Safety and Compliance Features for ATEX- or NEC 500-compliant internal chamber design for explosive or flammable materials

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