

**ESCO**  
LIFESCIENCES

# Soft Capsule<sup>®</sup> Soft Wall Cleanroom

The Flexible Solution for  
Cleanroom Applications







### Esco Experience

As a pioneer in cleanroom technology, since 1978, Esco has been creating controlled environments for the electronics, semiconductors, pharmaceutical, food, biotechnology, nanotechnology and other high technology industries. Today, increasing quality and process demands in these and other industries require the control of particulate contamination to stringent standards.

Esco Soft Capsule Soft Wall Cleanrooms are an ideal solution when clean air areas need to be created on a small to mid scale. Flexible and economical, they may be easily relocated when application requirements change. Esco offers a complete range of soft wall cleanrooms to meet various construction, dimensional and cleanliness class requirements.

### Applications

Uses include applications where clean air is required for process and product protection.

- Pharmaceuticals, Grade A filling suites
- Medical devices, plastic injection moulding
- Electronics assembly
- Contact lens packaging
- Hospital pharmacy (USP 797)
- Biotechnology
- Nanotechnology
- Life sciences
- Aerospace
- Quality control
- Food industries

Air Cleanliness Standards									
(ISO 14644-1, Air Cleanliness Particle Limits (No. of Particles / m <sup>3</sup> ))									
Particle Size (µm)	Cleanliness Class								
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9
0.1	10	100	1000	10000	100000	1000000	-	-	-
0.2	2	24	237	2370	23700	237000	-	-	-
0.3	-	10	102	1020	10200	102000	-	-	-
0.5	-	4	35	352	3520	35200	352000	3520000	35200000
1.0	-	-	8	83	832	8320	83200	832000	8320000
5.0	-	-	-	-	29	293	2930	29300	293000

## Soft Capsule Soft Wall Cleanroom

### Ceiling Grid

- Standard 2' x 4' (0.6 x 1.2m) cleanroom ceiling grid enables flexible placement of fan filter units. Non particulate shedding powder coated steel panels are provided to cover empty bays.

### Construction

- Cleanroom-grade construction utilizing full welded, reinforced, steel tubular sections. Structure is finished with an abrasion-resistant oven-baked powder coat. Esco Isocide antimicrobial coating on all painted surfaces minimizes contamination. Entire structure is free-standing and does not require any suspending ceiling supports.



### Lighting

- Built-in warm white, 5000k lighting provides excellent illumination of the cleanroom and reduces operator fatigue. The reliable lighting system is zero-flicker and instant start. Tear-drop design does not interfere with the laminar flow in the cleanroom.

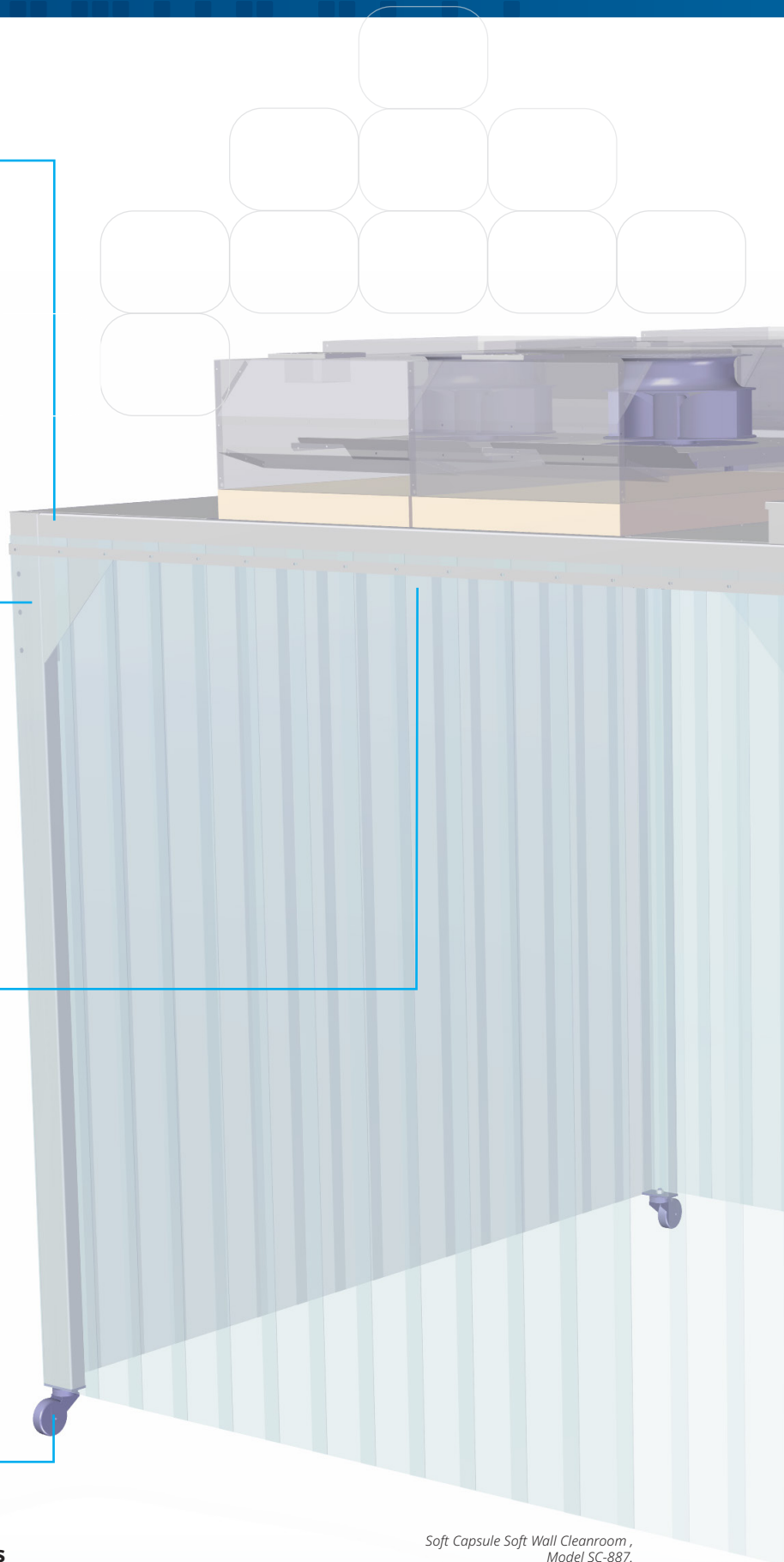
### Side Curtains

- Anti static Isostat™ vinyl curtains isolate the cleanroom from the ambient environment, while allowing for easy passage of materials and personnel in and out of the clean area. It terminates at a specific distance above the floor to allow exhaust of clean air out of the cleanroom.



### Casters

Stainless steel swivel casters feature non shedding polyurethane wheels (capacity: 300 lbs each)



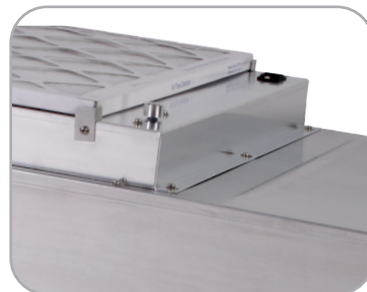
Soft Capsule Soft Wall Cleanroom ,  
Model SC-887.

**Control Panel**

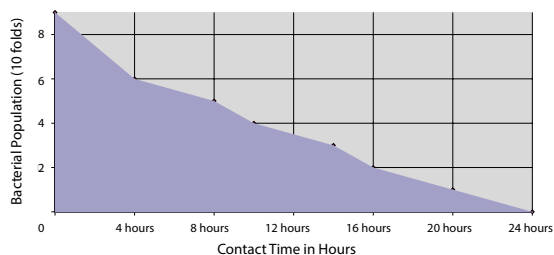
- Centrally mounted control panel enables rapid startup of fan filter units and lighting.

**Fan Filter Units**

- See page 6 for more details information.



**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.

**Installation**

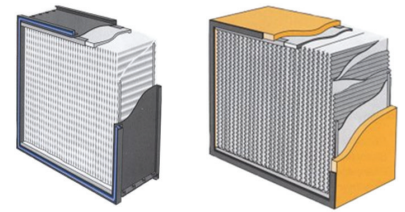
- The Soft Capsule Cleanroom is shipped unassembled with tools and parts for on-site assembly, turning an existing air-conditioned space into a cleanroom in a matter of hours.

## Fan Filter Units

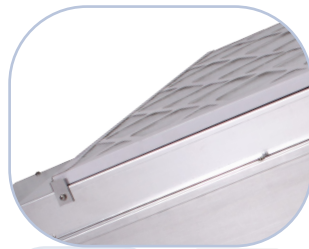
- Esco Airstream Fan Filter Units incorporate German made ebm-papst permanently lubricated, direct drive centrifugal blowers with external rotor designs, and Swedish Camfil-Farr HEPA/ULPA filters.
- The energy efficient external rotor motor design reduces operating costs and has extremely low noise and vibration levels, improving the working conditions in the cleanroom.
- Internal baffles maximize airflow uniformity.
- High quality HEPA filters utilizing an improved mini-pleated separation technique to maximizes surface area improves efficiency and extends the filter life. Filters operate at a typical efficiency of >99.995% at 0.1 to 0.3 micron sizes.

- An additional disposable pre-filter on all models traps large particles in the inflow air prior to reaching the main filter, protecting against damage and prolonging life.
- Built-in solid-state variable speed controllers is superior to conventional "step" controllers and offer infinite adjustment from zero to maximum setting.

### Mini-pleat Separatorless Filter (left) vs. Conventional Aluminium Separator Filter (right)



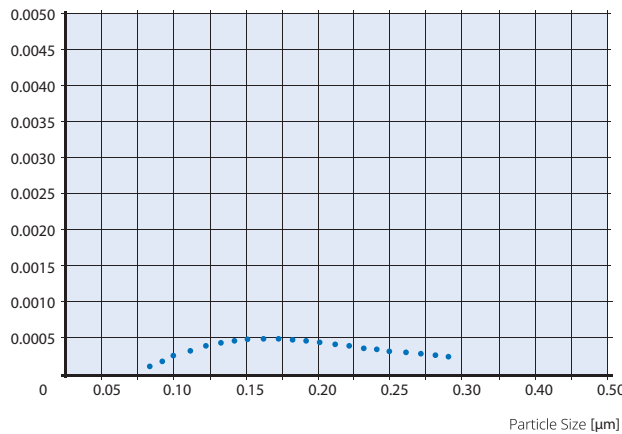
Esco cabinets use Swedish Camfil Farr® mini-pleat filters without aluminum separators to increase filter efficiency, minimize the chance of leakage, and to prolong filter life. Filters include a lightweight aluminum frame for structural stability and elimination of swelling common to conventional wood frames.



Airstream Cleanroom Fan Filter Units  
Model FFU-32A-AH-2

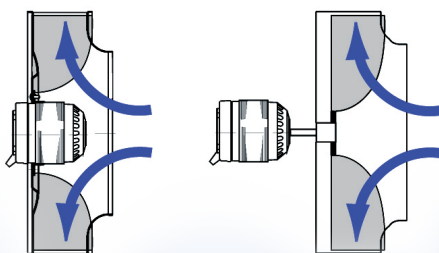
## Esco HEPA Filter Efficiency

(%) Maximum and Typical Penetration



• Typical Penetration

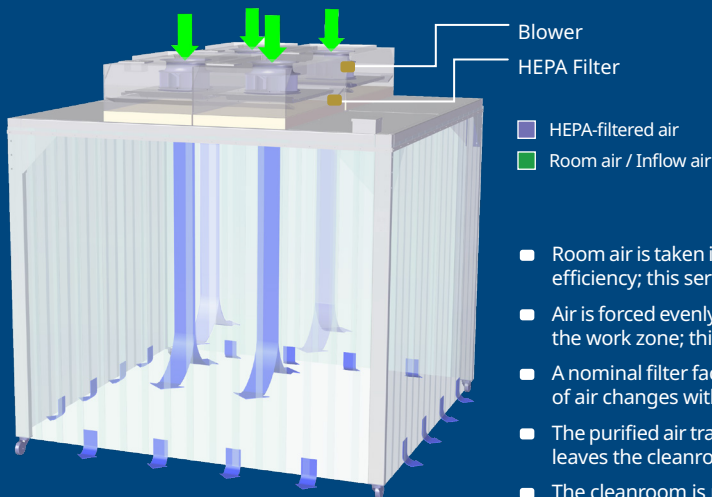
This filter efficiency graphs reflect filter efficiencies for HEPA filters with 66mm / 2.6" height for the nominal airflow velocity of 0.45 m/s or 90fpm. Filter efficiency figures change with different airflow settings and filter heights, e.g. filter efficiency will be higher for lower airflow velocities and vice versa.



## Esco Centrifugal Fan with External Rotor Motor (left) vs. Conventional Fan with Standard Motor (right)

- Esco cabinets use German made ebm-papst® permanently lubricated, centrifugal motor/blowers with external rotor designs.
- Integrated blades narrow the profile and eliminate need for a motor shaft.
- Motors are selected for energy efficiency, compact design, and flat profile. The completely integrated assembly optimizes motor cooling.
- All rotating parts are unitized and balanced for smooth, quiet, vibration-free operation.

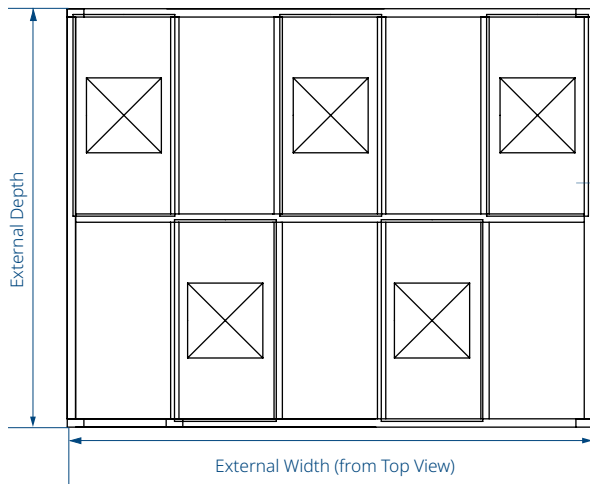
### Soft Wall Cleanroom Filtration System



- Room air is taken in from the top of the cleanroom through a disposable pre-filter with 90% efficiency; this serves to trap larger particles and increase the life of the main filter.
- Air is forced evenly across the HEPA filter(s); the result is a stream of clean laminar air within the work zone; this dilutes and flushes all airborne contaminants from the interior.
- A nominal filter face velocity of 0.45 m/s or 90 fpm ensures that there is a sufficient number of air changes within the cleanroom in order to maintain cleanliness.
- The purified air travels downward within the interior in a vertical, unidirectional stream, and leaves the cleanroom close to floor level at the perimeter.
- The cleanroom is positively pressurized to prevent ingress of airborne contaminants from the external environment.

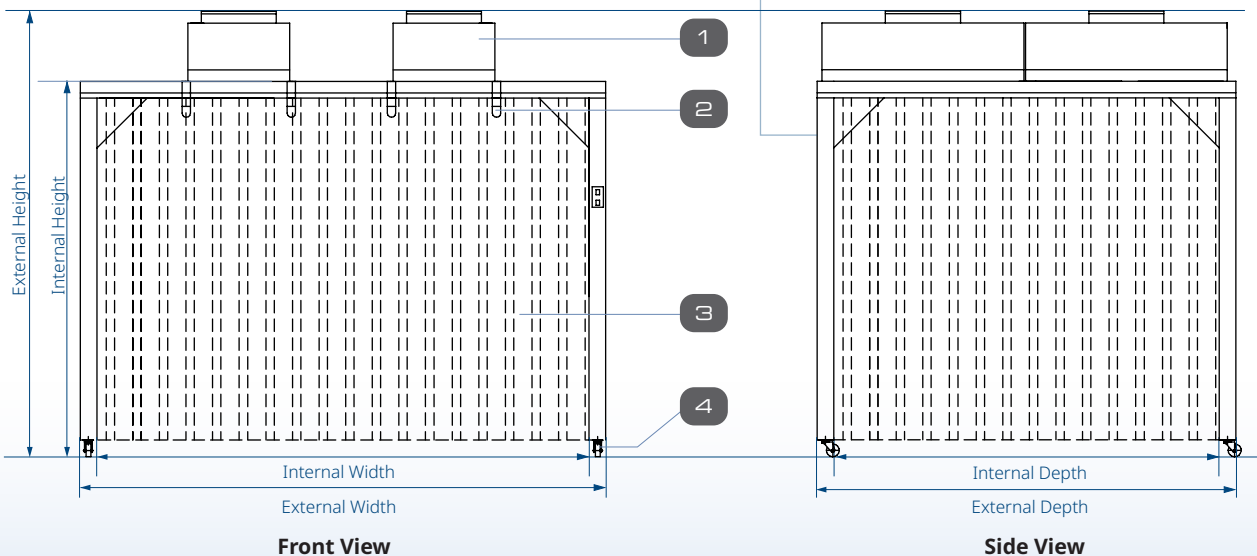
### Model SC, Soft Capsule Soft Wall Cleanroom Technical Specifications

Top View



- Airstream fan filter unit
- LED lamp
- IsoStat™ vinyl curtain
- Caster wheel

- Note: Numbers of Fan Filter Unit (FFU) depends on size and cleanliness class of the cleanroom. Refer to General Specifications, page 8 for details.
- Note: Cleanroom wider than 12ft and above require additional support beams



General Specifications, Soft Capsule Soft Wall Cleanroom, Model SC

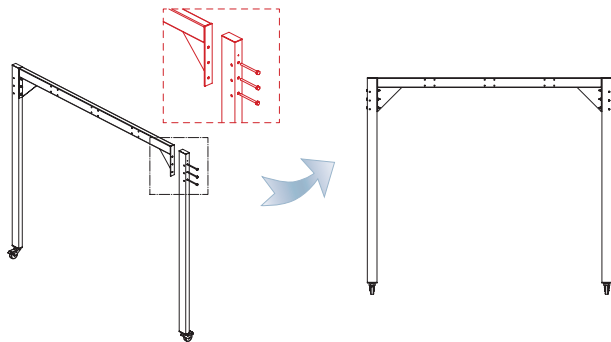
Cleanroom Class	Model	Internal Dimension (W x D x H)	External Dimension (W x D x H)	Power ** Consumption	No. of FFUs	Air Volume	Shipping Dimension (W x D x H) (Unassembled)	Shipping Volume
ISO Class 5* (US Federal Standard Class 100)	SC-447-M3.5	4' x 4' x 7'	4.23' x 4.23' x 8.60'	460 W	2	2300 m³/h (1360 cfm)	8.2' x 2.46' x 1.44'	0.825 m³
	SC-487-M3.5	4' x 8' x 7'	4.23' x 8.23' x 8.60'	500 W	2	2300 m³/h (1360 cfm)	8.2' x 4.1' x 1.31'	1.25 m³
	SC-687-M3.5	6' x 8' x 7'	6.30' x 8.23' x 8.60'	790 W	3	3450 m³/h (2040 cfm)	8.2' x 4.1' x 1.97'	1.87 m³
	SC-6127-M3.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	1210 W	5	5750 m³/h (3400 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M3.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	1420 W	6	6900 m³/h (4080 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M3.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	2000 W	8	9200 m³/h (5440 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M3.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M3.5	8' x 10' x 7'	8.23' x 10.32' x 8.60'	1370 W	5	5750 m³/h (3400 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M3.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	1500 W	6	6900 m³/h (4080 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M3.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	1920 W	8	9200 m³/h (5440 cfm)	8.53' x 3.12' x 2.43'	1.84 m³
	SC-8207-M3.5	8' x 20' x 7'	8.29' x 20.32' x 8.60'	2580 W	10	11500 m³/h (6800 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M3.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	2210 W	9	10350 m³/h (6120 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
SC-12127-M3.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	2290 W	9	10350 m³/h (6120 cfm)	13.06' x 3.12' x 2.3'	2.65 m³	
ISO Class 6* (US Federal Standard Class 1000)	SC-6127-M4.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	790 W	3	3450 m³/h (2040 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M4.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	1000 W	4	4600 m³/h (2720 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M4.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M4.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M4.5	8' x 10' x 7'	8.23' x 10.34' x 8.60'	950 W	3	3450 m³/h (2040 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M4.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	870 W	3	3450 m³/h (2040 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M4.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	1080 W	4	4600 m³/h (2720 cfm)	8.53' x 3.12' x 2.43'	1.84 m³
	SC-8207-M4.5	8' x 20' x 7'	8.29' x 20.32' x 8.60'	1620 W	6	6900 m³/h (4080 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M4.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	1580 W	6	6900 m³/h (4080 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
	SC-12127-M4.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	1450 W	5	5750 m³/h (3400 cfm)	13.06' x 3.12' x 2.3'	2.65 m³
	SC-12167-M4.5	12' x 16' x 7'	12.36' x 16.29' x 8.60'	2080 W	8	9200 m³/h (5440 cfm)	12.8' x 3.12' x 2.3'	2.59 m³
	SC-12207-M4.5	12' x 20' x 7'	12.36' x 20.32' x 8.60'	2080 W	8	9200 m³/h (5440 cfm)	13.12' x 2.95' x 2.3'	2.52 m³
ISO Class 7* (US Federal Standard Class 10,000)	SC-6127-M5.5	6' x 12' x 7'	6.26' x 12.26' x 8.60'	370 W	1	1150 m³/h (680 cfm)	12.8' x 5.51' x 1.48'	2.94 m³
	SC-6167-M5.5	6' x 16' x 7'	6.26' x 16.29' x 8.60'	500 W	2	2300 m³/h (1360 cfm)	8.2' x 4.1' x 2.46'	2.34 m³
	SC-6207-M5.5	6' x 20' x 7'	6.26' x 20.32' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 2.46'	2.28 m³
	SC-887-M5.5	8' x 8' x 7'	8.29' x 8.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.2' x 3.12' x 1.8'	1.31 m³
	SC-8107-M5.5	8' x 10' x 7'	8.23' x 10.34' x 8.60'	740 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 1.97'	1.82 m³
	SC-8127-M5.5	8' x 12' x 7'	8.29' x 12.26' x 8.60'	780 W	2	2300 m³/h (1360 cfm)	12.47' x 3.02' x 1.64'	1.75 m³
	SC-8167-M5.5	8' x 16' x 7'	8.29' x 16.29' x 8.60'	660 W	2	2300 m³/h (1360 cfm)	8.53' x 3.12' x 2.43'	1.84 m³
	SC-8207-M5.5	8' x 20' x 7'	8.29' x 20.32' x 8.60'	780 W	2	2300 m³/h (1360 cfm)	10.5' x 3.12' x 2.3'	2.91 m³
	SC-10127-M5.5	10' x 12' x 7'	10.32' x 12.26' x 8.60'	740 W	2	2300 m³/h (1360 cfm)	11.02' x 4.27' x 1.8'	2.4 m³
	SC-12127-M5.5	12' x 12' x 7'	12.36' x 12.36' x 8.60'	820 W	2	2300 m³/h (1360 cfm)	13.06' x 3.12' x 2.3'	2.65 m³
	SC-12167-M5.5	12' x 16' x 7'	12.36' x 16.29' x 8.60'	1240 W	4	4600 m³/h (2720 cfm)	12.8' x 3.12' x 2.3'	2.59 m³
	SC-12207-M5.5	12' x 20' x 7'	12.36' x 20.32' x 8.60'	1440 W	4	4600 m³/h (2720 cfm)	13.12' x 2.95' x 2.3'	2.52 m³

\*Other ISO cleanliness classes available. Contact Esco for information.

\*\*Based on 230V/single phase/50Hz (International electrical configurations available)

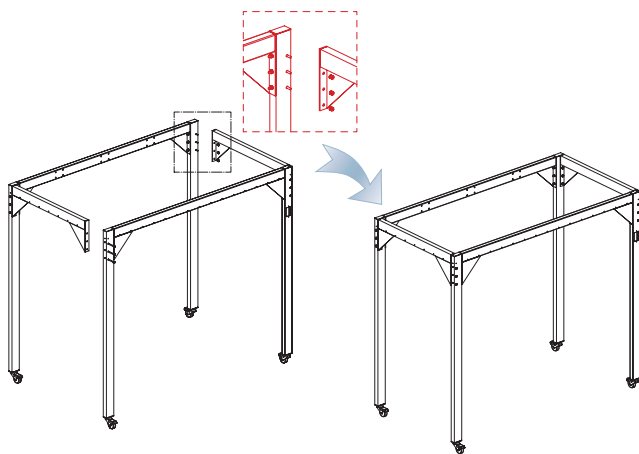


## Installation Procedure



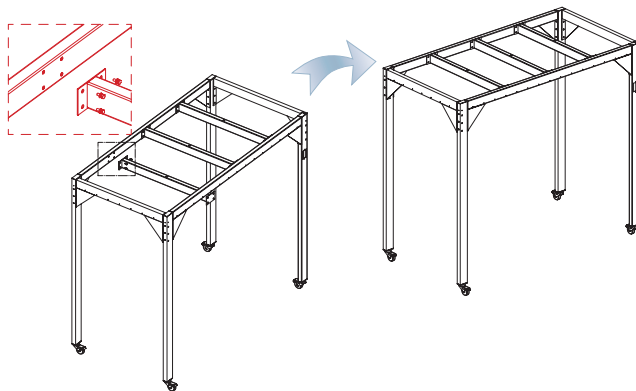
### STEP 1

- Assemble the horizontal to vertical bar to form a side frame.



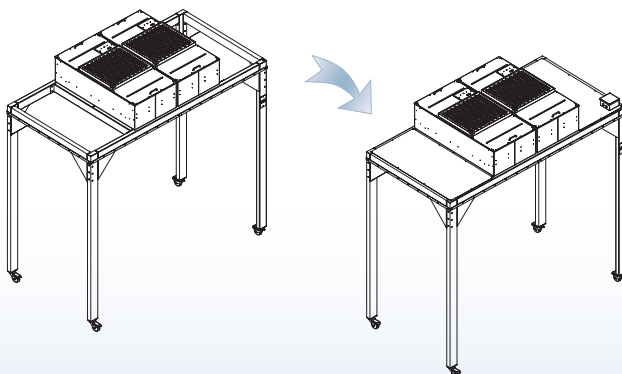
### STEP 2

- Assemble side frame with additional vertical beams to form framework.



### STEP 3

- Add ceiling bars to form a complete ceiling grid.
- Install tear-drop lighting below the ceiling grid.



### STEP 4

- Install fan filter units and cover panels for empty bays.
- Install curtains around the general framework to complete the assembly.

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- Air Shower
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- Ceiling Laminar Airflow Units
- Cleanroom Transfer Hatch
- Containment Barrier Isolator (CBI)
- Downflow Booth (DFB)
- Dynamic Floor Laminar Hatch
- Dynamic Pass Box
- Evidence Drying Cabinet
- Garment Storage Cabinet
- General Processing Platform Isolator (GPPI)
- 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)

Since 1978, Esco has emerged as a leader in the development of controlled environment, laboratory and pharmaceutical equipment solutions. Products sold in more than 100 countries include biological safety cabinets, fume hoods, ductless fume hoods, laminar flow clean benches, animal containment workstations, cytotoxic cabinets, hospital pharmacy isolators, and PCR cabinets and instrumentation. With the most extensive product line in the industry, Esco has passed more tests, in more languages, for more certifications, throughout more countries than any biosafety cabinet manufacturer in the world. Esco remains dedicated to delivering innovative solutions for the clinical, life science, research and industrial laboratory community.



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