



Today, the **Esco Ascent™ Opti Ductless Fume Cabinet** is **probably the most advanced in the world**, from a design and engineering point of view, of any low-cost ductless fume cabinet. Now users can enjoy, at an economical cost, the benefits of features previously found only on high-end ductless fume cabinets - a unique filter mounting system that eliminates bypass leaks inherent in conventional clamping systems, a generously-sized main filter with higher chemical retention capacities, all designed to meet the requirements of French Standard AFNOR NF X 15-211. Microprocessor-based control system provides the user with numerous safety and operational features, ensuring enhanced safety in the laboratory.

With the blower system running at less than maximum capacity, longer operating lifetimes and lower noise levels are achieved. The **motorised impeller design** of our blower system and our **internal optimised baffle design** ensure **better airflow uniformity** and distribution within the cabinet for **better operator protection**. Another key advantage of these models is their low energy consumption, due to Esco's employment of exclusive external rotor technologies.

CONSTRUCTION FEATURES

Industrial-grade main body constructed of electro-galvanised steel: with an abrasion-resistant white oven-baked powder-coated finish.

Chemical and abrasion resistant stainless steel work surface will never chip. Lip at front edge of the work surface contains spills in the work zone. Curved front edge minimizes airflow turbulence and improves user comfort.

All components designed for maximum chemical resistance for long service life and durability.

13-degree sloped front allows easy access to work zone - enhancing ergonomics, eliminating operator fatigue and increasing productivity.

Permanently lubricated direct drive centrifugal blower(s); **energy efficient external rotor motor** type design reduces operating costs; extremely low noise and vibration levels (less than 55dBA at working position) due to proprietary construction and mounting technology.

Transparent frameless acrylic front window and sides provide a high degree of visibility and operator comfort; front window is mounted on self-supporting pre-tensioned hinges, allowing for easy access during cabinet loading and startup.

Ergonomic apertures for hands in the front window allows for maximum movements within the workzone while providing the operator with extra protection from any possible chemical spillage.

The cabinet work zone comes factory-fitted with 2 provisional round openings for power cords of equipment to be used in the cabinet.

Integral fluorescent lighting is mounted out of the air stream for better airflow uniformity; the aerodynamic design of the enclosure ensures maximum containment possible.

FILTRATION SYSTEM

Activated carbon filter (7 different filter types available depending on the requirements of your application) and built-in pre-filter (replaceable from within work zone).

State-of-the-art baffle system constructed of 1.2mm epoxy powder-coated electro-galvanized steel delivers maximum containment by ensuring airflow uniformity throughout the main chamber of the cabinet.

CONTROL SYSTEM

Esco Sentinel™ Microprocessor control with built-in visual / audible airflow alarms ensures superior operator protection and alerts the user in case of any malfunction; Cabinet inflow velocity is constantly displayed on the backlit LCD screen, allowing for full monitoring of the cabinet performance.

Sentinel™ microprocessor control settings are fully configurable according to the operator's requirements.

Built-in solid state variable speed controller(s) (infinitely adjustable from zero to the maximum setting) with built-in RFI and noise filters is superior to conventional "step" controllers.

Compliant to International Standards: Esco Ascent® Opti Ductless Cabinets are designed and manufactured to meet and exceed the requirements of French Standard AFNOR NF X 15-211.

Designed to meet the general safety requirements of the IEC 61010-1 / EN 61010-1 / UL 61010A-1 / CSA C22.2 No. 1010.1-92.

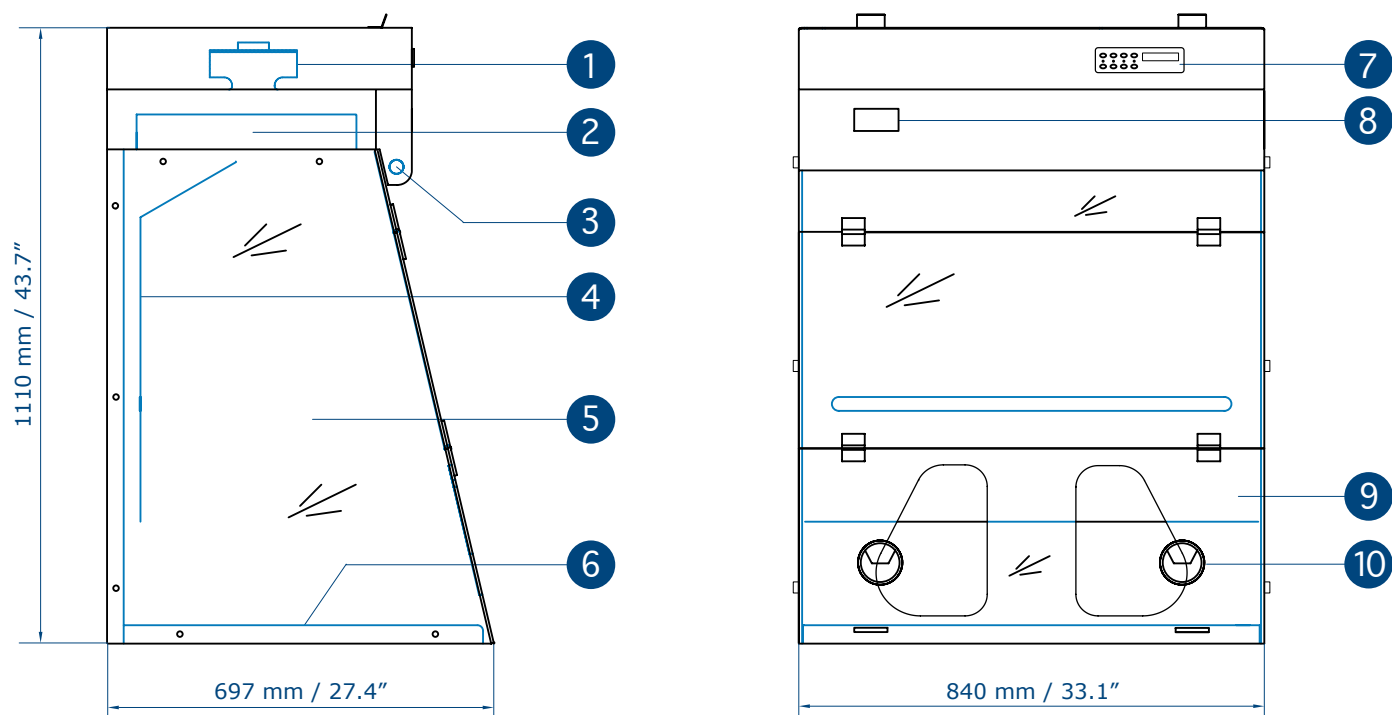
OPTIONS & ACCESSORIES

- Cabinet is available with a **transparent acrylic back-wall**, ideal for classrooms and educational demonstrations.



- **Optional mobile cart** for placement of Ascent™ Opti. It has foldable trays to accommodate storage of large equipments.



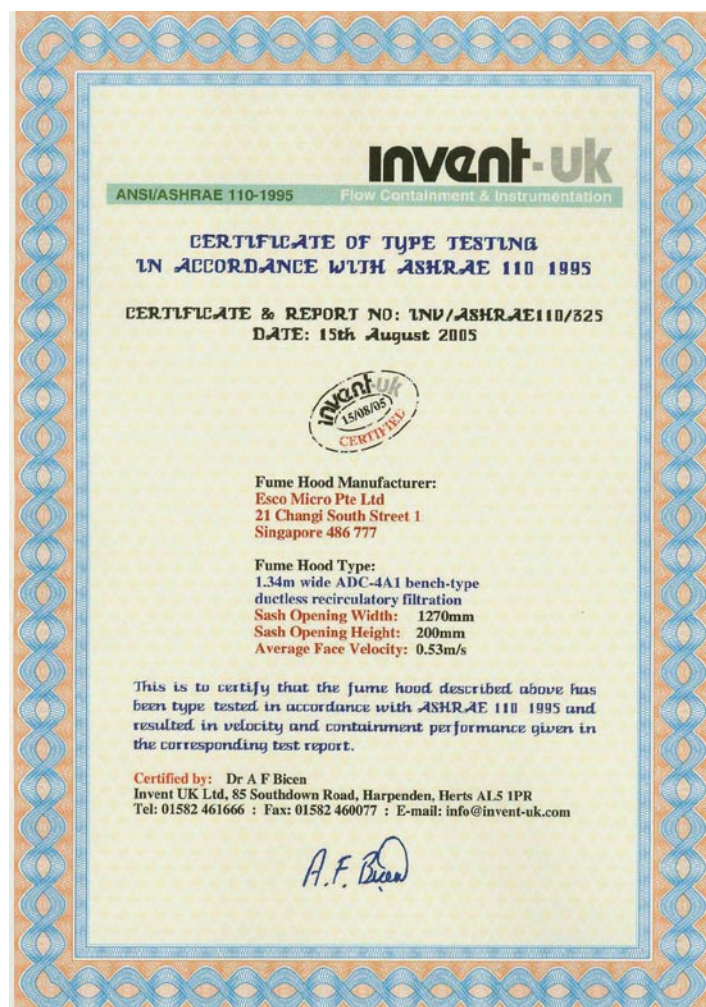


- 1.** Blower **2.** Activated Carbon Filter **3.** Fluorescent Lamp **4.** Back Baffle
5. Side Acrylic Panel **6.** Stainless Steel Work Surface **7.** Sentinel™ Microprocessor Control
8. Filter Code Display Panel **9.** Acrylic Hinged Window **10.** Pass-thru Flaps

General Specifications	SPB-2AX	SPD-3AX	SPD-4AX
External Dimensions (Width x Depth x Height)	540.8 x 666.8 x 1018.8 mm 21.3" x 26.2" x 40.1"	840 x 697 x 1110 mm 33.1" x 27.4" x 43.7"	1140x 697 x 1110 mm 44.9" x 27.4" x 43.7"
Air Volume (At Initial Velocity)	173 cmh / 102 cfm	234 cmh / 138 cfm	
Infflow Velocity	Initial setpoint: average of 0.5 m/s or 100 fpm measured in plane of work aperture		
Standard Filtration Elements	<p>Main filter: Activated carbon with granular media bed (7 different filter types available. Contact our staff who will help you choose the right filter type for your applications)</p> <p>Pre-filter: Washable non-woven polyester fibres with an efficiency of 20% against gross particulate matter.</p>		
Noise Level	<62 dBA	<58 dBA at initial blower speed setting measured at typical operator work position	
Light Intensity	No Light	>350 lux / >28 foot candles at work surface level	
Work Top	None (easy adaptability to any work surface)	Built-in 304 stainless steel work top	
Control Switches	Simple Switches	Esco Sentinel™ Microprocessor	
Max Shipping Dimensions (unassembled)	Packing 1: 760 x 660 x 430 mm Packing 2: 1030 x 820 x 160 mm	Packing 1: 907 x 785 x 480 mm Packing 2: 930 x 970 x 184 mm	Packing 1: 1220 x 790 x 470 mm Packing 2: 1230 x 970 x 220 mm
Construction	<p>Main Body & Internal baffle system: 1.2mmt / 0.05" / 16 gauge electro-galvanised steel with white oven-baked epoxy powder-coated finish</p> <p>Front window and side panels: 6mm / 0.2" acrylic</p>		
Power Supply	<p>Choose from the following power supply configuration codes when ordering (e.g. SPD-2A3, for 220-240VAC 60Hz)</p> <p>1: 220-240VAC 50HZ 2: 110-130VAC 60HZ 3: 220-240VAC 60HZ 4: 110-130VAC 50HZ 5: 100-110VAC 50HZ/60HZ</p>		
Power Rating	58.7W (230VAC units)	225W (230VAC units) 270W (115VAC units)	

Tests and Certification by INVENT UK LTD in accordance with the British Standard BS 7989

Certificate and Report No: INV/BS7989/327



1. INTRODUCTION

Gaseous filter tests carried out in a 1.34m side bench-type ADC-A41 recirculatory filtration fume cupboard of Esco Micro Pte Ltd are reported. General information on filter test methods, procedures and requirements are given in reference 1 (BS 7989). Information on frontal containment and velocity test methods, procedures and requirements can be found in reference 2 (BS 7258, Part 1 & 4), with the corresponding test results in reference 3.

2. DESCRIPTION OF GASEOUS-PHASE FILTER AND FUME CUPBOARD

The filter tested was activated carbon type (Indocard-D612) with an overall dimension of 57cm(W) x 51cm(D) x 6cm(H). Two of these filters were fitted side by side on the roof of the ADC-4A1 cupboard. The fume cupboard is a recirculatory filtration type and was designed & built by Esco Micro Pte Ltd. The sash opening width was 1270mm and the height 200mm from the work top.

3. DESCRIPTION OF TEST ROOM FACILITIES

The tests were carried out in Esco's test room. The extract volume flow of the cupboard during tests was 0.145m³/s resulting in an average velocity at the sash opening of 0.54m/s. The test room differential pressure, temperature, relative humidity and velocity during tests were:

Room differential pressure : -1Pa
Room air temperature : 22°C - 24°C
Room air relative humidity : 39%
Room air velocity : much less than 0.1 m/s

4. FILTER TESTS

The filter was tested using Propan-2-ol. Propan-2-ol was evaporated in the fume cupboard at a rate of 20.55 ml/min so that the average concentration in the enclosure during tests was 800ppm±40ppm.

4.1 Filter Efficiency Test:

The tests were carried out in accordance with Annex A of BS 7989 and the results for both sets of filters were as follows:

max concentration detected after 60 sec = <0.6ppm
max concentration detected after 300 sec = <0.6ppm
filter efficiency = >99.9%

4.2 Filter Capacity Test:

The tests were carried out in accordance with Annex C of BS 7989 and the results were as follows:

First set of filters:

max concentration detected after 1000ml evaporated = 29ppm
measured time for 1000ml evaporation = 46 min
filter efficiency at 1000ml evaporation = 96.4%
max concentration detected after 2000ml evaporated = 198ppm
measured time for 2000ml evaporation = 93 min
filter efficiency at 2000ml = 75.2%

Second set of filters:

max concentration detected after 1000ml evaporated = 34ppm
measured time for 1000ml evaporation = 45 min
filter efficiency at 1000 evaporation = 95.8%
max concentration detected after 2000ml evaporated = 209ppm
measured time for 2000ml evaporation = 91 min
filter efficiency at 2000ml evaporation = 73.9%

Chemical & air flow conditions used during tests:

Fume cupboard air flow rate: 0.145m³/s

Fume cupboard air velocity at sash opening: 0.54 m/s



Note: The open front panel where the filter is inserted.

Propan-2-ol: CH₃CH(OH)CH₃
Boiling point: 82.2 deg C @ 760mm Hg
Molecular weight: 60.1
Vapour density: 2.1 (Air=1.0)
VME, OEL, TWA: 400ppm
Evaporation (pump) rate: 20.55 ml/min (16.13 g/min)
Resulting average concentration in enclosure: 800ppm±5%

Tests and Certification by INVENT UK LTD in accordance with ANSI/ASHRAE 110-1995 standard.

Certificate and Report No: INV/ASHRAE 110-1995/325



1. INTRODUCTION

ANSI/ASHRAE 110-1995 type test carried out for a 1.34m wide bench-type ductless recirculatory filtration fume hood of Esco Micro are reported.

2. DESCRIPTION OF THE DUCTLESS FUME HOOD

The ductless fume hood tested was a 1.34m wide, bench type with recirculatory filtration. The width of the sash opening was 1270mm and the height 200mm from the work top.

3. DESCRIPTION OF THE TEST ROOM FACILITIES

The tests were carried out in Esco's test room. The tests facilities include a variable-speed extract air system to adjust the extract volume flow rate to the required value. The test room differential pressure, temperature, relative humidity and velocity during the tests were:

Room differential pressure : -1Pa
Room air temperature : 22°C - 24°C
Room air relative humidity : 39%
Room air velocity : much less than 0.1m/s

4. VELOCITY TESTS

The velocity tests were performed with the sash set at 200mm from the work top. The velocity type-test grid was spread over 4 points across the sash opening and the velocity results ranged from 0.51 m/s to 0.55 m/s, averaging at 0.53 m/s.

5. FLOW VISUALISATION TESTS

5.1 Local Visualisation (Low Volume Smoke) Tests

The following observation were made:

Along the sash edge = GOOD
Top LHS corner = GOOD
Top RHS corner = GOOD
Bottom LHS corner = FAIR
Bottom RHS corner = FAIR

5.2 Large Volume Smoke Test

The entry flow to the hood is good. The internal smoke clears within less than 5 sec.

6. CONTAINMENT TESTS

6.1 Static sash Tests


The containment tests were performed for the same sash opening as in the velocity tests. A mannequin is placed at 3 different points 100mm away from sash plane. Sampling probe is at breathing zone of mannequin and 75mm away from sash plane. Test gas injector is positioned on work top at the 3 corresponding locations of mannequin. At all locations, the injector is at 150mm away from the sash plane. Test gas is 100% SF₆ and the flow rate is 4.0 lt/min. The results show that the hood containment performance is very good.

6.2 Probe Traversing Tests at Static Sash Openings

These tests were obtained in accordance with the ASHRAE procedure. The tests were performed for the same sash opening as in the velocity tests. The test gas injector is positioned on work top at 150mm away from sash plane. Test gas is 100% SF₆ and the flow rate is 4.0 lt/min. Sampling probe is traversed along and at 25mm away from opening edge at a rate of ~75mm/sec.



Kindly fill up and return to us the following form in order for us to assess the compatibility of your application with Esco's ductless fume cabinets. Refer to the next page for more details on the information required under the various columns.

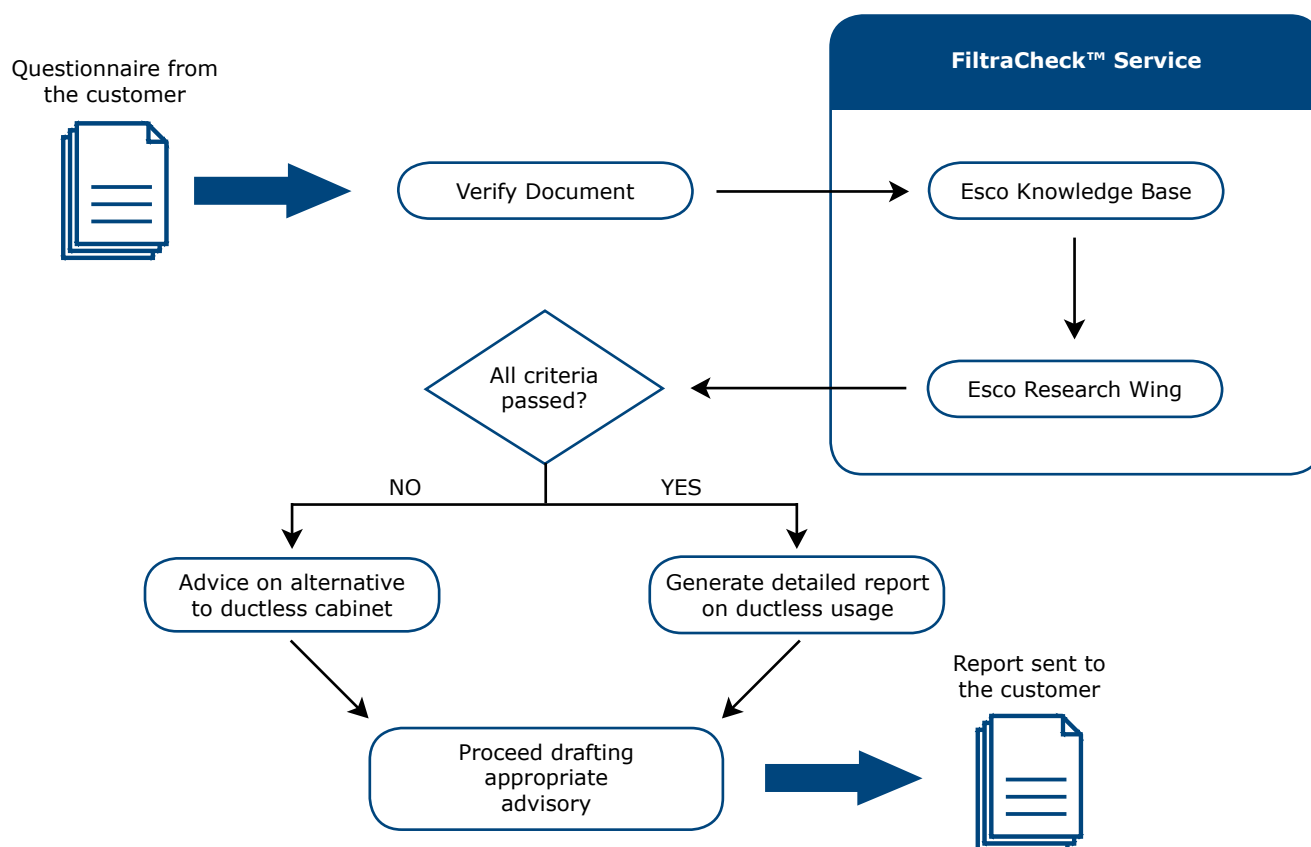
Esco® FILTRACHECK™ FORM											
Chemical			Container		Handling						
No	Name	Dilution (%)	Type	Surface area of evaporation	Open or covered	Type of work	Temperature of handling	Frequency of work Per Day (PD) Per Week (PW) Per Month (PM)	Quantity of chemical used (ml. or gm.)	Duration of handling (mins. or hrs.)	
Ref	I	II	III	IV	V	VI	VII	VIII	IX	X	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
Any additional comments:											
Any specific need or requirement:											
Name: Company name: Address:					Postal code: City: Telephone: Email:					Country: Fax:	

What is FiltrateCheck™?

FiltrateCheck is a trademark service provided by Esco's Fume Filtration Division. Customers who intend to purchase a ductless fume hood but are unsure whether the cabinet is suitable for their application, can forward a list of chemicals that they will be handling and their pattern of usage to Esco's FiltrateCheck service team. The document can be either forwarded by email or by fax to Esco. Please provide as much detail as possible in order for us to assess the compatibility of your application with Esco's ductless fume cabinets.

After careful analysis of the provided chemicals list and pattern of usage, a proper advice document will be generated and provided to the customer. A proper recommendation, with reasons and validations will be made for the right laboratory equipment to be installed. This document will recommend the appropriate laboratory equipment; ducted fume hood or ductless fume hood or neither based on the investigation done by the FiltrateCheck team. Depending on the type of chemicals used, the document may also contain a list of procedures, warnings, etc that will help in ensuring a safer laboratory working environment.

Detailed action flowchart



FiltrateCheck™ Guidance

Ref	
I	The name of the chemical used in the ductless fume cabinet e.g. Toluene
II	The extent to which the chemical has been diluted (in %)
III	Type of container used to hold the chemical e.g. plate, beaker etc
IV	Surface area through which the chemical can evaporate
V	Mention whether the process is being carried out open or covered
VI	Provide more details on the type or nature of the work / process being carried out e.g. distillation, transfer etc.
VII	The temperature at which the work / process is being carried out. This is specially important in case the process requires the chemical to be heated
VIII	Mention how frequently the concerned work / process is carried out
IX	Quantity of chemical (in ml. or gm.) used during the process
X	Time taken for carrying out the process

About Esco Fume Filtration Division

The Esco Fume Filtration Division is a highly focused manufacturer of ductless fume cabinets and other carbon-filtered enclosures designed for the containment of hazardous chemical vapours in the laboratory.

We are predominantly oriented towards the international marketplace, with sales in more than 70 countries. A network of international distributors and partners allows us to provide quick and responsive local service and support.

Esco offers one of the widest range of carbon filtered enclosures in the industry. Product configurations involving the enclosure and type of filter (more than 7 filter types available!) are carefully matched to the user's application to ensure safety. When this process is complete, the user can enjoy the benefits of carbon filtration (ductless) technology including mobility, energy-savings and no installation costs.

Esco also manufactures a complete range of laboratory clean air and containment equipment under our Biotechnology Equipment Division (laminar flow, biosafety and other HEPA-filtered cabinets) as well as our Laboratory Fume Hood Division (conventional ducted fume hoods). These and other Esco companies / divisions share a common pool of corporate resources while having dedicated sales, marketing and technical teams. This unique concept allows us to bring the best value and protection to the customer.



Your local distributor:

Esco Fume Filtration Division

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