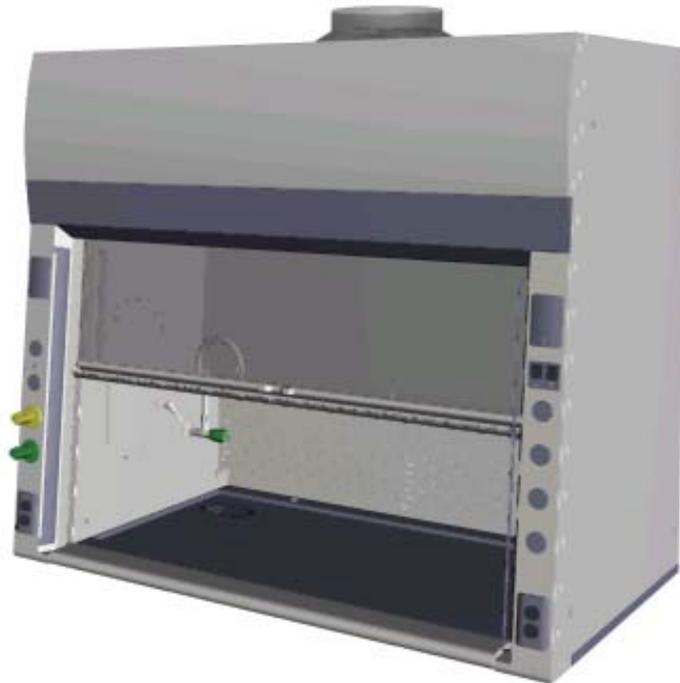


ESCO FRONTIER ACELA

PRODUCT SPECIFICATION

Bench Top /Standard Type



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Esco Frontier Acela Specification :

1. General :

Laboratory fume hoods that shall meet the definition of a Laboratory Fume Hood as stated in the SEFA 1 – 2002 Recommended Practice. (Scientific Equipment & Furniture Association)
www.sefalabs.com

Fume hoods shall function as ventilated, enclosed work spaces, designed to capture, confine and exhaust fumes, vapors and particulate matter produced or generated within the enclosure.

2. Hood Dimension :

2.1. Hood External Dimension :

- (W1220mm D900mm H1400mm) ± 10 mm
- (W1525mm D900mm H1400mm) ± 10 mm
- (W1830mm D900mm H1400mm) ± 10 mm
- (W2440mm D900mm H1400mm) ± 10 mm

2.2. Base External Dimension :

- (W1220mm D559mm H914.5mm) ± 10 mm
- (W762mm D559mm H914.5mm) ± 10 mm (2 units)
- (W915mm D559mm H914.5mm) ± 10 mm (2 units)
- (W1220mm D559mm H914.5mm) ± 10 mm (2 units)

2.3. Working Area Dimension :

- (W 996mm D672mm H1240mm) ± 10 mm
- (W1301mm D672mm H1240mm) ± 10 mm
- (W1606mm D672mm H1240mm) ± 10 mm
- (W2216mm D672mm H1240mm) ± 10 mm

3. Hood Construction :

Design fume hoods for consistent and safe air flow through the hood face. Negative variations of face velocity shall not exceed 20 percent of the average face velocity at any designated measuring point as defined in this section.

3.1 Structure:

3.1.1 Sectional module design includes the hood, work surface and base cabinet.

3.1.2 The rigid triple wall structure of hood provides the space for systematic arrangement of utility service lines.

3.1.3 To allow for maintenance and replacements, the interior access panels are removable without disassembly of the pan structure and outer steel panels.

3.1.4 Unique pan-type design enables fume hood to be shipped knocked down.

3.2. Hood Exterior:

3.2.1 Hood external structure is fabricated from 1.2mm \pm 5% thick cold roll sheet steel.

3.2.2 All exterior painted surfaces shall be epoxy-coated for maximum chemical resistance.

3.3. Hood Internal Liner:

3.3.1 Internal side wall panels to be fabricated of be made of 6 mm (\pm 5%) thick white solid phenolic resin boards.

3.3.2 Top panel to be fabricated of 4mm thick white solid phenolic resin boards for corrosion resistance.

3.3.3 Holes for service installation shall be cut by CNC router.

3.3.4 All liner fasteners are reusable and shall be made of chemical resistant material.

4. Hood Features :

4.1. Airfoil :

4.1.1 Airfoil is fabricated from 1.5mm (\pm 5%) thick epoxy coated Electro galvanized steel.

4.1.2 Airfoil sill is raised 10mm higher than the surface of the dished worktop with curved front edge to provide maximum air sweep across the work surface to eliminate back flow.

4.1.3 Airfoil hinged on 2 sides to allow easy access to under-side for cleaning.

4.1.4 When the sash is at the lowest position air foil will ensure an air inlet ($H10\pm 1\text{mm}$) between the sash lower edge and work surface to reduce reverse airflow.

4.1.5 Airfoil shall have a containment trough to contain spills along the rim and not in the dish area.

4.2. Work Surface :

Worktop of laboratory fume hood shall be molded by solid 25mm ($\pm 5\%$) thick epoxy resin (black) and have a 9 mm deep dished surface conforming to the hood interior.

Working Temperature: 600~800□.

Work Surface Dimension : (LabTops/Durcon/USA or equal basis)

- (L1220W777 $\pm 10\text{mm}$, □ (L1525W777) $\pm 10\text{mm}$
- (L1830W777) $\pm 10\text{mm}$, □ (L2440W777) $\pm 10\text{m}$

Other Types of Worktop :

- Trespa TopLab^{PLUS} Work Surface With Thickness 20 mm with front dished surface.
- Keraplan (Italy) Laboratory Ceramic Worktop
- Stainless Steel Worktop on Special Request

4.3 Removable access panel:

4.3.1 One removable access panel (H490mmW280mm) on each side liner provides easy access to service fixtures and plumbing lines.

4.3.2 The material and thickness shall be the same with liners and clipped by corrosion resistant PVC gasket.

4.3.3 Use of Plastic screw to fix the panel in place, ensuring that there is no exposed metal part in the fume hood workzone.

4.4. Baffles:

4.4.1 The corrosion resistant baffles are molded of the same material as the internal liner (6mm thickness).

4.4.2 Baffles are perforated to capture fumes quickly and ensure smooth laminar airflow near the working area of the fume hood.

4.4.3 Baffles shall be easily removable for cleaning and replacement by bare hands. (The manufacturing of the baffles shall be precise enough for them to be interchangeable among other identical fume hoods.)

4.5. Baffle Mounting Kits:

4.5.1 Baffle mounting kit to be molded from corrosion resistant PE (PolyEthylene) material, composed mainly of baffle support brackets.

4.5.2 All the necessary metal fasteners and screws used for fixing should be covered and isolated from the corrosive chemicals.

4.5.3 The load-bearing capacity of each baffle mounting kit shall be no less than 100kg.

4.6. Vertical Sash:

4.6.1 Sash Frame:

a. Structure: The structure of sash frame includes molded plastic (PP Material) concave handle, side and upper frames . The frame joints are mortised together and reinforced with screws. The design provides for structural strength and stability. The sash shall be surrounded in a molded corrosion resistant plastic frame.

b. Handle: Aerodynamically-shaped bottom sash handle design helps gently direct airflow into the fume hood without sacrificing visibility.

c. Side frames: The sash glass is surrounded by plastic Frame-like inner structure. The design of C-shaped tracks results in very low friction and no possibility of derailment. Slide-in chain disconnect joins sash frame to chain and sprocket, making it easy the to remove the original sash for sash replacement. It is not necessary to disassemble the external frame to replace the sash.

d. Maximum Opening : 740 mm

4.6.2 Sash Track :

a. Structure : C shaped molded plastic(PP Material) structure.

b. Movement : The sash shall operate smoothly without tilting when raised or lowered from either end and shall remain at rest in any open position unless when the

Creep Down (see 4.6.5) is in place.

c. Replacement : Ease of removal of fume hood side posts and slide-in chain disconnect ensures that the entire sash can be removed from front without taking apart the main structure for repair, maintenance, or replacement.

4.6.3 Sash Glass: 6mm ($\pm 5\%$) thick laminated Tempered Safety Glass for 4,5,6 ft hoods and 8mm thick laminated Tempered Safety Glass for 8ft hood.

4.6.4 Sash Chain: The chain and sprocket system (*Cycling Test of movement for more than 500,000 cycles*) is isolated from corrosive chemical fumes inside the hood chamber. The chain can load up to 150kg without fatigue. A bracket at the top of all sprockets prevents chain from jumping off the sprocket during transportation.

4.6.5 Sash Lock System:

- a. Sash Stop: Spring and rod system for to stop user from opening the sash beyond 18" to ensure safe user practices with a handle at the center of the sash handle for ease of over-riding the sash stop when required.
- b. Creep Down: Mechanism designed to automatically lower the sash back to 18" when it is pushed beyond the safe working height (18").
- c. Key Lock: Dual-function key lock allows user to keep the sash open at the maximum sash height to load instruments and to lock the sash down at full-close position to save energy and prevent unauthorized access to fume hood interior.

4.6.6 Sash Counterbalance: Single counterbalance sash weight suspended by two chains, complete with 8mm diameter SS connecting rod to ensure identical rotation of left and right sprockets.

4.7 Side Vanes:

Detachable side vanes on both front posts *2.0mm $\pm 5\%$ thick cold roll sheet steel* increases airflow sweep on the critical area at the side walls to improve containment.

4.8 Front Panel :

Fabricated from 1.2mm±5% thick cold roll sheet steel with epoxy powder coating. Detachable structure, when taken apart or assembled will not be obstructed by adjacent equipment or wall. Curved front edge ensures smooth air introduction into the work area.

4.9 Bypass Design:

Unique slot-line design provides to provide robust stream of bypass air into the hood cavity. The bypass shall be blockable with a standard device to convert a Constant Air Volume Fume Hood into a Restricted Bypass/Variable Air Volume Fume Hood.

4.10 Exhaust Collar :

Tapered exhaust collar is molded of corrosion resistant FRP (*Fiberglass Reinforced Plastic*). Rectangular receiving opening extended with bell shaped entry cone accelerates fume removal from the hood cavity and reduces pressure loss of the fume hood. The length of the extra duct connected with exhaust collar is 60mm to accept the duct system without an additional adapter. The dimensions of the exhaust collars are:

-10" x 1 exhaust collar (1.2M, 1.5M, 1.8M fume hood)

-10" x 2 exhaust collars (2.4M fume hood)

Galvanized or painted exhaust outlets are not acceptable.

4.11 Fluorescent Light Fixture:

Every hood should have a fluorescent lighting fixture provided at the top of the hood to give maximum light to the fume hood work zone. The light fixture shall be isolated from the hood interior by a safety glass panel sealed from the hood cavity. The light assembly shall be serviceable from outside the fume hood cavity. Light box wired to the hood with no screws nor hinges required, allowing pressure release during explosion in the internal work zone. Light Intensity should be at least 100 ft candles.

4.12 Pre-drilled provisions for remote control valves:

On both front side panels of the fume hood, there shall be 4 provisions each prepared for future addition of remote control fixtures. For aesthetics, the empty provisions are covered by compatible plastic (PS material) covers.

4.13 Pre-drilled provision for airflow sensor:

A location is prepared on the right front side post to allow for introduction of retrofit airflow control/monitoring system.

5. Electrical Features

5.1 Electrical Service:

5.1.1 The Fume Hood provides with a light and blower switch with anti-dust (or IP-44) cover, and all internal wiring to circuit junction boxes are located behind the front panel.

5.1.2 The Fume Hood features four 220 volt, three wire polarized and grounded electrical receptacles (Multi-Socket) mounted on the control panel. These 4 receptacles shall be wired to separate electrical circuits.

5.1.3 Optional Power Control Unit: Each Fume Hood is factory fabricated a conjunction box for power control unit located on the right base cabinet, it shall contain:

- a) 40A 2P NFB for main power (SIEMENS or equal basis)
- b) 16A 2P NFB for electrical receptacles with over current protector. (SIEMENS or equal basis)
- c) 3A 2P NFB for lighting fixtures. (SIEMENS or equal basis)

d) 6A 2P NFB for blower motor (SIEMENS or equal basis) (Note: Optional parts, the NFB will be different according to the blowers)

- All the NFBs can be operated easily from the front of the base cabinet and protected by an anti-dust cover.
- The power control unit is fabricated a power indicator for identification.
- All wiring is factory fabricated, and the electrical terminal is on the rear of the base cabinet protected by a plastic cover.

6. Test Reports :

Test Reports : Submit test reports verifying conformance to specified performance tests

6.1 Exhaust Requirement:

Exhaust requirements for fume hoods shall be calculated based on 0.5 m/s (100 fpm) of the average face velocity and 18" operation sash height :

- 4ft Fume Hood Exhaust Requirement: 24.2CMM/1450CMH/870cfm
- 5ft Fume Hood Exhaust Requirement: 31.7CMM/1900CMH/1140cfm
- 6ft Fume Hood Exhaust Requirement: 39.0CMM/2340CMH/1400cfm
- 8ft Fume Hood Exhaust Requirement: about 52.9CMM/3170CMH/1900cfm

6.2 Static Pressure Loss:

Static pressure loss readings shall be taken at 3 diameters above the hood outlet from 90 degrees apart. The static pressure loss must not exceed 124 Pa at 0.5m/s (100fpm) average face velocity while the sash is at full open position.

7. Standard Factory-fitted Accessories:

Enhanz(TM) Service Fixtures, Powder Coat Finished CW (cold water) 1 set, Gas (Gas) 1 set, Pre-Plumbed at top side of Hood

7.1 Water fixture

- a. Brand: Esco Enhanz™
- b. Mounting : Wall mounting
- c. Swivel spout faucet 360°
- d. Nozzle : Olive-type hose screw coupling
- e. Valve : Normal Regulation
- f. Material : Copper pipes with epoxy coated
- g. Maximum working pressure: 10 BAR °
- h. Valve color code complies with DIN12920 international standard

7.2 Remote Control Valve (Water):

- a. Brand: Esco Enhanz™
- b. Mounting: wall mounting (fume hood exterior panel / side post)
- c. Valve: Normal Regulation
- d. Material : brass alloy body with epoxy coated
- e. Maximum working pressure: 10 BAR °
- f. Service Outlets Identification :(Color Code Chart for Laboratory Taps Handles DIN 12920.

7.3 Cupsink :

On the work area it shall be provided a black Polypropylene oval cupsink, L176x W102 (mm), mounted flush with the recessed worktop for better straining. Predrilled cutouts for cupsink and required fixtures as shown on the shop drawing are provided.

8. Optional Factory-fitted Accessories:

8.1 Optional Fixtures :

With Additional Cutout until 6 fixtures inside the hood, Choice of additional fixtures :
Vacuum, Nitrogen Oxygen, Compressed Air, and Argon, Possible for other fixtures

9. Retrofit Kits:

9.1. Worktops :

- Durcon Epoxy Worktop
- Trespa TopLab^{PLUS} Worktop
- Keraplan Ceramic with Ceramic Sink

9.2. Mounting Bar (Distillation Grids)

9.3. Airflow Alarm for Front Face Velocity Control which easy to assembled in site

9.3. Circuit Breaker Set for electrical safety which assembled at the Base cabinet.

10. Base Cabinet :

10.1 Construction:

The cabinets shall be fabricated of 1.2mm \pm 5% cold roll sheet steel epoxy coated steel with four leveling feet.

Flushed Esco Made Door Handle from PS Material, Gripwel Roller Catch for smooth door closing, and Concealed Hinge for Nice and smooth Door Movement !

10.2 Main Features:

10.2.1 Base Cabinet can be leveled from inside the cabinet storage area.

10.2.2 The cabinet system consists of a vented storage cabinet and a cabinet for collecting all required piping and wiring lines.

10.2.3 The storage cabinet can be vented into hood with an optional PVC ventilation kit. Airflow is provided directly into the fume hood exhaust system without affecting the containment in the hood.

10.2.4 The back panel shall be removable to provide the passage for maintenance and repair.

10.2.5 Base cabinet can be shipped knocked down to save transport costs.

10.2.6 SEFA-8 Base cabinet Tested, Testing Items, and Result :

- Cabinet Load Test,
- Cabinet Concentrated Load Test,
- Cabinet Torsion Test,
- Cabinet Submersion Test,
- Door Hinge Test,
- Door Impact Test,
- Door Cycle Test,
- Chemical Spot Test,
- Hot Water Test,
- Impact Test on Coating,
- Paint Adhesion on Steel,
- Paint Hardness on Steel,

All the Testing results are OK, no Permanent Damage

11. Manufacturer :

A. Fume hood manufacturer : Esco Micro Pte Ltd, Singapore

B. Manufacturer's Qualifications: Modern plant with proper tools, dies, fixtures, and skilled production staff to produce high quality laboratory casework and equipment.

12. Warranty :

Provide a 1-year warranty against defects in materials and workmanship .

13. Submittal :

Product Data: Submit manufacturer's data for each type of hood specified. Include component dimensions, configurations, construction details, joint details, and



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attachments. Indicate location, size, and service requirement for each utility connection.

Maintenance Manuals: Provide written instruction manuals outlining operating and safety instructions and proper maintenance procedures