High Performance Fume Hood
Laminar Topography and Perfect Protection Perimeter
About Esco

Since Esco was founded in 1978 our company has earned a reputation for innovation in the worldwide laboratory equipment and pharmaceutical equipment industry. 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 our 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.

World-Class Test Facility

Esco is proud to be one of the few manufacturers in the world with a test facility capable of testing hoods to both ASHRAE 110-1995 (US) and the EN14175-3 (European) standards. Esco’s Fume Hood Test Laboratory was designed with the assistance of Tintschl Engineering AG, a specialist consulting firm from Germany. It has controlled relative humidity, room temperature and pressure for optimum test conditions. Esco is also one of the few companies to routinely sample and subject production fume hoods to a battery of containment and safety tests. All custom fume hoods with modified dimensions are also tested in our laboratory to ensure containment before delivery.

A Complete Range

Frontier Acela is the world’s first high performance / low flow fume hood product range with an ergonomically angled front. Frontier Acela is available in Benchtop, Perchloric Acid, Radioisotope, Acid Digestion and Floor Mounted configurations, in a wide range of widths, with a full range of options and accessories.
American Standard ASHRAE 110-1995
The ASHRAE 110-1995 standard is a comprehensive method for evaluating the operator safety of fume hoods by determining quantitatively and repeatably how well the fume hood contains vapors released in the workzone. First published in 1985 and extensively revised in 1995, this standard employs a set of rigorous tests to evaluate hood performance:

1. Airflow Visualization
   - Local and gross airflow visualization tests conducted to observe airflow patterns inside work chamber

<table>
<thead>
<tr>
<th>Grading</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>Smoke observed escaping from the hood</td>
</tr>
<tr>
<td>Poor</td>
<td>Reverse flow of smoke near opening Lazy flow into opening along boundary Observed potential for escape</td>
</tr>
<tr>
<td>Fair</td>
<td>Some reverse flow, not necessarily at opening No visible escape</td>
</tr>
<tr>
<td>Good</td>
<td>No reverse flows Active flow streams into hood around boundary</td>
</tr>
</tbody>
</table>

2. Face Velocity Measurements
   - Face velocity and uniformity tested at 100% and design sash opening position

3. Tracer Gas Containment
   - Tracer gas containment test: SF6 released at 4L/min inside work chamber
   - Consists of 3 parts
     - Static gas leak conducted at 3 positions (left, right, centre)
     - Face hood surface scan
     - Sash movement effect
   - Test criteria: leakage of less than 0.05ppm as-manufactured

European Standard EN 14175
EN 14175 is a harmonized European standard which supercedes the former national standards of Germany, the UK and France. A key element of the EN 14175, which is not present in the American ASHRAE 110 standard, is the robustness test, which simulates airflow disturbance in front of the hood.

1. Inner Grid Test
   - A set of 9 sampling tubes are arranged in a 3 x 3 grid, at a distance of 30 mm from the measurement plane
   - Leakage will be measured at 6 different grid positions

2. Outer Grid Test
   - Outer grid testing measures the leakage of tracer gas across the entire sash opening
   - Sash is closed then opened during the test to investigate dynamic effect of sash movement

3. Robustness Test
   - For the robustness test, a 0.4 x 1.9 m plate crosses the front of the fume hood at 1 m/s for 6 times
   - Provides an indication of the sensitivity of the fume hood towards external disturbances
Energy Efficiency

Fume hoods — essential safety devices used in laboratory environments — are highly energy-intensive, each one consuming more energy than three homes in an average U.S. climate. Depending on climate and system design, estimated energy costs for fume hoods range up to US$9000 annually¹, based on face velocities of 0.5 m/s (100 fpm) at full sash open position for a 1.8m (72.0") hood.

Compared with conventional hoods, Esco Frontier Acela® operates safely at 0.3 m/s (60 fpm) at 457 mm (18.0") or full open sash position while maintaining excellent ASHRAE and EN containment. Exhaust volume reductions of up to 58% may be achieved without compromising safety. This translates into an annual operating cost savings of up to US$5600. Unlike VAV systems the Esco Frontier Acela® is easy and inexpensive to install, commission and maintain.

<table>
<thead>
<tr>
<th>Fume Hood Width</th>
<th>Exhaust Volume</th>
<th>% Reduction in Exhaust Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2m (4')</td>
<td>541 cm³/h (316 cfm)</td>
<td>58%</td>
</tr>
<tr>
<td>1.5m (5')</td>
<td>777 cm³/h (457 cfm)</td>
<td>44%</td>
</tr>
<tr>
<td>1.8m (6')</td>
<td>872 cm³/h (510 cfm)</td>
<td>43%</td>
</tr>
<tr>
<td>2.4m (8')</td>
<td>1203 cm³/h (708 cfm)</td>
<td>49%</td>
</tr>
</tbody>
</table>

Benefits For All Stakeholders

Health and Safety Authorities
- ASHRAE 110 and EN 14175 tested at face velocities down to 0.3 m/s (60 fpm)
- UL1805 Listed
- Sash-lock and creep-down mechanisms ensure operator safety
- Optional Sentinel XL Airflow Monitor

Facility Owners
- Operates at 0.3 m/s (60 fpm) at 457 mm (18.0”) operating height
- Energy savings of up to US$5600 annually for each fume hood

Lab Personnel
- Certified safety
- Precisely-tuned aerodynamics
- High sight line
- Angled front
- Excellent ergonomics

Lab Designers and Architects
- Neutral color scheme
- Futuristic design
- Detailed architectural specifications and drawings

Installation and Service Personnel
- Robust tri-wall side pan construction
- Factory-fitted service fixtures are pre-plumbed
- Chain and sprocket sash
- Wide range of field-installed accessories
Frontier Acela®, High Performance Fume Hood
Laminar Topography and Perfect Protection Perimeter

Chain and Sprocket Sash Support System
Large arbor sprockets and chain drive make sash travel quiet and effortless.

High Sight Line
High sight line of 1803 mm (71.0”) coupled with an automatic lowering function combines safety and convenience.

Perfect Pitch Profile
Ergonomics, safety and aesthetics all come together with the 5° pitch of the face.

Acela® Shaping Vanes
Increase airflow “sweep” at the critical area at the side walls to improve containment, especially when laboratory traffic disrupts airflow in front of the hood.

Ergonomic Sash Handle
Gently directs air into the hood without sacrificing visibility.
**Computational Fluid Dynamics**

Computational Fluid Dynamics (CFD) modelling is employed in the development of Esco clean air and containment devices. Laminar Topography™ on Frontier Acela® Fume Hoods was developed with computational fluid dynamics modelling in the Esco Research and Development Center. The main thrusts of the project were improved airflow uniformity, enhanced safety, reduction in noise levels, and energy consumption.

First, engineering teams conceptualized possible designs, and, instead of building physical models, utilized CFD to simulate airflow patterns, pressurizations and visualize possible areas of turbulence. This allowed a large number of iterations of the airfoil, sash handle, baffle, bypass and exhaust collar to be evaluated. Finally, physical prototypes were constructed, tested, and the best design combination selected for production.

CFD has allowed us to effectively reduce the vortex in conventional fume hood designs to the minimum, resulting in a safe yet energy-saving fume hood design.

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**Hot Zone Baffles**
The unique Hot Zone Baffles draw most contaminants back in single pass displacement of the air. Thermal Heat Relief is quickly achieved.

**Aerodynamic Foil Entry**
Provides maximum airflow “sweep” on the critical boundary layer near to the work surface level to reduce turbulence and eliminate backflow.

**Functionally Robust Bypass**
The unique design provides a robust stream of bypass air into the hood cavity.

**Tapered Fiberglass Exhaust Collar**
Transitions exhaust air quietly and enhance airflow uniformity.

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**Standards Compliance**

<table>
<thead>
<tr>
<th>Chemical Fume Containment</th>
<th>Electrical Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 14175, Europe</td>
<td>EN-61010-1, Europe</td>
</tr>
<tr>
<td></td>
<td>IEC-61010-1, Worldwide</td>
</tr>
</tbody>
</table>
Superstructure
- Tri-wall construction for maximum robustness.
- Fabricated of electro-galvanized steel (zinc coated to prevent rusting even if the powder coat is abraded, and phosphate for better adhesion of the powder coating).
- Epoxy-polyester hybrid Isocide™ antimicrobial powder coating provides long term chemical, abrasion and weathering resistance.
- The pan type design from a single piece of steel (unlike frame welded designs) is easier to assemble on site, and more robust for long-term usage.
- Ergonomic design on the Esco Frontier Acela™ is anthropometrically proven.
- Hood lighting is pre-wired. Lighting is electronically ballasted, energy efficient, instant start. Typical light intensity on work surface is >1076 lux (>100 foot candles) in zero ambient conditions.

Aesthetics and Ergonomics Design
- Perfect Pitch Profile™. The gentle pitch of the hood enhances visibility and enables users to work further into the hood without strain.
- A tall sight line creates a bright, airy work space.
- Coordinated color scheme (neutral white with light grey accents) blends the hood with any casework, metal or wood.
- Color temperature is tuned to provide a gentle, bright (but not harsh) and comfortable work environment for the user.
- Sash stop limits sash movement beyond 457 mm (18.0"), ‘encouraging’ user to work at safe positions.
- When sash is raised above 457 mm (18.0"), it will automatically and gently fall back to the safe level (Esco’s creep-down mechanism) unless held in place. This enables the sash to be raised temporarily to the full open position for set up of equipment and apparatus in hood, while enforcing regular operation of the hood with a lowered sash.
- Sash creep down can only be disabled with a key, which permits the laboratory manager or safety officer to restrict operation of the hood at sash openings above 457 mm (18.0").
- The sash can also be locked down in the fully closed position with the key, in the event of a fume hood fault, facility shutdown, or, simply to restrict access to equipment set up in the hood.
- Fluorescent light casing is not secured, acting as an explosion relief, allowing upward pressure release during explosions, maximizing user safety.

Safety Certified and Tested
All Esco fume hoods are manufactured for the most demanding laboratory applications.
- Independently tested and certified (4ft, 5ft and 6ft models) by Tintschl Engineering AG to the European Standard EN 14175-3.
- Independently tested and certified by Exposure Control Technologies, Inc. to the American Standard ASHRAE 110.
- UL1805 Listed
- Ergonomic design features combine to create a more comfortable work environment, which promotes safety by enabling the user to concentrate on his / her work.
- Hoods are ASHRAE tested on the production line on a sampling basis (industry exclusive).
- Sash is clearly labeled with all operating instructions and illustrations.

Additional Safety Features
- Sash is clearly labeled with all operating instructions and illustrations.
- Hood is pre-wired. Lighting is electronically ballasted, energy efficient, instant start. Typical light intensity on work surface is >1076 lux (>100 foot candles) in zero ambient conditions.
- Ergonomic design on the Esco Frontier Acela™ is anthropometrically proven.
- Hood lighting is pre-wired. Lighting is electronically ballasted, energy efficient, instant start. Typical light intensity on work surface is >1076 lux (>100 foot candles) in zero ambient conditions.
Serviceability

- Baffles remove to allow cleaning inside the hood.
- Internal access panels on side walls facilitate access to plumbing connections for service, especially when hoods are installed next to each other.
- Removable front panel facilitates easy access to lighting and other electrical components mounted above the hood work chamber.
- Chain and sprocket sash system requires minimal service.

Warranty

The Frontier Acela® High Performance Fume Hood is warranted for 1 year excluding consumable parts and accessories. Contact your local sales representative for specific warranty details.
Model EFA, Frontier Acela, Fume Hood Technical Specifications

1. Fiberglass exhaust collar
2. Electrical junction box
3. Light housing
4. Removable baffle
5. Side access panel
6. Swan-neck water faucet
7. Flash airfoil, hinged for cleaning, spillage containment 0.4 Litres/0.1 gallons
8. Removable front panel
9. Tempered laminated framed sash glass
10. Provision for airflow alarm hinged airfoil
11. Light and fan switch
12. Distillation grid provision
13. Side vane
14. Electrical outlets
15. Sash stop
16. Sash keylock (lock sash at fully open and fully close)
17. Provision for additional outlets
18. Gas fixture remote
19. Cold water fixture remote

Fume Hood Dimensional Data

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFA-4UDR_W-</td>
<td>1220 mm (48.0&quot;)</td>
<td>996 mm (39.0&quot;)</td>
<td>610 mm (24.0&quot;)</td>
</tr>
<tr>
<td>EFA-SUDR_W-</td>
<td>1525 mm (60.0&quot;)</td>
<td>1301 mm (51.0&quot;)</td>
<td>763 mm (30.0&quot;)</td>
</tr>
<tr>
<td>EFA-6UDR_W-</td>
<td>1830 mm (72.0&quot;)</td>
<td>1606 mm (63.0&quot;)</td>
<td>915 mm (36.0&quot;)</td>
</tr>
<tr>
<td>EFA-8UDR_W-</td>
<td>2440 mm (96.0&quot;)</td>
<td>2210 mm (87.0&quot;)</td>
<td>664 mm (26.0&quot;)</td>
</tr>
</tbody>
</table>

Fume Hood Installation Requirements

- Proper location (refer to Esco recommendations)
- Exhaust system capable of delivering airflow and pressure drop requirements
- Exhaust ductwork and connection accessories
- Exhaust blower (or building exhaust system)
- Contactor (if applicable)
- Means of adjusting exhaust flow (damper or frequency inverter)
- Sufficient laboratory supply air
- Base cabinet or other means of support
- One set of filler panels for each continuous row of hoods
- Plumbing and electrical hook-up
- Unless otherwise specified, items and services specified above are not provided by Esco
Options and Accessories

Esco offers a variety of options and accessories to meet application requirements.

- All Frontier Acela® Fume Hoods include 1 water and 1 gas Enhanz™ remote-controlled fixture plumbed to the top of hood and and 4 single outlets standard. (Specify outlet code when ordering)

### Electrical Outlets

4 single outlets per fume hood.

<table>
<thead>
<tr>
<th>Electrical Supply Code</th>
<th>Electrical Outlets</th>
<th>Electrical Supply Code</th>
<th>Electrical Outlets</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>H</td>
<td>C</td>
<td>I</td>
</tr>
<tr>
<td>D</td>
<td>J</td>
<td>E</td>
<td>GFCI</td>
</tr>
<tr>
<td>F</td>
<td>UNI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sentinel™ XL Airflow Alarm Kit

Real-time digital display of face velocity. Audible and visual alarms.

- SXL – EFA

### Distillation Grids

Scaffoldings to support clamps for distillation apparatus.

### Drip-Cups

Material

- SPP : Polypropylene
- SIC : Ceramic, Only For Ceramic Work Tops

### Work Tops

### Fume Hood Work Surface Selection

Esco offers 5 types of fume hood work surfaces for different applications

<table>
<thead>
<tr>
<th>Type</th>
<th>SS304</th>
<th>SS316</th>
<th>Trespa TopLab® Plus Phenolic Resin</th>
<th>Epoxy</th>
<th>Ceramic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Resistance</td>
<td>Good</td>
<td>Better</td>
<td>Better</td>
<td>Better</td>
<td>Best</td>
</tr>
<tr>
<td>Temperature Resistance</td>
<td>(300°C)</td>
<td>(300°C)</td>
<td>(110°C)</td>
<td>(165°C)</td>
<td>(1200°C)</td>
</tr>
<tr>
<td>Cost</td>
<td>Low Price</td>
<td>Mid Price</td>
<td>Mid Price</td>
<td>Mid Price</td>
<td>Premium</td>
</tr>
</tbody>
</table>
Frontier Acela® Base Cabinetry (EBA)

Safety Certified and Tested
- Built and tested according to SEFA-8 recommended practices.

Superstructure
- Fabricated of electro-galvanized steel (zinc coated to prevent rusting even if the powder coat is abraded, and phosphated for better adhesion of the powder coating).
- Epoxy-polyester hybrid Isocide™ antimicrobial powder coating provides long term chemical, abrasion and weathering resistance.
- Ships unassembled, assembles rapidly on site.

Aesthetics and Ergonomics Design
- Concealed door hinges.
- Soft-close insulated doors.
- Adjustable shelf allows user to select optimum heights for upper and lower storage compartments.

Serviceability
- Convenient access to levelers from inside base cabinet.
- Removable rear access panel facilitates installation and maintenance of plumbing and drainage systems.

Options and Accessories
- MCB/ELCB
  - Protects laboratory equipment during sudden fluctuation of current.
  - Fume hood circuit protection.
  - Only applicable to 230V, AC, 50/60Hz hoods.
  - Factory-installed; specify when ordering.
- Ventilation Kit (VK-EBA)
  - Ventilates base cabinet utilizing the hood exhaust system.
  - Field-installed.
- Filler Panel (FP-EBAD)
  - One set of filler panels required per continuous row of hoods.
  - Field-installed

SEFA-8 Test on Frontier Acela® Base Cabinet (EBA)

<table>
<thead>
<tr>
<th>No.</th>
<th>Type of Test</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cabinet load test</td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>Cabinet concentrated load test</td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>Cabinet torsion</td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>Cabinet submersion test</td>
<td>PASS</td>
</tr>
<tr>
<td>5</td>
<td>Door hinge test</td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>Door impact test</td>
<td>PASS</td>
</tr>
<tr>
<td>7</td>
<td>Door cycle test</td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>Chemical spot test</td>
<td>PASS</td>
</tr>
<tr>
<td>9</td>
<td>Hot water test</td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>Impact test</td>
<td>PASS</td>
</tr>
<tr>
<td>11</td>
<td>Paint adhesion on steel</td>
<td>PASS</td>
</tr>
<tr>
<td>12</td>
<td>Paint hardness on steel</td>
<td>PASS</td>
</tr>
</tbody>
</table>
Model EBA, Frontier Acela® Base Cabinet Technical Specification

1. Rear access panel
2. Soft close door
3. Adjustable shelf
4. Adjustable shelf slot
5. Base cabinet height leveler
6. Base cabinet filler panel (optional)
7. MCB/ELCB set (optional)
8. Ventilation provision

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**Front View**

EBA-4UDG-\_ (for EFA-4UDR_W\_)  
EBA-5UDG-\_/ EBA-6UDG-\_/ EBA-8UDG-\_  (for EFA-5UDR_W\_, EFA-6UDR_W\_, EFA-8UDR_W\_)  

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**Top View (for All Sizes)**

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**Side View (for All Sizes)**

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**Table**

<table>
<thead>
<tr>
<th>Model*</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBA-4UDG-0 / EBA-4UDG-8</td>
<td>1220 mm (48.0&quot;)</td>
<td>610 mm (24.0&quot;)</td>
</tr>
<tr>
<td>EBA-5UDG-0 / EBA-5UDG-8</td>
<td>1525 mm (60.0&quot;)</td>
<td>381 mm (15.0&quot;)</td>
</tr>
<tr>
<td>EBA-6UDG-0 / EBA-6UDG-8</td>
<td>1830 mm (72.0&quot;)</td>
<td>457.5 mm (18.0&quot;)</td>
</tr>
<tr>
<td>EBA-8UDG-0 / EBA-8UDG-8</td>
<td>2440 mm (96.0&quot;)</td>
<td>610 mm (24.0&quot;)</td>
</tr>
</tbody>
</table>

* Model EBA-\_\_\_0 is standard base cabinet without MCB/ELCB.  
Model EBA-\_\_\_8 is with MCB/ELCB protection and only applicable for 230V/AC 50/60Hz units. MCB/ELCB panel is always mounted on the top right hand corner of base cabinet set.
Esco Resinate™
Esco Resinate™ is a proprietary composite material specifically designed for use as internal liner in laboratory fume hoods.
- Excellent chemical resistance (refer to table below)
- Excellent physical properties provide structural reinforcement for the hood
- Smooth, attractive, easy-to-clean finish

### Chemical Resistance* of Esco Resinate™ Internal Liner

<table>
<thead>
<tr>
<th>Acids</th>
<th>Chemicals</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>85% Sulfuric Acid</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>98% Sulfuric Acid</td>
<td>1st Grade</td>
<td></td>
</tr>
<tr>
<td>50% Nitric Acid</td>
<td>1st Grade</td>
<td></td>
</tr>
<tr>
<td>65% Nitric Acid</td>
<td>2nd Grade</td>
<td></td>
</tr>
<tr>
<td>36% Hydrochloric Acid</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>85% Phosphoric Acid</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>40% Hydrofluoric Acid</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>60% Chromic Trioxide</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>99% Glacial Acetic Acid</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Aqua Regia</td>
<td>No Effect</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solvents</th>
<th>Chemicals</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>37% Formaldehyde</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>N-Hexane</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Ethyl Acetate</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Ethyl Ether</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Ethyl Alcohol</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Carbon Tetrachloride</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Chloroform</td>
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<td></td>
</tr>
<tr>
<td>Methanol</td>
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<tr>
<td>Toluene</td>
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<tr>
<td>Xylene</td>
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<tr>
<td>Acetone</td>
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</tr>
<tr>
<td>Styrene</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Phenol</td>
<td>No Effect</td>
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<table>
<thead>
<tr>
<th>Alkalis</th>
<th>Chemicals</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>40% Sodium Hydroxide</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>65% KOH</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>10% Iron Chloride</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>10% Copper Sulfate</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>15% Sodium Sulfide</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Ammonium Hydroxide</td>
<td>No Effect</td>
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</table>

<table>
<thead>
<tr>
<th>General Reagents</th>
<th>Chemicals</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% Magnesium Sulfate</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>34% Hydrogen Peroxide</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Urea</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Copper Sulfate</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Karl Fisher Reagent</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Iodine</td>
<td>No Effect</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stains and Indicators</th>
<th>Chemicals</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% Gentian Violet</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Methylene Blue</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Crystal Violet</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Methyl Red</td>
<td>No Effect</td>
<td></td>
</tr>
<tr>
<td>Methyl Orange</td>
<td>No Effect</td>
<td></td>
</tr>
</tbody>
</table>

Note: Esco Resinate™ may not be suitable for fume hoods for increased acidic and heat loads. Contact your local sales representative for details.

* Test Method: One drop of test chemical placed on material surface and covered with watch glass for 16 hours before result is observed.
- 1st Grade: Slight effect on color and gloss. No change to physical properties.
- 2nd Grade: Clear effect on color and gloss. No change to physical properties.

Esco Resinate Plus™
Esco Resinate Plus liner is offer excellent chemical and physical resistance against harsh environments particularly against highly corrosive acids.
- Fiberglass Reinforced Plastic
- UL1805 Compliant
- Smooth, attractive, easy-to-clean finish
Ordering a Frontier Acela® Fume Hood

Check List:

1. Fume Hood Width and Depth ................................ page 9
   Widths: 
   - 1220 mm (48.0”)
   - 1525 mm (60.0”)
   - 1830 mm (72.0”)
   - 2440 mm (96.0”)
   Depth: 900 mm (35.4”)

2. Fume Hood Internal Liner Material ...................... page 14
   - Esco Resinate™ Phenolic Resin Liner
   - Increased Acidic and Heat Loads, Contact Esco

3. Sash Type ............................................................. page 9
   - Vertical
   - Combination

4. Electrical Outlet Codes .............................................. page 11
   4 single outlets standard per fume hood. Specify outlet codes when ordering.

5. Service Fixtures ....................................................... page 11
   1 water and 1 gas remote-controlled fixtures standard. Up to a maximum of 6 more fixtures:
   - Water
   - Gas
   - Oxygen
   - Argon
   - Nitrogen
   - Compressed Air

6. Optional Airflow Monitor .................................. page 11

7. Optional Distillation Grids ................................ page 11

8. Worktop Material .................................................... page 11
   - Trespa ToplabPlus™
   - Epoxy
   - Ceramic
   - SS304
   - SS316

9. Drip-Cup .............................................................. page 11
   - Polypropylene
   - Ceramic (only compatible to ceramic worktop)

10. Base Cabinet .................................................. page 12,13

11. Optional MCB/ELCB Protection ................... page 12,13

12. Optional Base Cabinet Ventilation Kit .......... page 12,13

13. Base Cabinet Filler Panels ....................... page 12,13
   One set required per continuous run of hoods.

14. Select appropriate fume hood location (Esco’s hood location recommendations are in every fume hood user manual)

15. Select appropriate exhaust blower and ducting system (refer to general specifications table on page 9 for EFA exhaust volume and static pressure requirements)
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, compounding pharmacy equipment, containment/pharma products, ductless fume hoods, in vitro fertilization workstations, lab animal research products, laboratory fume hoods, laboratory ovens and incubators, laminar flow clean benches and PCR products 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.

www.escoglobal.com