ESCO Technologies, Inc • 2940 Turnpike Drive Suite 15-16, Hatboro, PA 19040 • Phone: 215-441-9661 • Fax: 484-698-7757

ESCO FRONTIER ACELA
THE INDUSTRY LEADING ENERGY EFFICIENT, HIGH PERFORMANCE FUME HOODS,

Esco Frontier Acela are high performance fume hoods that can operate at 60 fpm instead of traditional 100 fpm, that saves about $2000/year in electric bills from lower exhaust and make-up air requirement (heating and cooling). The small additional price for high performance fume hood will pay off on the first year of usage, when compared to conventional fume hood.

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 annually**[1], based on face velocities of 0.5m/s (100fpm) at full sash open position for a 1.8m (72.0") hood.

Variable Air Volume (VAV) is one of the various approaches presently employed to reduce hood energy consumption. The table below compares conventional hoods, VAV hoods, and the Esco Frontier Acela® High Performance Low Flow Hood.

	Conventional Fume Hood	Variable Air Volume (VAV) Fume Hood	High Performance Low Flow Fume Hood
Working Principle	0.5 m/s (100 fpm) @ full open sash position	0.5 m/s (100 fpm) @ all sash positions with sophisticated control system	0.3 m/s (60 fpm) @ 457 mm (18") sash opening using advanced aerodynamic designs
Initial Cost	Low	High	Medium
Running Cost	Very High	Medium (VAV Maintenance)	Low
Ease of Installation, Commissioning and Maintenance	Easy	Difficult	Easy

[1] *Energy use and savings potential for laboratory fume hoods, Evan Mills, Dale Sartor; Energy, 2003*

Green Product

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.

Fume Hood Width	Exhaust Volume		% Reduction in Exhaust Volume
	Frontier Acela® 0.3 m/s (60 fpm) @ 457 mm (18")	Conventional Fume Hood 0.5 m/s (100 fpm) @ full sash open	
1.2m (4')	541 cmh (316 cfm)	1296 cmh (763 cfm)	58%
1.5m (5')	777 cmh (457 cfm)	1400 cmh (824 cfm)	44%
1.8m (6')	872 cmh (510 cfm)	1543 cmh (908 cfm)	43%
2.4m (8')	1203 cmh (708 cfm)	2372 cmh (1396 cfm)	49%

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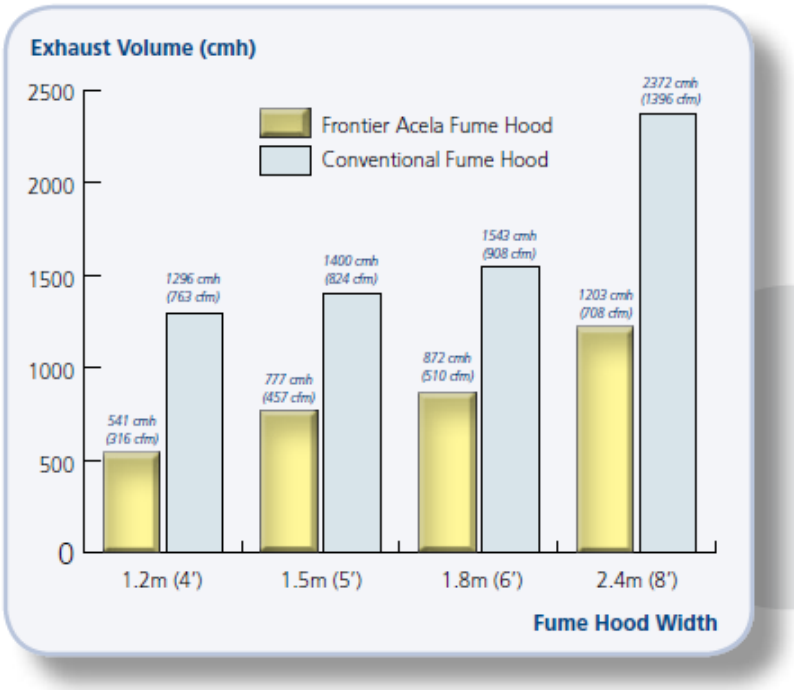


High containment is achieved by incorporating aerospace technology using airfoils and Computational Fluid Dynamics:

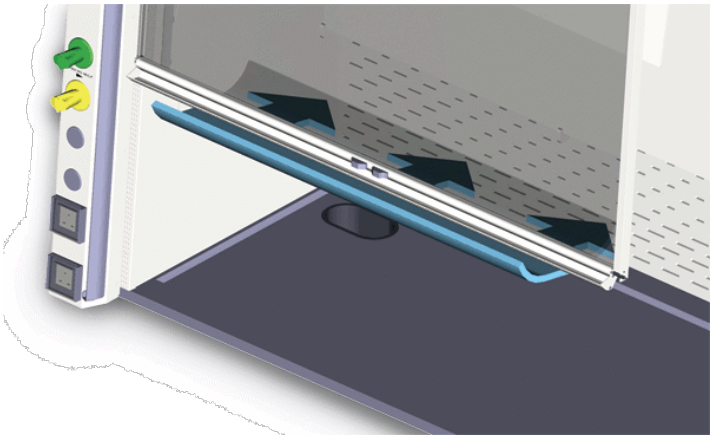
1. Airfoils on all 4 front opening perimeter, to create high velocity airflow to prevent chemical vapor leak on this critical area, where the airflow is weak on conventional hood.

2. Variable perforated back wall to even out suction and make the airflow unidirectional, with added benefit of reducing chance for cross-contamination between one side to another side of the hood

3. Slots in 4 different height to quickly remove light, medium, heavy weight chemical vapor, and top bypass to reduce vortex on top

4. Evenly distributed exhaust suction, using trapezoidal exhaust collar and variable back perforation to ensure that there is no vapor leak from left and right walls, which are the furthest points from the blower

1a. Sash handle air foil



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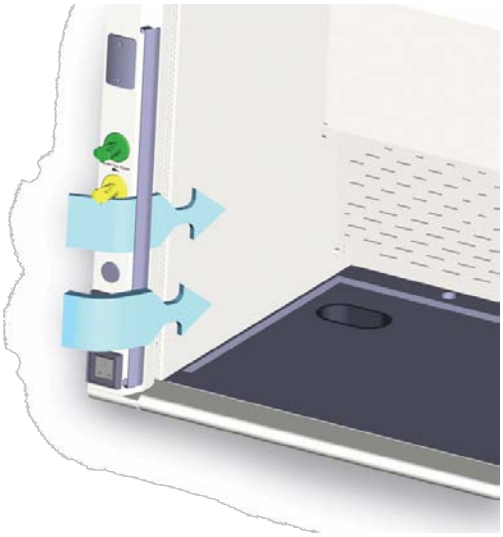
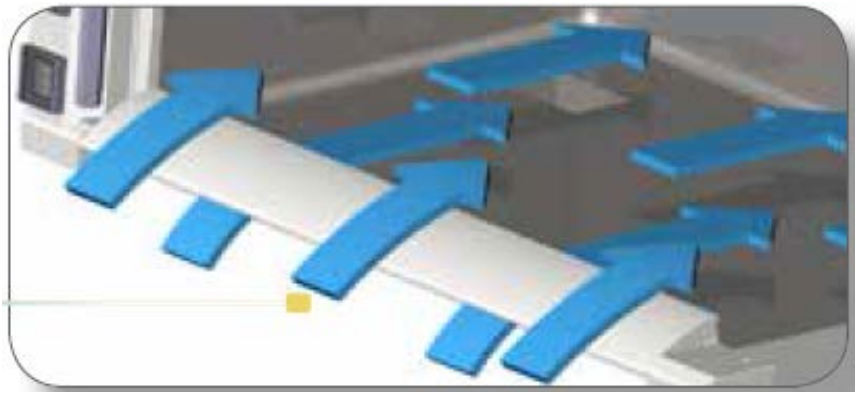
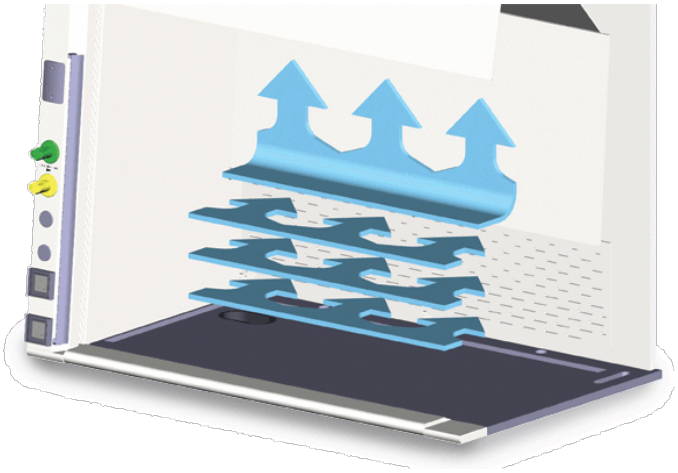
1b. Side air foil



1c. Arm rest air foil



2. Back baffle



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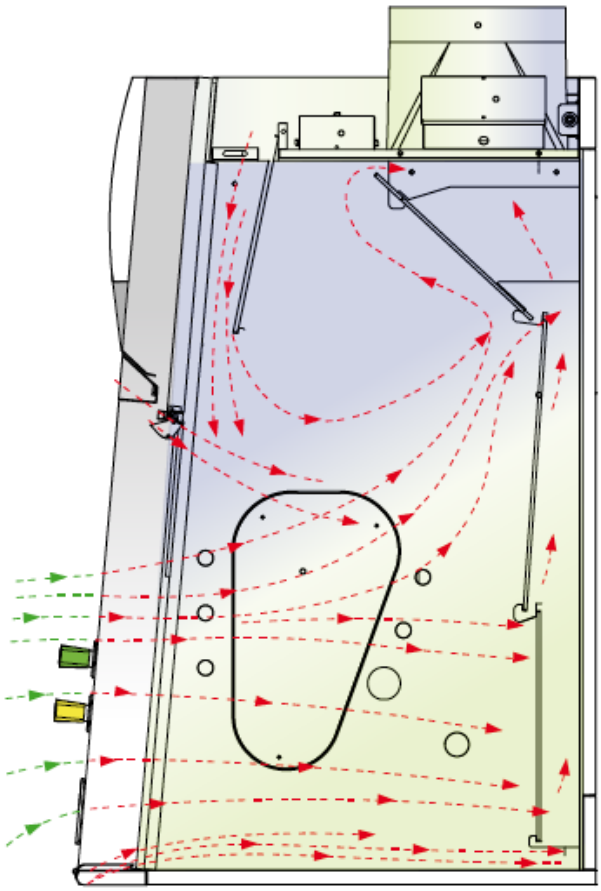
3. Four different height chemical vapor removal, depends on vapor weight:
- light vapor (top)
- medium-light (second from top)
- medium (middle and back perforation)
- heavy (bottom)

Also includes top bypass to reduce vortex on the top



4. Trapezoidal exhaust collar and larger back perforations on the left / right sides to distribute the exhaust suction evenly across work zone width: