



SAFT FLOW™ FUME HOODS

SUPERIOR ENGINEERING, ASSEMBLY & PERFORMANCE

- 60% energy savings possible at the same demonstrated containment using lower face velocities
- Engineered for acids, solvents, kilo quantity chemical synthesis, pharma and mineral powder analysis, and much more!
- Tested against ASHRAE 110 and ISPE's Assessing Particulate Containment Protocol
- Features include quick attach scaffolding, removable worktop, unique bypass compatible with either VAV or constant volume operation
- Our fume hoods are uniquely adaptable to a wide range of applications



1.800.849.3429 | WWW.FLOWSCIENCES.COM | LELAND, NC



TABLE OF CONTENTS

Our Culture.....	3
Consultation Process.....	4
Design Process.....	5
Unique Features.....	6
Fume Hood Types.....	8
General Purpose Fume Hood.....	8
Floor Mount Fume Hood.....	9
SS Bench Fume Hood.....	10
SS Perchloric acid Fume Hood.....	11
Base Cabinet Options.....	12
Custom Fume Hoods.....	13
FAT Testing.....	14
Standard Enclosures, Turnkey Solutions.....	15

OUR CULTURE

OUR HIGHEST QUALITY ENSURES YOUR EXCELLENT RESULTS.

Flow Sciences, Inc. has over 40 years of experience in the containment industry. A vital lesson those 40 years taught us is that the only constant is change. The presence of engineering and consulting firms in the pharmaceutical industry has increased over the years and technologies have advanced. In response, we regularly invest time and effort in re-evaluating our products to ensure we provide the latest containment innovation. Proper engineering controls help develop consistent products and results while keeping personnel safe.

Industry leaders choose Flow Sciences, Inc. as their containment provider because we provide adaptable solutions that can grow with your operations. Our products range from turnkey standard products with quick lead times to tailored enclosures built for specific equipment and tasks. We have the engineering and production capability to provide the appropriate solution for your needs.

We are ISO 9001:2015 certified in production quality, proving our dependability and quality. Bespoke enclosure designs must receive Factory Acceptance Testing (FAT) before shipping. If you cannot find an enclosure that meets your containment goals, suits your process or equipment, contact our experts, we have the containment solution for you.



TAILORED CONTAINMENT SOLUTIONS AVAILABLE

We have the capability to design and manufacture containment systems to suit your application. Our enclosures can contain within most Occupational Exposure Bands (OEB). Whether you need an environment that offers unmatched balance stability or a humidity controlled environment, our enclosures keep your personnel and materials safe. From solid dose to aseptic, we are your containment experts. Contact us for more info!

QUESTIONS? LET'S TALK

📍 2025 MERCANTILE DRIVE
LELAND, NC 28451

📞 1-800-849-3429

🌐 WWW.FLOWSCIENCES.COM



“Solutions to containment challenges come from understanding the relationship between equipment, operator, and process.”

RAY RYAN, FLOW SCIENCES INC.
CEO/President

WHAT HAPPENS WHEN YOU CONSULT WITH FLOW SCIENCES?

BEFORE WE BEGIN THE DESIGN PHASE,
WE ESTABLISH THESE 5 CRITERIA:



1. PROCESS

What do we need to contain?
We identify the processes and procedures performed inside and outside the enclosure to ensure proper design theory.



2. CPT

The Containment Performance Target is a customer-defined level of acceptable exposure for personnel. Usually applies when handling HPAPI/API.



3. SCOPE

Define expectations of the parties involved in the project. This includes setting an acceptable budget, lead time, and complexity of the containment solution.



4. FACILITY

Document allowances and restrictions in the designated work space, such as required power/voltage, installation process, and operation procedures.



5. EQUIPMENT

Define specifications and parameters of the operating machines, instruments, and hardware used inside the enclosure. We need to ensure proper sizing.



6. DESIGN

Once the scope is defined, we move the process into the design phase. Our engineers will work to provide drawings that fit your required specs.

DESIGN PROCESS

CFD: PIONEERING TECHNOLOGIES

Computational Fluid Dynamics (CFD) uses governing equations of fluid/gas flows to predict the characteristics and structure of a flow field. The most important feature, or advantage, of using CFD in the design process is the ability to see airflow.

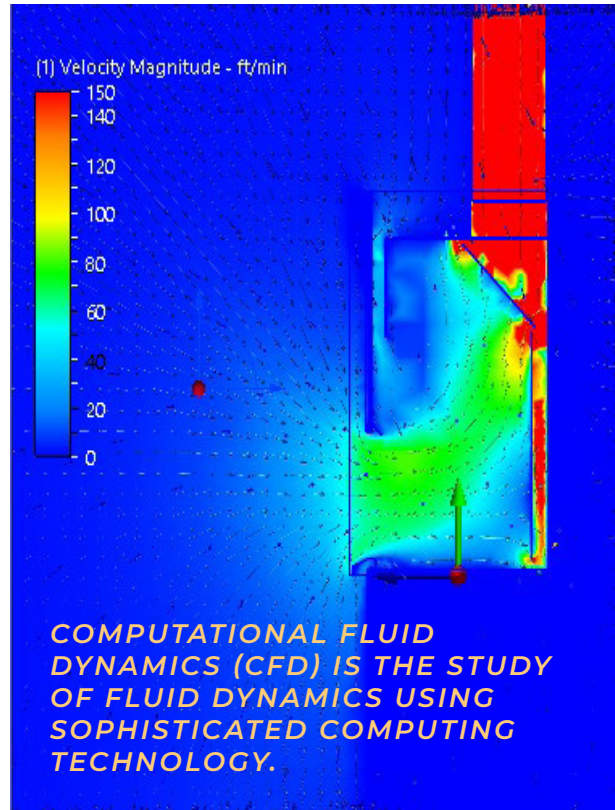
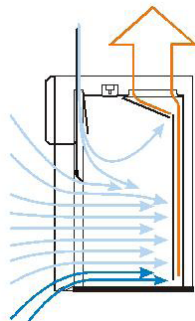
CFD allows us to see the results of engineering in design more effectively when compared to the naked eye. The effects of small features in the designing process are seen and compared using CFD. It would not be possible to see these changes without it. The ability to visualize and compare flow fields also allows us to replicate the design over and over.

We integrate CFD into our design process, allowing us to study changes in airflow caused by design changes. Even small changes to an enclosure's design affect the airflow structure within its interior. Our goal is to ensure a stable workspace for sensitive equipment by reducing turbulent airflow and minimizing potential product loss.

Using CFD, we have the advantage of evaluating performance of any enclosure even before assembly, and then we verify those results in our testing lab.

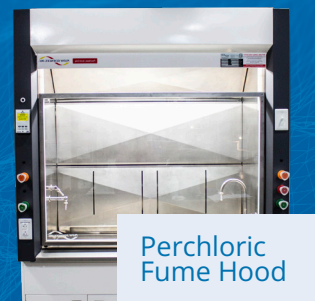
OVERLAPPING SASH BYPASS (OSB)

Our Overlapping Sash Bypass uses bypass air to clear fumes from behind the main sash. Meaning exhausted air is re-used to add containment. We have tested our OSB from 100 FPM (fully open sash) down to 60 FPM (18" sash opening) with ASHRAE 110 containment equipment. The results did not show any difference in containment performance at any face velocity or opening size within this range. Breathing zone containment resulted from 0.005 ppm down to undetectable.



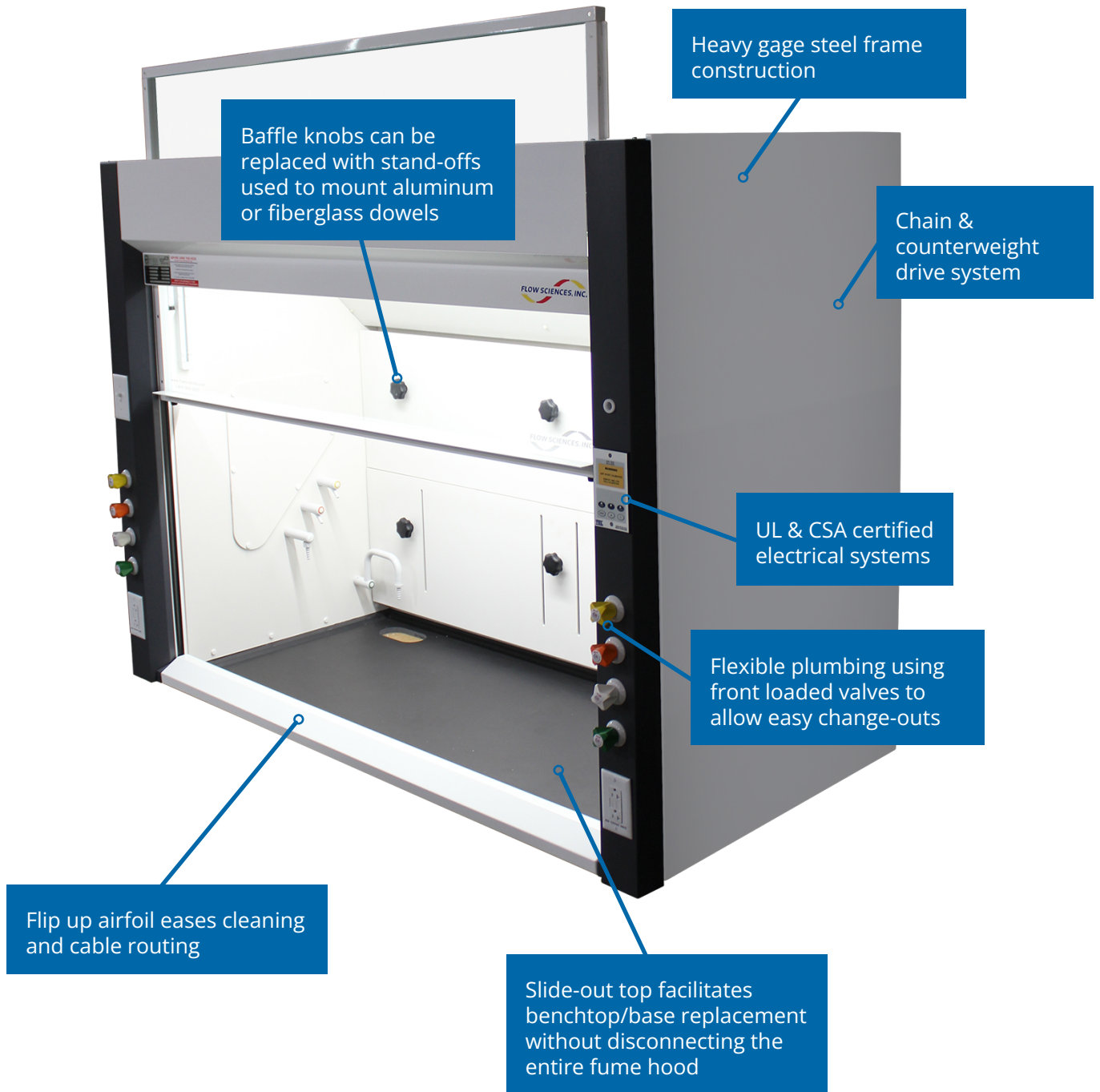
CUSTOM HOODS FOR YOUR APPLICATION

Our team is prepared to listen to your needs and meet them with our tailored solutions. Whether you are working with biological materials, animal medicine, vivarium waste, or perchloric acid, we can provide solutions like stainless steel liners and more to handle your process. Call 1-800-849-3429 or visit www.flowsciences.com to start your build today!



Perchloric Fume Hood

UNIQUE FEATURES



UNIQUE FEATURES

TESTED AGAINST ASHRAE 110 & ISPE'S ASSESSING PARTICULATE CONTAINMENT PROTOCOL

We tested all standard widths and sash types against ANSI/ASHRAE 110:2016 (a containment test using tracer gas) to verify safety under static and kinetic conditions. In all cases, containment in the breathing zone of an operator scored at 0.005 ppm or lower.



ASHRAE 110 Vapor Containment

HEAVY DUTY CONSTRUCTION

Heavy gage steel frame, Class-A low flammability liner, high-quality epoxy top, and chain-counterweight system rated at 500,000 cycles! A particle containment level of $50 \mu\text{g}/\text{m}^3$ for specified applications, measured using ISPE's Assessing Particulate Containment protocol.



Heavy Duty Frame Construction

PLUMBING

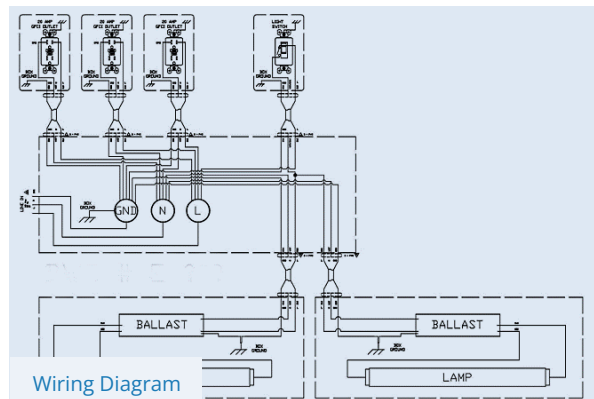
We provide shielded, flexible plumbing and front loaded valves. This system is much easier to install in the field and facilitates adding fittings as needed. Modularity reduces workarounds (typically required) to a minimum when adding fixtures in plumbing array.



Front Loaded Valve Heads

ELECTRICAL

We supply UL and CSA certified electrical fittings, typical for fume hoods, including ground fault interrupted outlets, light switches, greenfield cable, junction boxes, and explosion proof electrical fittings, where required. Factory installed options include LED lighting, leak proof fittings, velocity alarm, fan switch, and multiple circuits for complex wiring applications.



Wiring Diagram

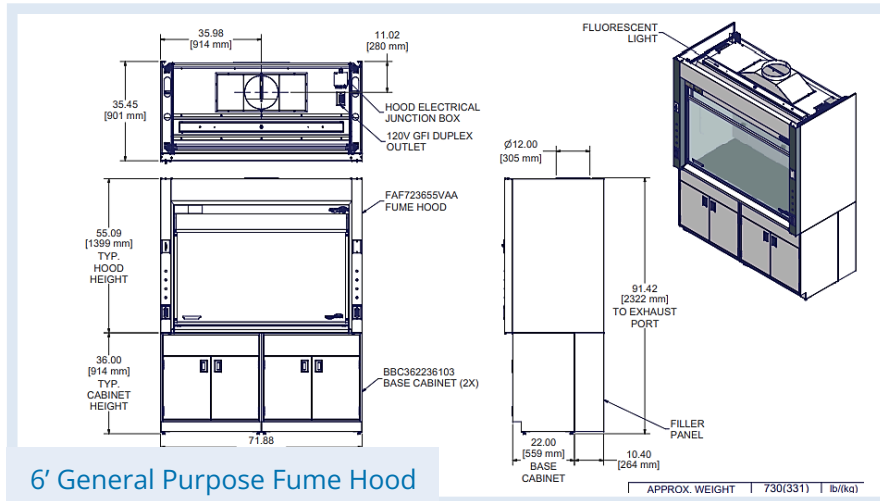
FUME HOOD TYPES & AIR FLOW



GENERAL PURPOSE

Designed to accommodate the broadest range of applications, the SAFT FLOW™ general purpose model comes with a flame- and chemical-resistant liner, a chain-and-sprocket counterbalance system, and a top which can slide out for modification without disturbing plumbing or electrical connections.

VAV can be installed initially or afterwards without changing the bypass system. Order up to four valves on each side or add plumbing later if your process or application changes!



6' General Purpose Fume Hood

Fume Hood Dimensions		80 FPM CFM & Static Pressure			
		28" (458 mm) Sash Opening		18" (711mm) Sash Opening	
Feet	mm	Classical Units	Metric	Classical Units	Metric
3'	915	464 CFM @ 0.07"	789 CMH @ 17.4 Pa	317 CFM @ 0.02"	539 CMH @ 5.0 Pa
4'	1220	674 CFM @ 0.12"	1146 CMH @ 29.9 Pa	460 CFM @ 0.07"	782 CMH @ 17.4 Pa
5'	1525	884 CFM @ 0.17"	1328 CMH @ 42.3 Pa	603 CFM @ 0.08"	1025 CMH @ 19.2 Pa
6'	1830	1094 CFM @ 0.25"	1860 CMH @ 62.3 Pa	726 CFM @ 0.12"	1234 CMH @ 29.9 Pa
7'	2135	1304 CFM @ 0.37"	2217 CMH @ 92.1 Pa	890 CFM @ 0.15"	1513 CMH @ 37.9 Pa
8'	2440	1536 CFM @ 0.18" ₂	2611 CMH @ 44.8 Pa	1033 CFM @ 0.08" ₂	1756 CMH @ 19.4 Pa

Annotations: 1 CFM ≠ 1.70 M³/H | 1" Static Pressure = 249 Pa | 1 Foot = 305 mm

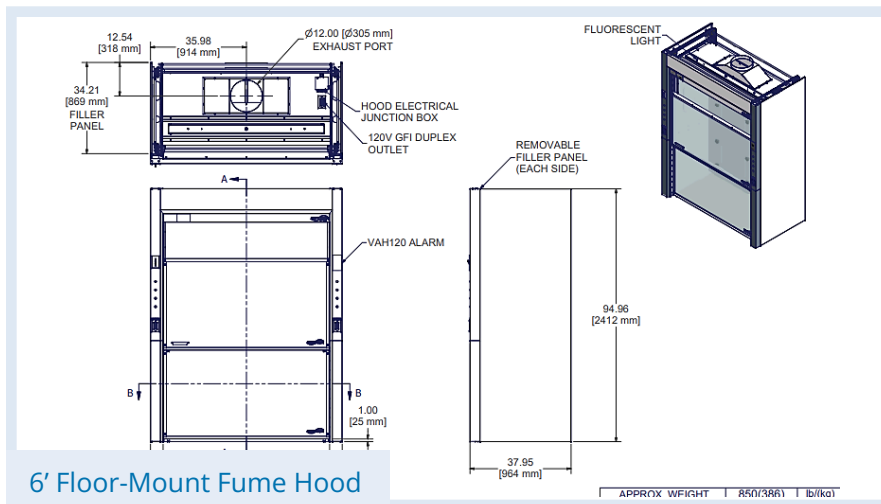
FUME HOOD TYPES & AIR FLOW



FLOOR-MOUNT FUME HOOD

Designed to accommodate large lab or process equipment, the floor-mount model comes with an 86" interior clearance, flame- and chemical-resistant liner, and two chain-and-sprocket counterbalanced sashes. Rigorously tested compliance against AIHA Z-95 recommended ASHRAE 110 containment control levels.

VAV can be installed initially or afterwards without changing the bypass system. Order up to eight valves on each side or add plumbing later if your needs change!



Fume Hood Dimensions		80 FPM CFM & Static Pressure			
		28" (458 mm) Sash Opening		18" (711mm) Sash Opening	
Feet	mm	Classical Units	Metric	Classical Units	Metric
4'	1220	761 CFM @ 0.12"	1294 CMH @ 29.9 Pa	469 CFM @ 0.07"	797 CMH @ 17.4 Pa
5'	1525	892 CFM @ 0.17"	1516 CMH @ 42.3 Pa	603 CFM @ 0.13"	1039 CMH @ 32.4 Pa
6'	1830	1104 CFM @ 0.26"	1877 CMH @ 64.7 Pa	756 CFM @ 0.14"	1285 CMH @ 34.9 Pa
7'	2135	1347 CFM @ 0.39"	2290 CMH @ 97.1 Pa	926 CFM @ 0.17"	1574 CMH @ 42.3 Pa
8'	2440	1528 CFM @ 0.12" ₂	2598 CMH @ 19.9 Pa	1047 CFM @ 0.11" ₂	1780 CMH @ 27.4 Pa

Annotations: 1 CFM ≠ 1.70 M³/H | 1" Static Pressure = 249 Pa | 1 Foot = 305 mm

FUME HOOD TYPES & AIR FLOW

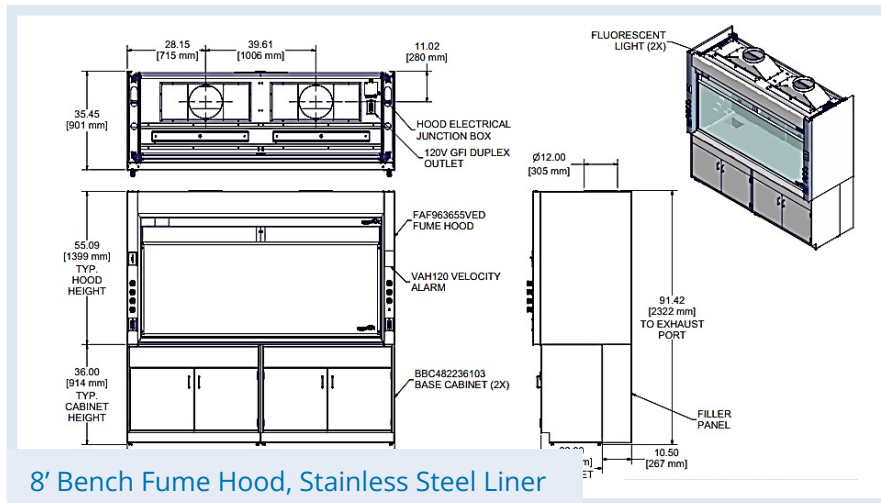


SS BENCH FUME HOOD

Designed for a variety of purposes, our stainless-steel fume hoods are available in all standard widths and can come with painted base cabinets or a stainless steel table to accommodate your application. Our craftsmanship on these units is unmatched!

Animal waste disposal, radioisotope work, biological research, and EV battery formulation applications can all be performed in this style of stainless steel fume hood. We individually test any stainless steel hood, documenting compliance to AIHA Z-95 recommended ASHRAE 110 containment control levels. We can also conduct ISPE surrogate powder testing, per customer requirements.

VAV can be installed without changing the bypass system. Order up to eight valves on each side or add plumbing later if your needs change!



Fume Hood Dimensions		80 FPM CFM & Static Pressure			
		28" (458 mm) Sash Opening		18" (711mm) Sash Opening	
Feet	mm	Classical Units	Metric	Classical Units	Metric
3'	915	464 CFM @ 0.07"	789 CMH @ 17.4 Pa	317 CFM @ 0.02"	539 CMH @ 5.0 Pa
4'	1220	674 CFM @ 0.12"	1146 CMH @ 29.9 Pa	460 CFM @ 0.07"	782 CMH @ 17.4 Pa
5'	1525	884 CFM @ 0.17"	1328 CMH @ 42.3 Pa	603 CFM @ 0.08"	1025 CMH @ 19.2 Pa
6'	1830	1094 CFM @ 0.25"	1860 CMH @ 62.3 Pa	726 CFM @ 0.12"	1234 CMH @ 29.9 Pa
7'	2135	1304 CFM @ 0.37"	2217 CMH @ 92.1 Pa	890 CFM @ 0.15"	1513 CMH @ 37.9 Pa
8'	2440	1536 CFM @ 0.18" ₂	2611 CMH @ 44.8 Pa	1033 CFM @ 0.08" ₂	1756 CMH @ 19.4 Pa

Annotations: 1 CFM ≠ 1.70 M³/H | 1" Static Pressure = 249 Pa | 1 Foot = 305 mm

FUME HOOD TYPES & AIR FLOW

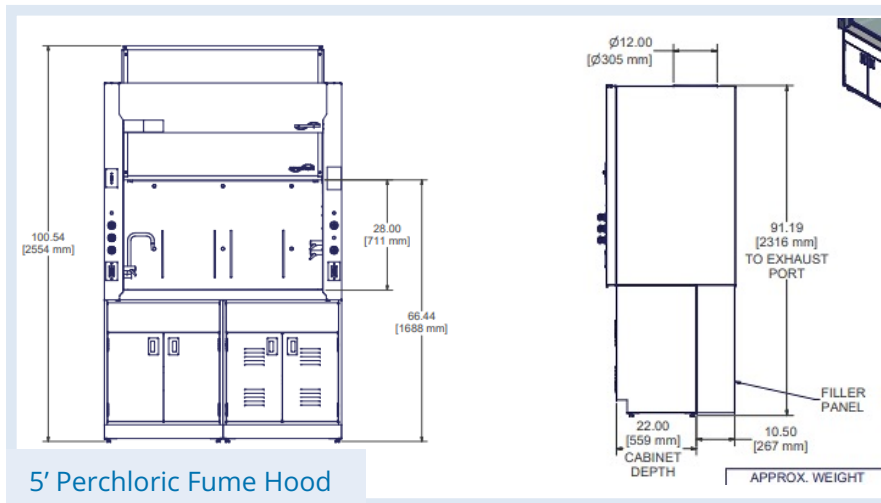


SS PERCHLORIC ACID FUME HOOD

Designed exclusively for perchloric acid processes, this fume hood is available in 4' through 8' widths and can come with painted or stainless steel base cabinets appropriate for your application. Our craftsmanship on these units is superb!

This unit features a PVC wash-down system, rear trench drain with dual outlets, in 5' wide and larger models, and custom service outlets from stainless steel as needed. Based on general market dissatisfaction with PVC-lined perchloric acid hoods, we only offer the SAF T FLOW perchloric hood with 304 or 316 stainless steel construction.

These hoods must be incorporated into an exhaust system with a dedicated fan, duct wash-down piping, and spray nozzles integrated into the tip of the exhaust stack. A short duct route is necessary to facilitate manageable duct washdown volume, which is drained at the hood rear of the interior workspace.



Fume Hood Dimensions		80 FPM CFM & Static Pressure			
		28" (458 mm) Sash Opening		18" (711mm) Sash Opening	
Feet	mm	Classical Units	Metric	Classical Units	Metric
3'	915	464 CFM @ 0.07"	789 CMH @ 17.4 Pa	317 CFM @ 0.02"	539 CMH @ 5.0 Pa
4'	1220	674 CFM @ 0.12"	1146 CMH @ 29.9 Pa	460 CFM @ 0.07"	782 CMH @ 17.4 Pa
5'	1525	884 CFM @ 0.17"	1328 CMH @ 42.3 Pa	603 CFM @ 0.08"	1025 CMH @ 19.2 Pa
6'	1830	1094 CFM @ 0.25"	1860 CMH @ 62.3 Pa	726 CFM @ 0.12"	1234 CMH @ 29.9 Pa
7'	2135	1304 CFM @ 0.37"	2217 CMH @ 92.1 Pa	890 CFM @ 0.15"	1513 CMH @ 37.9 Pa
8'	2440	1536 CFM @ 0.18" ₂	2611 CMH @ 44.8 Pa	1033 CFM @ 0.08" ₂	1756 CMH @ 19.4 Pa

Annotations: 1 CFM ≠ 1.70 M³/H | 1" Static Pressure = 249 Pa | 1 Foot = 305 mm

BASE CABINET OPTIONS



OPEN-BACK BASE CABINET

The open-back base cabinet is designed for equipment storage or providing a space for drain piping and plumbing maintenance. It is not recommended for solvents or corrosives storage.



CORROSIVES (ACID) CABINET

Corrosives (Acid) Cabinets allow the storage of acidic and corrosive materials without damage to the metal cabinet itself. It is not recommended for storing equipment or solvents.

The cabinet has an insert made of polypropylene to retard any corrosive environment initiated by items in the cabinet. Each shelf also has shelf boards capable of neutralizing spilled acids in short order.



FLAMMABLE (SOLVENT) CABINET

The Flammable (Solvent) Cabinet has a three-point locking door system and double steel wall construction. Two bung holes located in cabinet rear diagonally from each other facilitate optional venting capability. Not recommended for equipment or corrosive storage.

CUSTOM FUME HOODS

For us, a custom fume hood means unique dimensions, special liners and interface areas for operators to interact with the contents. Clearly, the fume hood sash is one of these areas and we can use sliding panels within a vertical framework, glove-equipped sashes, and sashes made from HF-resistant polycarbonate. Our customers frequently need separate containment units linked together

to avoid cross contamination between applications, or to keep toxic materials contained during transfer from one work area to the next.

Below are a few examples of how we have helped our customers achieve their objectives. The following examples have been tested using ASHRAE 110 and ISPE Surrogate.



Array of connected fume hoods to handle processes with toxic materials.



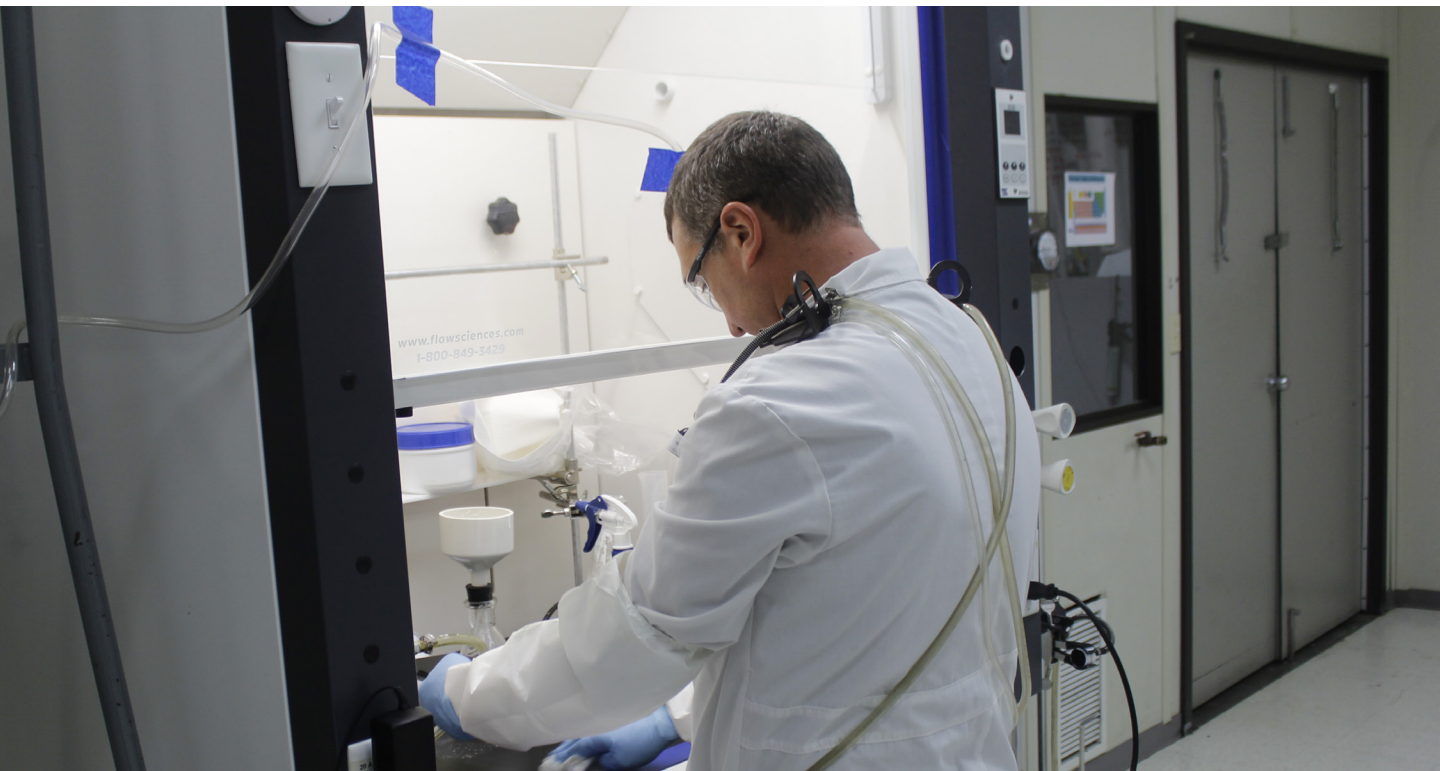
Fume hood connected to a lateral flow glovebox for continuous process work.



FAT TESTING

We have two laboratories available to test our products for conformance to the relevant standards (ie. ASHRAE 110-2016, Tracer Gas Testing). Every unique enclosure or hood that is manufactured in the facility is tested to these standards to ensure quality and performance to the ISO 9001:2015 standard.

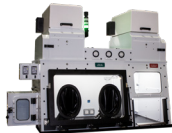
Additionally, our facility can be used to perform further testing, using surrogate materials to determine expected enclosure containment capabilities. This factory acceptance testing using surrogate materials is often accompanied by a third-party industrial hygiene group, as well as the customer. This helps to replicate the end process exactly, and also to suggest SOPs and GLPs for best use of the equipment.



STANDARD PRODUCT LINES

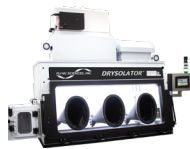
Our selection of standard products offers a simplified buying experience. The benefits of purchasing a standard product include quicker lead times, containment data on file, and a large selection of add-on features and parts for endless configurations.

ANALYTICAL PROCESS ISOLATOR™



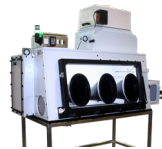
The Analytical Process Isolator™ provides a higher level of containment than an open-faced enclosure for highly toxic APIs. Flow Sciences' engineered controls assist in the prevention of containment loss. Third-party testing has proven containment to below 10 ng/m³, based on process and quantity.

DRYSOLATOR™



Our Drysolator™ glovebox series offers protection against highly-potent materials. This workstation operates under negative pressure and protects personnel in the event of a glove breach. The controlled interior environment allows low oxygen and/or low humidity levels for material protection.

GLOVEBOX WORKSTATION



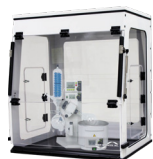
The Glovebox Workstation provides containment for highly toxic applications using APIs, and HPAPIs, that need higher safety standards than an open face enclosure. Our engineered controls assist in the prevention of containment loss. Third-party testing has proven containment on these units to below 30 ng/m³, dependent on application and quantity.

HYBRID ISOLATOR™



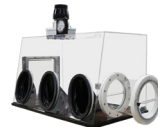
The Hybrid Isolator™ series provides containment for highly toxic applications using APIs and HPAPIs. Engineered controls assist in the prevention of containment loss. Third-party testing has proven containment on these units to below 50 µg/m³, dependent on application and quantity.

LOCAL EXHAUST VENTILATION III™



The LEV III™ Series provides safety from chemical vapors generated during lab processes such as flash chromatography, evaporation from rotary evaporators, and similar applications. Vapors are pulled to the rear of the enclosure, then through the plenums to keep laminar flow across the work surface and remove vapors safely and effectively.

NITROGENEMA™



With HEPA filtration, a one-way check valve, and the ability to connect to a house exhaust system, this product & personnel safety enclosure provides both the operator and the application with the highest level of safety available.

NITROGENEMA II™



The Nitrogenema II™ offers containment for materials that react with high moisture or oxygen levels by reducing RH to below 2% and O₂ to below 1%. Nitrogen gas can be used to purge the interior workspace under positive pressure. This unit can connect to house exhaust with dual HEPA filters in place to contain material from the exhaust.

SAF T FLOW™ FUME HOOD



Our SAF T FLOW™ Fume Hood provides superior ASHRAE 110 containment results, under a wide range of constant volume and VAV conditions. It is constant volume or VAV capable without altering bypass. Over 60% energy savings possible at same demonstrated containment using lower face velocities.

TOP MOUNT ENCLOSURE



Our Ventilated Balance Enclosure provides a safe, stable working environment in most laboratory settings. This series offers containment for various benchtop/scale-up and nanotechnology applications. Internal plenums and mounted aerodynamic airfoils around the face opening ensure a smooth, horizontal airflow pattern across the work surface, reducing eddies and turbulence. Third-party testing has proven containment on these units to below 1 ng/m³, based on process and quantity.

VBSE™



This small and compact unit allows you to provide personnel safety at a reduced footprint. It is a versatile and lightweight unit, making it perfect for small labs where space is at a premium. Containment results vary depending on the quantity and toxicity of materials handled within the workspace.



Flow Sciences' team of industrial engineers design workstations and enclosures that reduce product contamination and maximize protection for professionals who work with toxic substances and uncertain risks. All of our products are engineered and manufactured at our corporate headquarters in Leland, NC and are backed by our sophisticated design process and award-winning excellence in engineering, including 11 U.S. Government patents. We have worked with pharmaceutical companies, research and development laboratories, manufacturing, and production facilities for 30 years. Our task-specific designs are dynamic solutions that are adaptable to our clients' workflow and specific needs.

Flow Sciences was one of the first companies in the U.S. to use computational fluid dynamics (CFD) in drafting our enclosures to ensure optimum airflow. Our engineers use CFD algorithms to simulate fluid flows and interactions within contained spaces. This enables us to predict and control airflow through design, which we then test in our state-of-the-art laboratory. Working closely with our clients to mimic real-world applications, we develop testing protocols based on the intended use of our enclosures and measure them against industry-accepted standards to ensure proper containment. We have designed, manufactured, and tested over 13,000 enclosures, generating a wealth of data on situational flow dynamics, which allows us to control for consistency, safety, efficacy, and overall quality.