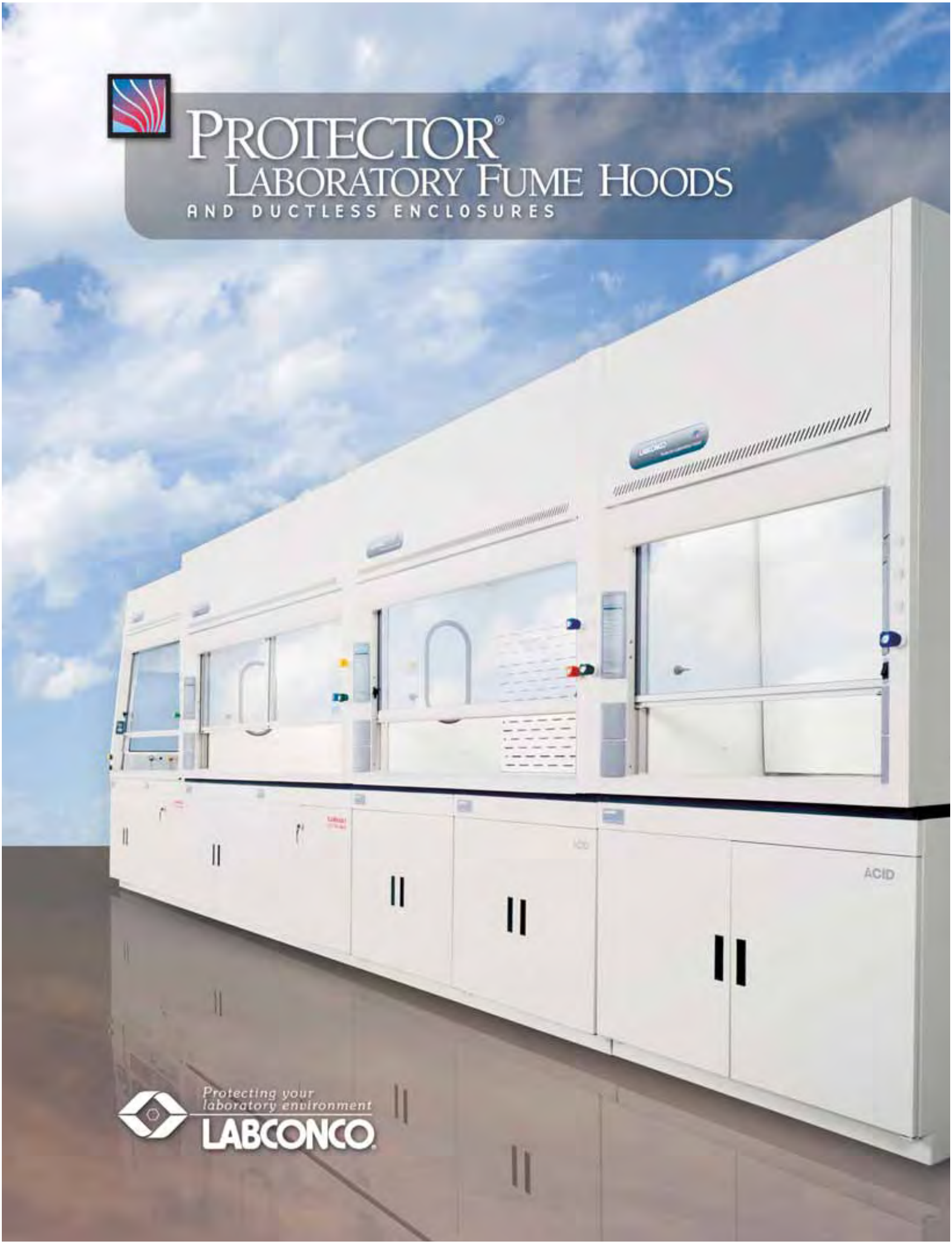
PROTECTOR®
LABORATORY FUME HOODS
AND DUCTLESS ENCLOSURES



Protecting your laboratory environment

LABCONCO

Protector® Laboratory Fume Hoods & Enclosures

Overview

Since the manufacture of our first product in 1925, the Kjeldahl Apparatus, Labconco has focused on finding effective ways to remove chemical fumes from the laboratory. That knowledge and experience led to the development of our first molded fiberglass-lined fume hoods in 1961. We continue to build on that expertise today as we refine our designs to exacting standards and adapt to the changing needs of the marketplace. The result is the broadest, most comprehensive and innovative line of laboratory ventilated enclosures available anywhere.

Labconco is ISO 9001 certified, one measure of our commitment to quality and consistency in design and manufacturing. We back our quality products with outstanding customer service. Whether you need a single fume hood and all its required system components, a unique custom-designed fume hood to handle a special application, or an entire building of fume hoods and supporting casework, Labconco technical specialists are ready to help you throughout the process. With our worldwide network of distributors, we are dedicated to providing quality products and service to meet your requirements and exceed your expectations.

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SEFA

LPA Laboratory Products Association

Protector® Laboratory Fume Hoods & Enclosures

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Protecting your laboratory environment
LABCONCO

Built To Exacting Standards

Protecting your laboratory environment is the foundation of our product development, and every Labconco fume hood and enclosure is designed with safety in mind. Our fume hoods are rigorously tested and conform to a long list of government and independent agency standards that specify safe construction and performance criteria for laboratory hoods:

- Occupational Health and Safety (OSHA) Federal Register 29 CFR Part 1910
- *Industrial Ventilation*, American Conference of Governmental Industrial Hygienists
- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 110-1995
- ANSI Z9.5-2003
- Scientific Equipment & Furniture Association (SEFA) 1-2006
- National Fire Protection Association (NFPA) 45-2004
- American Society for Testing and Materials (ASTM) E84-09C
- Underwriters Laboratories (UL) 1805
- UL 3101-1/61010-1
- Canadian Standards Association (CAN/CSA) C22.2 No. 1010.1 & 61010-1
- European Community (CE)

Brief explanations of these standards can be found on page 11. Throughout the catalog, the specific regulations and standards met by each style of hood are provided in the ordering information.

To ensure that our hoods meet or exceed ASHRAE 110-1995, Labconco engineers rigorously test newly designed fume hoods and routinely test randomly-selected hoods from our product line in Labconco's Airflow Test Laboratory (see pages 122-125 for more information). Besides internal testing, many of our hoods undergo stringent testing and certification by an unbiased independent organization, Intertek Testing Services (ITS). ITS, which acquired ETL Testing Laboratories in 1996, is recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) just as UL, CSA and several other independent organizations are recognized. A federal law passed in 1988 established the NRTL program to eliminate provisions that explicitly required or implied that product certification be performed only by standard-writing companies such as UL. Since each NRTL must meet the same OSHA competency requirements, NRTLs recognized for the same product safety test standard are considered equivalent in the capability to certify to that standard. Labconco fume hoods with the ETL mark have been certified to UL 1805 and/or UL 3101-1/61010-1 and CAN/CSA Standard C22.2 No. 1010.1 & 61010-1. Products that bear the ETL mark are subjected to a comprehensive safety program that includes testing, listing, labeling and quarterly follow-up inspections. For a current list of Labconco products bearing the ETL mark, go to www.etlsemko.com.

As part of ASHRAE 110-95, a tracer gas is released at an established rate and at various positions within the hood. The gas is monitored in the breathing zone of a mannequin placed at various positions in front of the hood. Based on the release rate of the tracer gas and the average exposure in the breathing zone, a performance rating is determined. An "As Manufactured" (AM) rating of 0.05 part per million (ppm) or less is considered effective containment.

Labconco fume hoods designed for international 230 volt, 50 Hz operation carry the CE mark. The CE mark indicates that the product conforms to all safety and other directives/specifications presently required by the Council of European Communities. The CE mark was established in 1993 to standardize European countries' electrical directives into a single set of regulations, eliminating barriers to trade. Present rules require that products meet electrical safety requirements set for laboratory equipment and also pass electromagnetic emissions testing (interference signals being output by the product) and electromagnetic immunity testing (the product should not respond to outside electromagnetic interference signals). An independent outside agency tests and confirms Labconco hoods' conformity to electromagnetic emissions and immunity standards.

Protector®—first choice in hoods

The Protector line of laboratory hoods offers you choice. Protector Hoods run the gamut of styles that fit a full range of applications from general chemistry to perchloric acid use. Liner materials include one-piece molded fiberglass, fiberglass-reinforced composite panel, stainless steel, PVC and tempered safety glass. Whatever your laboratory situation demands, there's a Protector Laboratory Hood to meet your needs.

Protector® Laboratory Fume Hoods & Enclosures

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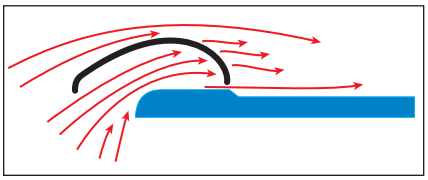
Defining Features

Consistent among Protector Hoods are several defining features that set them apart from the rest. Sleek exteriors with durable glacier white epoxy coating complement laboratory casework and allow compatible mixing and matching of several hood types.

The unique ***ergonomic air foil with Clean-Sweep™ openings*** is patented.* The aerodynamic curve of the air foil allows air to sweep the work surface for maximum containment. Clean-Sweep openings pull inflow air from under the air foil so that clean air continually flows over the air foil creating a constant protective barrier that keeps contaminants away. In addition, should the operator inadvertently block the air flowing across the air foil, air continues to enter from beneath and through the Clean-Sweep openings.



Side view of an air foil with Clean-Sweep openings illustrates airflow entering over, through and under the air foil.

When the operator blocks the front of the air foil, air enters from under the air foil so "dead-air" zones are minimized and containment maintained.

Protector ***corner posts*** have a streamlined shape to enhance containment and are epoxy-coated for chemical resistance. Switches and electrical receptacles mounted in the standard locations on the corner posts meet Americans with Disabilities Act (ADA) height requirements.

Color-coded service fixtures are also mounted at ADA height on the corner posts. Each service type has a sculpted, colored knob and matching interior-mounted hose connector for easy service identification and comfortable grip.

Access plates on the corner posts provide front availability to plumbing connections to simplify installation and service. Cover plates feature hood operating instructions, providing constant reminders to work safely in the hood.

Color-coded fixtures provide at-a-glance service type identification.

Protector Premier Laboratory Hoods—superior molded fiberglass liner

Protector Premier Laboratory Hoods feature interior liners molded of specially formulated fiberglass reinforced polyester. The one-piece, glossy fiberglass liner has been the signature feature of Labconco's leading line of general chemistry fume hoods since its development by Labconco engineers in 1961. Benefits you can expect from fiberglass include durability, cleanability, high light reflectivity, fire resistance and chemical resistance.

Front cover plates may be easily removed for quick access to service valves.

Labconco fiberglass withstands exposure to a wide range of laboratory acids, solvents and alkalies. It will not absorb spills and resists staining and discoloration. The smooth one-piece surface with radiused corners has no cracks or crevices for contaminants to collect, so maintenance is minimal.

The chart of chemical resistance for Labconco fiberglass material shown below is based on ASTM Test C-581-00 in which 4" x 5" samples are *immersed in reagents* for one to three months or longer.

Fiberglass Chemical Resistance

Reagent	Satisfactory For Normal Use	Satisfactory For Occasional Use	Slight Discoloration with Heavy Use
Acetic Acid	•	•	
Acetone (50%)		•	
Ammonium Hydroxide		•	
Benzene		•	
Fatty Acids	•	•	
Formaldehyde (44%)		•	
Hydrochloric Acid	•	•	
Hydrofluoric Acid		•	•
Hydrogen Peroxide	•	•	•
Naphthalene	•	•	
Nitric Acid (35%)	•	•	•
Peracetic Acid	•	•	
Perchloric Acid	*Use only in Protector Stainless Steel or PVC Perchloric Acid Hood.*		
Petroleum Ether	•	•	
Phosphoric Acid	•	•	
Tannic Acid	•	•	
Sulfuric Acid (50%)	•	•	•

** U.S. Patent No. 6,461,233*

Protector® Laboratory Fume Hoods & Enclosures

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Protector XStream Laboratory Hoods—high performance and energy savings

The performance of a fume hood is measured by its ability to contain contaminants, i.e. its safety. No fume hood keeps contaminants contained better than Protector XStream Laboratory Hoods. Unlike other high performance, low flow, low volume hoods on the market, Protector XStream Laboratory Hoods do NOT rely on restricted sash openings, airflow sensors and electronic control, mechanical components or additional fans. Protector XStream Laboratory Hoods have patented* features that work together to significantly reduce the concentrations of contaminants in areas behind the sash opening, and near the user's breathing zone. These features include an upper dilution air supply that bathes the area behind the sash with clean air, *without the use of additional blowers*; an ergonomic air foil with Clean-Sweep openings that allow air to sweep the work surface; a rear downflow dual baffle system that directs airflow in non-turbulent laminar flow air streams to the back of the hood and counteracts the tendency for air inside a fume hood to roll forward; and a containment-enhancing sash handle that sweeps airflow into the hood with minimal turbulence.

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A Protector XStream Laboratory Hood is installed along the wall. Protector XVS Ventilation Stations are mounted back-to-back on islands of casework.

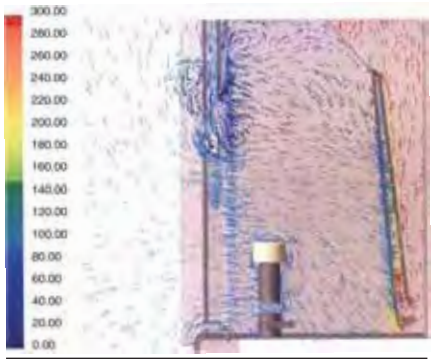

Figure 1: *The Protector XStream Hood's velocity vector at 60 fpm is shown on a plane through the center of the hood. The horizontal laminar air vectors turn downward as they reach the perforated baffle. The Protector XStream Hood shows diminished vortex roll, thereby reducing air turbulence and instability in the hood.*

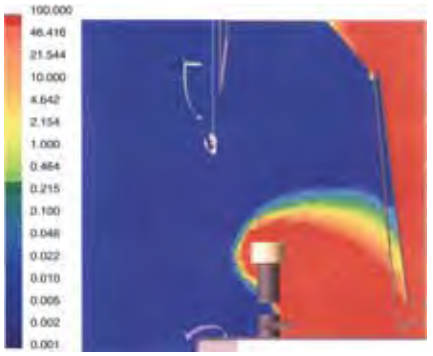

Figure 2: *Sulfur hexafluoride (SF_6) gas is emitted from the ejector on a plane through the center of the hood at 4 liters per minute. The Protector XStream Hood is operating at 60 fpm with the sash fully open. The area near the sash plane where the operator would stand and work is dark blue indicating it is free of contaminants. The concentrations of contaminants, shown in orange, are contained deep within the interior of the hood so that contaminants can be exhausted in a single pass.*

To ensure that containment was maintained under adverse conditions, Labconco engineers developed variations of the ANSI/ASHRAE 110-1995 Standard to challenge the Protector XStream Hood. They tested the hood's containment limit by varying face velocities (as low as 40 fpm), differing sash heights and adding interior obstructions, cross drafts and door movements. In every instance, the Protector XStream showed tracer gas leakage below the acceptable ASHRAE level of less than 0.05 ppm. These worst-case conditions demonstrate the robust nature of the Protector XStream Hood.

To validate their successful ASHRAE test results, Labconco engineers used computational fluid dynamics (CFD) to build a model of the Protector XStream Hood. CFD predicts fluid flow behavior and provides a means of visualizing airflow. Like the tracer gas in ASHRAE testing, CFD was used as a tool to test the hood's performance. Design features were fine-tuned based on CFD test results until performance was optimized. The illustrations in Figures 1 and 2 are actual CFD outputs.

Protector XStream Laboratory Hoods are the clear choice when looking for energy savings without compromising safety. Operating these hoods at OSHA-approved 60 fpm provides significant energy savings compared to operating a traditional hood at 80 or 100 fpm and provides a comfortable margin of safety, confirmed by the adverse challenges these hoods withstood. In addition, because Protector XStream Hoods maintain containment, *regardless of sash position*, they may be installed with confidence in areas where users have poor, or unproven technique, such as teaching facilities with unsupervised student operators.

** U.S. Patent No. 6,461,233*

Protector® Laboratory Fume Hoods & Enclosures

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Protector XL Laboratory Hoods—broadest range of sizes and options

Protector XL Laboratory Hoods have a flexible platform for customization of features and dimensions. Their liners of durable fiberglass-reinforced composite panels may be configured in a variety of widths and depths to match architect specifications. Benchtop models are offered in widths from 4 to 16 feet and three depths.

Protector XLE Laboratory Hoods—enhanced safety features and energy savings

Protector XLE Laboratory Hoods feature a sash that automatically closes to an 18" sash opening to help conserve energy. Since the sash self-closes to a preset operating height and does not require a sash stop, sash position is not dependent on user compliance. In addition, these hoods have a viewing height of 35" and a low profile air foil with secondary spill trough, which enhances operator access to the interior. The spill trough does not add to the hood's overall height. Protector XLE Hoods are available in widths from 4' to 8', including 7' hoods.

Protector XL Floor-Mounted Laboratory Hoods—for maximum work area

Protector XL Floor-Mounted Laboratory Hoods have additional interior height to accommodate large apparatus. Hood interior depths from 30" to 48" and widths from 4' to 16' are available. Since they mount on the floor, these hoods permit roll-in loading of heavy or bulky apparatus.

Protector ClassMate Laboratory Hoods—for instructional laboratories

Patented* Protector ClassMate Laboratory Hoods have clear sides, back and baffle for visibility from all sides. A stationary glass viewing panel above the sash frame creates a 39" viewing height. They are ideal for advanced educational settings where students need to observe demonstrations conducted in the hood or the instructor needs to supervise students using the hood.

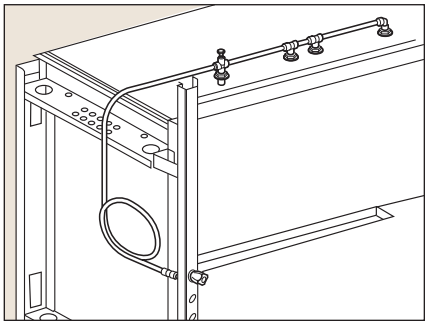
Transparent glass backs and baffles provide a clear view through these Protector ClassMate Combination Sash Laboratory Hoods mounted back-to-back on peninsular casework at this university laboratory.

Protector Pass-Through Laboratory Hoods—access on two sides

Protector Pass-Through Laboratory Hoods are designed for in-wall installation between two laboratories or for an island or peninsular configuration. Sashes on two sides allow access and visibility from either side. To maintain a safe airflow velocity, only one sash may be opened at a time — an audible alarm sounds when both sashes are opened simultaneously.

Protector Special Application Laboratory Hoods—for radioisotope, perchloric acid or heavy acid use

Applications involving radioisotopes, perchloric acid and acid digestion require laboratory hoods with specialized features. Protector Stainless Steel Radioisotope Hoods have integral welded work surfaces and coved interiors to facilitate decontamination. Labconco offers two perchloric acid hoods: the Protector Stainless Steel Perchloric Acid Hood and the Protector PVC Perchloric Acid Hood. These hoods feature washdown systems, integral work surfaces and drainage troughs so that they may be thoroughly rinsed after each use to prevent the accumulation of potentially reactive perchloric salts. Protector PVC Acid Digestion Hoods feature Lexan** sashes, recommended for hydrofluoric acid use.



Protector Perchloric Acid and Acid Digestion Hoods feature a built-in washdown system consisting of plumbing connected to a control knob and spray nozzles located along the top interior.

Labconco offers you choices

The discussion that follows provides some of the factors to consider when choosing a laboratory ventilation system. The Selection Guides on pages 8-10 provide an at-a-glance listing of the fume hoods, ventilated enclosures and carbon-filtered enclosures offered in this catalog. The Guides help you find the Labconco fume hoods and enclosures with the characteristics you require for your system.

** U.S. Design Patent No. 472,645*

***Lexan® is a registered trademark of General Electric Company.*

Protector® Laboratory Fume Hoods & Enclosures

Overview

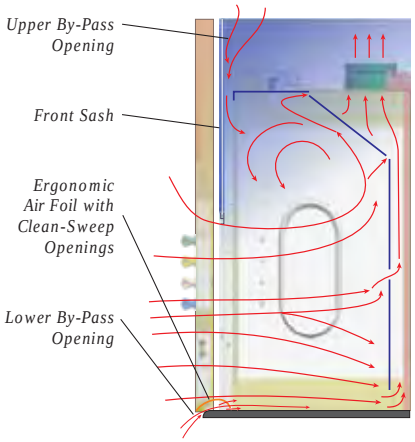
Types of Exhaust Systems

Fume hoods use one of two types of exhaust systems: constant air volume (CAV) or variable air volume (VAV). The fume hoods offered in this catalog have been designed to be used with a constant volume system and can be easily modified for use with a variable air volume system. Contact Labconco for ordering information on variable air volume modifications.

Constant volume hoods come in conventional, by-pass and auxiliary-air types. All Labconco fume hoods feature by-pass airflow design. Protector Premier for use with remote blower, and XL Laboratory Hoods may be modified to an auxiliary-air design with an accessory Auxiliary-Air Plenum Kit (see page 120).

By-Pass

By-pass hoods have a movable, fully-closing front sash and an interior baffle. These hoods are designed so that as the sash is being closed, the air entering the hood is redistributed via by-pass openings above and below the sash. These openings help to stabilize airflow and eliminate high velocity air streams that can disturb delicate procedures or instrumentation in the hood. All Protector Premier, XStream, XL, XLE, Stainless Steel and PVC Hoods as well as Basic and Fiberglass 30 Hoods incorporate the by-pass feature.



By-Pass Airflow Design

Size

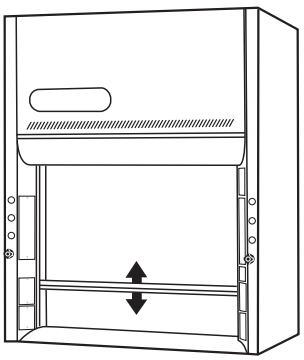
Labconco offers hoods in a range of sizes from compact 24" wide Protector XVS Ventilation Stations and 30" wide Fiberglass 30 Laboratory Hoods to Protector XL Laboratory Hoods as wide as 16 feet. OSHA 29 CFR-1910 recommends laboratories provide an average of 2.5 linear feet of hood space per person.

Sash Configuration

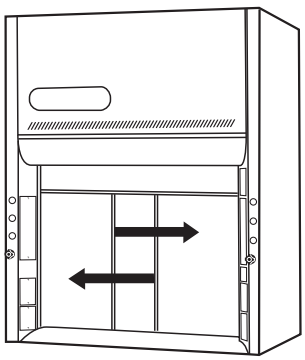
Most Labconco Hoods have vertical-rising sashes. ***Vertical-rising*** sashes may be lifted to the completely open position offering the maximum area for loading materials and apparatus. During operation, the sash should be lowered as much as possible to a comfortable working height to provide a barrier to protect the user from splashes and chemical reactions.

Horizontal-sliding sashes allow the user to reach around both sides of the sash while using the sash as a shield. Horizontal-sliding sashes provide a smaller maximum sash opening, approximately one-half the size of vertical-rising sashes. Because their sash openings are smaller and less air volume is exhausted, hoods with horizontal-sliding sashes conserve energy. Protector XL Floor-Mounted Hoods in widths from 8 to 16 feet have horizontal-sliding sashes.

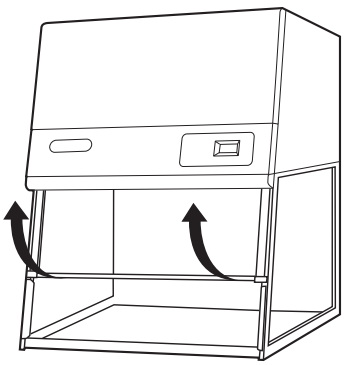
Pivoting sashes are found on Protector Demonstration Hoods, Paramount Ductless Enclosures, Protector XVS Ventilation Stations and Protector Work Stations. These enclosures have a small permanent sash opening height that restricts energy usage. The sashes may not be fully closed but may be pivoted up to a full open position for loading of materials.



Vertical-rising sash

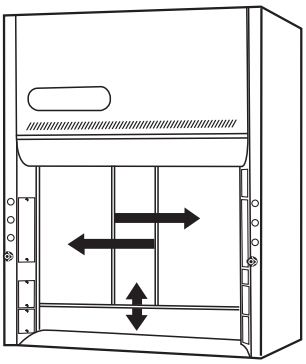


Horizontal-sliding sashes



Pivoting sash
(See Combination Sash next page)

Combination vertical-rising/horizontal-sliding sashes offer the advantages of both sash types. For energy conservation, the hood's air volume is based on its smaller horizontal-sliding sash opening (generally 50% of the full open position). To maintain safe face velocities, sash stops limit opening the vertical-rising sash beyond 50% except when deliberately released by the operator during loading or unloading. Some models of Protector ClassMate Hoods have combination sashes. Combination sashes on other hood models are available upon request.



Combination vertical-rising/horizontal-sliding sashes.

The Protector XL Benchtop Laboratory Hoods installed in this laboratory feature combination vertical-rising/horizontal-sliding sashes.

Remote Blower vs. Built-In Blower

Most laboratory hoods are designed for use with remotely-located blowers. Of all the components required to complete a laboratory hood ventilation system, the blower is the most crucial to the hood's performance. Labconco offers a variety of blowers and exhaust devices sized for our hoods. The Blowers Booklet located in the back pocket of this catalog provides further information on our Coated Steel, Fiberglass and PVC Blowers, and Ductwork.

Selected models of Protector Premier Hoods in 4', 5' and 6' widths, Basic Hoods, Fiberglass 30 Hoods and some carbon-filtered enclosures have built-in blowers. Easy to install, these hoods feature blowers sized to accommodate relatively short, uncomplicated duct runs. Contact Labconco at **800-821-5525** or **816-333-8811** for technical assistance regarding the use of hoods with built-in blowers.

The built-in blower in this Protector Premier Laboratory Hood is visible when the front panel is removed.

Liner Material

Labconco offers a variety of liner materials. Protector Premier and Fiberglass 30 Laboratory Hoods are lined with molded, one-piece fiberglass. Protector XStream, XL and XLE Hoods have fiberglass-reinforced composite panel liners. Protector Radioisotope and Perchloric Acid Hoods have stainless steel liners. Other Protector Perchloric Acid and Acid Digestion Hoods have PVC liners. Protector ClassMate Laboratory Hoods, Pass-Through Hoods, XVS Ventilation Stations, Protector Demonstration Hoods, Paramount Ductless Enclosures and Protector Work Stations have interiors that use tempered safety glass and epoxy-coated steel and aluminum channel construction. Basic Laboratory Hoods are epoxy-coated steel inside and out.

The best liner material for your hood should be determined by the applications, types and concentrations of chemicals that will be handled in the hood and exhaust system. Hood liners are subject to attack from acid fumes and solvent vapors by: (1) corrosion (the destruction of metal or other material by chemical or electrochemical action), (2) dissolution (a dissolving action to which coatings and plastics are subject), and (3) melting (occurs with certain plastics and coatings at elevated operating temperatures). The Hood Liner Materials table on page 7 describes the characteristics of the various liner materials found in Labconco hoods and enclosures to help you select the right ventilation product for your application.

Protector® Laboratory Fume Hoods & Enclosures

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Hood Liner Materials

Liner Material	Stain Resistance	Moisture Resistance	Chemical Resistance	Heat Resistance	Flame Spread Index*
One-piece, molded fiberglass	Good	Excellent	Excellent	Very good	≤25
Fiberglass-reinforced composite panel	Good	Excellent	Excellent	Very good	≤25
Tempered safety glass	Excellent	Excellent	Excellent	Very good	0
Stainless steel (Type 316 or 304)	Good	Excellent	Good resistance to a wide range, subject to attack by some acids	Excellent	0
Polyvinyl chloride (PVC)	Very good	Excellent	Excellent except for some solvents	Poor. Distorts at 160° F. Usable at 140° F.	≤20
Epoxy-coated steel	Good	Very good	Good	Very good	≤5

** The lower a material's flame spread index, the greater its flame-retarding capabilities. NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals states that materials of construction should have flame spread of 25 or less. The flame spread index is determined using ASTM E84 test method which compares the surface flame spread and smoke development measurements of a particular material to those obtained from tests of standard calibration materials at the opposite ends of the spectrum — mineral fiber cement board (flame spread index = 0) and select grade red oak flooring (smoke spread index = 100). The test specimen surface, 18" wide x 24' long, is exposed to a flaming fire for 10 minutes. Flame spread over its surface is measured and recorded. Test results are presented as the computed comparisons to the standard calibration materials.*

Ducted Hoods vs. Ductless Carbon-Filtered Enclosures

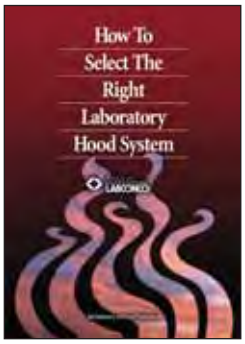
Protector, Basic, Fiberglass 30 and Canopy Hoods, Protector XVS Ventilation Stations and some models of Protector Work Stations and Protector Demonstration Hoods require ducting to the outside so that contaminants can be dispersed and diluted above the roofline. Ducting to the outside provides the safest means to ensure that contaminants are removed from the laboratory. Other Labconco enclosures, such as the Protector XVS Ventilation Stations and Protector Demonstrations Hoods with FilterMate Portable Exhausters, Paramount Ductless Enclosures, Protector Work Stations and Fume Adsorbers, return filtered exhaust air back to the laboratory. These enclosures rely on specially treated or activated carbon media that treat or adsorb chemical gases including certain organic solvents, ammonia, acids and formaldehyde. Paramount Ductless Enclosures and some models of Protector XVS Ventilation Stations with FilterMate may use both carbon and HEPA filters. These enclosures are suitable for applications that create both gaseous and particulate contaminants.

Since Paramount Ductless Enclosures require no ducting to the outside, they have the flexibility to be placed in hard-to-vent areas and may be moved from laboratory to storage when necessary.

Filtered enclosures provide a practical solution for situations where ducting is not feasible, such as laboratories surrounded by interior walls and located several stories from the roof. Filtered enclosures are appropriate for light duty chemical work in air-starved laboratories where make-up air is unavailable. When placed on mobile stands, they become portable stations that can be shared by several laboratories or easily moved out of the way for storage.

Whether or not a carbon-filtered enclosure is the right ventilation product for your application requires consideration of factors such as the time-weighted exposure limits of your materials. Using Labconco's exclusive chemical assessment program, our technical specialists can help you determine the right product for your application. To begin the process, please complete the Chemical Usage Assessment Form available at **www.labconco.com.** In addition, an online Chemical Guide allows users to search individual chemicals to determine their suitability for use in a carbon-filtered enclosure.

In-depth Laboratory Hood System Information Available



The preceding discussion on the many fume hood options available provides an overview to the detailed ordering information on specific hoods, enclosures, base cabinets, stands, work surfaces and accessories that follows. For an in-depth generic discussion on various hood selection considerations and choices, Labconco offers the *How To Select The Right Laboratory Hood System* booklet.

Please call **800-821-5525** or **816-333-8811** or visit **www.labconco.com** for your free copy of this informative guide.

Chemical Fume Hoods and

Product	Applications/Considerations	Liner Material	Nominal Exterior Widths
Protector Premier	Broad range for general chemistry	One-piece molded fiberglass	4', 5', 6', 8'
Protector XStream	Broad range for general chemistry, Energy savings, Enhanced containment	Fiberglass-reinforced composite panel	4', 5', 6', 8'
Protector XL Benchtop	Broad range for general chemistry	Fiberglass-reinforced composite panel	4', 5', 6', 8', 10', 12', 16'
Protector XL Floor-Mounted	Broad range for general chemistry, large apparatus and processes	Fiberglass-reinforced composite panel	4', 5', 6', 8', 10', 12', 16'
Protector XLE	Broad range for general chemistry, Energy savings	Fiberglass-reinforced composite panel	4', 5', 6', 7', 8'
Protector ClassMate	Instruction, Demonstration	Tempered safety glass, Epoxy-coated steel	4', 5', 6'
Protector Pass-Through	Instruction, Demonstration	Fiberglass-reinforced composite panel, Tempered safety glass	4', 5', 6'
Protector Stainless Steel Radioisotope	Low level radiochemistry	Type 304 stainless steel	4', 5', 6', 8'
Protector Stainless Steel Perchloric Acid	Perchloric acid	Type 316 stainless steel	4', 5', 6', 8'
Protector PVC Perchloric Acid	Perchloric acid	PVC	4', 6', 8"
Protector PVC Acid Digestion	Acid digestion, Hydrofluoric acid	PVC	4', 6', 8'
Basic	Light duty general chemistry, Organic chemistry	Epoxy-coated steel	4', 6'
Fiberglass 30	General chemistry	One-piece molded fiberglass	30"
Protector XVS Ventilation Station	Light duty chemistry/weighing, Instruction, Organic chemistry	Tempered safety glass, Epoxy-coated aluminum and steel	2', 3', 4', 5', 6', 8'
Protector Demonstration	Low-toxicity, Instruction, Demonstration	Tempered safety glass, Epoxy-coated aluminum	3'
Protector Work Station	Histology, Pathology, Tissue grossing, Staining, Organic chemistry	Type 304 stainless steel, Tempered safety glass, Epoxy-coated aluminum	4'

Enclosures Selection Guide

Interior Depths	Blower Options	Auxiliary-Air	Sash Configurations	Pages
23.5"	Remote, built-in	Available on some models	Vertical-rising*	12-19
27.3"	Remote	—	Vertical-rising*	20-25
24", 30", 36"	Remote	Available on some models	Vertical-rising*	26-31, 37-38
30", 36", 48"	Remote	—	Vertical-rising, Horizontal-sliding	32-36, 39-40
30"**	Remote	—	Vertical-rising	41-43
25.75", 26.25"	Remote	—	Vertical-rising, Combination	44-47
23.75"	Remote	—	Vertical-rising	48-51
23.5"**	Dedicated remote	—	Vertical-rising	52-55
23.5"**	Dedicated remote	—	Vertical-rising	56-59
30"	Dedicated remote	—	Vertical-rising	60-63
30"	Dedicated remote	—	Vertical-rising	60-63
18.44"	Remote, Built-in	—	Vertical-rising	64-69
22.67"	Remote, Built-in	—	Vertical-rising	70-71
23"	Remote, FilterMate Portable Exhauster	—	Pivoting with permanent 8" or 10" opening	82-85
23.4", 30.00"	Remote, FilterMate Portable Exhauster	—	Pivoting with permanent 8", 10" or 12" opening	88-89
23"	Remote	—	Pivoting with permanent 8" opening	90-93

** Contact Labconco at 800-821-5525 or 816-333-8811 for ordering information on hoods with combination sashes.*
*** Contact Labconco at 800-821-5525 or 816-333-8811 for ordering information on hoods with other depths.*

Carbon-Filtered Enclosures Selection Guide

Product	Filter Types	Applications	Carbon Filter Capacity	Liner Materials	Nominal Exterior Widths	Interior Depth	Pages
Paramount Ductless Enclosure	Organic Carbon	Histology/cytology, Soldering, Solvent cleaning, Welding & gluing	7.5 lbs.*	Tempered safety glass, Epoxy-coated aluminum & steel	2', 3', 4', 5', 6'	23.4" or 30.0"	74-81
	Acid-Sulfur Carbon	Acid pouring & mixing	10 lbs.*				
	Ammonia-Amine Carbon	Fertilizer research	11 lbs.*				
	Formaldehyde Carbon	Endoscopy instrument cleaning, Pathology/ tissue grossing	10 lbs.*				
	Radioisotope Carbon	Iodine isotope handling	10 lbs.*				
	MIxed Bed Carbon	Science education, Additional applications suitable to the carbon filter type	10 lbs.*				
	Carbon/HEPA	Cleanroom/ critical environment, Combination dry & liquid chemicals, Hormone research, Non-biohazardous particulate samples with trace chemicals, Soldering	Varies*				
Protector XVS Ventilation Station or Protector Demonstration Hood with FilterMate Portable Exhauster	Organic Carbon	Histology/cytology Soldering, Solvent cleaning, Welding & gluing	12 lbs. (1 or 2 each required)	Tempered safety glass, Epoxy-coated aluminum	2', 3', 4'	23.0"	82-89, 94-95
	Ammonia Carbon	Photoengraving, Plastics production	16 lbs. (1 or 2 each required)				
	Formaldehyde Carbon	Endoscopy instrument cleaning, Pathology	14 lbs. (1 or 2 each required)				
	Carbon/HEPA	Cleanroom, Critical environments, Combination dry & liquid chemicals, Non-hazardous microbes with trace chemicals, Pathology, Soldering, Solvent cleaning	Varies				
Protector Work Station	Organic Carbon	Histology/cytology	11 lbs. (2 each required)	Type 304 stainless steel, Tempered safety glass, Epoxy-coated steel	4'	23.0"	90-95
	Formaldehyde Carbon	Pathology	13 lbs. (2 each required)				
	Ammonia Carbon	Photoengraving, Plastics Production	15 lbs. (2 each required)				
Fume Adsorber/ Fume Adsorber-2	Organic Carbon	Histology/cytology	6 lbs./12 lbs.	Acrylic, Epoxy-coated steel	30", 60"	14.5"	72-73
	Formaldehyde Carbon	Pathology	7.5 lbs./15 lbs.				
	Ammonia Carbon	Photoengraving	8.8 lbs./17.6 lbs.				

*Two each to eight each filters required depending on the model.

Protector® Laboratory Fume Hoods & Enclosures

Applicable Standards

Key aspects of standards and codes as they relate to laboratory ventilation are summarized below.

Federal Register 29 CFR Part 1910

Occupational exposure to hazardous chemicals in laboratories

National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (Non-mandatory) from "Prudent Practices."

- Fume hoods should have a continuous monitoring device.
- Face velocities should be between 60-100 linear feet per minute (lfpm).
- Average 2.5 linear feet of hood space per person.

Occupational Safety & Health Administration
U.S. Department of Labor

200 Constitution Avenue, NW
Washington, DC 20210
(800) 321-6742
www.osha.gov

Industrial Ventilation-ACGIH

- Fume hood face velocities between 60-100 lfpm.
- Maximum of 125 lfpm for radioisotope hoods.
- Duct velocities of 1000-2000 fpm for vapors, gases and smoke.
- Stack discharge height 1.3-2.0 x building height.
- Well designed fume hood containment, loss <0.10 ppm.

Industrial Ventilation:
A Manual of Recommended Practice
27th Edition, 2010

American Conference of Governmental Industrial Hygienists

1330 Kemper Meadow Drive
Cincinnati, OH 45240
(513) 742-2020
www.acgih.org

ASHRAE 110-1995 Method of Testing Performance of Laboratory Fume Hoods (ANSI Approved)

Evaluates fume hood's containment characteristics

- Three part test: Smoke generation, face velocity profile, tracer gas release @ 4 liters per minute.
- Rated As Manufactured (AM), As Installed (AI) and As Used (AU).

American Society of Heating, Refrigerating and Air-Conditioning Engineers

1791 Tullie Circle NE
Atlanta, GA 30329
(404) 636-8400
www.ashrae.org

ANSI Z9.5-2003 Standard—Laboratory Ventilation

Covers entire laboratory ventilation system.

- Vertical stack discharge @ 2000-3000 fpm.
- New and remodeled hoods shall have a monitoring device.
- Ductless hoods should only be used with non-hazardous materials.

American Industrial Hygiene Association

2700 Prosperity Avenue, Suite 250
Fairfax, VA 22031
(703) 849-8888
www.aiha.org

SEFA 1-2006 Laboratory Fume Hoods Recommended Practices

- Fume hood face velocities based on toxicity levels of chemicals.

  Class A— materials of extreme toxicity—125 to 150 fpm.

  Class B—standard lab chemicals—80 to 100 fpm.

  Class C— materials of low toxicity—75 to 80 fpm.
- Test method—face velocity profile and smoke generation.

Scientific Equipment & Furniture Association

1205 Franklin Avenue
Suite 320
Garden City, NY 11530
(516) 294-5424
www.sefalabs.com

NFPA 45: Standard on Fire Protection for Laboratories Using Chemicals, 2004 Edition

- Laboratory hoods should not be relied on for explosion protection.
- Fume hood exhaust air should not be recirculated.
- Services should be external to the hood.
- Canopy hoods only for non-hazardous applications.
- Materials of construction should have flame spread of 25 or less.

National Fire Protection Association

1 Batterymarch Park
Quincy, MA 02169-7471
(800) 344-3555 or (617) 770-3000
www.nfpa.org

ASTM E84-09C Standard Test Method for Surface Burning Characteristics of Building Materials

Determines the relative burning behavior of the material by observing the flame spread along the specimen.

- Measures flame spread and smoke development.
- Material is exposed to flaming fire for 10 minutes and the results measured and recorded.
- Results are compared to the indexes of mineral fiber cement board (flame spread and smoke development of zero) and red oak flooring (smoke development of 100).

ASTM International

100 Barr Harbor Drive
P.O. Box C700
West Conshohocken, PA 19428-2959
(610) 832-9585
www.astm.org

UL 1805—Standard for Laboratory Hoods and Cabinets

- Hood interior constructed of nonflammable, corrosion and chemical-resistant materials.
- Counterbalanced sash of non-shattering material.
- Shielded by-pass opening.
- Dished work surface to contain spills.
- No air recirculation.
- Integral blower wheel of nonsparking materials.
- Externally-mounted electrical receptacles, light fixtures and service fixture controls.
- No indication of reverse flow or backflow when tested with sash at full, 2/3 and 1/3 open positions at flow rate recommended by the manufacturer.

UL 61010-1 (formerly 3101-1) Electrical Equipment for Laboratory Use

Specifies the general safety requirements for electrical equipment

- Based on International Electrotechnical Commission (IEC) Publication 61010-1 with differences noted for U.S. use.
- Tests for protection against electrical shock, mechanical hazards, spread of fire, radiation, liberated gases, explosion and implosion.
- Tests for resistance to shock, vibration, impact, heat, moisture and liquids.

Underwriters Laboratories Inc.

333 Pfingsten Road
Northbrook, IL 60062-2096
(847) 272-8800
www.ul.com

CAN/CSA Standard C22.2 No. 1010.1-92 & No. 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use

Specifies general safety requirements for electrical equipment

- Design and methods of construction should provide adequate protection to the operator and the surrounding area against shock or burn, mechanical hazards, excessive temperature, spread of fire from the equipment, gas liberation, explosion or implosion.

Canadian Standards Association

5060 Spectrum Way, Suite 100
Mississauga, Ontario
L4W 5N6
CANADA
(800) 463-6727 or (416) 747-4044
www.csa.ca

CE Marking

Established in 1993 to standardize the European Community's electrical directives into a single set of regulations. Indicates an electrical apparatus conforms to all safety and other directives/specifications presently required by the Council of European Communities.

- Electrical safety.
- Electromagnetic emissions testing—interference signals being output by the product.
- Electromagnetic immunity testing—the product does not respond to outside electromagnetic interference signals.

European Union
www.europa.eu