erlab
You can breathe.

GreenFumeHood® 3

GreenFumeHood® 3

Integrated Filtration Technology

The ERLAB company

ERLAB since 1968 has been the specialist, inventor and leader in the field of world-wide zero-emission filtration hoods autonomous no laboratory connections for the safe handling of chemicals.

The findings

In recent decades the global community has become increasingly aware of the impacts of human activity on health and the environment.

In 2003, **ERLAB** launched a new research program to rethink ways of protecting the environment and human health. People related to the dangers of handling chemicals and their consequences on the quality of the air breathed inside and outside of laboratories.

GreenFumeHood, a new class of fume cupboard

After 5 years of research, **ERLAB** launched in 2008 **GreenFumeHood**, a new class of fume cupboard with zero-emission connection filtration capable of competing with conventional, fixed, energy consuming and polluting fume cupboards. **GreenFumeHood** allows for energy savings of up to 96% while reducing infrastructure and maintenance costs by up to 70%.

GreenFumeHood technology packs

In 2009 **GreenFumeHood** becomes an integrated fume cupboard filtration technology package. It becomes the most advanced filtration technology in the world.

GreenFumeHood technology packs do not emit any pollutants into the air and the fume cupboards that integrate it do not emit any heated or conditioned air. Laboratories can thus achieve substantial energy, infrastructure and maintenance savings throughout the life cycle with rapid ROI, sometimes instantaneously.

The third generation

With the new ERLAB **GreenFumeHood 3**rd generation technology packs, **ERLAB** once again pushes the limits of molecular and particle filtration, enabling the replacement of conventional connected fume cupboards by up to 90% while still meeting the current filtration and containment standards.

With more than 500 installations in the USA, Europe and Asia, **GreenFumeHood** is a proven technology that is currently used in the fume cupboards of more than 25 partners specialist integrators of laboratory equipment selected by **ERLAB.**

From left to right:
Stéphane Hauville : Chief Executive Officer
Antoine Hauville : Chief Operational Officer

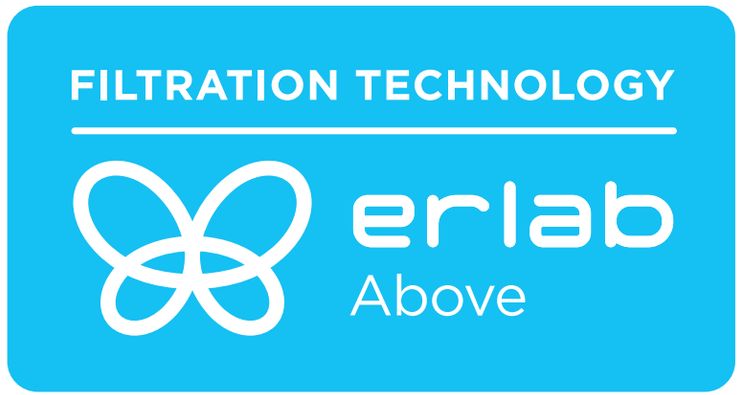
Filtration Technology ERLAB ABOVE

FILTRATION TECHNOLOGY ERLAB ABOVE is a seal of quality and a guarantee of safety, the result of more than 50 years of research and innovation in the field of filtration technologies related to the protection of laboratory personnel.

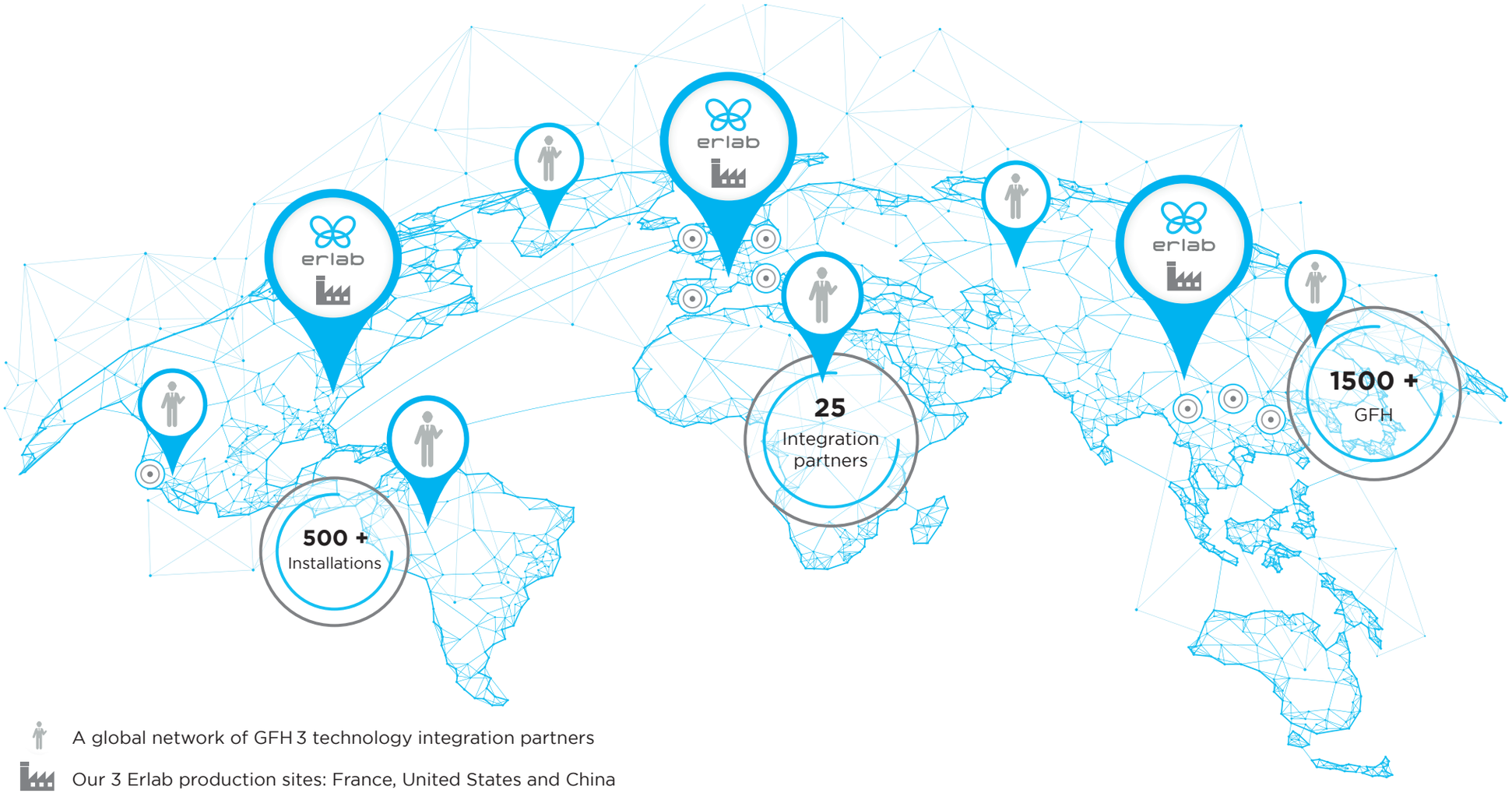
Our technological advances and know-how are the driving forces behind the solutions, turning the impossible into the possible.

ERLAB ABOVE is the invisible difference. It encompasses the technology of components that filter, detect and communicate, making the laboratory air we breathe cleaner and safer both indoors and outdoors.

For your safety, demand the **FILTRATION TECHNOLOGY ERLAB ABOVE** label - a label that has proven itself since 2009.



GFH 3 technology is based on the expertise and experience of our integrator partners
selected from the leading manufacturers of laboratory furniture in Europe and around the world



A global network of GFH 3 technology integration partners

Our 3 Erlab production sites: France, United States and China

Representative offices Erlab

CONTENTS

FILTRATION TECHNOLOGY

erlab Above

THE BENEFITS

Filtration technology for fume hoods

Enhanced Safety

- Risk assessment: Chemical hazards are assessed by the Erlab laboratory to ensure the best filtration solution through our **eValiQuest** service.
- High levels of filtration and containment, guaranteed by the most rigorous safety standards: **NF X15-211 and EN 14175-3**.
- Splash protection with a vertically sliding front panel.
- Constant monitoring of safety settings with an integrated set of sensors and real-time smart alarm alerts through our **eGuard APP**
- Monitoring of the fume hood throughout its service life with the Erlab Safety Program® **ESP**

Reduced Environmental Impact

- Chemical pollutants captured at the source: no chemical emissions released into the atmosphere.
- Filters made from environmentally friendly raw materials and recycled through energy recovery.
- Low consumption.
- Reducing the environmental impact of buildings: indoors and outdoors.

Flexibility + Adaptability

- Versatile filters and sensors suitable for a wide range of laboratory operations.
- Plug & Play fume hood: simplified installation of new ductless filtering fume hoods for immediate use (no impact on laboratory ventilation).
- Portable equipment: to be reconfigured as desired.

GreenFumeHood 3

Integrated Filtration Technology

Reduced Costs

- **Infrastructure costs:**
  - Standalone system: decoupled from ventilation air
  - Less space required for HVAC equipment
  - More space for work
  - Ductless ventilation
  - No air compensation is required for the fume hood to operate: reduced costs from the air handling unit
- **Operating Costs:**
  - Low energy costs: less than €100 per year
  - Filter service life: up to 48 months

Optimisation of Laboratory Design

- Standalone, ductless filtering fume hood that can be integrated at any time (design original on added later).
- Simplification of the building's heating, ventilation and air conditioning (HVAC) system: less space required for technology, more space for work.
- Room configuration not constrained by extraction: no limits to creativity.
- Fume hoods have no impact on the air balance in the building: all fume hoods can be used simultaneously.
- Fume hoods can be moved at any time according to users' needs
- Possibility of setting up temporary or mobile laboratories without any specific infrastructure.

STANDARDS

Compliance with safety standards

A high level of filtration and containment guaranteed by the most rigorous standards

Containment efficiency of the enclosure

The level of containment is defined by the capacity of the fume hood to keep pollutants within the enclosure, preventing their release into the laboratory environment.
Containment efficiency is proven by tests carried out following the protocols outlined in the **EN 14175-3, ASHRAE 110:2016 and AFNOR NF X15-211 (2009) standards.**

The containment standards applicable to **GreenFumeHood 3** fume hoods are identical to those for fume extraction hoods.

European standard EN 14175-3

American standard ASHRAE 110:2016

Filtration efficiency according to the AFNOR NF X15-211 standard

Neutrodine® Unisorb filtration technology conforms to the **NF X15-211 standard**, the most rigorous industry standard for molecular filtration developed by a committee of independent scientists and specialist manufacturers.
This standard establishes the specific performance criteria which impose a maximum release of 1% of the TLV (Threshold Limit Value) of the handled products.

Solvent test
Performance criterion met: <1% of the TLV

Acid test
Performance criterion met: <1% of the TLV

What is the AFNOR NF X15-211 standard?

It is currently the most advanced and rigorous industry standard to assess the safety of filtering fume hoods. The French Union of Mechanical Standardisation, comprising a panel of experts (from the French National Research and Safety Institute, state bodies and professional unions), was appointed by AFNOR to establish the AFNOR NF X15-211: 2009 standard. This standard applies to filtering fume hoods (also known as recirculating fume hoods or ETRAF) designed for any laboratory work in research, analysis, teaching, etc. in which chemical agents subject to occupational exposure limits (TLV or OEL) are handled.

This standard sets out performance requirements related to:

- Filtration efficiency
- Containment efficiency
- Air face velocity

The classes set out by the standard are:

Class 1 : Filtering fume hood with safety reserve, one main filtration level and one safety filtration level.

Class 2 : Filtering fume hood without safety reserve and with one main filtration level.

GreenFumeHood 3 TECHNOLOGY

Erlab and our integration partners are offering you an eco-friendly, turnkey protective enclosure solution for laboratories which meets all your advanced safety requirements. With **GFH 3 filtration technology,** you benefit from the dual expertise in filtration and protective enclosure design provided by both Erlab and our integration partners. To ensure the highest possible level of satisfaction, our partners offer you local technical support teams, trained on all filtration technologies in the Erlab ecosystem.

Enjoy optimum filtration capacity combined with revolutionary zero-emission technology:

- The most advanced filtration technology in the world which has already been integrated into the fume hoods of our 25 partners.
- 50 years of research expertise in the field of molecular and particulate filtration.
- Performance of the new generation of high-retention-capacity **Neutrodine® Unisorb** filters.
- Compliance with filtration and containment standards for your safety.
- New generation of simpler and safer embedded intelligence for optimum real-time safety.
- Technology which has already been integrated into the fume hoods of our integration partner network.

Our world-leading integrated filtration technology for fume hoods

+

Our integration partners' expertise in the field of laboratory enclosures

=

An innovative, safe and environmentally friendly technological solution.

GreenFumeHood 3

Integrated Filtration Technology

Filtration performance verification

Neutrodine® Unisorb filtration

Universal vapour filtration for general chemistry, with advanced retention capacity

Anemometer

Ensures a consistent air face velocity, a guarantee of effective protection

Tachometer

Real-time monitoring of fan operation

Temperature sensor

Humidity sensor

For optimal containment and filtration conditions

Smart Technology

A simplified human-machine interface that is focused on safety to ensure it is simpler and safer to use

FILTRATION

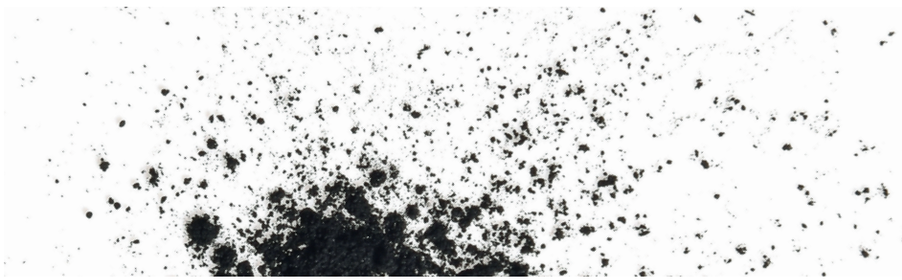
Expertise and technologies mastered by a leading R&D team

We provide technology to protect laboratory personnel from inhaling chemical substances

Our unique solutions allow pollution to be captured at the source and to catch pollutants in the filters before they are released into the clean air of the work environment. These filter cartridges are available as part of a unique range of activated carbon focused on protecting personnel from inhaling substances.

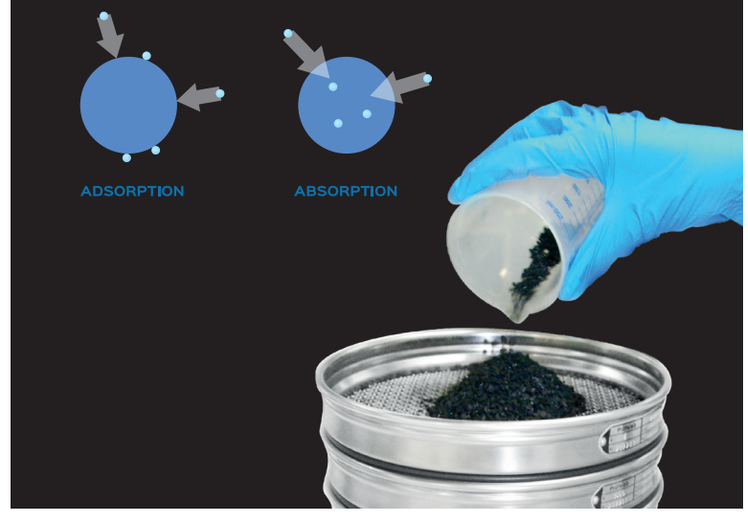
This is made possible thanks to the filtration technology which our Erlab Research and Development department has been constantly improving for over 50 years.

A very strict product specification based on compliance with standardised international protocols allows us to select raw materials and develop technologies with tailored porosity which have the capacity, under normal usage conditions, to adsorb a very broad spectrum of molecules without risk of desorption, just like in military-style gas masks. Our filters are subject to the rigorous tests as laid out by the **AFNOR NF X15-211:2009** standard, the reference standard in the field of filtering fume hoods.



What is adsorption?

Adsorption is a group of physico-chemical surface reactions through which free molecules are condensed on the surface of a solid. They can take place in a liquid or gaseous medium. The phenomenon of adsorption has long been of interest for the capture of gaseous pollutants, particularly in gas masks or filtering fume hoods. Be careful, however, not to confuse adsorption with absorption.



Neutrodine® Unisorb

Neutrodine® Unisorb, a molecular filter for laboratory vapours and gases

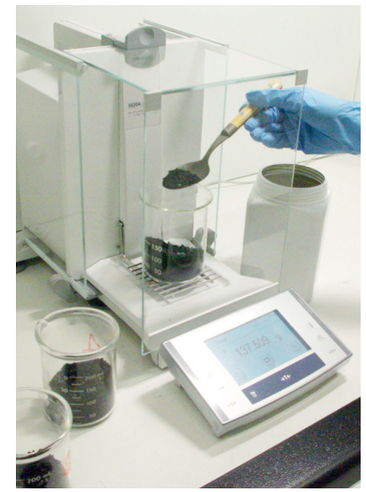
The product of our latest research, **GFH 3**, is equipped with a new generation of filters: **Neutrodine® Unisorb.**
We have been developing this technology at our R&D laboratory for over 5 years. It has been tested hundreds of times, from the first attempts at formulating new filtration materials right up to the performance evaluation of these new filters in real-life situations.

Neutrodine® Unisorb greatly increases the retention capacity for the majority of vapours emitted from laboratory procedures. These improvements are significant for the molecules known to be the most difficult to retain with classic activated carbon filters, such as polar VOCs with low molar mass and boiling points.

Improved performance compared to conventional filters.

Cyclohexane	**Acetone**	**Ethanol**
+50%	**+50%**	**+280%**
HCl	**Ammonia**	**Isopropanol**
+60%	**+50%**	**+90%**

and over 700 other chemicals filtered!
Ask for our Chemical Listing



Neutrodine® Unisorb Filtration*

- Ability to simultaneously handle solvents, acids and bases with the same filter.
- Unprecedented retention capacity.
- Unique formulation without carbon blend.
- No heavy metal impregnation.

*Performance of **Neutrodine® Unisorb** filter tested against the **AFNOR NF X15-211** standard.

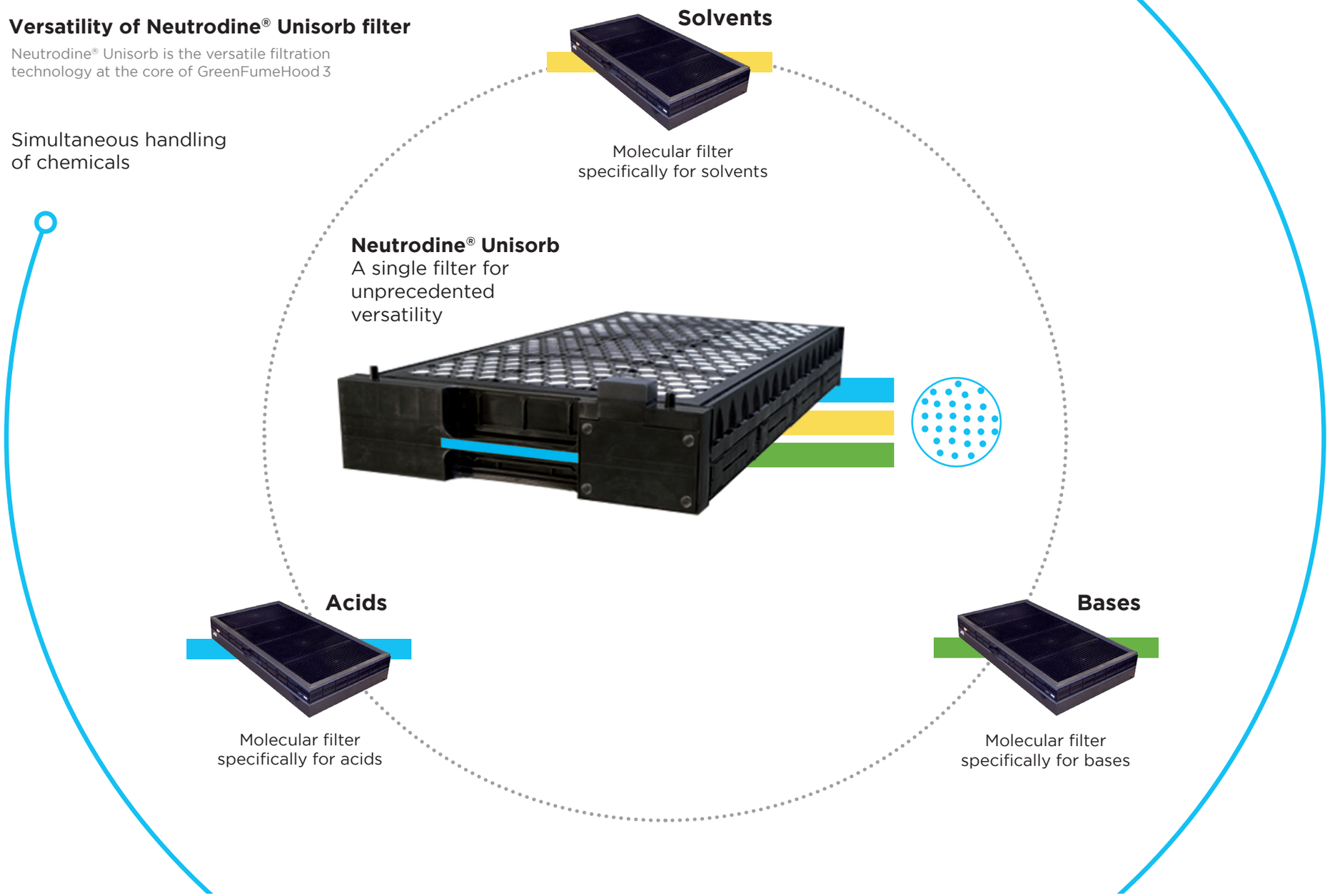
Patented innovation

- **Anti-pollutant release filter system:** US patent number 7,563,301
- **Neutrodine® Unisorb filter:** US patent application number 12/465,434

Versatility of Neutrodine® Unisorb filter

Neutrodine® Unisorb is the versatile filtration technology at the core of GreenFumeHood 3

Simultaneous handling of chemicals



Revolving® Filter System

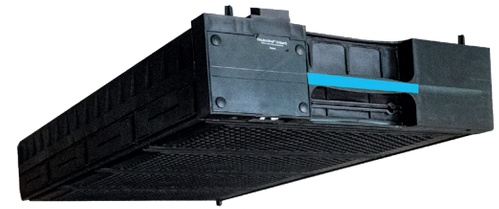
Optimisation of the main filters' service life

NF X15-211 standard "Class 1" filtration column with two levels of filtration: **1 main module + 1 safety module.**
The Revolving® system allows you to replace one filter module at a time and optimises the main filter's service life.

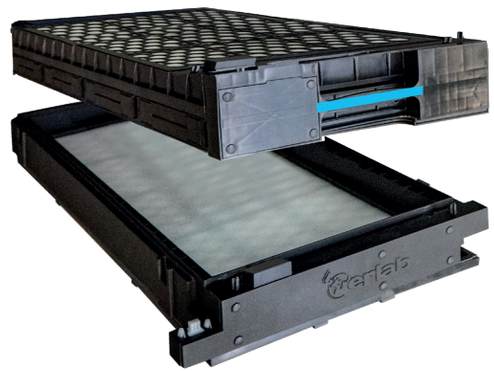
No pollutants released into the laboratory, even if the main filter is saturated.
When the main filter is saturated, molecules are directed towards the safety filter. The safety filter replaces the main filter when the latter reaches maximum capacity. A new filter is then installed in place of the safety filter.

Revolving® Filter System

Neutrodine® Unisorb safety filter module



New Neutrodine® Unisorb safety filter



The Neutrodine® Unisorb safety filter module becomes the main Neutrodine® Unisorb filter module

ecosystem

Disposal and energy recovery of the Neutrodine® Unisorb filter, in an environmentally friendly way

Composition of the GFH 3 filtration column

A detailed look at GFH 3 technology, a modular filtration column adaptable to all present and future laboratory needs

Intelligent filter:
An embedded microchip enables its management to be optimized during use.

Filtration performance sensor:
Sensors: solvents, acids, formaldehyde.

Smart handles:
Automatic filter recognition and improved grip.

Blade/Gutter:
The blade/gutter system guarantees the perfect seal between the two filters.

Humidity/temperature sensor:
Detection of abnormal values in the enclosure.

Pre-filter:
Particulate and molecular pre-filter for improved retention.

Safety Neutrodine® Unisorb filter module

No release of pollutants into the laboratory, even if the main filter is saturated.

US Patent: 7,563,301
US Patent: 9,114,338 B2

Ventilation module

Ventilation regulation.
Low energy consumption.
Reduced noise level.

Main Neutrodine® Unisorb filter module

Increased filtration efficiency. Single filter for simultaneous handling: solvents, acids and bases. Unique formulation without carbon blend. No heavy metal impregnation.

US Patent: 7,563,301
US Patent: 9,114,338 B2

HEPA H14 particulate filter module

High-efficiency particulate filtration. Guaranteed overall filtration efficiency of 99.995% (particles greater than 0.1 micron).

Lighting module

Communicating base with daylight LED lighting module, temperature sensor and humidity sensor.

GreenFumeHood 3

Integrated Filtration Technology

Filtration column that is adaptable according to requirements

FILTRATION TECHNOLOGY
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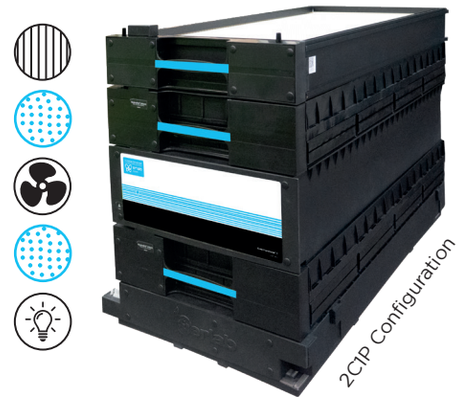
- Adaptable to the vast majority of laboratory procedures
- Able to handle liquids and powders
- Quick and simple reconfiguration of filtration columns to suit changing requirements

For handling liquids

For handling liquids + powders



For handling in cleanrooms

Molecular filter | Particulate filter | Fan + detection | Lighting module

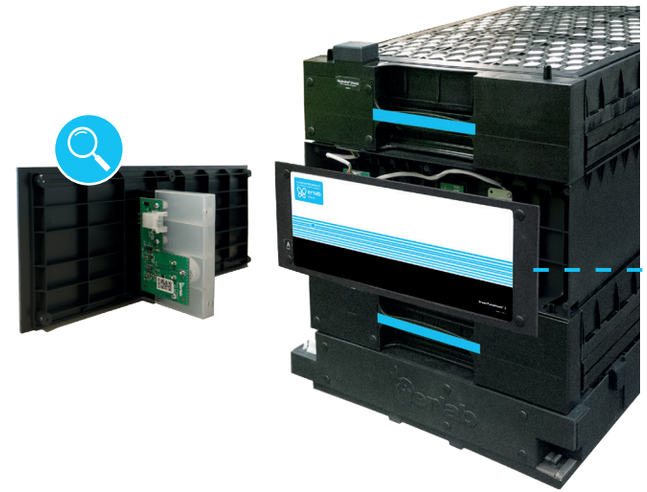
DETECTION

Sensors

Exclusive filtration quality monitoring system

The exclusive **GreenFumeHood 3** detection system consists of a network of 3 sensors suitable for detecting a very broad spectrum of molecules. It allows users to monitor the **Neutrodine® Unisorb** filtration efficiency and performance.
The GFH 3 technology packs automatically include the *VOC* (Molecode S) sensor in each of the three possible configurations. The two other sensors, *Formaldehyde* (Molecode F) and *Acids* (Molecode A), will be integrated following the automatic online chemical hazard analysis via our eValiQuest service.

The detection system has 4 other sensors which monitor the correct operation of your enclosure in real time. **You can find this information in the eGuard® app for GreenFumeHood 3.**



Technology GFH 3 packs:

up to 7 sensors for optimum containment of the enclosure and total handling safety.

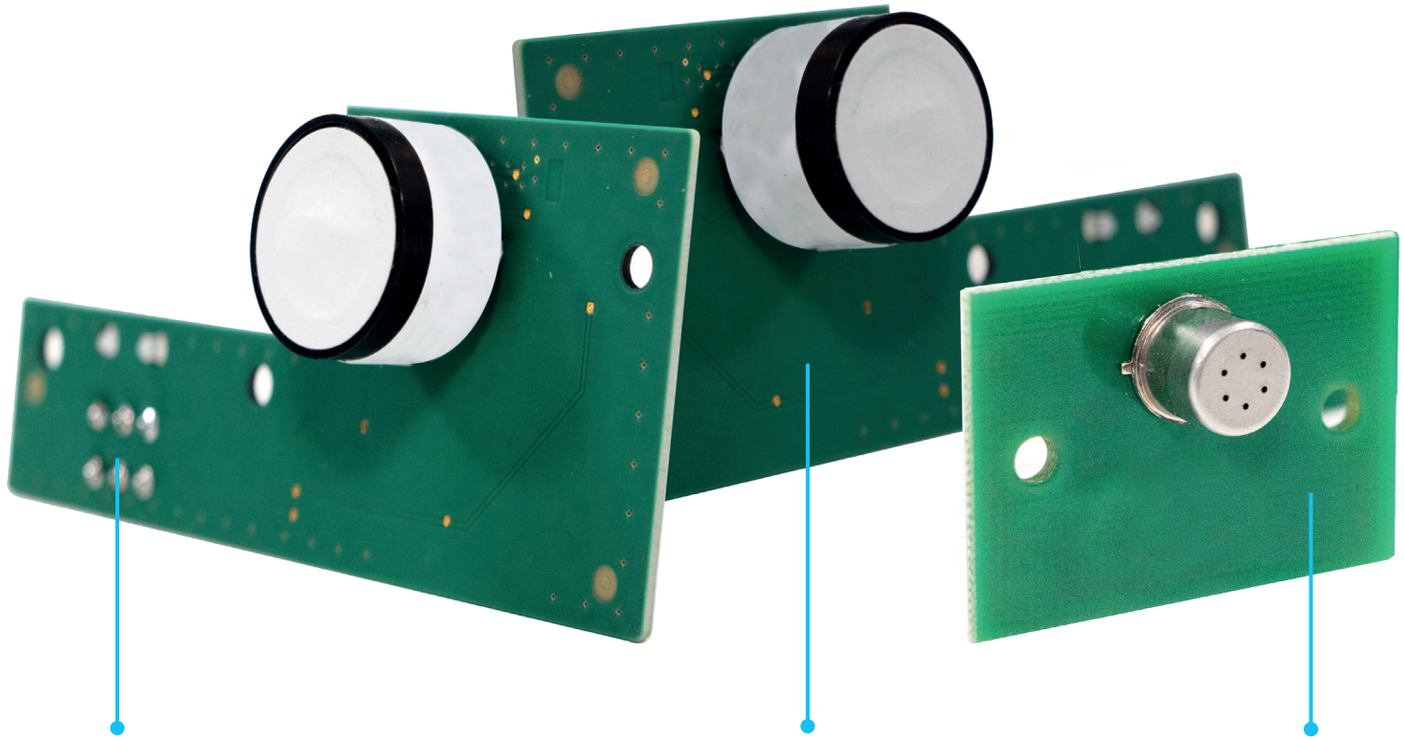
Formaldehyde (Molécode F)	**Acids** (Molécode A)	**VOC** (Molécode S)	**Temperature**	**Humidity**	**Anemometer**	**Tachometer**
Filtration performance monitoring for formaldehydes	Filtration performance monitoring for acids	Filtration performance monitoring for VOC	Real-time monitoring of the temperature inside the enclosure	Real-time monitoring of relative humidity	Monitoring of air face velocity	Monitoring of fans
Included as per the eValiQuest assessment. (Automatic online analysis of chemical hazards)	Included as per the eValiQuest assessment. (Automatic online analysis of chemical hazards)	✓ Included	✓ Included	✓ Included	✓ Included	✓ Included

GreenFumeHood 3

Integrated Filtration Technology

The panel in front of the fan can be fitted with a ***Formaldehyde* sensor** or ***Acid* sensor** according to the assessment carried out by our eValiQuest service. Thanks to the **plug & play system** these can easily be interchanged, allowing the user to continue experimenting with new procedures while maintaining optimal safety.

3 sensors specifically adapted for the detection of a very broad spectrum of molecules:



***Formaldehyde* Sensor** (Molecode F)

Electrochemical sensor for the detection of formaldehyde vapours.

***Acid* Sensor** (Molecode A)

Electrochemical sensor for the detection of acid vapours.

***VOC* Sensor** (Molecode S)
Automatically integrated in the pack.

Semiconductor sensor for the detection of volatile organic compounds.

COMMUNICATION

Optimisation of the main filters' service life

Smart Command

Free yourself from operational constraints with the new Command Module.

Activate the simple and intuitive power of Smart Technology.

Erlab has developed its protective technology so you can concentrate on what is important: chemical handling. **Smart Command,** included in all our **GreenFumeHood 3** filtration packs, will seamlessly alert you.

What is Smart Technology?

Smart Technology is a simple and innovative method of communication for added safety. Through its simple and intuitive operation, this communication interface allows operators to focus all their attention on what is important: handling.
Using light and sound signals, the technology indicates the user's level of protection.

Simplified access point (PC, tablet, etc.)

Connection to command module via WiFi or Ethernet.

Simpler and safer Smart alert system

Alerts via light and sound pulses.

U.S. Patent: D10, 528, 014

- Maintenance
- Filtration fault indicator
- Ventilation fault
- Air face velocity

Simplified and intuitive commands

Touch screen icons.

GFH 3 INTEGRATION TECHNOLOGY PACKS

Adaptable to the width of your enclosure

FILTRATION TECHNOLOGY
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Pack M1

Enclosure width
≃900-1000 mm

Treated air flow rate
220m³/h

80 W
Very low energy consumption

FILTRATION TECHNOLOGY
erlab Above
Pack M2

Enclosure width
≃1200 mm

Treated air flow rate
440m³/h

150 W
Very low energy consumption

FILTRATION TECHNOLOGY
erlab Above
Pack M3

Enclosure width
≃1500 mm

Treated air flow rate
660m³/h

225 W
Very low energy consumption

erlab
You can breathe.

GreenFumeHood 3

Integrated Filtration Technology

FILTRATION TECHNOLOGY
erlab Above
Pack M4

Enclosure width
≃1800 mm

Treated air flow rate
880m³/h

295 W
Very low energy consumption

FILTRATION TECHNOLOGY
erlab Above
Pack M5

Enclosure width
≃2100 mm

Treated air flow rate
1100m³/h

370 W
Very low energy consumption

FILTRATION TECHNOLOGY
erlab Above
Pack M6

Enclosure width
≃2400 mm

Treated air flow rate
1320m³/h

440 W
Very low energy consumption

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