



# Pharmaceutical

Pharmaceutical environments,  
contained and controlled.

Clean air pioneers since 1858

**The safer the better.**

Discover the proven protection  
of Howorth Air Tech.

Trusted to

# PROTECT

The logo for Howorth Air Tech is a circular emblem composed of numerous small, light blue dots. The dots are arranged in a pattern that creates a bright, glowing center, with the density of dots decreasing towards the outer edge. The text 'Howorth Air Tech' is centered within this circular pattern.

Wherever pharmaceutical containment matters, you'll find Howorth. As leading designers of specialist containment equipment for the pharmaceutical industry, we provide some of the most advanced systems available.

We work alongside our customers in some of the most technically demanding areas, listening to their needs and developing our systems to create bespoke solutions that offer the highest levels of safety and performance.

Our global experience and passion for innovation continually shapes and defines everything we do, generating new ideas to keep people and processes safe all around the world.

**With advanced solutions,  
comes advanced service.**

Bringing an advanced level of

# containment

to your work environment

## con-tain-ment

(noun) The action of keeping something harmful under control or within limits.

Our expertise in developing proven, high performance clean air engineering solutions has been pivotal in the creation of world class protection, bringing greater control to containment across the global pharmaceutical market.

At Howorth, we listen to your needs and work with you to optimise and tailor our solutions to fit your application needs precisely.

### Definition of containment:

Helping operators to handle and produce products, safely.

The functions and operations carried out within the pharma industry consist of 3 basic elements; personnel (operator), product and environment.

Containment can therefore be defined as providing a safe, controlled and contained or aseptic space for operators to operate in and for products to be produced in; usually in a controlled area, physical structure or activities that isolate the product from the other two elements.

Giving you  
the control  
you need  
to contain  
and maintain  
safe, efficient  
environments.

We have developed three high performance system solutions covering all aspects of safety across the two types of containment in the pharmaceutical spectrum:

#### Operator & Environmental Containment

Needed in all areas where processes involve handling Active Pharmaceutical Ingredients (API) or Highly Potent Active Pharmaceutical Ingredients (HPAPI) that can be harmful in any way to personnel operating in that environment.

#### Aseptic Processing Containment

Required in process areas where the formulations being handled need to be protected against external contamination arising from 1) personnel, 2) the environment or 3) from the bacterial growth arising from both these elements.

# At a glance in your work place:



We use every nanogram of our knowledge and expertise to inform our solutions. Whatever the hazard or level of exposure, we're here to keep your personnel safe.

This combination of technical precision and passion defines our culture and makes Howorth a breath of fresh, microbiologically clean air, always here to keep you better informed and better protected.

For example, here's how containment performance relates to a grain of sugar:

100 µg – 647 x smaller than a typical grain of sugar

1 µg – 64,790 x smaller than a typical grain of sugar

1 ng – 64,790,000 x smaller than a typical grain of sugar

## CPT

Containment performance target

### OEL

Occupational exposure limit

### OEB

Occupational exposure band

### ADI

Allowable daily intake

### DEL

Design exposure limit

### OHC

Occupational health categorisation

### TH

Toxic hazard

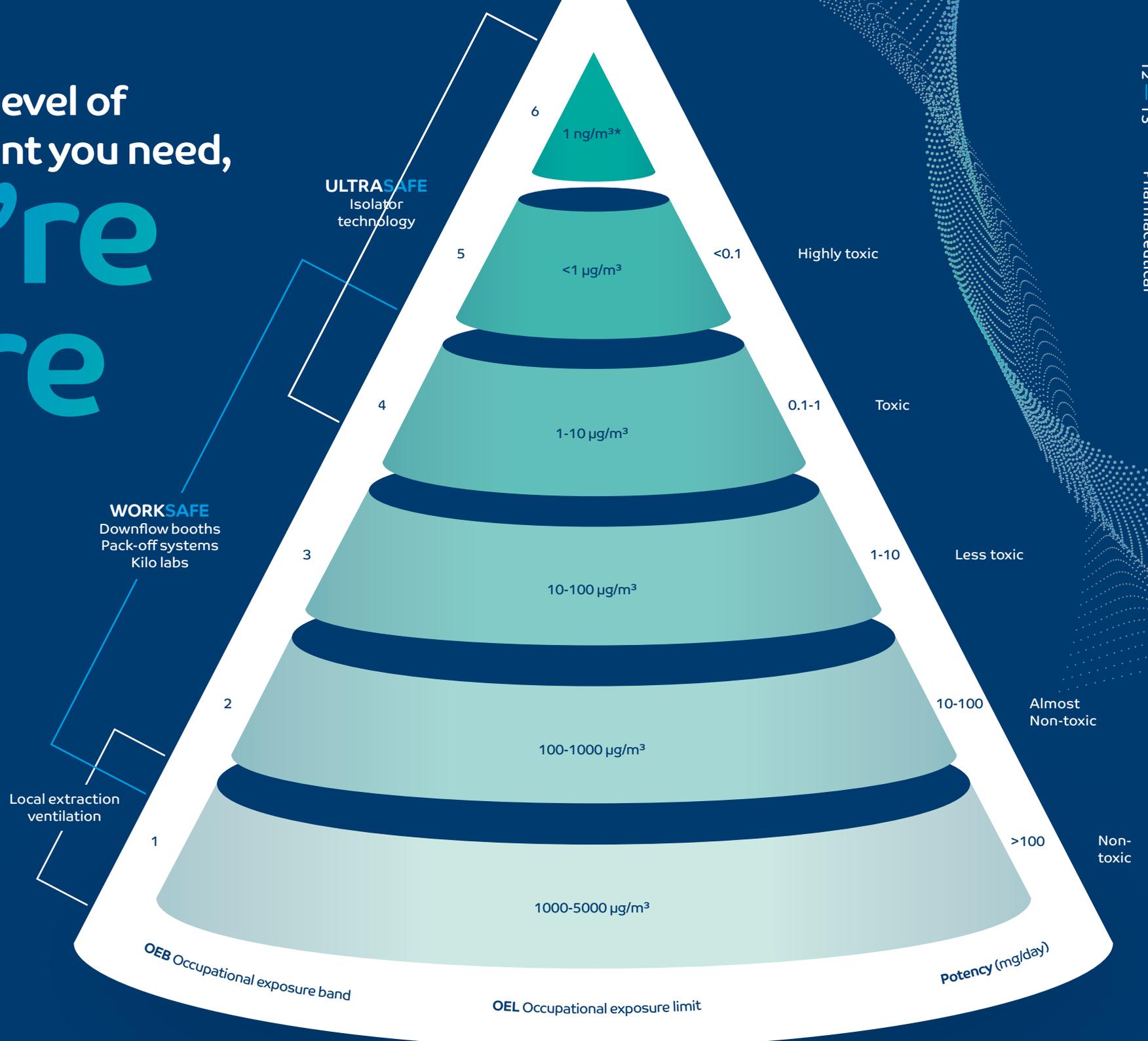
### ADE

Allowable daily exposure

### STEL

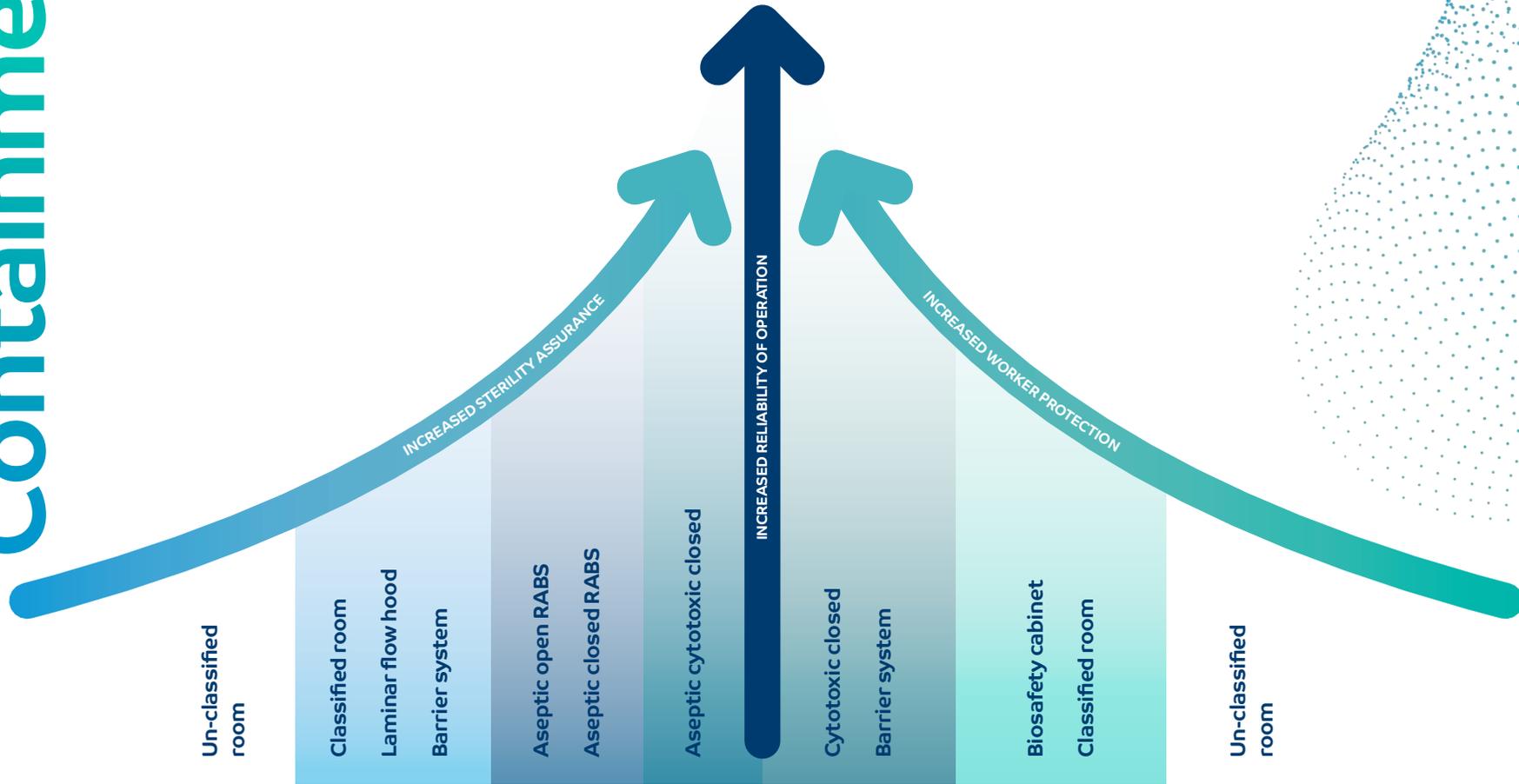
Short term exposure limits

Whatever level of containment you need, **we're here**



\*8Hr TWA or Task Based Containment Level based on mutually agreed SOP.

# Aseptic vs Containment



GMP REQUIREMENTS

GMP + HSE REQUIREMENTS

HSE REQUIREMENTS



Positive pressure

Negative pressure



ULTRASAFE  
(PG 16 - 21)

ENVIROSAFE  
(PG 34 - 45)

WORKSAFE  
(PG 22 - 33)



## Your workforce in **ULTRASAFE™** hands

When containment has to be both complete and completely reliable, **ULTRASAFE** is the optimum solution.

Our high containment equipment provides advanced performance levels for both API and HPAPI, backed by a service that's ultra-focused on your needs.

We work closely with you to gain an all round understanding of your requirements, evaluating ergonomic-related issues to improve isolator efficacy and improve operator protection.

# Nanogram containment is now an exact science



## API Containment Isolators

API Isolators provide the highest levels of containment for handling toxic compounds. The manufacturing of Active and Highly Potent Active Pharmaceutical Ingredients (API and HPAPI) has become a growth area within the industry.

There is an ever increasing demand for higher containment, improved operator protection and equipment integration, as well as preventing cross-contamination within facilities.

Each isolator is a bespoke build to meet the client's requirements and processes.

We can produce isolators to suit many different types of processes, here are just a few examples:

- ADC Containment Isolators
- Filter Dryer Isolators
- Roller Compactor Isolators
- Sampling & Dispensing Isolators
- Reactor Charging Isolators
- Fluid Bed Drying Isolators
- Granulation & Milling Isolators
- Compression Tablet Press & Encapsulation Isolators
- Vacuum Tray Drying Isolators
- BSL-4 isolators



## Process Isolators

Process Isolators are containment systems that allow the handling of toxic substances for various industries including pharmaceuticals.

They can provide primary and secondary containment around pharmaceutical and chemical process activities.



## Bespoke Integrated Isolators

Howorth is a market leader in providing innovative containment solutions.

Utilising our clean air engineering expertise, we can create safe and clean working environments for Pharmaceutical, Biological and Chemical organisations.

Our extensive knowledge and expertise in designing bespoke isolator systems to suit a variety of processes, ensures we provide our customers with solutions to suit even the most demanding requirements.

We have built a strong reputation within the industry for our innovative integration of process equipment within barrier isolation systems having successfully completed many equipment integration projects, both with end users and OEMs.



## Patented **DOCKSAFE**<sup>™</sup> system

To design for today and tomorrow, Howorth have developed the revolutionary and patented **DOCKSAFE**<sup>™</sup> multi-connection system. This enables flexibility and interchangeability for stand alone isolators to change their input/exit transfer methods and to 'dock' onto other systems including, but not limited to, other isolators, kilo-labs, hoods and fume cupboards.

The **DOCKSAFE**<sup>™</sup> system allows an isolator to be multi-functional and future proof providing significant benefits to the manufacturing of APIs and HPAPIs particularly where a quick response to market is required.





# WORKSAFE™

We make containment,  
priority one

**WORKSAFE** containment solutions create safety-optimised environments to meet operation performance levels between  $100 \mu\text{g}/\text{m}^3$  and  $1 \text{ug}/\text{m}^3$  8 Hours TWA (when using the High Containment Screen).

Our Downflow Booth technology upscales operator safety by taking a controlled unidirectional flow of air and directing it away from the breathing zone into low exhaust grilles and through the filtration system, ensuring a safer workspace.

# Advanced containment, at its most controlled

## Downflow Booths

Containment by airflow is a well proven concept taken to new levels by Howorth's air engineers.

Our booths are available in two different configurations depending upon the application:

- Re-circulatory booths – typically used for powder operations
- Single pass booths – recommended where solvent or fume vapours are present

Our booths utilise a unidirectional airflow which is passed through ceiling mounted distribution screens or HEPA filters ensuring a controlled flow of air.

This airflow can be directed to carry contaminants away from the breathing zone of operators and

into low level exhaust grilles and then through the booths filter system.

Howorth has a standard booth range or it can work with clients to develop an airflow containment solution that meets their exacting requirements.

Our inherently flexible systems, together with our experience of equipment integration, will allow clients to meet their safety needs without having to compromise on process efficiency.



## Downflow Benches

Howorth Downflow Benches utilise the recirculation principals of the Downflow Booth but with operation through an open sash.

The bench is ideal for small powder dispensing or sampling operations within labs or small facilities. They will provide containment of OEB 3 for compounds between 10 to 100  $\mu\text{g}/\text{m}^3$  8 Hours TWA.

Each bench will include a dedicated extraction system including Safe Change HEPA filtration and HMI/PLC controls.

We offer standard benches or we can work with you to develop a custom unit that meets your specific requirements.





## Kilo Labs & Fume Cabinets

Whether for use in research, as a pilot-plant or for full production, Kilo Labs are frequently utilised within pharmaceutical facilities.

Our Kilo Lab containment enclosures can provide a high level of operator protection from dust, vapour and liquids, whilst allowing ease of access for maintenance.

Capable of providing OELs below  $10 \mu\text{g}/\text{m}^3$  8 Hours TWA,

our GMP compliant enclosures provide an excellent safeguard against hazardous materials.

Horizontal, sliding sash glass panels combined with full-length double opening doors ensure maximum operator visibility and accessibility.

## Pack-off Booths

Howorth has considerable experience in supplying containment booths for a range of processes, including Pack-off systems.

The Pack-off system is designed to offer a primary level of containment when off-loading and packing off powdered products. The booth is providing an extra layer of protection to the operator (secondary containment) during the offloading/filling of drums, IBC, FIBC, and other containers.

Our extensive knowledge and expertise in the design of these systems ensures that we provide our clients with systems to suit even the most demanding specifications.





## High Containment Screens

High Containment Screens are a simple yet effective way of boosting the containment capabilities of any Downflow Booth.

With our latest range of screens, we are able to offer previously unattainable levels of operator protection. The 5D Screen has been designed to enhance the comfort of operators while the range of movement helps to prevent bad practices during operations.

Independent testing has confirmed that OEL's as low as  $1 \text{ ug/m}^3$  8 Hours TWA can be achieved. This means that for operations where an air suit or isolator were previously the only option, a Downflow Booth combined with a High Containment Screen is now a viable solution.

In addition, our latest range of screens have been developed specifically to allow them to be fitted within existing booth facilities.



## Drum & Solvent Booths

Drum and Solvent Handling Booths are designed to control vapours and aerosols that are created during the transfer of solvents and liquids and other handling processes i.e. drum to drum transfer or drum to process reaction vessel.

Protecting surrounding environments against hazardous vapours and aerosols, Drum and Solvent Handling Booths safeguard both the operator and the room environment during all reactions, distillations, and general wet chemistry experimental work.

These booths are typically employed in kilo, pilot and developmental wet chemistry labs.

Our equipment can also be designed to satisfy the requirements of REACH.

ENVIROSAFE™



# Make your environment ENVIROSAFE™

ENVIROSAFE is the all round solution that provides total aseptic reassurance, by completely separating the product from external contamination during processing.

It safeguards patients by safeguarding processing, providing continuous segregation of the inside of the isolator from the external room and on-site operators, ensuring complete process integrity by combining greater safety with lower risk.



## Safeguarding patients by **safeguarding processing**

### Aseptic Isolators

Aseptic Isolators are routinely found within the pharmaceutical industry and are widely used for a number of applications including:

- Sterility testing
- Compounding
- Sterile injectables
- Pharmacy dispensing
- Liquid filling
- Aseptic transfer
- Medical device manufacture and assembly
- Packaging
- Integration of key monitoring, processing and decontamination systems

Howorth provide the complete ‘turnkey’ facility to support the sampling activities including:

- **WORKSAFE** containment booths including High Containment Screens
- **ULTRASAFE** Sampling Isolators
- Cleanroom and HVAC facility
- Integrated materials handling equipment such as roller track conveyors, roller shutter doors and wrapping systems etc.
- Fully integrated controls system and associated interlocks

## Sampling Facilities

Sampling of the API or Chemical is an important requirement to comply with industry regulations including:

- Preventing contamination of the opened container, the materials and the operator
- Preventing cross-contamination by other materials, products and the environment
- Protecting the individual who samples (sampler) during the sampling procedure





## Restricted Access Barrier Systems

Operators pose the greatest risk to product contamination during ‘conventional cleanroom’ aseptic processing.

Many different barriers of varying capabilities have been used to separate operators from critical sites during aseptic processing with the objective of reducing the probability of a contaminated unit.

These range from simple flexible curtains used on many traditional aseptic processing lines to advanced aseptic processing in isolators.

A Restricted Access Barrier System (RABS) is an advanced aseptic processing system that can be utilised in many applications in fill-finish and processing areas.

RABS provides an enclosed environment to reduce the risk of contamination to product, containers, closures, and product contact surfaces compared to the risks associated with conventional cleanroom operations.

RABS can operate as “doors closed” for processing with very low risk of contamination similar to isolators or permit rare “open door interventions” provided appropriate measures are taken.

## UDAF Booths and Canopies

Uni-Directional Air Flow (UDAF) Booths and Canopies provide a localised clean air environment of ISO 5 (Grade ‘A’) over an aseptic process. They are usually positioned above machines and pieces of equipment within cleanrooms or secure environments.

The booths and canopies are of a customized design and built in modules or enclosures that can be standalone or integrated as part of the cleanroom facility.



## BIOGEN Decontamination Systems

Our **BIOGEN** decontamination technology can be fully integrated into an **ENVIROSAFE** isolator.

This cost effective decontamination solution brings greater precision to protection in small volume enclosures such as safety cabinets, microbial incubators and glove box isolators.

This system manually draws up a developed amount of 33 to 35% Hydrogen Peroxide and disperses the vapour via an ultrasonic nozzle to fill the chamber. The cycle is completed once the vapour is extracted.



# With advanced air technology, comes a more advanced understanding of your needs.

## Head office

Howorth Air Technology Limited,  
Victoria Works,  
Lorne Street,  
Farnworth, Bolton,  
BL4 7LZ, UK

**Telephone:**  
+44 (0)1204 571 131

**Email:**  
info@howorthgroup.com

## Raven Locks

Howorth Air Technology Limited,  
Unit 37,  
Raven Locks,  
Ravenscraig Road,  
Little Hulton, Salford,  
M38 9PU, UK

## USA office

Howorth Air Technology Inc.

**Telephone:**  
+1 (609) 246 5679

**Email:**  
usa@howorthgroup.com

## In country representatives

### Korea

Young Sciences Inc.

**Telephone:**  
+82 32 624 4500

**Email:**  
info@youngscience.com

**Website:**  
www.youngscience.com

### Singapore

1Supplier PTE Ltd

**Telephone:**  
+65 6316 5120

**Email:**  
alfio.gullifa@1supplier.com.sg

**Website:**  
www.1supplier.com.sg

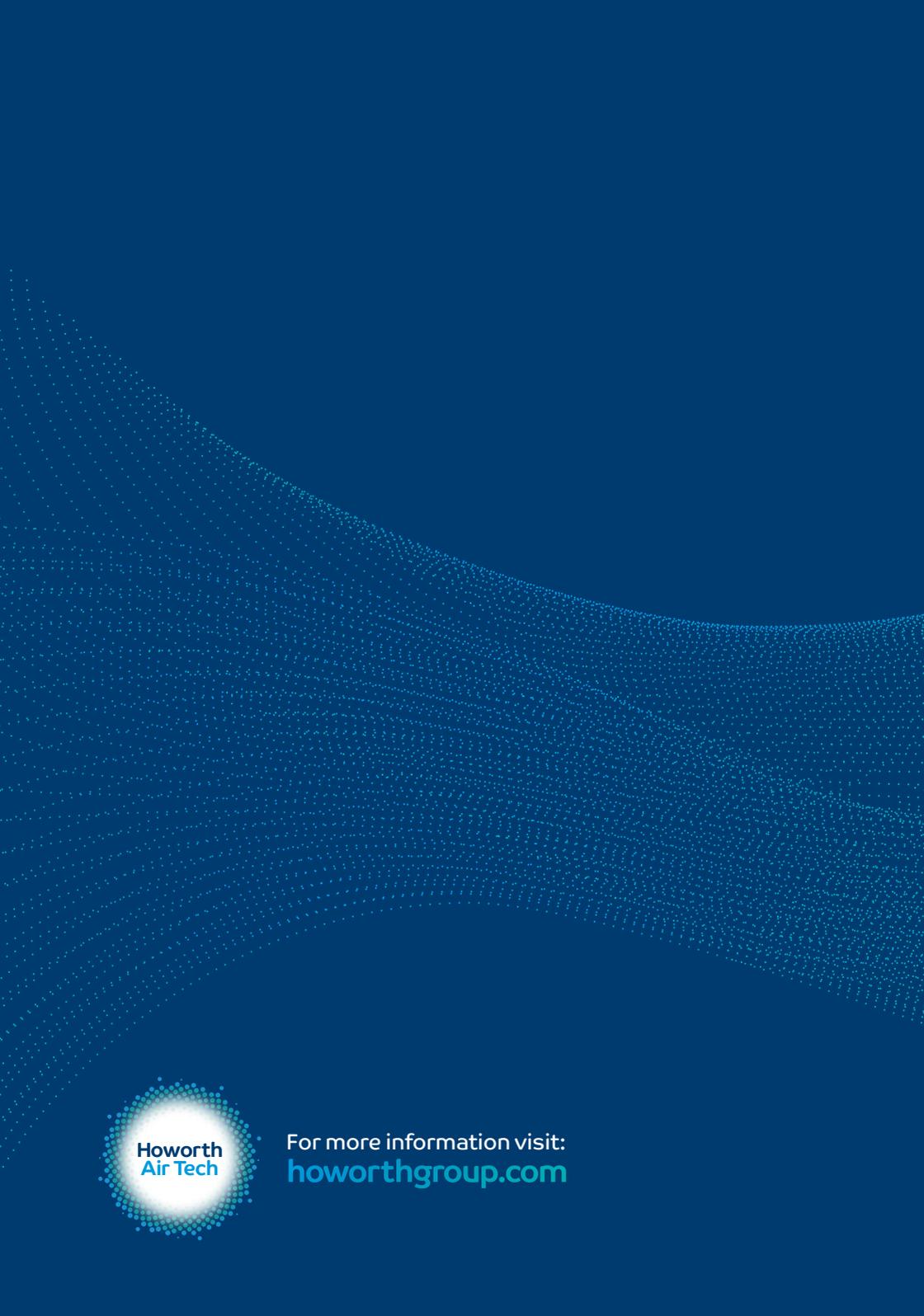
### Malaysia

Rykertech Asia Sdn Bhd

**Telephone:**  
+603 7734 4484

**Email:**  
info@rykerasia.com

**Website:**  
www.rykerasia.com



**Howorth**  
**Air Tech**

For more information visit:  
[howorthgroup.com](http://howorthgroup.com)