

# Ultra Clean Operating Theatres & Suites



**howorth**  
air technology

EXPLOW 32



# Howorth - Pure Protection

For more than 150 years, the Howorth name has represented technical creativity and expertise in air engineering and its application to climatise and control the working environment.

Howorth is a specialist supplier of air technology solutions, serving the global medical, pharmaceutical and wider industrial markets. Our clients include small businesses, blue-chip private companies and the government sector.

The company's strong reputation has been earned by providing well designed, high quality goods, together with a superior level of customer service, both pre and post order.

## Inventors of the Ultra Clean Operating Theatre

In the early 1960s, Howorth's experience and skills were applied in response to the needs of the medical profession. Working in close collaboration with renowned orthopaedic surgeon, Sir John Charnley, Howorth designed and developed the world's first Ultra Clean Ventilation (UCV) system.

From this pioneering first step, the company went on to create the Howorth Exflow™ UCV, which remains a global leader in the field of ultra clean ventilation.

In addition to the Exflow™, Howorth also provides a broad range of additional products and services for the medical market, ranging from theatre lighting and ceiling service units to complete turnkey healthcare facilities.



## Showroom & Research Facility

Howorth's recently refurbished medical products showroom includes a fully fitted twin operating theatre complex, complete with Exflow™ UCVs and a variety of ancillary equipment. The showroom is an invaluable aid for demonstrating Howorth's range of healthcare products and is also utilised extensively in our ongoing product development programmes.

## US Operations

Howorth continues its ongoing expansion into the Americas with the opening, in early 2011, of a brand new operating theatre showroom, research and development facility. Based just outside Philadelphia, the facility will enable Howorth to better serve the North American market and provide a base from which to deliver an enhanced level of product and service support.

## Tailored Financial Solutions

Whether you are purchasing equipment or undertaking a full turnkey new build or refurbishment project, Howorth can offer a range of tailored financial packages to suit your budget (subject to terms and conditions).



# Exflow UCV Systems

The original and still the best, today's Exflow™ provides a larger Ultra Clean zone and a reduced risk of entrainment without the need for restrictive full length side walls.



## Exflow - The Original UCV System

The Howorth Exflow™ UCV system was developed jointly with the internationally acclaimed orthopaedic surgeon, Sir John Charnley. Howorth subsequently perfected and patented the unique Exflow unit with a graded velocity airflow, vertical in the central area and radially outwards at the periphery, creating an exponential profile.

Installed in nearly 3,000 operating theatres worldwide, the Howorth Exflow™ is now available in two sizes. Both models provide microbiological cleanliness and airflow results exceeding all current regulatory requirements.

## Exflow 32™

The Exflow 32™ has an enlarged Ultra Clean operating zone of 3.2 x 3.2m, allowing the entire operating team and all their instrument tables to be accommodated beneath the canopy. Its in-built luminaires can provide a measured light level in excess of 1,200 lux.

Despite the increase of nearly 50% in the volume of air generated by the Exflow 32™, the system is extremely quiet, meeting noise level targets set-out in HTM 03-01.

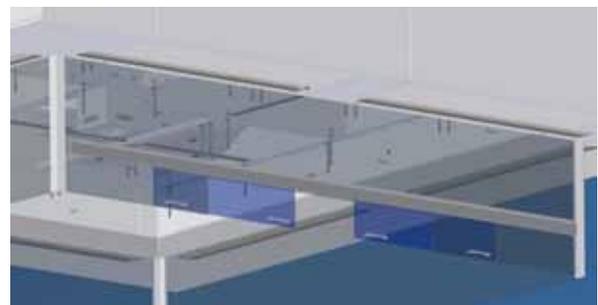
## Exflow 28™

The Exflow 28™ provides an Ultra Clean operating zone of 2.8 x 2.8m. The unit provides all the benefits of its larger brother but in a compact package that makes it ideal for retrofit or refurbishment projects.



## Sliding Screens

Developed in consultation with customers and users, the design principle behind our sliding screens is unique to Howorth. The sliding screens give theatre staff the flexibility to bring non-howorth pendants and equipment into the clean zone, whilst maintaining compliance with HTM 03-01.



## Barn Theatres

The Exflow™'s ability to exclude entrainment of external airborne particulate has made it particularly suitable for so-called 'barn theatres', within whose totally open space multiple operations can be carried out simultaneously under adjacent Exflows. Barn theatres are validated regularly to ensure complete safety and full compliance with HTM requirements.

## Body Exhaust

The Charnley Howorth Body Exhaust System has been designed to remove bacteria-carrying particles emitted by the surgical team, and works in perfect conjunction with the Exflow™ canopy to bring new levels of air cleanliness to operating theatres.



# Healthcare Associated Infections

The use of Howorth's Exflow™ UCV has been proven to reduce the occurrence of micro-organisms within the operating theatre and more specifically at the wound site.

Healthcare associated infections (HAIs) are one of the most pressing issues facing health services today. In the UK and many other European countries nearly one in ten patients acquires a HAI.

## Surgical Site Infections (SSIs)

Surgical site infections (SSIs) are an important cause of healthcare associated infections. In the UK, they account for 14% of all HAI and have been estimated to nearly triple the length of a hospital stay.

However, infection rates associated with orthopaedic surgery are around 1%, and many researchers believe this is a direct result of the use of Ultra Clean Ventilation (UCV) systems in orthopaedic operating theatres.

But there is no room for complacency. *Staphylococcus aureus* (both in the form of MRSA and MSSA), along with a number of other micro-organisms, are still to be found in many operating theatres.

The use of Howorth's Exflow™ UCV has been proven to reduce the occurrence of micro-organisms within the operating theatre and more specifically at the wound site.

## Antibiotics

Antibiotics are often seen as complementary or even alternative to ultra clean operating theatres. However, there is an increasing consensus that a major driver of antimicrobial resistance is the use and particularly overuse/misuse of antimicrobial agents (antibiotics).

There is also growing evidence that antibiotic use is a major contributor to the development of *Clostridium difficile*.

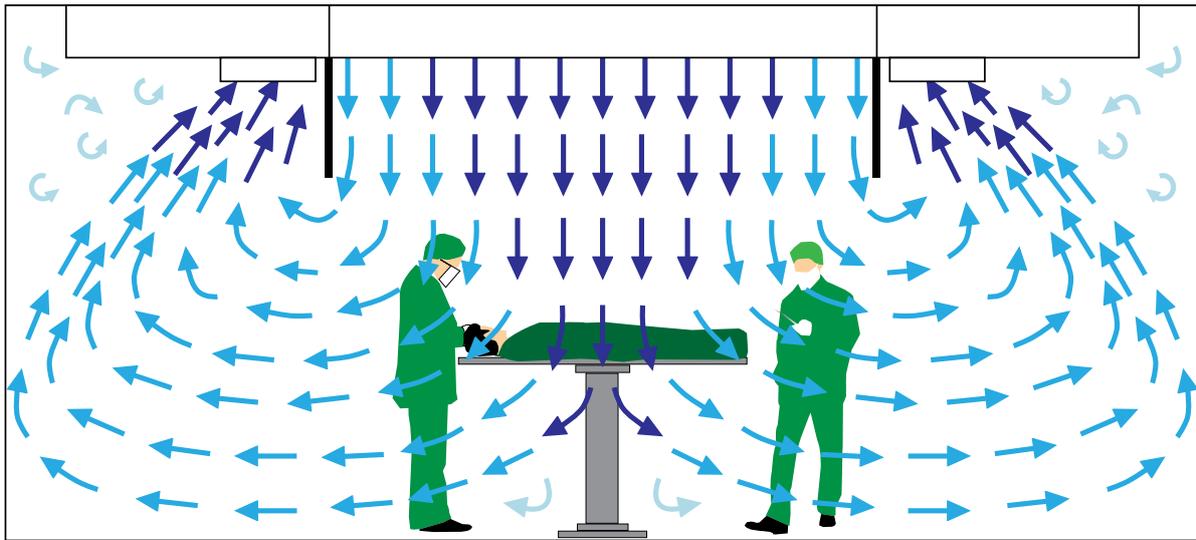
Thus the optimal use of antimicrobial agents involves a balancing act, with a need to use antibiotics to treat infections on the one hand, and a need to try and reduce antimicrobial prescribing in order to contain or reduce the occurrence of resistant pathogens, on the other.

The utilisation of ultra clean theatres is a proven way to reduce surgical site infection without the excessive use of antimicrobial agents.



# Exponential Airflow Technology

Howorth's exponential flow system (Exflow™) offers superior levels of patient protection through its unique engineered air profile.



## Exponential Flow

In addition to the standard benefits that an ultra clean canopy can provide, i.e. bathing the patient in sterile HEPA filtered air, the unique graded flow profile of the Exflow™ (higher flow in the centre) helps to overcome buoyancy related updrafts, while the exponential flow path assists in carrying away any contamination generated by the surgical team.

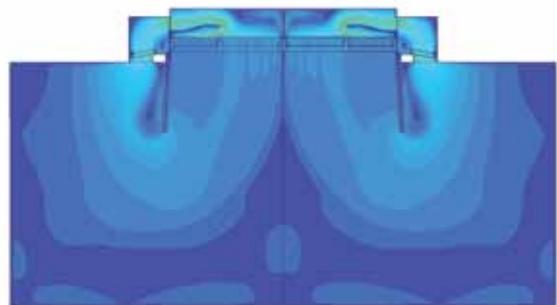
The Exflow™'s air streams also create a barrier against the entrainment of contaminants from outside the clean zone.

## Computational Fluid Dynamics (CFD)

Computational fluid dynamics (CFD), also known as flow visualisation, is a type of computer-aided engineering program that uses numerical methods and algorithms to solve and analyse complex fluid flow problems.

At Howorth, we utilise CFD as a key tool to support our ongoing project engineering and as an integral part of our product development process.

One of the key advantages of CFD is that it enables a variety of possible design solutions to be quickly assessed, the results of which can then be visually studied, hence the term "flow visualisation".



# New Build Theatres & Suites

A new Theatre Department complete with Ultra Clean Theatres and state-of-the-art equipment in less time than you might think.



Howorth is able to design, build and install operating theatres and suites, including critical care units, TSSUs aseptic suites, and all clinical environments.

Our highly experienced team of project managers and engineers have successfully undertaken a variety of turnkey healthcare construction projects. Whether working alone or in collaboration with one of our partner companies, we will ensure that your new facilities are delivered on time and to budget.

Our service includes the undertaking of a full feasibility study which can include layout proposals, drawings, options and budgetary pricing. We offer:

- Full Turnkey Projects
- Fast Track Programmes
- Multiple Building Material Options
- External or Internal Construction
- Complete Supply of HVAC and Air Management Systems, including Ultra Clean Ventilation
- All Work Fully Compliant with HTM and Other Standards
- All Services Lamps, Pendants and Other Equipment Fully Fitted, Tested and Operational

## Modular Building Solutions

Configured to suit your specific requirements and site conditions, Howorth's modular healthcare buildings are factory built and brought to site in rapidly assembled sections. Whether your capacity issues are short-term or permanent, our modular buildings offer you a flexible solution, and offer:

- Whole-life Cost Savings
- Rapid Deployment
- Reduced Site Disruption
- Strict Production Quality Control
- Permanent or Relocatable Buildings
- M and E Plant Rooms Fully Fitted Off-site
- Reduced Maintenance
- No Wet Trades

Howorth modular healthcare buildings provide the rapid solution to your needs without compromising quality, design or functionality.





EXFLOW

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# Theatre Refurbishments and Upgrades

In under a month, you could have a virtually new operating theatre, complete with Exflow™ Ultra Clean Ventilation, and fully compliant with HTM 03-01.

## Increase Throughput, Reduce Infection Levels

Howorth has refurbished hundreds of operating theatres, transforming them in just a few weeks into state-of-the-art, Ultra Clean, fully HTM compliant facilities.

Whether you are planning to extend an existing structure, convert a redundant area into a new operating department or upgrade an old facility, we have the experience and expertise to make your plans a reality.

## Turnkey Solutions

Howorth's cost effective design, manufacturing and comprehensive installation service will provide additional clinical capacity with minimum downtime.

Upgrade your existing facilities to a high performance Ultra Clean operating theatre, quickly and economically. Fully Compliant with HTM 03-01 standards, we can provide:

- Ultra Clean Exflow ventilation system
- Medical Gas Pendants
- Surgical Lighting
- Theatre Control Panels
- Isolated/Uninterrupted Power Systems
- Flooring and Ceiling Replacement
- Decoration

Our theatres are fully commissioned and validated, sterilised and ready for operational use.

## Audits, Surveys and Designs

Without charge or obligation, we will undertake an initial feasibility study, develop a layout proposal and produce budgetary pricing. As part of this free service we can typically offer:

- Audit of current facilities to assess their potential for compliance with current regulations
- Physical site inspection
- Testing to measure performance against design criteria
- Full written proposal, including budget pricing
- Layout drawings and schematics
- Provisional project schedule

We can then work with you to develop a more detailed design in order to furnish you with a fixed price quotation.



# Theatre Control Panels

Theatre Control Panels are a key part of any Operating Theatre. Howorth's panel is clear, easy to use and can be fully integrated with the Exflow™, surgical lights and other theatre systems.



Howorth's range of theatre control panels provide the surgical team with environmental controls and equipment monitoring alarms, together with clocks and many optional extra facilities, including X-ray film viewers or monitor screens.

The panels are fully HTM 03-01 compliant and can be mounted into either a stainless steel fascia or behind a polycarbonate membrane.

The membrane option offers the advantage that all switches and lamps are mounted behind the flush, easy-clean membrane.

Also exclusive to the Howorth's theatre panel is the graphic visual representation of the Exflow™ unit and operating lamps for ease of recognition, monitoring performance and control switching.







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# Pendants & Ceiling Service Units

The Howorth Exflow™ range of service pendants and workstations is the only pendant system specifically designed to work in conjunction with an ultra clean air canopy.

## Exflow Pendant Range

There is a variety of pendant options available within the Howorth Exflow™ range, with varying ranges of movement to suit your requirements. The newest addition to the family is the Exflow Multi-Movement Pendant which offers a streamlined, easy to clean unit which rotates in and out of the Exflow™ UCV. An articulated option is also available.

Howorth also offers a full range of equipment carrying pendants, from endoscopy racks, through monitor arms, to critical care pendants.



The Howorth Exflow™ range of service pendants and workstations are all CE registered and fully compliant with UK and other international standards.



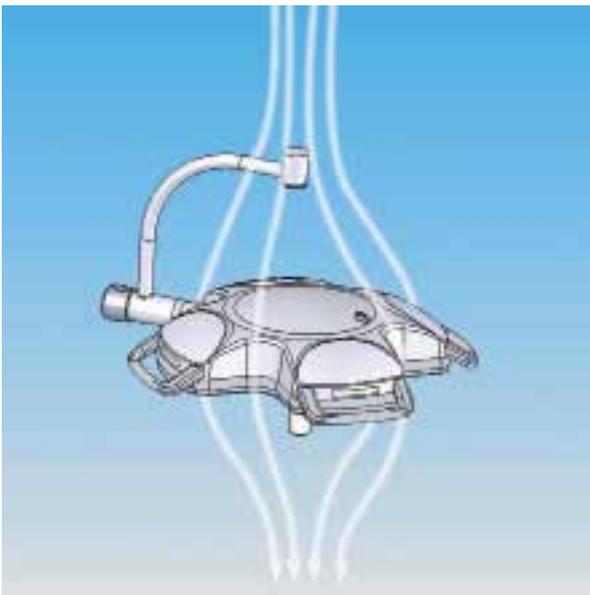
## Media Bridges

Media bridges or beams offer an alternative to traditional pendants. Howorth is able to offer media bridges fully integrated into the Exflow™ UCV. As with our pendants, these systems can be configured to your specific needs. They are capable of delivering electrical services, medical gases, data, video and other services.



# Lighting for Ultra Clean Theatres

Specialist airflow requires specialist lighting - Howorth has the solution.



## Getting the Right Light

Clinical lighting is crucial within the operating theatre environment. Howorth continues to work with major surgical lighting suppliers around the world, to offer advice and guidance on the most appropriate and effective lighting solutions for use beneath a Howorth Exflow™ UCV Canopy.

Second generation LED lighting is now available providing surgical users with optimal lighting levels, colour index manipulation, low ambient temperatures, slimline casing design and integration with HD digital imaging. LED lighting also facilitates lower energy consumption and reduced maintenance.

## The Importance of Lighting under UCVs

In addition to the principle purpose of any surgical light, i.e. to provide adequate levels of lighting for the clinical team, surgical lights can have a substantial influence on the performance of an Ultra Clean Ventilation system and hence the overall sterility of the operating theatre.

Factors such as the light's cross-sectional area, the shape of the light, and amount of heat that it dissipates, all have an influence upon the surrounding airflow. This, in turn, impacts upon the ability of the UCV to operate effectively.



# Integrated Operating Theatres

Providing communication design consultancy and installation for ultra modern operating theatres, incorporating surgical imaging and digital video communication systems.



## Advanced Technology

To further enhance our commitment to providing the most advanced technology for our clients, Howorth is working in association with leading healthcare communications design consultancy, OR Networks. The company specialises in designing and equipping ultra-modern theatres with OR-TV surgical imaging and digital video communication systems.

OR-TV transmits live surgical images to a local seminar room, or across thousands of miles, via telecommunications systems for live broadcasts. Studio-quality microphones and sound systems provide crystal clear two-way audio links.

It is transmitted over the unique OR-Cast system, which is “anything-in and anything-out”, and is compatible with all digital video formats over N3, ISDN, satellite, fibre networks and public Internet.

As well as employing advanced technology, OR-TV is a highly user- and patient - friendly choice for the operating theatre:

- Medical staff can view video images on flat panels mounted on positionable arms for optimised viewing angles
- Equipment is controlled from single or multiple touch panels, strategically placed in the theatre or lecture facility
- Infection control is enhanced by reducing the amount of equipment and people brought in and out of the theatre
- All video equipment interconnects via integrated cable systems, minimising trailing leads, thus creating ergonomic surgical workplaces with less clutter and more floor space





# Aftermarket Support & Servicing

We can offer an ongoing support service over the full lifetime of our products and beyond, to meet your current and future needs.



## Experience

In our 150 year history we have learnt many things, the most important of which is to ensure our customers get outstanding levels of product support and aftermarket service.

All of our installation, commissioning and service teams utilise only fully trained, skilled personnel. We use genuine factory approved OEM spares, with guarantees on all our work coming as standard.

## Installation and Commissioning

We are totally focused on minimising downtime and disruption, delivering you a theatre that operates as quickly as possible. Our installation service covers every aspect of successful project implementation.

Howorth's commissioning of all air systems includes an initial validation to HTM 03-01 and all other relevant standards.

## Service and Validation

Regular servicing, validation and preventive maintenance of your clean air systems and other theatre equipment is not only a legal obligation, but makes economic sense as well.

Howorth's maintenance packages can be tailored to suit the level of support you require, from parts-only to all-inclusive, multi-year service contracts and anything

in between, including a number of emergency call-out options.

The Engineering Health Technical Memorandum 03-01 'Specialised Ventilation for Healthcare Premises' (HTM 03-01 Part B), dictates that operating theatres and their accompanying ventilation systems should be inspected quarterly and have their performance fully validated annually. As the leading supplier of UCV systems, Howorth is uniquely positioned to be able to provide a comprehensive aftermarket service.

Included within the annual validation to both conventional and ultra clean operating theatres, Howorth engineers will complete a full survey of the air handling plant, along with air volume measurements of the full theatre suite, room differential pressures, mechanical and electrical function checks, alongside a standard service to the ultra clean canopy including velocity profiling and HEPA filter DOP testing.

On completion of the theatre validation, a full comprehensive report will be submitted.

Other services such as clean room and aseptic suite validation, servicing of safety cabinets, ductwork cleaning and (with our sister company Westbury Filtermation) supplying and installing a wide range of filters and spares, makes Howorth Air Technology a one-stop-shop for all your clean air requirements.



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