



# INDOOR AIR QUALITY – VERIFICATION & VALIDATION OF SPECIALISED VENTILATION SYSTEMS

**Modern systems must be designed and operated to achieve a proper balance between air quality, thermal comfort and energy consumption. In healthcare premises, ventilation is used extensively in all types of facilities to provide a safe and comfortable environment for patients and staff. Specialised ventilation is provided in primary patient treatment areas such as operating departments, critical care units and in sterile services departments and pharmacies to ensure compliance with quality assurance.**

If ventilation systems do not achieve and maintain the required standards there is an increased health risk to patients. Indeed the link between surgical site infection and theatre air quality has been well established. UCV systems are designed to provide a zone around the patient that is effectively free of bacteria-carrying airborne particles during an operation.

Ventilation systems in healthcare premises are becoming increasingly sophisticated. Patients and employees have a right to expect that these systems will be designed, installed, operated and maintained to standards to ensure it will adequately and satisfactorily fulfill its desired functions.

## Health Technical Memorandum 03-01

The Health Technical Memorandum (HTM) 03-01 – “Specialised ventilation in healthcare premises” has been produced to supersede ALL previous versions of HTM 2025 – “Ventilation in healthcare premises”.

Key issues HTM03-01 addresses include:

- The Verification testing of Critical Ventilation Systems, including pre 2007/8 theatres.
- The Validation testing of New Build conventional and ultra-clean ventilation (UCV) systems.
- The prevention and control of healthcare related infections.
- Layout of minimum requirements for the design of air handling units (AHU) with regard to safe access for routine inspection and maintenance and the control of Legionella.
- Controlling exposure to harmful organisms, toxic and anaesthetic substances.

## Verification

The objective of the Verification processes is to establish that the critical ventilation systems, as defined by HTM03-01, remain fit for purpose and are achieving an adequate operating capacity by satisfying the following criteria:

1. The AHU conforms to minimum standards;
2. The fire containment has not been breached;
3. The general condition of the ventilation system is adequate;
4. The fabric of the area served is satisfactory;
5. The system performance is adequate with respect to the functional requirement:
  - a) The measurement of room temperatures and relative humidity;
  - b) A full measure of the supply and extract air flow rates;
  - c) The calculation of room air-change rates if applicable;
  - d) The measurement of room differential pressures if applicable;
  - e) The measurement of room noise levels;
  - f) Air-quality checks if appropriate;
  - g) A check on control functions.

## New Build Conventional & Ultra Clean Ventilation (UCV) Unit Validation

In order to ensure the complete system operates correctly and achieves design requirements, it will be necessary to validate the system as a whole from the air intake through to the extract discharge. HBE can provide the following services to ensure compliance with HTM03-01 and hence validate the suitability and performance of an UCV suite.

LEGIONELLA CONTROL

INDOOR AIR QUALITY

ASBESTOS MANAGEMENT

HVAC COMMISSIONING

FIRE RISK ASSESSMENT

ENVIRONMENTAL SERVICES

OCCUPATIONAL HEALTH & SAFETY

DISABILITY ACCESS AUDIT

CDMC/PSDP

COMPLIANCE TRAINING

WEB-BASED COMPLIANCE SYSTEM

(continued)

### 1. Conventional Theatre Standards

- Supply AHU will have achieved the minimum standard
- Operation of Fire Dampers will have been proved
- Supply & Extract Flow rates will have achieved their design values
- Room temperature, humidity & differential pressures will be correct

### 2. Challenge tests:

- The UCV terminal is correctly assembled and sealed;
- The terminal filters are correctly sealed in their housings;
- The terminal filters are of the same grade, of uniform quality and undamaged.

### 3. Air velocity measurements:

- A sufficient quantity of air is being delivered to the terminal;
- The terminal quadrants are in balance;
- The air flow has sufficient velocity to reach the working plane.

### 4. An entrainment test:

- Outside contaminants are not drawn into the UCV terminal.

### 5. Visualisation techniques:

- Establish an understanding of overall system performance.

### 6. Noise measurement:

- Working conditions are satisfactory.

### 7. Control systems checks:

- The system operates as specified.

### 8. Biological monitoring:

- Determine the effectiveness of the system in use.

### Our Services

- HTM 03 Verification testing of Critical Ventilation Systems
- HTM 03 Validation testing of New Build Conventional & UCV
- Assessment of Category 3 & 4 Laboratories - as required by the HSE & the Advisory Committee on Dangerous Pathogens

- Pharmacy Aseptic Suites – should conform to the European Guide to Good Manufacturing Practice
- Sterile Services Dept; Inspection & Packing Rooms – ISO 14644 & Building Note 13
- LEV Systems – CoSHH Regs

### Web Based Risk Compliance System

We understand how important it is to have access to up-to-date information. With HBE, you have the option to access your reports via our secure online Risk Compliance System, MBR, detailing the findings of all tests conducted. The reports will conclude with a clear statement as to whether the ventilation system achieved or did not achieve the desired standard and highlight any actions that need to be taken.

### About HBE Risk Management

With over 30 years' experience as trusted advisors to some of the UK and Ireland's largest private and public sector organisations, HBE Risk Management, has the knowledge and expertise to ensure that our clients' buildings not only meet, but exceed all legislative and health and safety requirements.

As an R&D-led organisation, our unrivalled team of health and safety experts, engineers and industry-leading scientists – working from locations right across the UK and Ireland – is constantly innovating and diversifying to ensure that we can respond to our clients' needs with the latest, state-of-the-art health and safety solutions..

Whether you are responsible for an acute hospital, a manufacturing or industrial facility, an office block, a school, a sheltered housing scheme or other building to which the public have access, our industry-accredited team offers leading environmental health expertise and specialist services.

For more information about verification and validation of your ventilation systems call HBE Risk Management, email [info@hberm.com](mailto:info@hberm.com) or visit [www.hberm.com](http://www.hberm.com)



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