

## CASE STUDY

### MAT AT IMPERIAL COLLEGE LONDON DELIVERING FACILITIES FOR WORLD-LEADING RESEARCH



In 2020, Imperial College London approached Medical Air Technology (MAT) to discuss the provision of two new ISO Class 6 cleanrooms. The cleanrooms, located within the Sir Michael Uren Hub, would allow the university to further extend the range of research that could be carried out within its new White City campus.

After completing several previous cleanroom and containment laboratory projects at Imperial College London, MAT was proud and excited to once again have the opportunity to work in partnership with such a prestigious institution to deliver the new research environments.

After initial designs were developed and approved, building work began in summer 2020 and the new cleanrooms were handed over in June 2021, the entire project having taken just 11 months.

#### **The Sir Michael Uren Hub at Imperial College London**

Imperial College London is a global top ten university with a world class reputation. Its alumni include 14 Nobel Prize winners, including Sir Alexander Fleming.

To enable the highest level of research, the university offers the best possible facilities. One of its flagship buildings is the £90m Sir Michael Uren Hub, located at the White City campus. Designed as a collaborative facility, the 13-storey Hub provides space for Imperial's world-leading researchers, engineers, scientists and clinicians to work alongside one another to investigate some of the twenty first century's most urgent biomedical and healthcare problems.

#### **FEATURES CONTAINED WITHIN THE CLEANROOMS:**

- **High standard ISO Class 6 clean areas with air change rates from 50 to 70 per hour**
- **High load bearing raised and ventilated floor**
- **Modular cleanroom ceiling with HEPA fan filter units**
- **Complex CMR airflow and room pressure controls.**
- **Complete mechanical and electrical installation including air handling units, HEPA filtration and specialist airflow and pressure controls**
- **Piped specialist, hazardous and house gases, including vacuum systems**
- **Hazardous gas emergency release abatement systems**

## What is Meant by ISO Class 6?

The new cleanrooms MAT was commissioned to design and build both had to be ISO Class 6 standard to safely accommodate the semiconductor research that would be carried out in them. Class 6, as defined in ISO 14644-1:2015 Cleanrooms and Controlled Environments, refers to the cleanliness levels that must be met within the cleanroom.



In addition to having a high air change rate, an ISO 6 environment must be accessed through airlocks to preserve pressurisation differentials and prevent the migration of particles from outside into the cleanroom space, increasing one class at a time. So, users should pass through an ISO 8 environment, then an ISO 7 environment, before entering the ISO 6 cleanroom.

## MAT – Designer and Main Contractor

MAT acted as the designer and main contractor on the cleanroom project, working closely with the university to ensure minimum disruption to the other activities being carried out in the Sir Michael Uren Hub.

The team developed a design built around the complex research equipment and specialist tools that would be housed in the new cleanrooms. Work included final services connections and extensive bottled and house gases installation to several hazardous gases and associated gas detection systems.

## THE HVAC SYSTEM

HVAC design is complex and requires a highly skilled delivery team.

MAT is an expert in the provision of specialist HVAC systems. The HVAC system is at the heart of cleanroom design. Cleanroom HVACs differ from standard systems in that they have an increased air supply, different airflow patterns, use of high efficiency particulate air (HEPA) filters, and room pressurisation, and clean to dirty room air cascades.

In order to meet the required air cleanliness, the air must pass through HEPA filters. The lower the ISO class, the more often the air must pass through the HEPA filter. This 'air changes per hour' rate (ACH) and the room volume are used to calculate the HVAC's required airflow. A conventional HVAC system usually makes two to four air changes per hour, whereas in a cleanroom it can range anywhere from 10 to 250 or even more.

The ISO Class 6 cleanrooms at Imperial College London require air change rates from 50 to 70 per hour.

## A Specialist Contractor

MAT designs, manufactures and installs bespoke critical ventilation systems and turnkey project solutions for new build and refurbishment projects. As a specialist contractor with many years' experience, we are passionately committed to improving patient protection and end-user safety in demanding clinical, research and drug production arenas.

We have extensive experience of working in live environments and understand the challenges around delivering a project within an operational scenario.

In addition, MAT FM provides a range of competitively priced and highly effective service and maintenance packages for all core products and turnkey solutions offered by MAT or other suppliers, ensuring that equipment is maintained, serviced and validated correctly for optimum performance.



Written and distributed by:  
Further information:  
Call:  
Email:

Medical Air Ltd  
Will Evans  
+44 (0)844 871 2100  
will.evans@medicalairtechnology.com

**Need solutions? Let's work together**

At Medical Air, we aim high - we are committed to being the automatic choice for every life sciences facility that needs safe, clean, productive environments.