Guardtech group

CLIENT CASE STUDY

GRAPHENE RESEARCH FACILITY

ISO Class 5, 6 & 7

THE CLIENT

University of Cambridge – the Cambridge Graphene Centre investigates the science and technology of graphene, carbon allotropes, layered crystals and hybrid nanomaterials. The innovation centre allows partners to meet and establish joint industrial academic activities to promote innovative and adventurous research with an emphasis on applications.

THE BRIEF

Cleanroom Solutions were tasked with building a cleanroom facility split over two floors, incorporating a unique passenger lift between floors, air shower, specialist E-beam close control room (+/- 0.1 C), ISO5 & 6 areas, plus wet process benches with extract set back facility and localised ISO5.

R&D

21°C+/- 0.1

500m²

UNIVERSITY OF CAMBRIDGE

"A very detailed design..."

Cleanroom Solutions Project Director Sean Gaylard said: "This project was in a brand-new building, split over two floors. The first floor was offices and we had a lift shaft to take people between the two floors. When designing the cleanroom, [Cleanroom Solutions Director] Jan Pyrgies had to create a bespoke 'clean shaft' to ensure that the work being done in the cleanroom wasn't compromised by people coming in from the other floor.

"The E-Beam, which sits in the ISO5 room, is an expensive piece of equipment – and when it's fully operational, it has to run at 0.1 of a degree. So to control that Jan had to come up with a unique design for controlling humidity and temperature. We did it through a combination of chilled and hot water and sensible cooling coils. It was a very intricate control system – AHUs on the roof, chillers, a very detailed design.

"It was a complex project, which really challenged us, and we were delighted with the final result."

Sean Gaylard
Project Director

Cleanroom solutions

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Contact Us

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THE TECH SPECS

Fresh air to the cleanroom(s) provided via a roof mounted Air Handling Unit (AHU) complete with frost coil, cooling coil and reheat coil, incorporating full Trend BMS controls. A specialist process gas system, complete with extract and abatement system, plus a monitored leak detection and O2 depletion monitoring, DI water system.

Electrical installation: Full installation, including sub main distribution, 230v sockets, 3-phase power, data cabling, CCTV, fire detection/aspirator and gas leak detection wiring.

ISO7 second floor areas: Conventional air flow design incorporating a plenum and FFUs, complete with sensible cooling coils utilising chilled water and trim heaters to provide more stable room temperatures. Conventional low level return air grills returning to the plenum areas via external service chase/corridor areas.

ISO5 ground floor areas: Full laminar flow design incorporating a plenum & FFUs. complete with sensible cooling coils utilising chilled water and trim heaters to provide more stable room temperatures. A raised access floor with air grills provided the air flow path back to the plenums via the service corridor areas and built-in room return air ducts. Access to the ground floor cleanrooms was provided by a passenger lift with HEPA filtration at high level, cleaning the sealed lift shaft, as well as an air shower prior to entering the ISO5 areas.

ISO5 area (E-Beam room): Ground floor area with full laminar flow design, incorporating a plenum & FFUs, complete with sensible cooling coils utilising chilled water and trim heaters to provide more stable room temperatures (+/-0.1 degree C). A raised access floor with air grills provided the air flow path back to the plenums via built-in room return air ducts.

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THE RESULT

Cleanroom Solutions Project Director Sean Gaylard said: "This project was in a brand-new building, split over two floors. The first floor was offices and we had a lift shaft to take people between the two floors. When designing the cleanroom, [Cleanroom Solutions Director] Jan Pyrgies had to create a bespoke 'clean shaft' to ensure that the work being done in the cleanroom wasn't compromised by people coming in from the other floor.

"The E-Beam, which sits in the ISO5 room, is a very expensive piece of equipment – and when it's fully operational, it has to run at 0.1 (achieving 0.05) of a degree. So to control that Jan had to come up with a unique design for controlling the humidity and temperature. We did it through a combination of chilled and hot water and sensible cooling coils. It was a very intricate control system – AHUs on the roof, chillers, a very detailed design.

"Using heating and cooling at the same time often surprises people, but it was critical to control the temperature in this way.

"It was a complex project, which really challenged us, and we were delighted with the final result."