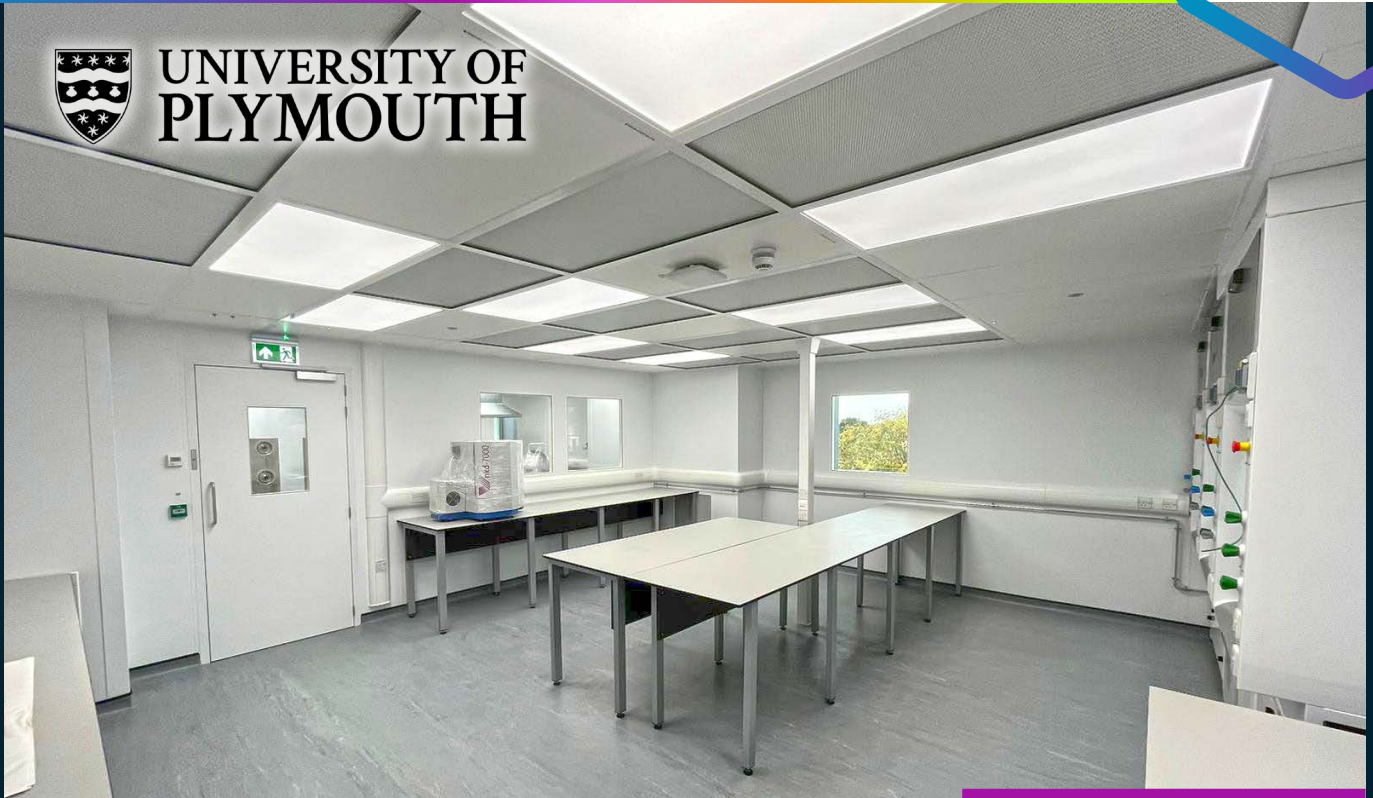




**UNIVERSITY OF
PLYMOUTH**



THE CLIENT

The University of Plymouth – a broad-based, research-intensive university, open to all who can benefit from a University of Plymouth education, delivering excellent interdisciplinary research, experiential education and civic engagement.

THE BRIEF

Cleanroom Solutions were engaged by a Principal Contractor to design and install ISO5 cleanrooms & ISO8 laboratories for Nanofabrication and Analytical research purposes, including a Personnel Airlock and bespoke Air Shower. This project was part of the university's £63 million Babbage Building – a state-of-the-art space to inspire the engineering and design pioneers of the future.



Semiconductor/
R&D



21+/-2C
45%RH +/-10%



125m²



“A job well done by all involved..”

Guardtech Group Projects Director Sean Gaylard said: “For a relatively small footprint, this was quite an interesting and complex project, particularly given the nature of the exciting NanoFab research the students would be conducting in the rooms.

“From design to install to commissioning, the Cleanroom Solutions team produced a top-class controlled environment, working in a flexible manner to ensure the cleanroom was up to our usual standards. This included a bespoke Air Shower that we incorporated beautifully into our GT Shell panelling system. Overall, a job well done by all involved.”

Sean Gaylard
Guardtech Group
Projects Director



**UNIVERSITY OF
PLYMOUTH**



cleanroom
solutions

NANOFAB R&D LAB



THE TECH SPECS

A controlled environment designed, installed, cleaned and commissioned by Guardtech Group built to the following specification:

- ◆ **Structural:** GT Shell Plus wall panel system, GT Access Plus single and double doors, GT Vision glazing panels, GT Deck Plus vinyl flooring system, suspended T50 ceiling grid, plenum top created utilising existing concrete slab (sprayed),
- ◆ **Electrical:** GT Lux Plus LED lighting panels complete with three-hour duration emergency lighting, three-compartment PVC dado trunking with 13amp sockets and CAT6 data outlets, full fire alarm system designed and installed to include smoke detectors, sounders, aspirator system and duct sensors.
- ◆ **Mechanical:** Bespoke GT Air Max Air Handling Unit (AHU) with ductwork, 4sqm bespoke three-way interlocked personnel air shower for entry to ISO5 areas, GT Flow

Pro AC Fan Filter Units (FFUs) with H14 HEPA filters – including roomside change and controls, DX cooling, Variable Air Volume Devices (VAVs) on return air ducts to sync with Fume Cupboards' extract and fresh air balancing.

THE CHALLENGES

Fan-do attitude: When we initially began work on the project, the client had opted to build the lab spaces themselves. The brief was to design the ISO8 labs, supply the relevant FFUs, filters, grilles to achieve the classification and then validate and commission. However, the Fan Filter Units had all been fitted in incorrect positions and so the Cleanroom Solutions team carried out additional remedial works were carried out in order to achieve a clean plenum condition.

Balancing act: Balancing the cleanroom provide particularly tricky with this project, with Constant Air Volume (CAVs) and Variable Air Volume (VAVs) devices placed on the return air ducts from each room so that as the extract was activated, the VAVs were

closed down to maintain the pressure in the room. That then activated a damper on the fresh air, so at times it was running at almost 100% fresh air, as the VAVs virtually closed down to around 10% so the fresh air had to open up to maintain the air volumes. Getting that complex system balanced took some time, but luckily the Cleanroom Solutions team have plenty of experience with such complex air change arrangements.

Shower power: A bespoke three-way interlocked personnel Air Shower was installed that was intelligently incorporated into our GT Shell wall panel system. This featured one door from the changing area that then led into a NanoFab process room and an Analytical process room. All three doors were interlocked to ensure process safety. Our Install Engineers configured the system to ensure none of the doors could be opened whilst the shower was in use.

Fire safety: Green emergency break glass units were incorporated into the bespoke Air Shower in order to keep the occupants safe at all times. As well as this, all of the FFUs, HVAC and controls were

NANOFAB R&D LAB

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linked to the fire alarm system so that fresh air wouldn't be drawn through the system in any cases of fire alarm activation.

Sticking to our principals: Whilst the project generally went pretty well, we prefer to assume as much responsibility as possible on our builds and pride ourselves in the thorough co-ordination, planning and management processes and application of CDM rules and regulations.

THE RESULT

Guardtech Group Projects Director Sean Gaylard said: "For a relatively small footprint, this was quite an interesting and complex project, particularly given the nature of the exciting NanoFab research the students would be conducting in the rooms."

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