

SEMICONDUCTOR FACILITY

TTP



THE CLIENT

TTP – an independent technology firm where engineers and scientists work together to invent, design and develop new products and technologies. TTP develop proof of concept ideas across a wide spectrum of industries, creating breakthrough solutions for commercial value and technological benefits.

THE BRIEF

To repurpose a small office for outsourced R&D semiconductor manufacturing. The area, which included the ceiling, needed to be totally stripped out and the space maximised to have as much footprint in the cleanroom as possible. In all, a complete fit-out with external AHUs, dedicated extraction system, nitrogen generator and storage vessel and bespoke chemical wet benches.



Semiconductor 21°C +/- 2°C & 50+/-10% RH 150m²



“They have a knack for finding good solutions!”

“Guardtech built our bio-lab and microfabrication cleanroom and we have a very good working relationship. Their quotes are always reasonable and they react quickly.

“For the building of the cleanroom, they tackled the most challenging of problems – working in the smallest of spaces, dealing with metal girders in the way of ducting and working well with on-site contractors. They have a knack for finding good solutions!

“They were within project costs and timescales, provided good quality workmanship and a great after-sales service, including maintenance contracts, validations and certifications. We highly recommend Guardtech for any future TTP or external cleanroom projects.”

Fred Hussain,
MEMS Manager, TTP





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THE TECH SPECS

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

◆ **Structural:**

[GT Shell Plus PIR Wall Panels](#), [GT Lid Lite Ceiling Grid & Tiles](#), [GT Access Lite Doors](#), [GT Deck Plus Vinyl Floor Capped & Coved](#).

◆ **Electrical:** 13amp double sockets flush-mounted, three-phase power.

◆ **Mechanical:** Filtration provided by H14 HEPA filters through terminal hoods and room accessible gel seal filters. Extraction via one dedicated fan for acids and a separate fan for solvents. Bespoke air handling units with dedicated chiller and electric heater.

◆ **Furniture:** Storage racking, stainless steel benches, stepover bench with

integrated garment rail, stainless steel lockers, emergency escape panel, laminar flow units, emergency showers, nitrogen generator and storage vessel, bespoke chemical wet benches.

◆ **Monitoring:**

Standard magnehelic monitoring.

THE CHALLENGES

Ceiling height: Existing ceiling joists were just 2.15m high in some sections of the facility. The restrictive nature of the ceiling impacted Guardtech's design in terms of where services could be run and where lighting was placed. This meant an extensive design process was required to overcome the limitations of the troublesome joists.

Ductwork: Some creative refashioning was needed. The ductwork serving the extraction units and air handling unit was restricted and had to come through a lab canopy and then into the cleanroom area. Guardtech fabricated bespoke ductwork to fit through a diamond-shaped portion of

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a steel beam – an innovative amendment to a section of the ductwork which was, as usual, cylindrical.

Wet benches: Guardtech installed back-to-back wet benches in the facility and so also needed to create a service channel between the two. This is so they could be maintained from outside the cleanroom environment while minimising the impact on the footprint.

Laminar flow: Again, because of the height restrictions, this unit was essentially too tall for the room. So Guardtech had to use all their design and construction expertise and lateral thinking to 'poke' the unit through the ceiling and ensure maximum internal head height of cleanroom while navigating a crowded void.