Research Collaboration
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Which fit is best for you?
Cleanroom Access
Processing, Prototypes & Consultancy
Research Collaboration
Three partnership options

Research Collaboration
- Partner with leading researchers from across Chalmers University of Technology
- Innovative R&D solutions for industry & academia
- Responsive to our partners’ needs

Cleanroom Access
- Your own employees access our state-of-the-art research laboratory
- Creative & innovative environment
- Education & training available

Contact: Head of Department
stefan.bendisch@mc2.chalmers.se
+46 31 772 1881

Processing, Prototypes & Consultancy
- Professional, confidential, and expert cleanroom engineering staff
- Fabrication according to your specs
- Process development to meet the functionality you require

Contact: External Processing Coordinator
goran.metzig@mc2.chalmers.se
+46 31 772 8496

The Process Laboratory and its Strategic Focus Areas

The Process Laboratory at MC2
The Process Laboratory at MC2 is a world-class university cleanroom for research into and fabrication of micro- and nanotechnology. It is managed by Chalmers and is part of the Chalmers Microtechnology and Nanoscience (MC2) at Chalmers, but is available for the entire university as well as external academic and commercial interests.

Cleanroom operation in its current form was started in 2001. The laboratory is a state-of-the-art facility with 1240 m² of cleanroom classified area with process and measurement tools providing a broad platform for the development and testing of new micro and nano technologies. The laboratory is also a member of m-fab, the Swedish micro and nano fabrication network. The laboratory is connected to the research council, SSF, Vinnova and Knut and Alice Wallenberg Foundation.

MC2's two strategic focus areas have recently resulted in the launch of two processing lines in the Laboratory to complement the flexible processing and fabrication platforms in the laboratory. The lines increase the quality, throughput, and stability of the microwave & nano-quantum devices and components fabricated in the Laboratory.

Strategic Focus Area #1: Micro & Photonic Processing Line
- The microwave and photonic processing line consists of a complete set of process tools for the fabrication of microwave and photonic devices and components.
- Process tools which make up the line are either strictly limited to microwave/photonic devices, or have a limited number of approved processes which have been demonstrated to not have any adverse effects on microwave/photonic processing.
- The line has resulted in improved stability, quality, and yield in the complete process flows used in wide bandgap, low-noise, photonic, and terahertz devices. These are finding use in, for example, space applications for projects run through the European Space Agency. The materials processed on this line are predominantly SiC, GaN, and InP based MMICs as well as GaAs based VCSEs.

Strategic Focus Area #2: Nano & Quantum Technology Line
- The nano & quantum technology line serves to increase the Laboratory's ability to produce state-of-the-art superconducting and quantum devices and nano or quantum components in higher yield. The line is anchored around Chalmers' long history and competence within electron beam lithography.
- Particular focus is being laid on attaining high yield on structures smaller than 20nm. With research and development in nanotechnology booming, this process line positions Chalmers to continue to be innovative for years to come. A very broad range of applications is served by this line, from bioelectronics to single electron devices.

Electron Beam Lithography
- The laboratory provides to commercial and academic clients, patterning a wide variety of substrates for diverse applications.

Thin Film Deposition
- A wide variety of metal and insulating thin films can be deposited by a number of evaporation and sputter systems. A brand new FHR 150 mm sputter deposition system with 6 targets along with a Leaker Spectros e-beam evaporation system with 8 sources were installed in the Laboratory during 2004.

Magnetic Processing
- Plasma Processing

- The Laboratory provides to academic and commercial interests.
- The Process Laboratory predominantly to grow III-V materials.
- An EPI 930 MBE system is used in the Laboratory.
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Thermal Processing
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Cleanroom operation in its current form was started in 2001. The Laboratory is a state-of-the-art facility with 1240 m² of cleanroom classified area with process and measurement tools providing a broad platform for the development and testing of new micro and nano-facilities for the entire university as well as external academic and commercial interests.

The Laboratory is also a member of µ-Fab, the Swedish micro and nano fabrication network, supported by the Swedish research council, SSF, Vinnova and Knut and Alice Wallenberg Foundation. These links have given access to a larger infrastructure through the Microstructure Laboratory at Uppsala University and the Electrum Laboratory at KTH in Stockholm.

MC2’s two strategic focus areas have recently resulted in the launch of two processing lines in the Laboratory to complement the flexible processing and fabrication equipment in the Laboratory. The lines increase the process quality, throughput, and stability of the microwave & nano/quantum devices and components fabricated in the Laboratory.

Strategic Focus Area #1: Microwave & Photonic Processing Line
The microwave and photonic processing line consists of a complete set of process tools for the fabrication of microwave and photonic devices and components. Process tools which make up the line are either strictly limited to microwave/photonic devices, or have a limited number of approved processes which have been demonstrated to not have any adverse effects on microwave/photonic processing. The line has resulted in improved stability, quality, and yield in the complete process flows used in wide bandgap, low-noise, photonic, and terahertz devices. These are finding use in, for example, space applications for projects run through the European Space Agency. The materials processed on this line are predominantly Si, GaN, and InP based MMICs as well as GaAs based VCSELs.

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Processing & Education

Electron Beam Lithography
Chalmers and MC2 have many years of experience and are extremely competent in the use of electron beam lithography. Chalmers is the clear leader in EBL in Scandinavia. Currently two JEOL systems are in operation in the cleanroom, including a JBX 9300FS currently writing features down to 8 nm. EBL is one of the most popular processing services that the Process Laboratory provides to commercial and academic clients, patterns a wide variety of substrates for diverse applications.

Thin Film Deposition
A wide variety of metal and insulating thin films can be deposited by a number of evaporation and sputter systems. A brand new FHR 150 mm sputter deposition system with 6 targets along with a Lesker Spectros e-beam evaporation system with 8 sources were installed in the Laboratory during 2004.

Plasma Processing
The Laboratory has a wide assortment of plasma tools for dry etching and deposition.

Thermal Processing
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MBE of III-V materials
An EPI 930 MBE system is used in the Laboratory predominantly to grow III-V based heterostructures for microwave and photonic device applications. The following material combinations are possible: Ga, Al, In / N, P, As.

Education & Training
Education is a further function of the Process Laboratory. In its simplest form, hands-on training on the use of process tools is given by the staff. Classroom instruction is also given first in the form of The Cleanroom Introduction Course, which is a pre-requisite for all who wish to access Laboratory as a user. This covers such areas as safety, handling chemicals, proper cleanroom behaviour and specific information concerning the Process Laboratory. The course is offered on a monthly basis, and at additional times if the demand is sufficient.

A graduate course in micro and nano processing technologies is also offered by the Laboratory. This gives a theoretical introduction to the common processes used in a cleanroom environment.

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