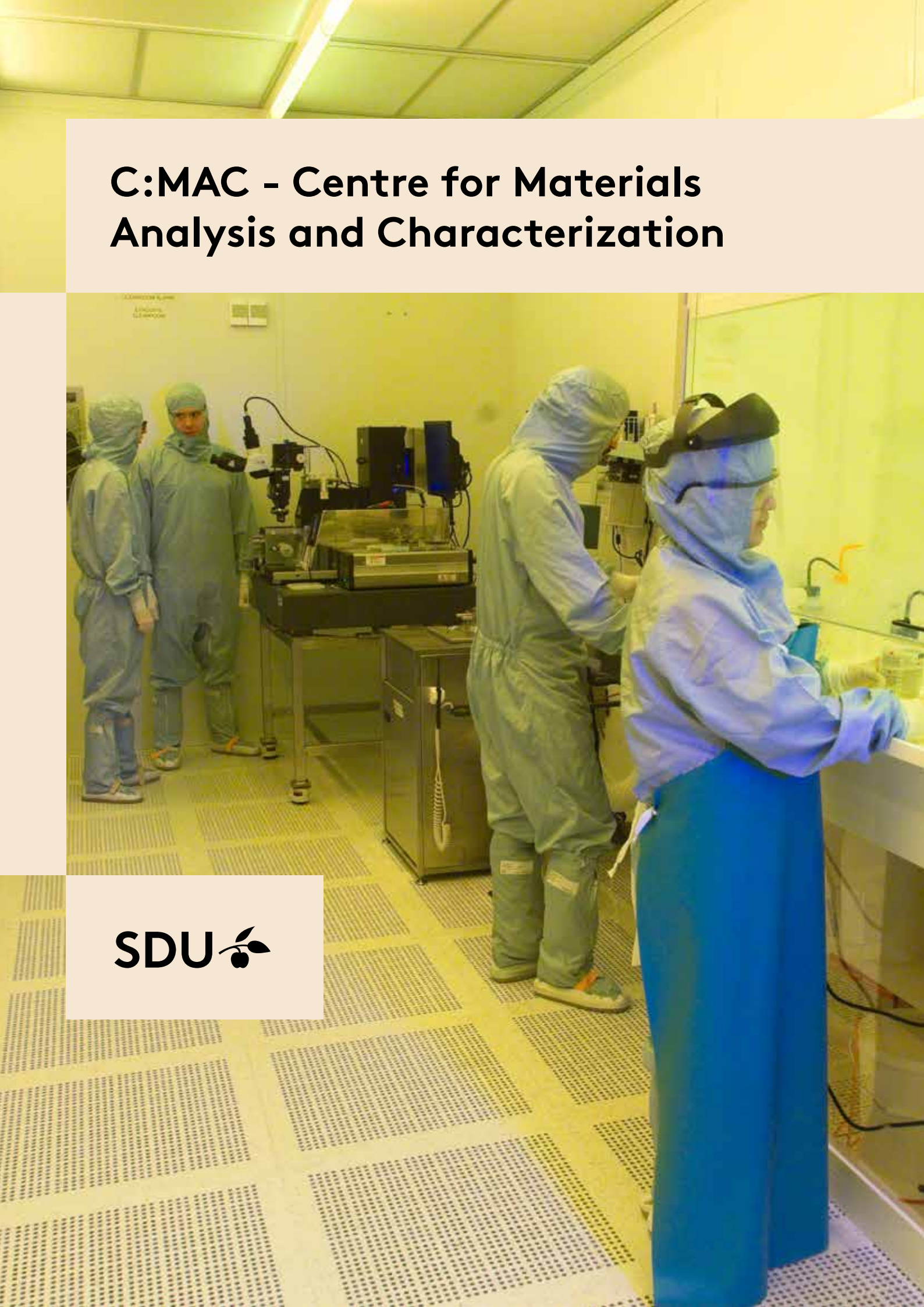
C:MAC - Centre for Materials Analysis and Characterization



SDU

Take a step inside!

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and take a virtual
tour of our facilities

Explore the possibilities at C:MAC

What do electronics and aerospace industry, bioscience and medical science have in common? Their development was only possible through full access to analysis, characterization and cleanroom facilities, as well as deep knowledge about materials, coatings, surfaces and interfaces.

The development of a component or a device requires control of the environment, since dust particles as well as fluctuations in humidity and temperature will inevitably lead to a large percentage of component and system failure. Each step of the fabrication process must be carefully monitored, and the resulting structures must be inspected and characterized to achieve optimum results.

SDU's Centre for Materials Analysis and Characterization is an umbrella unit with the mission to provide swift access to SDU campus Sønderborg's facilities to companies and researchers from various fields. The centre thus acts as a single point of contact. On the next few pages of this booklet we illustrate what is possible at C:MAC.

Enjoy!

Arkadiusz J. Goszczak, Ph.D.
Head of Centre for Materials Analysis and Characterization

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- +30 subsidiaries

Got a question?

- Our team is ready to assist you with technical information, starting a project, career opportunities and more.

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Work with us

Our scientists work with your company to analyze and characterize products and components in terms of materials, surfaces and interfaces. Because of the deep understanding of failure mechanisms provided by these insights, said insights enable the development of new technologies and lead to innovative and reliable products.

We provide the full range of Mads Clausen Institute competencies as well as laboratory equipment for materials and surface analysis.

We collaborate with various industries:

- Automotive
- Food
- Industrial electronics
- Lighting
- Medicine and biotechnology
- Wind energy
- Sensors and photonics
- Solar power

Equipment and facilities at C:MAC

Cleanroom

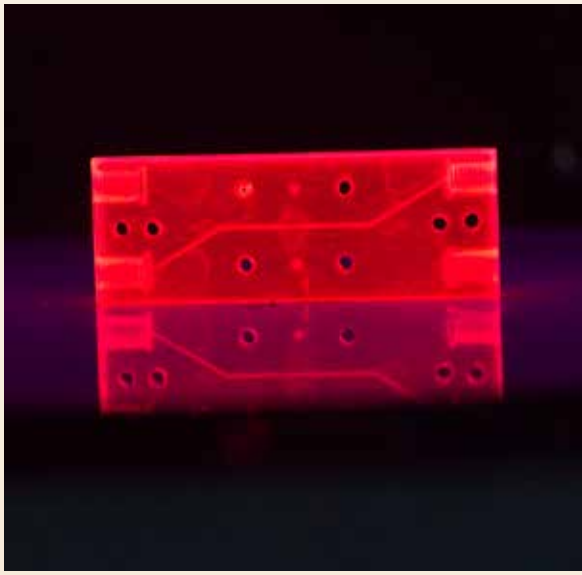
A cleanroom is an engineered space that maintains a very low concentration of airborne particulates. It is well isolated, well-controlled from contamination and actively cleansed. Such rooms are commonly needed for scientific research and in industrial production for all nanoscale processes, such as semiconductor manufacturing. A cleanroom is designed to keep everything from dust to airborne organisms or vaporised particles away from it, and as such from whatever material is being handled inside it.

Cleanroom facilities:

- ISO 5 classification
- 235 sqm usable area
- Controlled temperature environment at 21±1°C
- Controlled humidity at 40±3% relative humidity
- Space available for rental
- Professional training for usage of the equipment

Other facilities

In addition to having fully functional cleanroom facilities, C:MAC also has complementary imaging facilities with state of the art Helium Ion Microscope and RAMAN analysis to support its characterization and analysis capabilities. Moreover the microfluidics lab with the newest additive manufacturing capabilities allow the fabrication and characterization of devices with microchannels for the Bio- and Medical sector.



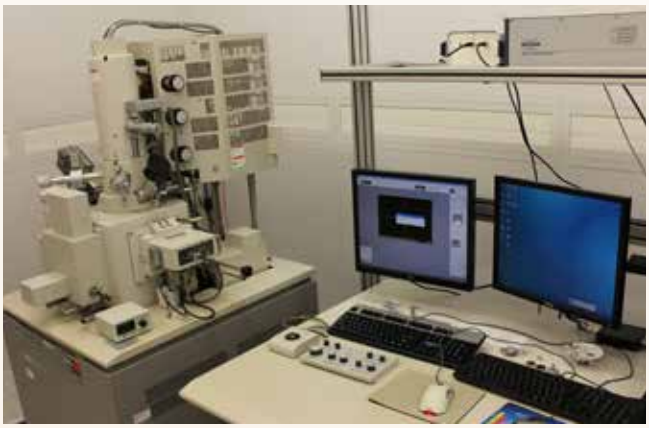
Visit www.sdu.dk/en/forskning/cmac
for more information of the available equipment and services

Scanning electron microscope

A scanning electron microscope is a type of microscope that uses a beam of electrons to scan a sample's surface. The electrons in the beam interact with the atoms on the sample and produce signals that contain information about the sample's surface topography, composition and other properties, such as electrical conductivity. The result is a high-analysis image of the sample with ultra-high resolution down to a few nanometers.

By using the same beam of electrons it is possible to write patterns on samples for the formation of structures and also analyze the elemental composition of the surface of a sample.

Partners have been using the SEM at C:MAC facilities to analyze powders, surfaces and coatings to assist in manufacturing line in the industrial area, food industry to analyze filters used in food manufacturing, whereas other partners in the medical and bio sector for example to analyze fabricated particle formation and elemental distribution, fibrin clot formation etc.



ORION helium ion microscope

The Zeiss ORION NanoFab helium ion microscope is a new, advanced instrument for ultra-high resolution imaging and nanofabrication. Its operation is similar to that of a scanning electron microscope (SEM), but in contrast to SEM, the ORION microscope exploits focused ion beams (FIB), instead of an electron beam, for both image generation and nanostructuring. A complex instrument but more advantageous than SEM as it offers easy analysis of non-conducting surfaces and higher material contrast. Together with RAMAN, HIM is a powerful correlative microscopy tool when it comes to characterization.

Services

Use direct and quick access to commercially based competencies and analytical services. Please contact us to receive a customized offer tailored to your specific requirements.

We can assist with:

- Elemental analysis
- Failure analysis (damages, fractures, breakdown, etc.)
- Film thickness measurements
- Interface characterization
- Materials analysis
- Particle sizes, charge and structure
- Surface characterization

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