

## IMT BUCHAREST - RESEARCH INFRASTRUCTURES

### Facility for Design, Simulation, Micro- and NANO FABrication of electronic devices and systems (IMT-MINAFAB)

IMT-MINAFAB is a state-of-the-art facility, unique in Romania and competitive at the European level, for research and development of micro- and nano- electronic devices, sensors and systems, launched in April 2009.

The facility provides "open access" to modern, state of art equipment, and is the only facility in Romania where one can fabricate electronic components and systems (including smart sensors and systems), all the manufacturing chain being available: design, modelling, CAD, technological fabrication, micro-physical characterization, functional testing and reliability examinations. The facility is a collaborative platform for research, industry and universities, similar with other EU centres and benefits of the expertise of a multidisciplinary team.

IMT-MINAFAB provides several clean-room areas with specialized technological and characterization laboratories - totalizing a surface of almost 700 m<sup>2</sup> (including one clean room of class 1.000), and modern equipment worth more than 8 MEuro. Since June 2011, the services and administrative activities of the centre are SR EN ISO 9001:2008 certified by TÜV Thüringen e.V. This research infrastructure enabled IMT to extend its R&D capabilities. MINAFAB infrastructure contains a key unit, the „Facility for micro-nanostructuring of devices and systems“, unique in this country. This facility is responsible for mask fabrication, photolithography and also for micro-nanostructuring using Electron Beam Lithography – EBL. The facility acts as a platform for integrated Key Enabling Technologies (KETs), especially micro-nanoelectronics, photonics, nanotechnologies and advanced materials. In 2017, the facility has been upgraded with an area of 280 m<sup>2</sup> of clean room class 10,000, which will accommodate new equipment scheduled to arrive in 2018.

IMT-MINAFAB is included in the [MERIL](#) and [ERRIS](#) databases (<https://erris.gov.ro/MINAFAB>).

Short presentation of the most important components of the research infrastructure follows:

- A class 1000 clean room (220m<sup>2</sup>) for the mask shop and the most demanding technological processes (in use since September 2008);
- A class 100,000 clean room, the so called "Grey Area" (200 m<sup>2</sup>), mostly for the characterization equipment (in use since September 2008);
- A class 10,000 clean room (105m<sup>2</sup>) for thin layer deposition by CVD techniques: LPCVD, PECVD; DRIE; RTP etc. (fully in use since early 2012);



## Research Centre for Integrated Systems Nanotechnologies and Carbon Based Nanomaterials (CENASIC)

CENASIC is a new research infrastructure which provides access to new equipment, laboratories and state-of-the art technologies related to the newest developments in carbon-based materials and devices.

The project was financed by Structural Funding Sectorial Operational Programme "Increase of economic competitiveness Project POS-CCE- (2011-2015) and represents an investment of 6 MEuro in a new building for offices, clean rooms and equipment. There are approximately 1000 m<sup>2</sup>, including 4 levels: the clean room (ground floor), technical level, 2 levels for labs and offices. CENASIC is a unique infrastructure in Romania, competitive at regional and European level, with 8 new modern laboratories, with state of art, complex equipment, dedicated to carbon-based materials and devices.

CENASIC is included in the [ERRIS](https://erris.gov.ro/CENASIC) database (<https://erris.gov.ro/CENASIC>)

The centre is focused on 3 main research topics, but it's constantly growing and extending it's original scope:

- ✓ SiC technologies and functional micro-nanostructures; Processes for SiC-based micro- and nanostructures
- ✓ Technologies for graphene and hybrid MEMS/NEMS
- ✓ Technologies for nanocrystalline diamond and applications in MEMS/NEMS and precision mechanics

The CENASIC centre is somehow complementary to the MINAFAB facility, improving the overall R&D capabilities of IMT-Bucharest and it's partners by adding new technologies and equipment:

- ✓ Multiprocess Furnace System
- ✓ Molecular Beam Epitaxy (MBE)
- ✓ High Temperature Plasma Enhanced Chemical Vapor Deposition
- ✓ Atomic Layer Deposition (ALD)
- ✓ RF Magnetron Sputtering

The research infrastructures coordinated by IMT Bucharest are fully operational, the access policy allow scientific users to further develop their ideas and projects, not only by performing experiments, but also joint technological development and training.

