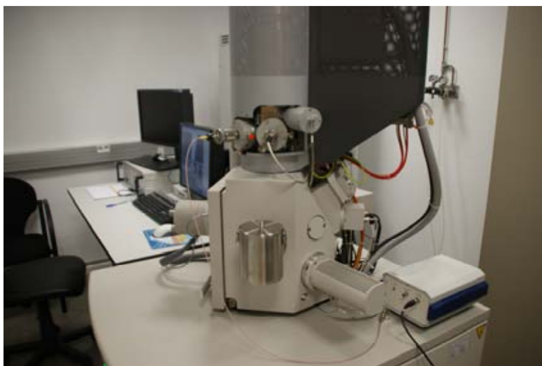
IBEC
Institute for Bioengineering of Catalonia
MicroFabspace
Core Facilities

Manufacturer
Raith

Model
Elphy Plus (SEM based System)

Electron beam lithography



High resolution lithography
The Elphy Plus system allows maskless lithography processes at the nanometer scale.

Depending on the final purpose, negative and positive resists can be used:

• Positive resists are used to produce the same image of the pattern, i.e., the portion of the resist undergo a conversion from low to high solubility upon exposure to electrons, then after development, the electron beam exposed structure is deeper than the surrounding substrate area (ex. PMMA - polymethyl methacrylate).

• Negative resists are used to produce the reverse image of the pattern, i.e., the electrons convert the material to low solubility, then after development process, the structures exposed to electron irradiation are higher than the surrounding substrate area.

Technical specifications

- Writing resolution:
- Dwell time < 2ns
- High speed electrostatic beam blanker (50 MHz)
- Keithley picoammeter exchange box
- Software to correct proximity effect
- Vacuum level: $3{\cdot}10^{-5}$ mbar
- Sample size: Maximum 12 mm x 12 mm

Available material*

- PMMA – Polymethyl methacrylate
- Electra 92 resist (conductive coating for e-beam lithography)

*Possibility to implement new materials under demand.

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