PAUL SCHERRER INSTITUT

PICO

Raith EBPG 5000Plus - Electron Beam Direct Writer for Maskless Lithography

Training: Mandatory and on-request (contact Kevin Hofhuis)

Substrates and Materials

Allowed Substrates: This tool is compatible with pieces of 5x5 mm^2 up to wafers up to 150 mm in diameter and mask blanks up to 5x5 square inches.

Allowed Materials: Accommodates a variety of materials suitable for electron beam lithography, including e-beam resist materials for high-resolution exposures such as PMMA, MMA, HSQ, ZEP etc.

Processes (Materials/Gases/Etc.) Available

Materials: This tool supports a wide range of substrates for electron beam lithography applications, with a spot focused to less than 5 nm in diameter. Only ultra-high vacuum compatible substrates are allowed.

Gases: Nitrogen for venting the loadlock.

Anything Else Important

The tool operates in a cleanroom of class 100, maintaining a constant temperature of 21 ± 0.1°C to minimize thermal drift in electron optics, ensuring top-notch system performance.

Vector-scan direct write tool with a Gaussian-shaped beam, offering a maximum writing field size of 1024×1024 μm^2 and high beam stepping frequencies of up to 125 MHz.

Wide range of beam currents ranging from 250 pA to 200 nA, it provides versatility for both high-throughput and high-resolution exposures.

Operating at 100 keV acceleration voltage allows the exposure of thick e-beam resist layers with minimal forward scattering.

Impressive overlay precision, with values below 20 nm for larger write fields and 10 nm for smaller (100×100 μm^2) write fields, ensures accurate patterning.

CAD patterns are converted into machine-specific format with proximity effect correction (PEC) using Layout BEAMER software from GenISys GmbH. In certain cases, direct coding of beam movement can enhance exposure speed or resolution especially repeating patterns.

The Raith EBPG 5000Plus is a highly versatile electron beam direct writer for maskless lithography, offering exceptional precision and flexibility in patterning various substrates with a wide range of materials. It operates in a controlled environment to ensure optimal performance and is equipped with advanced features for achieving high-resolution patterns.