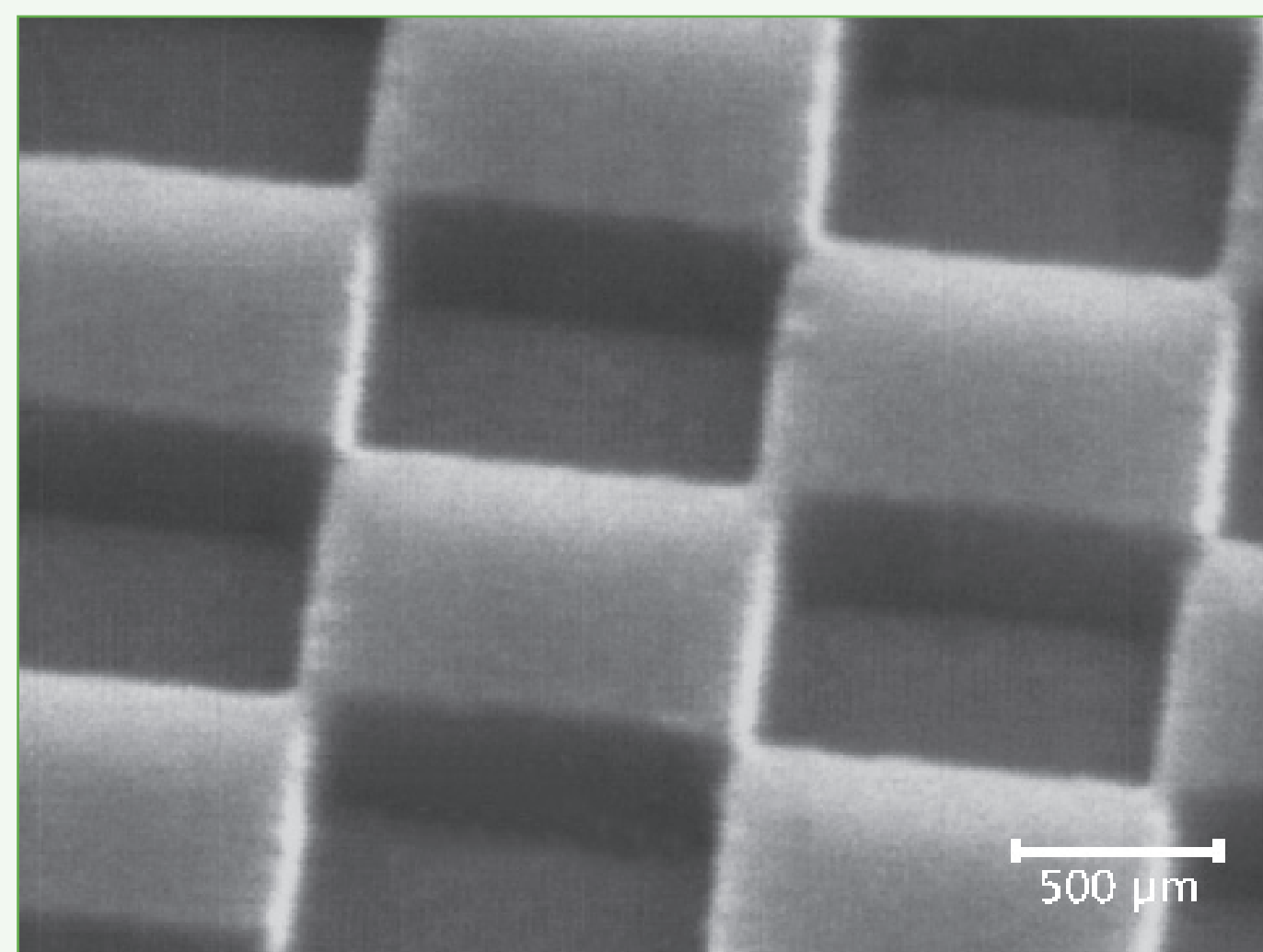


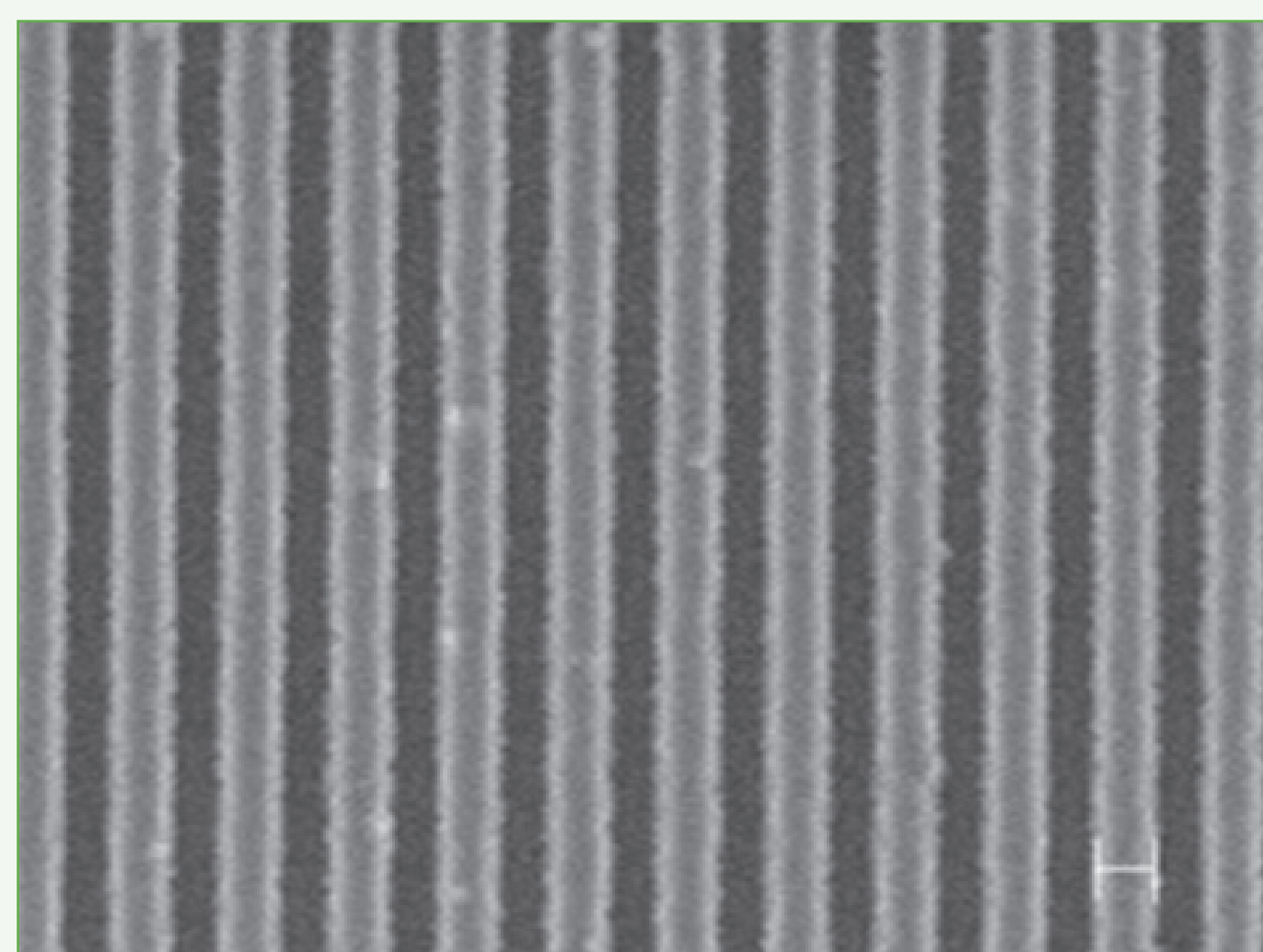
ma-N 2400 and mr-EBL 6000 - Negative Tone Photoresists

For thin Film E-beam or Deep UV Lithography

ma-N 2400 – E-beam and Deep UV sensitivity



300 nm thick, chess pattern, e-beam
 (Courtesy of IPHT Jena - Germany)



200 nm period patterns, 100 nm thickness,
 DeepUV@266 nm
 (Courtesy of EULITHA/ Zurich - Switzerland)

Unique features

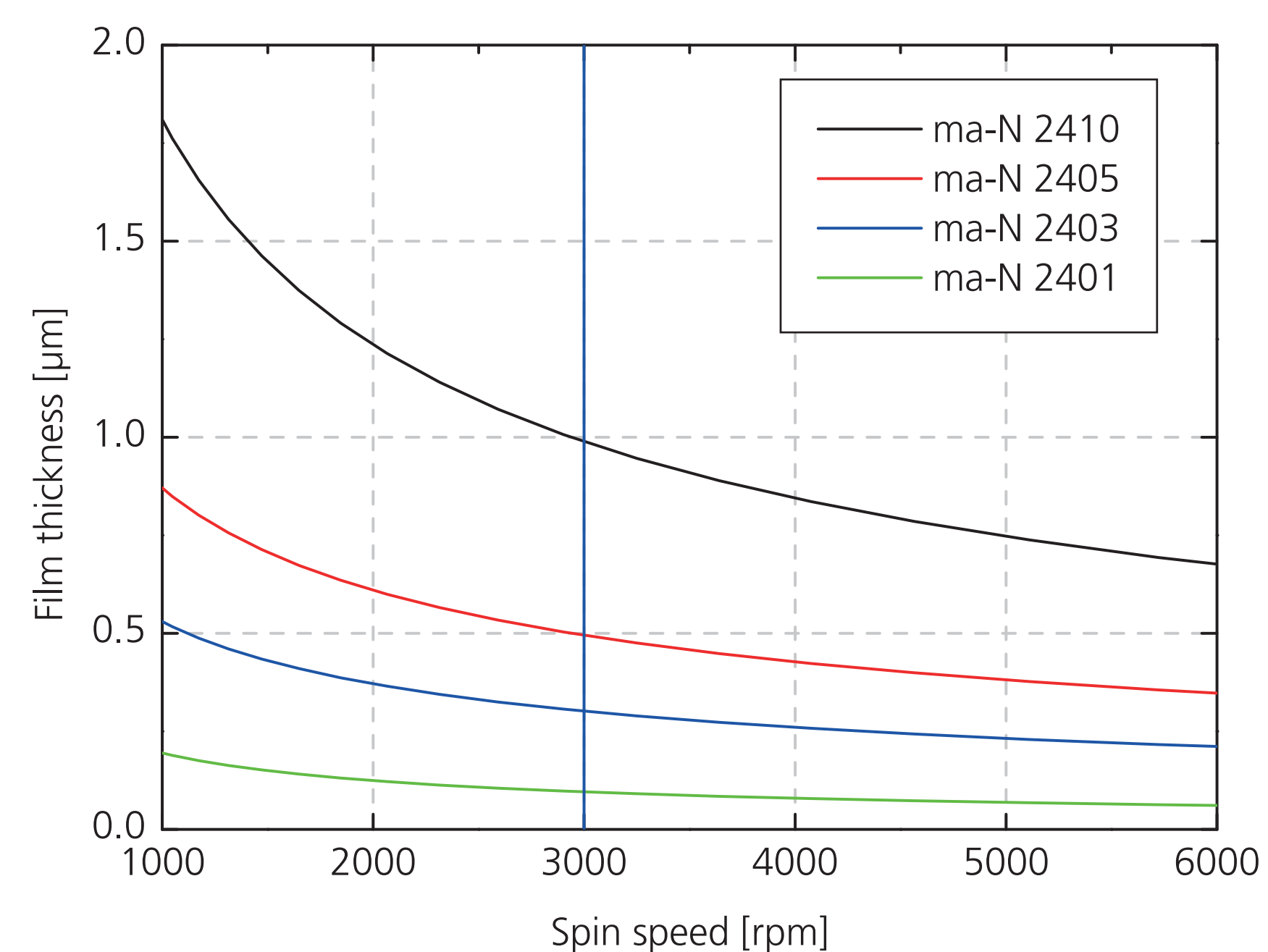
✓ E-beam sensitivity:

- 20 - 45 $\mu\text{C}/\text{cm}^2$ @ 10 keV
- 80 - 200 $\mu\text{C}/\text{cm}^2$ @ 20 keV
- 95 - 300 $\mu\text{C}/\text{cm}^2$ @ 30 keV
- 150 - 350 $\mu\text{C}/\text{cm}^2$ @ 50 keV
- 240 - 550 $\mu\text{C}/\text{cm}^2$ @ 100 keV

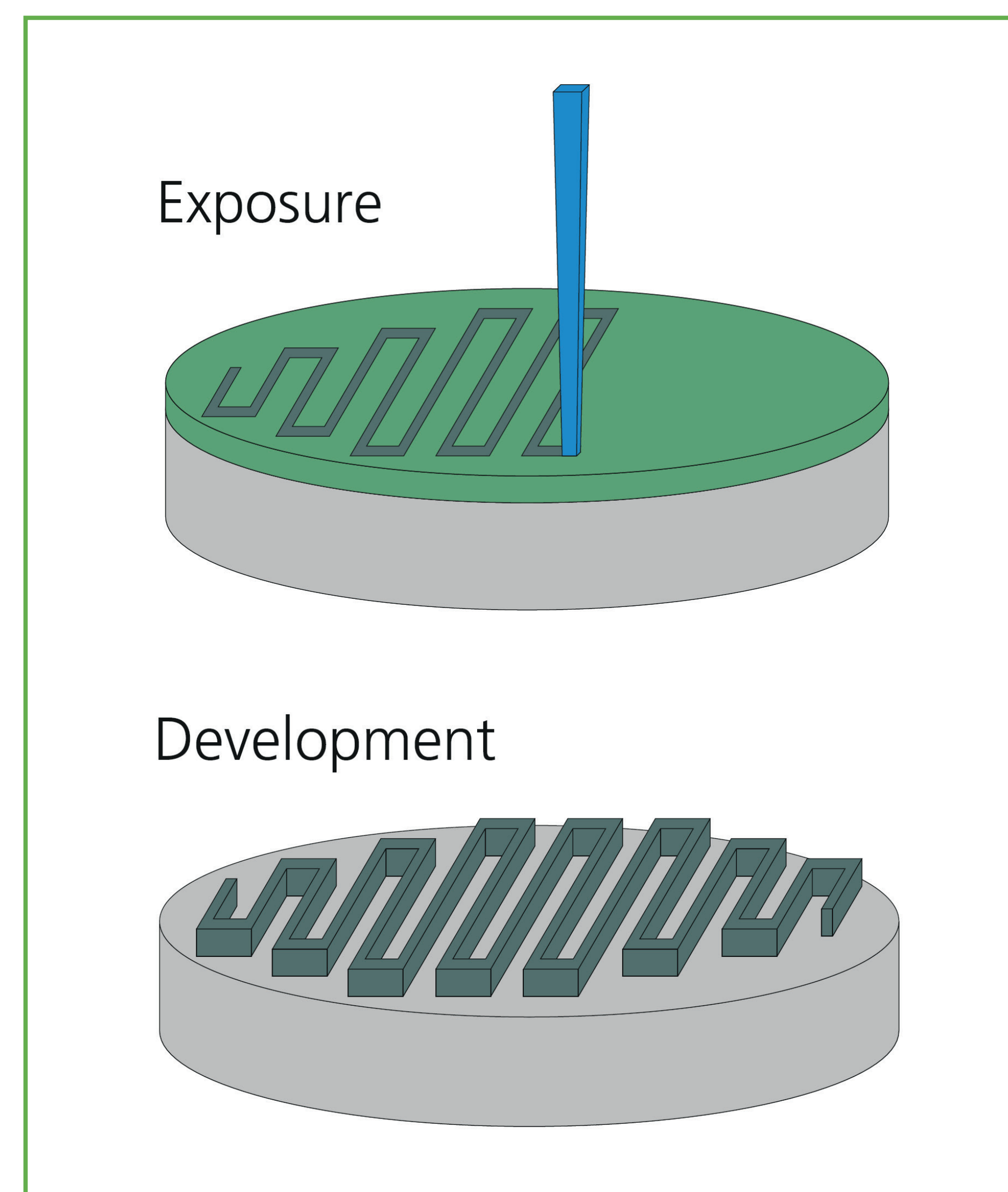
✓ Deep UV sensitivity:

5 - 20 mJ/cm^2 @ 248/254/266nm

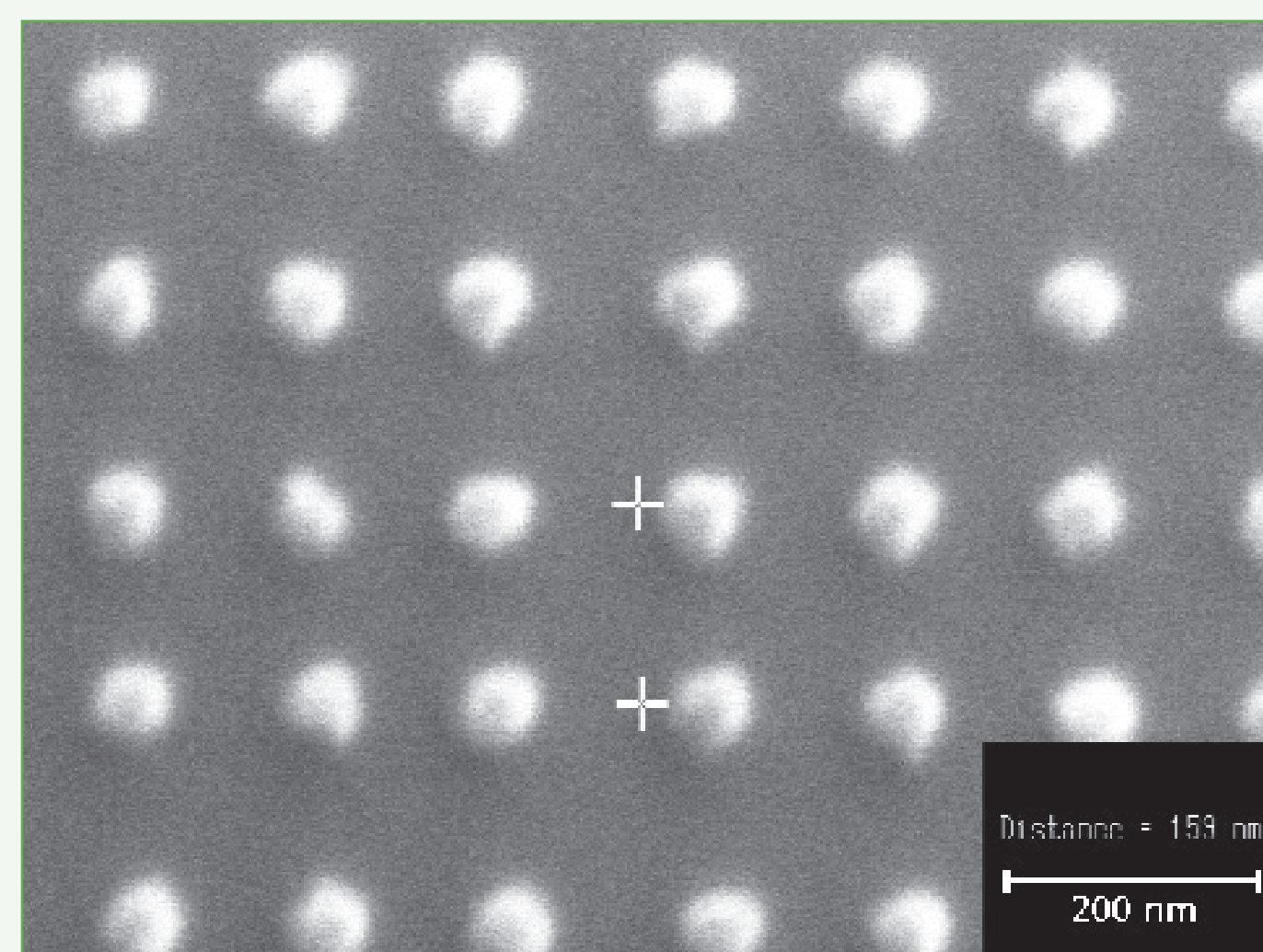
- ✓ Aqueous alkaline development
- ✓ No post exposure bake
- ✓ Easy to remove
- ✓ Good thermal stability of the resist patterns
- ✓ High wet and dry etch resistance
- ✓ Good pattern transfer fidelity
- ✓ Resolution capability: 50 nm



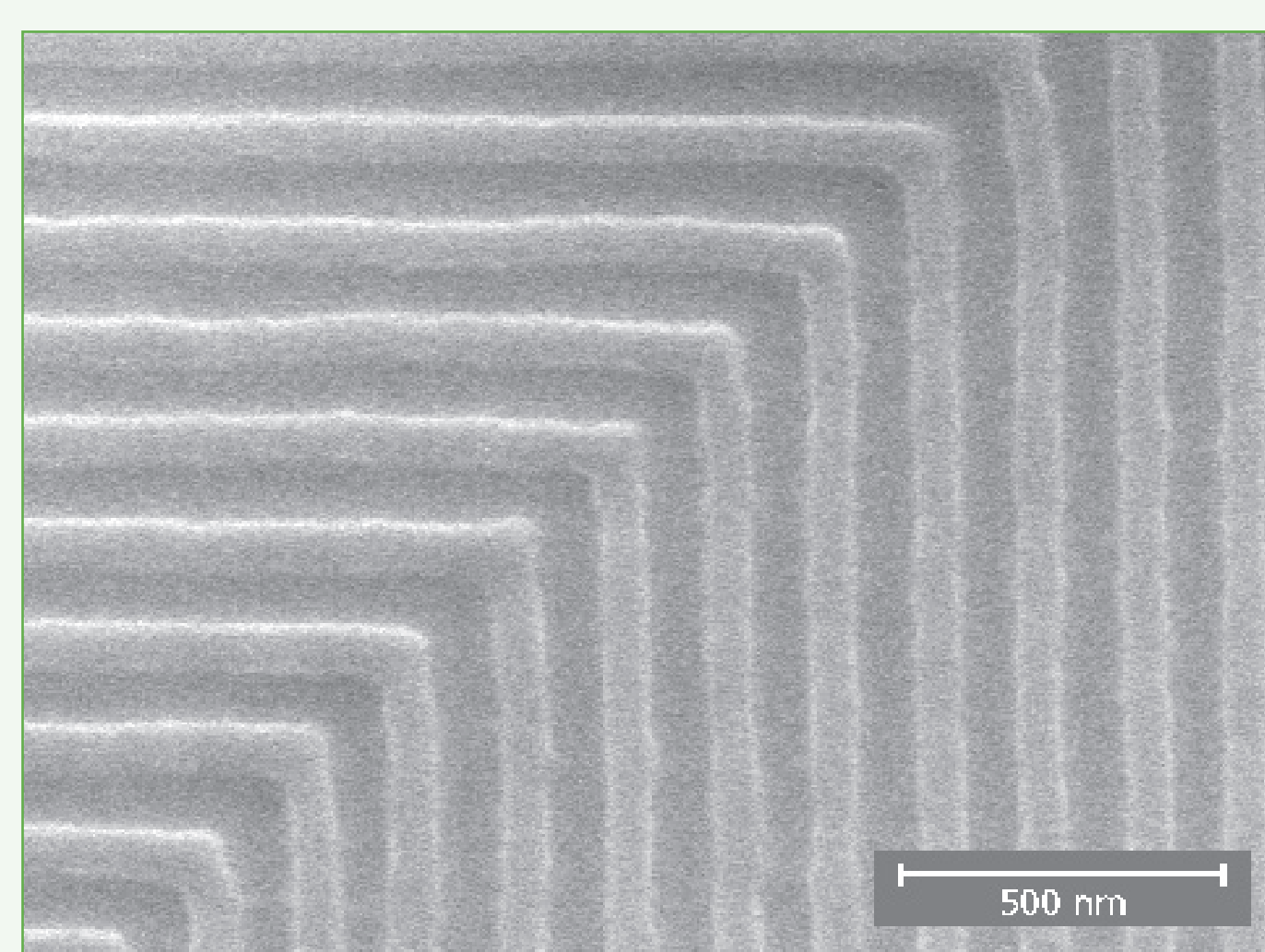
Process Flow



mr-EBL 6000 – High E-beam and UV sensitivity



100 nm thick, 80 nm dots, e-beam



100 nm thick, 80 nm L/S, e-beam
 (Courtesy of Fraunhofer HHI/Berlin - Germany)

Unique features

✓ E-beam sensitivity:

- 1 - 6 $\mu\text{C}/\text{cm}^2$ @ 30 keV
- 1 - 6 $\mu\text{C}/\text{cm}^2$ @ 50 keV
- 8 - 15 $\mu\text{C}/\text{cm}^2$ @ 100 keV

✓ UV sensitivity:

400 - 550 mJ/cm^2 @ 365nm

- ✓ Post exposure bake (PEB) necessary
- ✓ Development in organic solvents
- ✓ Excellent thermal stability of the resist patterns
- ✓ High dry and wet etch resistance
- ✓ Good pattern transfer fidelity
- ✓ Resolution capability: 80 nm

Applications

- Use in micro- and nanoelectronics
- Manufacturing of semiconductor devices
- Mask for etching, e.g. of Si, SiO₂, Si₃N₄ or metals
- Generation of sub 100 nm pattern
- Generation of stamps with nanopatterns

