

*This example shows how Geometrically Induced Dose Correction (GIDC) reduces line edge roughness (LER). Left: Printing layout. Right: Simulated dose deposition and line edge roughness.*

## The problem: Process limitations

E-beam lithography is faced with increasing challenges to achieve a reasonable patterning of structures because of process limitations. These limitations include the unavoidable blurring of the deposited energy due to beam blur, electron scattering (forward and backward) as well as resist effects.

## The solution: Geometrically Induced Dose Correction (GIDC)

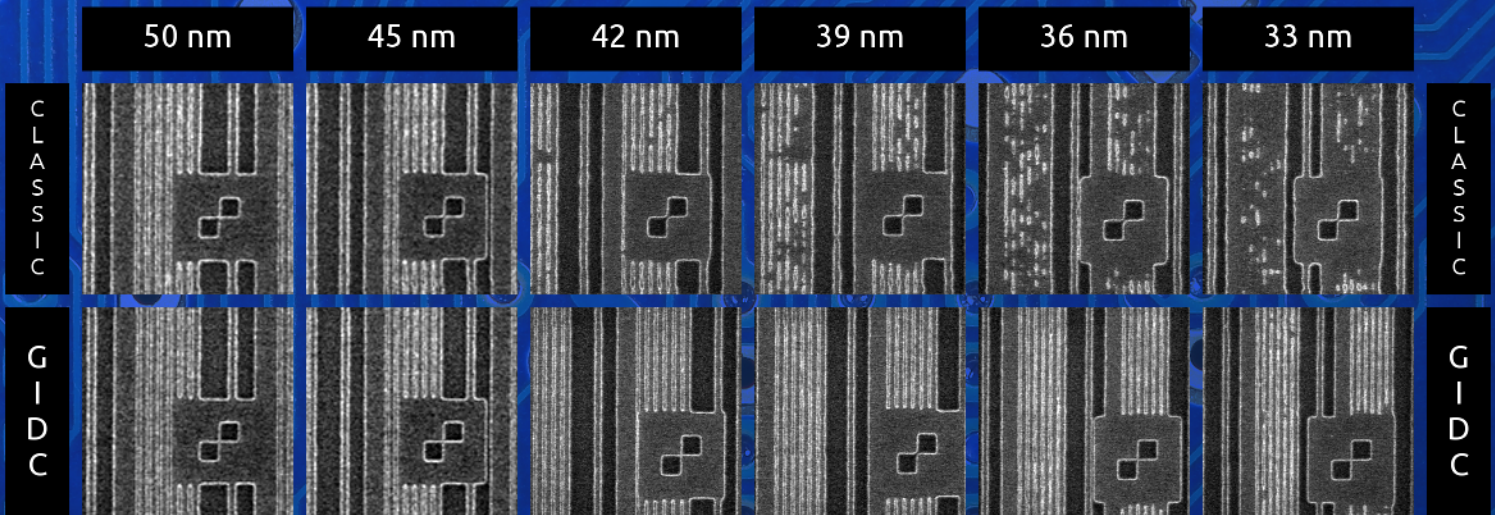
By enhancing the contrast of the printing layout ePLACE achieves

- better printability,
- reduced LER/LWR, and
- a larger process window.

This technology is protected by patents in Germany and other countries. GIDC is a license option for ePLACE with PROXECCO.

## How it is done

The layout is divided into frame and bulk areas. The frame is shrunk and its dose increased accordingly. The bulk area's dose is reduced. This yields sharp edges and corners and outperforms undersize-overdose due to reduced overall electron deposition and backscattering.



*The same pattern is printed with classical dose correction and Geometrically Induced Dose Correction. The minimal achievable line CD for classical dose correction is 45 nm for this process. If GIDC is applied, even lines with 36 nm can be printed. For other processes similar improvements can be observed.*