# Interference Lithography

Description

Interference Lithography (IL) is an optical holographic lithography technology where an interference pattern of two ultra violet light beams is transferred in a high resolution photo sensitive material. The patterns are stitching free and spatially coherent over many square centimeters with features smaller than 100 nm. The IL process at AMO is designed for high contrast gratings transferred in standard DUV photo resist suitable for anisotropic pattern transfer. IL is the most suitable lithography technology for precision gratings. AMO offers flexible exposure and development services for gratings in a cleanroom environment on two dedicated actively stabilized interferometers. Pattern transfer and further processing can be performed according to customer requirements.
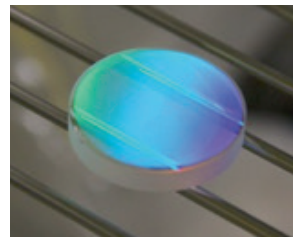
600 nm linear grating, 1,5" SiO$_2$

Fully covered, 4", 6" and 8" wafer

Application

▶ Large area gratings
▶ Periodic nanostructures
▶ Spatial coherent gratings and grids
▶ Porous surfaces
▶ Photonic crystals
▶ Optical components

Specification

Resolution	Fixed Angle IL	Variable Angle IL
Exposure Wavelength	266 nm	266 nm
Minimum Feature Size	50 nm	50 nm
Substrate Material	Silicon, Quarz	Silicon, Quarz
Substrate Size	up to 6" (8" for selected configurations)	depending on pitch
Pitch	150 nm, 180 nm, further on request	300 nm – 2.500 nm
Resist	Chemical amplified positive & negative DUV resist	Chemical amplified positive & negative DUV resist
Tools	Two beam optical bench system (4 x 2,5 m²), fringe locking system	One beam Lloyds Mirror system, free adjustable interference angle
Pattern Transfer Process	Silicon, Quarz, Al, Ti, Cr, Ta$_2$, O$_5$ and more on request	Silicon, Quarz, Al, Ti, Cr, Ta$_2$, O$_5$ and more on request

Further substrates, processes and dimensions are available on request

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