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NANO IMPRINTED HIGH- AND LOW-INDEX GRATINGS FOR LIGHT IN&OUT COUPLING IN AR GLASSES (NEDs)

Near-Eye Displays (NEDs) are optical systems used in AR and VR headsets to project digital content directly into the user's eyes. They employ technologies like waveguides, and metasurfaces to create high-resolution, lightweight, and immersive visual experiences. Key challenges include improving field of view, resolution, transparency, and minimizing eye strain.

1) Materials must be as transparent as possible to prevent optical losses.

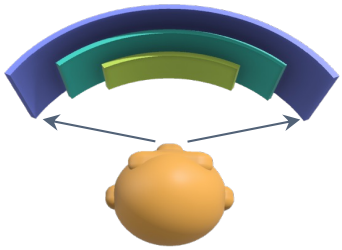
2) Material refractive index must be as high as possible to increase the field of view (FOV).

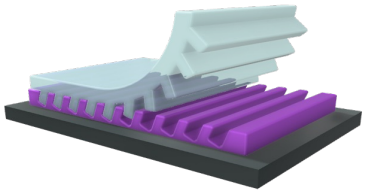
3) Materials must be easily processed.

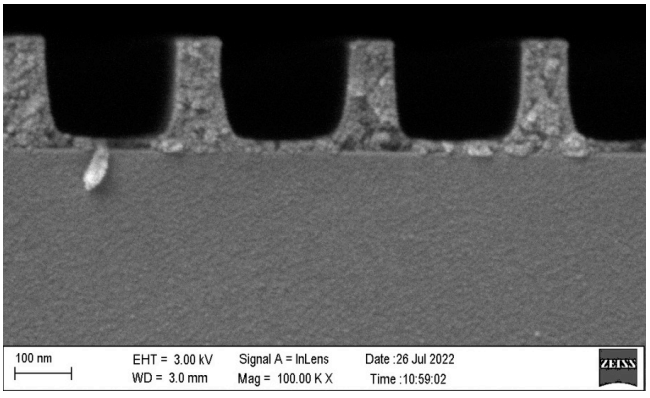
RI = 2.5
Very High FOV = 62°

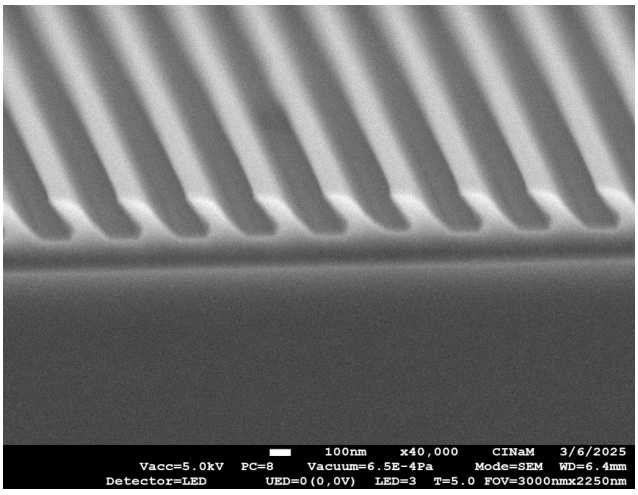
RI = 2.3
High FOV = 51°

RI = 2
Low FOV = 32°









SEM image of Slanted (Right) and Vertical (Left) gratings produced by NIL using SOLNIL resins. The vertical gratings is composed of high index nanocrystalline TiO_2 (RI = 2.5) while the Slanted grating is composed of low index hydrophobic SiO_2 (RI = 1.4).

SOLNIL**, Pépinière d'entreprises Luminy Biotech, 163 avenue de Luminy, 13011 Marseille France / **www.solnil.com