

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

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.

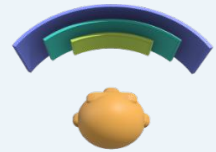
➔ **Materials must be as transparent as possible to prevent optical losses.**

➔ **Material refractive index must be as high as possible to increase the field of view.**

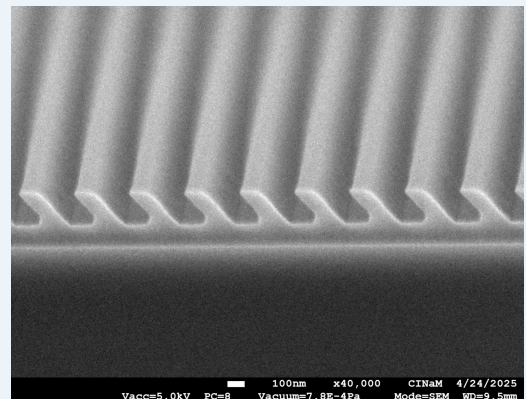
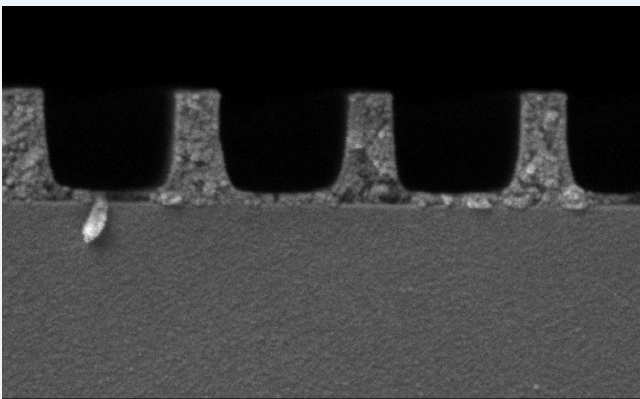
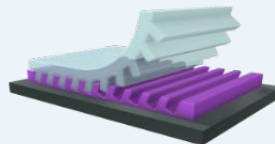
RI = 2.6 => Very High FOV = 62

RI = 2.3 => High FOV = 51

RI = 2 => Low FOV = 32



➔ **Materials must be easily processed.**



SEM images of Slanted (Right) and Vertical (Left) gratings produced by NIL using SOLNIL resins. The vertical gratings is composed of high index TiO₂ (RI = 2.5) while the Slanted grating is composed of low index hydrophobic SiO₂ (RI = 1.4).