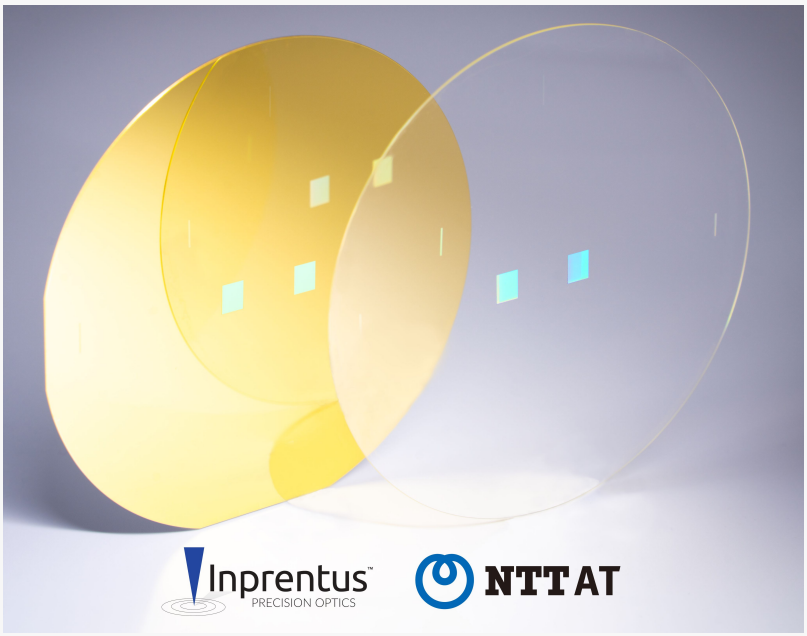
Inprentus - USA, in partnership with NTT-AT Corporation – Japan, Presented a High Index Blazed Waveguide Coupler

Inprentus has released a whitepaper highlighting the details of the high index transparent waveguide coupler and replication, showcased at SPIE XR 2025



Inprentus - NTT-AT Augmented Reality Blazed Waveguide

CHAMPAIGN, IL, UNITED STATES, March 10, 2025 /EINPresswire.com/ -- Inprentus Precision Optics - USA, in partnership with NTT Advanced Technology Corporation (NTT-AT) – Japan, showcased the design, fabrication, and measurement of a high index (n=1.9) blazed waveguide coupler at SPIE XR 2025 in San Francisco, January 2025.

To spread the word about this successful partnership, Inprentus has released a whitepaper highlighting the details of the high index transparent waveguide coupler and replication. The partnership involved the full production cycle of an Augmented Reality (AR) waveguide, from design to fabrication to nanoimprint lithography (NIL)-based replication to metrology. Inprentus took charge of the master design, fabrication, metrology, and efficiency simulation of the master, while NTT-AT created a transparent replica using their high-index NIL resins.

The blazed waveguide coupler master was designed with an input and output surface relief grating (SRG) to measure coupling efficiency. The resulting transparent replica waveguide was then used for efficiency measurements using a 543 nm efficiency measurement system at Inprentus. The blazed grooves in the replica waveguide were characterized using Scanning Electron Microscopy (SEM), and the groove shape simulated for expected efficiency was measured using RCWA and ray tracing methods. The simulated and measured efficiency showed excellent agreement, a testament to the high quality of the NTT-AT nanoimprint high-index resins used to create the waveguide replica. This project was directed by Senior Scientist Nick Toombs

at Inprentus.

Subha Kumar, the COO of Inprentus, noted “The demonstration of the waveguide replica resulting from the partnership between Inprentus and NTT-AT was received extremely well-received at the SPIE-XR conference. High-index resins can be extremely complex to work with; however, they provide the highest field of view (FOV) for immersive augmented reality experience. The excellent agreement between expected and measured efficiency shows that NTT-AT high-index resins have very little loss and that Inprentus has excellent control of optical power in the field of view and in its ability to create high-quality blazed waveguide masters.”

> “The demonstration of the waveguide replica resulting from the partnership between Inprentus and NTT-AT was received extremely well-received at the SPIE-XR conference.”
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> *Subha Kumar, Chief Operating Officer of Inprentus*

Inprentus designs, manufactures, and sells X-ray and EUV diffraction gratings for a variety of scientific and commercial applications by companies, academic institutions, and government laboratories around the world. Inprentus was founded in June 2012 to commercialize an innovative, nano-scale lithography technology using mechanical deformation of metallic surfaces. Proudly located in the Midwest of the USA, the Inprentus team truly exemplifies an unwavering belief in the power of can-do creativity, perseverance, and excellence.

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