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For Immediate Release

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Presentation on AR UV Nanoimprint Resin

at SPIE (The International Society for Optical Engineering)

1. About SPIE AR | VR | MR

SPIE (The International Society for Optical Engineering) is the international society for optics and photonics. It organizes conferences in various fields, including optoelectronics, remote sensing, information communication, and mechanical optics, where researchers, engineers, investors, entrepreneurs, customers, and suppliers from around the world participate.

Toyo Gosei will participate in the AR (Augmented Reality) | VR (Virtual Reality) | MR (Mixed Reality) conference, contributing to a poster session on the research and development of UV nanoimprint resins.

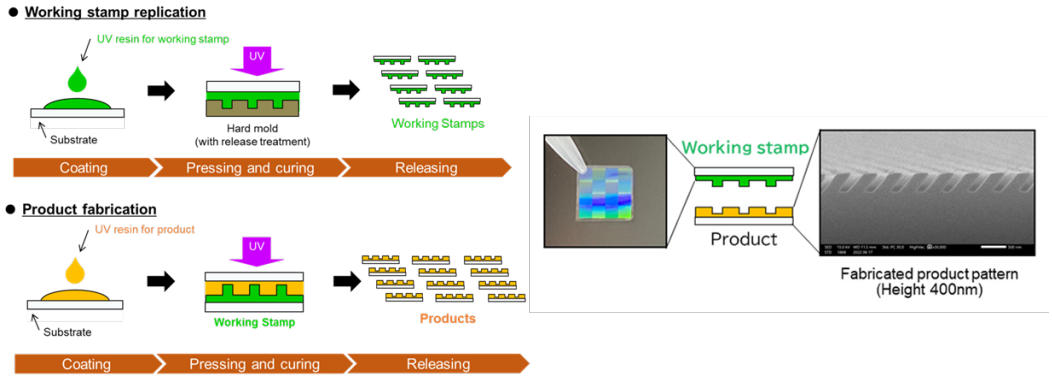
2. Details of the Presentation

Nanoimprint technology is a fine patterning technology allowing the transfer of nano-scale patterns from mold to resin on a substrate. Among the technologies, UV nanoimprint has the advantage of fabrication patterns at angles that were challenging with traditional lithographic pattern techniques.

Waveguide optics used in AR glasses require the formation of fine diffractive structures over large areas with high precision. In particular, for Surface Relief Grating (SRG)-based waveguides, nanoimprint technology is regarded as a promising fabrication method due to its advantages in mass productivity and cost efficiency. As the AR glasses market is expected to expand alongside the development of the metaverse and generative AI, the importance of nanoimprint technology capable of supporting mass production is expected to increase further.

[Features of our UV nanoimprint resins for working stamps]

・High durability for repeat imprinting
・High releasability properties
・Solvent-free, no pre-bake process for solvent removal
・UV cure only, no post-bake process to ensure curing



In general, conventional working stamp materials have limited durability performance. To address this issue, we previously developed fluorine-containing working stamps and commercialized them in the AR market. However, the regulations on per- and polyfluoroalkyl substances (PFAS) are becoming increasingly strict, especially in Europe. In this study, we developed a new PFAS-free resin for working stamps to meet the regulatory trends. The working stamps using this PFAS-free resin successfully fabricated patterns with no significant variation in pattern height throughout the entire process, from the master mold replication to final products. Moreover, the performance was maintained even after 50 repeated imprint cycles using a single working stamp and was confirmed to be comparable to that of fluorine-containing working stamps. These findings suggest that this material represents an effective alternative in response to PFAS regulations.

Title:	PFAS-free working stamp resin with high release performance and dimensional stability for UV nanoimprint in AR waveguide fabrication
Presenter*/Author:	Taigo Akasaki*, Michiya Naito, Risa Tanaka, Takeshi Osaki, Toyo Gosei Co., Ltd.
Date:	19 January 2026 · 5:30 PM – 7:00 PM PST
Venue:	Poster Hall (Moscone West, Level 2)
Session:	Poster Session (No. 13821-71)
Website:	https://spie.org/conferences-and-exhibitions/photonics-west/program/conferences/ar-vr-mr/

【About Toyo Gosei Co., Ltd.】

Toyo Gosei Co., Ltd. is an independent chemical materials manufacturer founded in 1954 and celebrating the 70th anniversary in 2024.

Its core businesses are the photosensitive materials business, which supplies photosensitive materials used in the manufacture of semiconductors and flat panel displays, and the chemical products business, which supplies high-purity solvents used in the manufacture of electronic devices.

The logistics business also includes the storage and management of liquid chemicals.

As a company with high originality, production technology, and stable supply capabilities, the photosensitive materials business was selected by the Ministry of Economy, Trade and Industry as one of the “Top 100 Global Niche Top Companies in 2020”.

In November 2024, plans to expand supply capacity at Chiba Plant (Tonosho-machi, Chiba Prefecture), Ichikawa Plant (Ichikawa City, Ichikawa Prefecture), and Awaji Plant (Awaji City, Hyogo Prefecture),

The Minister of Economy, Trade and Industry has approved the plan to expand the supply capacity of the company's Ichikawa (Ichikawa City) and Awaji (Awaji City, Hyogo) plants as eligible for subsidies under the Act on the Promotion of National Security Assurance. The company is expected to grow as a promising company in the future strategy of Japan's semiconductor industry.

Toyo Gosei Co., Ltd. :https://www.toyogosei.co.jp/english/

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