

SOLAYER achieves breakthrough in the development of high-performance optical filters (hydrogenated amorphous silicon) for 3D sensing



AVIOR M-300 deposition platform

DRESDEN, Germany, October 20, 2020 -- In a technical breakthrough that aims to enable new advancements in 3D sensor technologies, SOLAYER reported today that it has produced high-performance filters based on hydrogenated amorphous silicon (a-Si:H) by using its AVIOR M-300 deposition platform. The company innovates vacuum coating equipment and processes for high-precision optical applications. The new technical milestone validates SOLAYER's approach to resolve warpage – a stubborn obstacle associated with processing ultra-thin substrates, and promises customers a practical new solution to enable next-generation 3D sensors.

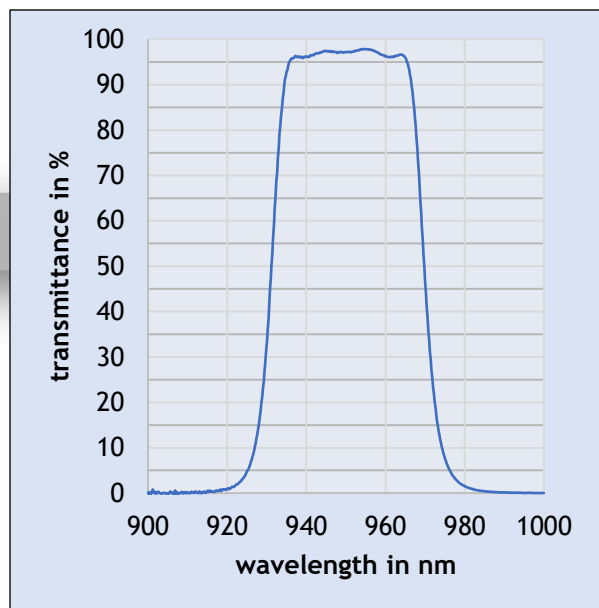
Consumer electronics like smartphones and video games rely on 3D sensor technologies for core functionality like geolocation capabilities, high-end photography, and immersive virtual/augmented reality experiences. The technology also enables biometric markers for cyber security, robotics used in medical and industrial environments, advanced imaging equipment for medical diagnostics, and smart cars, where sensors enhance driver safety.

To achieve the high-performance filters, SOLAYER had to overcome the challenges associated with extremely thin substrates, namely warpage caused by the coating process. Such warpage can hinder and even limit subsequent processing steps.

Using a special manufacturing process, SOLAYER was able to coat substrates with a thickness of 0.2 mm and a diameter of 200 mm, and generate a substrate deflection of less than 11 mm. This is an improvement on traditional methods that have only been able to achieve a deflection of > 13 mm. In addition to enabling low deflection, the SOLAYER processes can be used to produce filters with a very high transmission $T_{avg} > 96\%$. At an angle of incidence of 30° (AOI 30°), the bandpass filter only shows a shift of < 10.5 nm.

The high-performance filters are characterised by the following features:

Transmittance	T avg in PB > 96 % T min in PB > 93 %
Blocking in cut off bands	OD > 5 avg (UV-900 nm) OD > 4 abs (UV-900 nm)
AOI Shift	CWL at AOI 30° < 10,5 nm
Slope	$T(90\%) - T(10\%) < 9$ nm
Substrate size	200 mm round
Substrate thickness	0.2 mm
Warpage	< 11 mm



High-performance filter features

With demand for 3D imaging and 3D sensor technologies on the rise, the new filter breakthrough boosts SOLAYER’s capability to meet market needs with its portfolio of integrated process and equipment solutions.

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