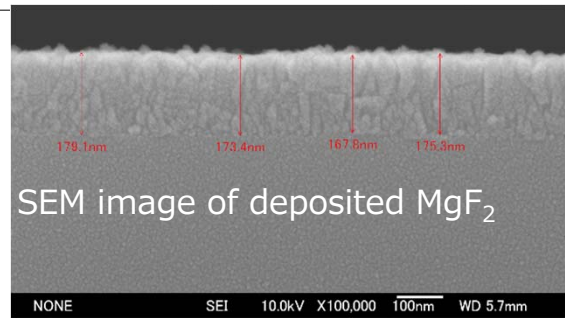
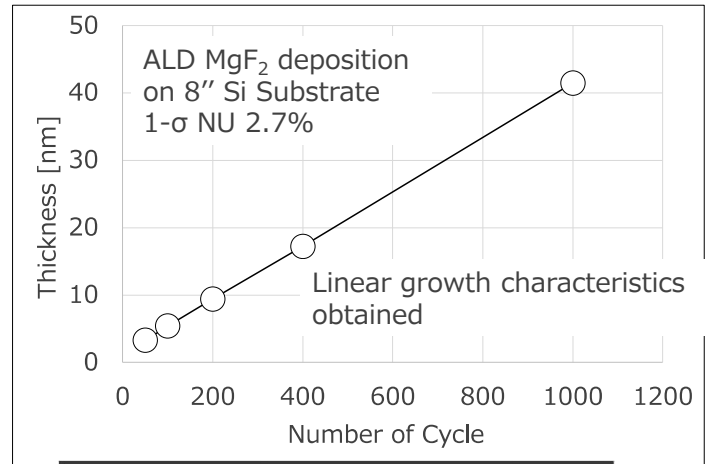


MgF₂ coatings by ALD

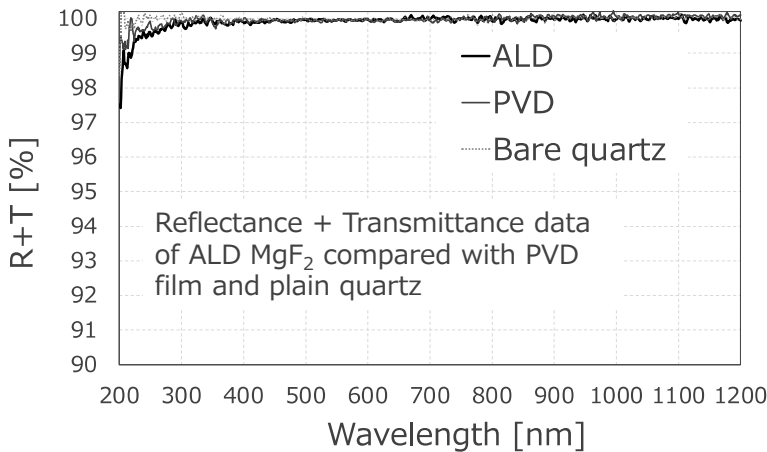
Magnesium fluoride (MgF₂) has been commonly utilized for optical coatings to increase the performance of optical components, such as anti-reflection coatings for lenses, and mirrors. MgF₂ properties, such as low refractive index below 1.4, and relatively stability against various chemicals are desired for many optical and barrier layer applications. However, its applicability has been limited because MgF₂ can be typically only deposited via physical vapour deposition (PVD).

Atomic layer deposition (ALD) is a method to provide uniform and conformal coatings for 3D structures, even on inner surfaces of objects. This is not possible with conventional PVD methods. To facilitate demanding optical coatings, ALD MgF₂ coatings were successfully developed using commercially available ALD reactor, Picosun R-200 Adv. Available ALD processes for optical films also include SiO₂, Al₂O₃, HfO₂, and TiO₂.



All these established ALD coating processes enable new applications for optical and barrier layer coatings. Optical multi-material stack deposited by ALD on round shaped lenses is demonstrated in picture below.

Optical films deposited by ALD, including MgF₂, are now available for evaluation.



Wavelength 550nm	ALD	PVD
Refractive Index (n)	1.389	1.378
Extinction Coefficient (k)	9.0E-5	4.0E-5

n & k data of ALD MgF₂ compared with PVD film

