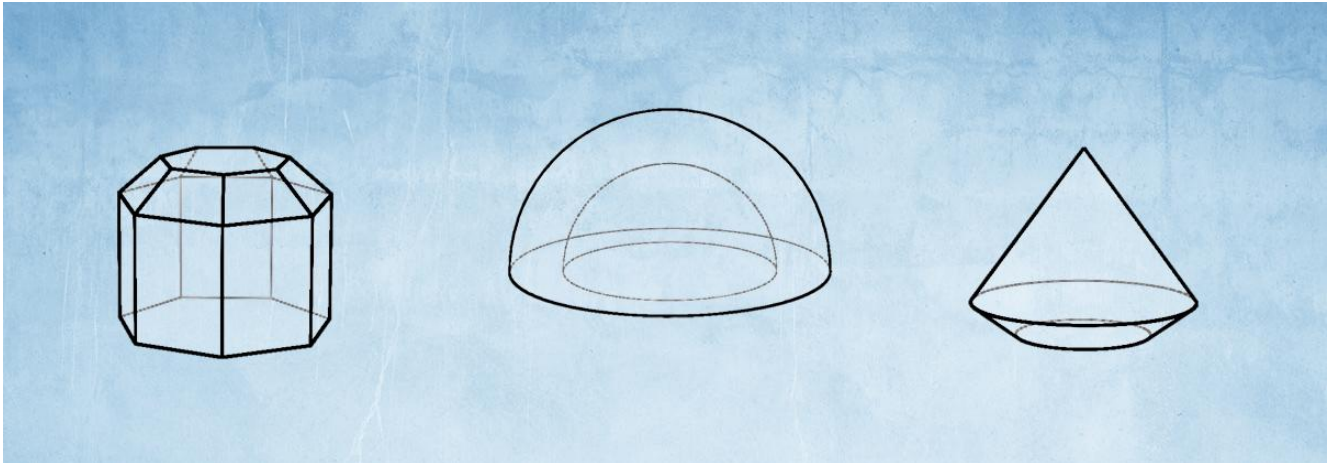




Atomic Layer Deposition (ALD) Technique *so-called Modified Chemical Vapor Deposition (CVD)*



This innovative coating technique is the best choice for complex and custom-made optical components

Highlights:

	EBE	MS	IBS	ALD
Coating on 3D-optics	++	+	+	++++
Microstructure quality	+	+++	+++	+++
Uniformity	+	+	++	+++
Low internal stress	+++	++	++	+++
Price	+	++	+++	+++

Available coating types:

Anti-Reflective <i>available</i>	Partially Reflective <i>available</i>	High Reflective <i>can be suited</i>	Filter <i>can be suited</i>	Polarizer <i>available</i>
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Spectral range:



Basic capacity of our tools:

Option A: up to $\varnothing 300$ mm or ~ 100 pcs. of 1" ($\varnothing 25.4$ mm)

Option B: up to 1000 mm in any dimension

*In order to meet your requirements
each option can be rearranged*

Available materials:

- SiO₂
- Al₂O₃
- Ta₂O₅
- HfO₂



Optical coating methods in short

	Electron Beam Evaporation	Ion Assisted Deposition	Magnetron Sputtering	Ion Beam Sputtering	Atomic Layer Deposition
Coating properties:					
Coating on 3D-optics	++	+	+	+	++++
Extreme long substrates	+	+	++	+++	+++
Unusual substrate materials	++	++	++	+	+++
Coating uniformity	+	+	+	++	+++
Films Purity	++	++	++	+++	+++
Hardness	++	+++	+++	+++	++
Adhesion	+	++	+++	+++	+++
Thermal treatment, °C	150 - 300	150 - 300	up to 150	up to 150	150 - 300
Grows rate, Å/sec	≈ 10	≈ 5	≈ 3	≈ 1	≈ 0.5
Internal stress, MPa	< 100	≈ 100	few 100	few 100	< 100
Microstructure quality	porous	dense	near bulk	near bulk	near bulk
Spectral range:					
VUV	+++	-	-	-	+
UV	+++	++	+++	+++	+++
VIS	+++	+++	+++	+++	+++
NIR	+++	+++	+++	+++	+++
IR	+++	+++	++	++	+
Optical properties:					
Lowest absorption	++	++	++	+++	+++
Lowest scattering	++	++	+	+++	+++
Lowest losses	++	+	+	+++	+++
LIDT _{cw} stability	+	+	+++	+++	+++
LIDT _{pulsed} stability	+++	+	+	+	++
Humidity resistance	+	++	+++	+++	+++
Aging resistance	+	++	+++	+++	+++
Costs:					
Shortest process time	+++	++	++	++	+
Lowest price per coating run	+++	++	++	+	+
Lowest price per unit	++++	+++	+++	+	++