

Conformal Coating of Polymer Domes: Antireflection and Mirror Multilayer Systems made by PEALD

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Optical components have an increasingly complex shape, whereby freeforms, aspheric, half-ball and ball lenses, or various concave-convex optics are used. As one of the most challenging components, dome-shaped optics are required for numerous applications, including optical remote sensing, cameras, lidar and laser communication systems. Their optical performance relies on complex functional coatings applied on their surface such as antireflection coatings, reflective coatings, beamsplitters, etc.

Wide-angle antireflection coatings at 905 nm wavelength on polycarbonate (PC) planar and dome substrates using plasma enhanced atomic layer deposition in a small batch reactor are presented. The specular reflection of a double-side coated PC plate is below 0.4% at 905 nm. The single-side reflectance measured along the entire outer surface of several domes is about 0.2% at 905 nm (Fig. 1). Besides, enhanced Al mirrors on PC domes are realized. Their environmental stability is discussed. Atomic layer deposition enables a precise coating of 3D shaped components.

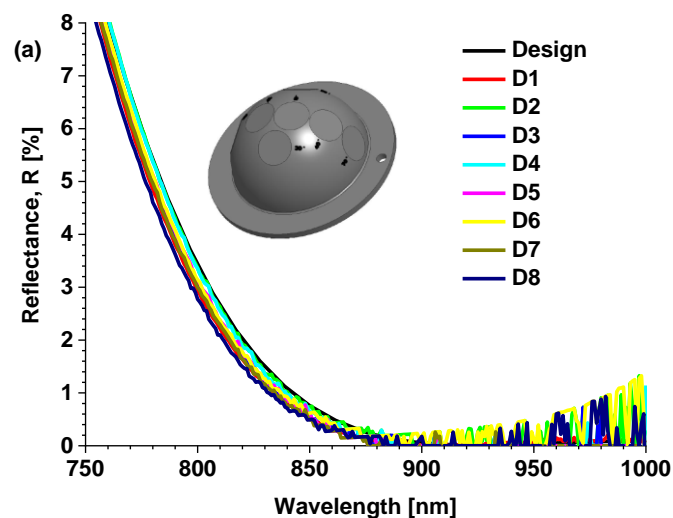


Figure 1. Reflectance measured on eight PC domes coated with AR coatings by PEALD.