

ISTN

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Next Generation Anti-Reflection (AR) Coatings for Polycarbonate

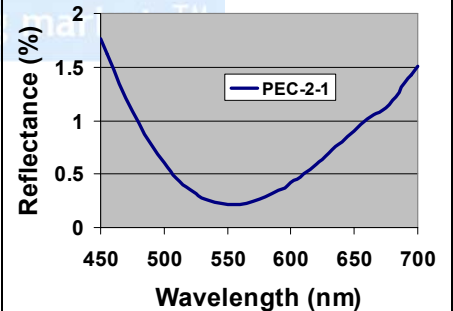
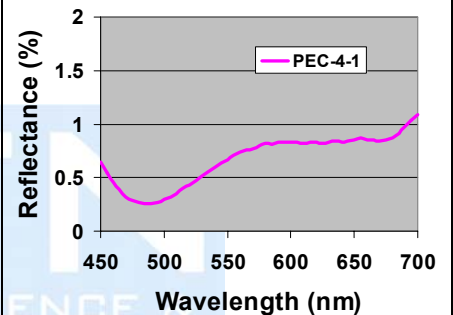
ISTN's opto-electronic technologies are based on its expertise in synthesizing nanoparticles with precisely controlled size and physical, chemical, and electronic properties. With the ability to create these customized particles, ISTN has the building blocks necessary to produce composite materials based on sound theoretical fundamentals that deliver a unique combination of performance and cost.

ISTN's AR technology consists of silica nanoparticles that are partially emerged from a bonding resin layer to give it the moth-eye structure needed to achieve exceptional AR properties. This structure creates a refractive index gradient on the top layer of the substrate. The refractive index gradient effectively reduces surface reflection as a result in a gradual change in refraction index from air (~1) to substrate (~1.5).

The top protective coating can achieve excellent anti-smudge and mechanical properties necessary for the AR coating. The efficient wet coating process results in significant improvements in processing speed and cost over existing deposition-based methods.

The clear polycarbonate used for these samples are commercially available. The optical properties of the AR coated polycarbonate are listed below as measured at ISTN's optical testing lab. The AR coated substrates can be properly cleaned by simply rinsing with isopropanol and air-drying.

Pictures: Reflective spectra of two typical AR coated polycarbonate samples.



Key Properties			
Substrate	Transmission	Reflection* (~ 550nm)	Mechanical Properties**
polycarbonate	~ 99%	0.2 - 0.7%	★ ★ ★

* Reflection is measured from both sides.

** Mechanical Property Testing

Abrasion/Solvent Resistance - tested by rubbing with cheesecloth in the presence of alcohol and observing damage.

Adhesion Test - An X is cut in the surface of the substrate with a scalpel. Pressure sensitive tape is applied to the cut and then removed. Visual inspection is used to reveal any peeling.

ISTN currently has a joint development agreement with Optimax Technology Corporation of Taiwan to develop this AR coating product for LCD polarizers. It is seeking additional commercialization partners to extend this technology to other optical applications.

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