Valentis Nanotech Coating Characteristics

Increased Strength

Valentis produces coated plastic films with increased tensile elasticity. The diagrams demonstrate the tensile elasticity of coated polyethylene (PE), biaxially-oriented polypropylene (BOPP), and polyethylene terephthalate (PET) films increased by 118%, 22%, and 14%, respectively with Valentis Nanotech's coatings.

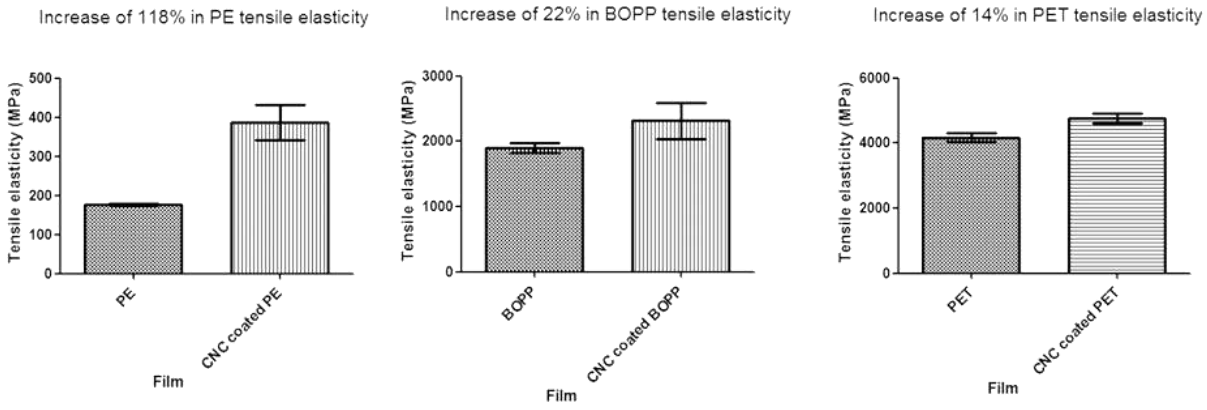

Fig. 1: Tensile elasticity comparison of coated and uncoated plastic films

Morphology of Coatings

Valentis produces transparent coatings (2-A) that can be printed on according to clients' needs. Valentis' coatings formulations are stable in water solutions and can be coated on different matrices. The procedure for drying the coatings results in a highly ordered multi-layered film (2-B), in which nanoparticles (NPs) are dispersed between the CNC layers (2-C).

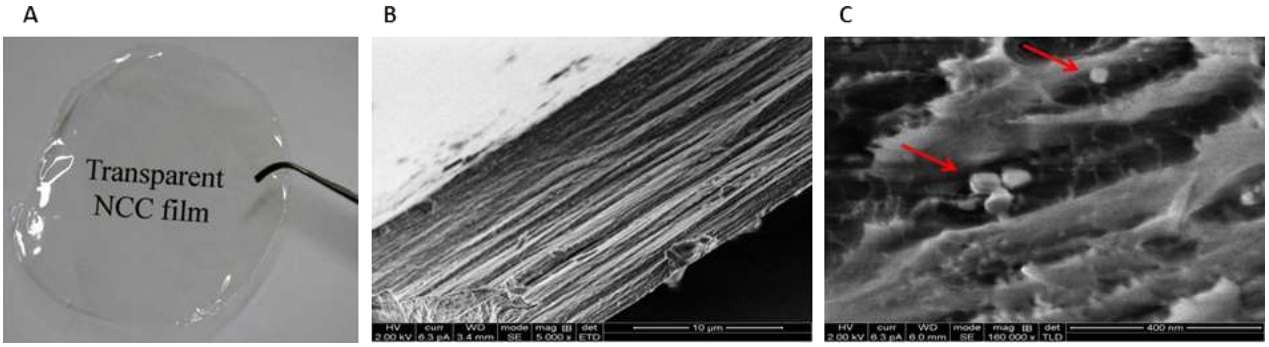

Fig. 2:

A- Transparent CNC film.

B- Electron microscopy picture of the highly ordered CNC multi-layer film.

C- Electron microscopy picture of composite CNC and nanoparticles (NPs) film. The NPs are located between the CNC layers.

Spectral Control

Valentis produces transparent coatings with tunable wavelength blocks (UV-figure 3, IR- figure 4) and light transmission percentages.

Tunable UV block Optimal: 0% UV penetration vs. 100% visibility

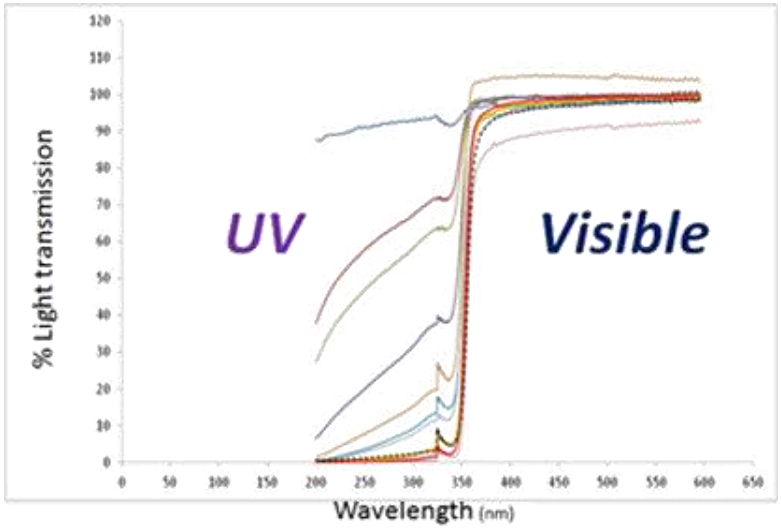

Fig. 3:

UV blocking films. Light transmission in the UV and visible spectrum of plastic films coated with different UV blocking formulations

IR Block Optimal: 100% visibility vs. almost 100% IR blocking

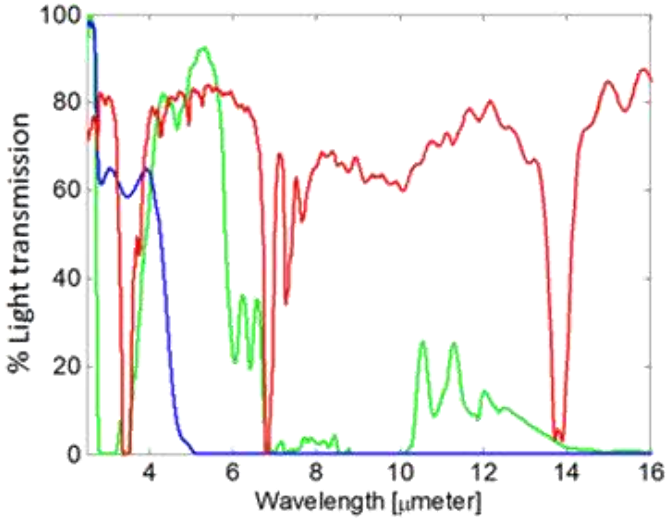

Fig. 4:

IR blocking films. Light transmission in the IR spectrum of of glass (blue curve), polyethylene film (red curve) and polyethylene film coated with IR blocking formulation.

Gas Barrier

Oxygen transmission rate (OTR)

Valentis Nanotech's transparent coatings have excellent oxygen barrier properties. The OTR of different coating formulations ranges between 0.6-3.3 cc/m^2 day.

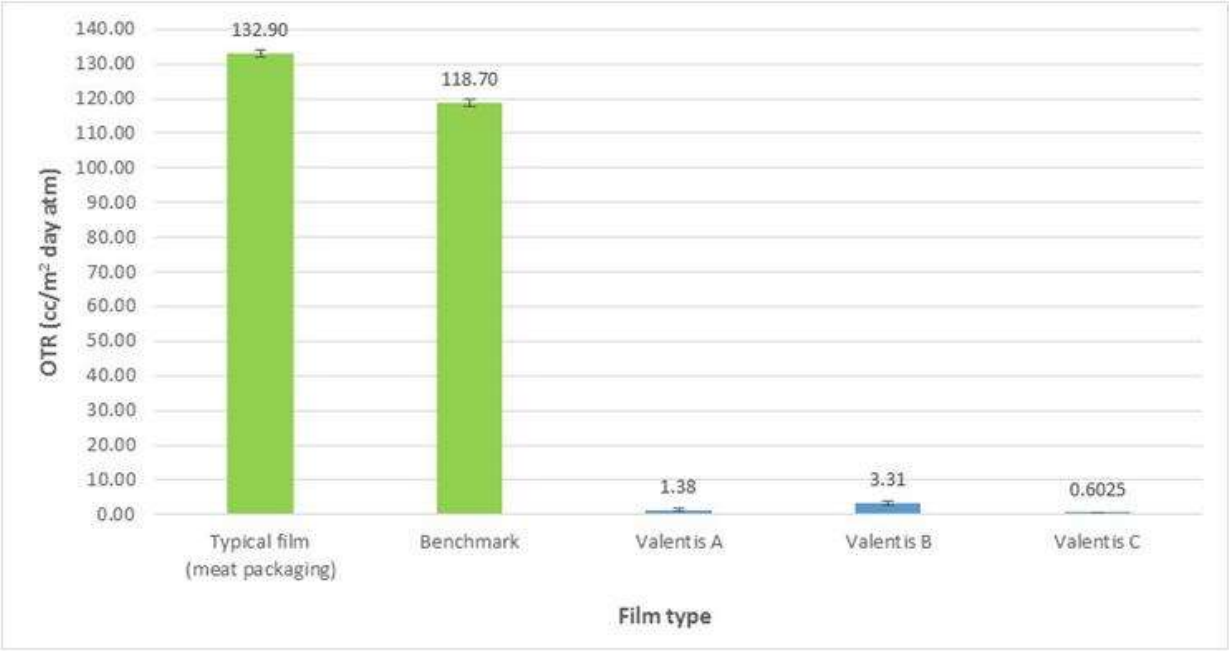

Fig. 5:

Oxygen transmission rate (OTR) of Valentis coated and laminated films. OTR values of 3 Valentis coated films (Valentis A, B & C) in comparison to an uncoated film (benchmark) and to a typical meat packaging film.

Water vapor transmission rate (WVTR)

Valentis Nanotech's transparent laminates have excellent water vapor barrier properties. The WVTR of different laminates are below 1.8 gr/m^2 day.

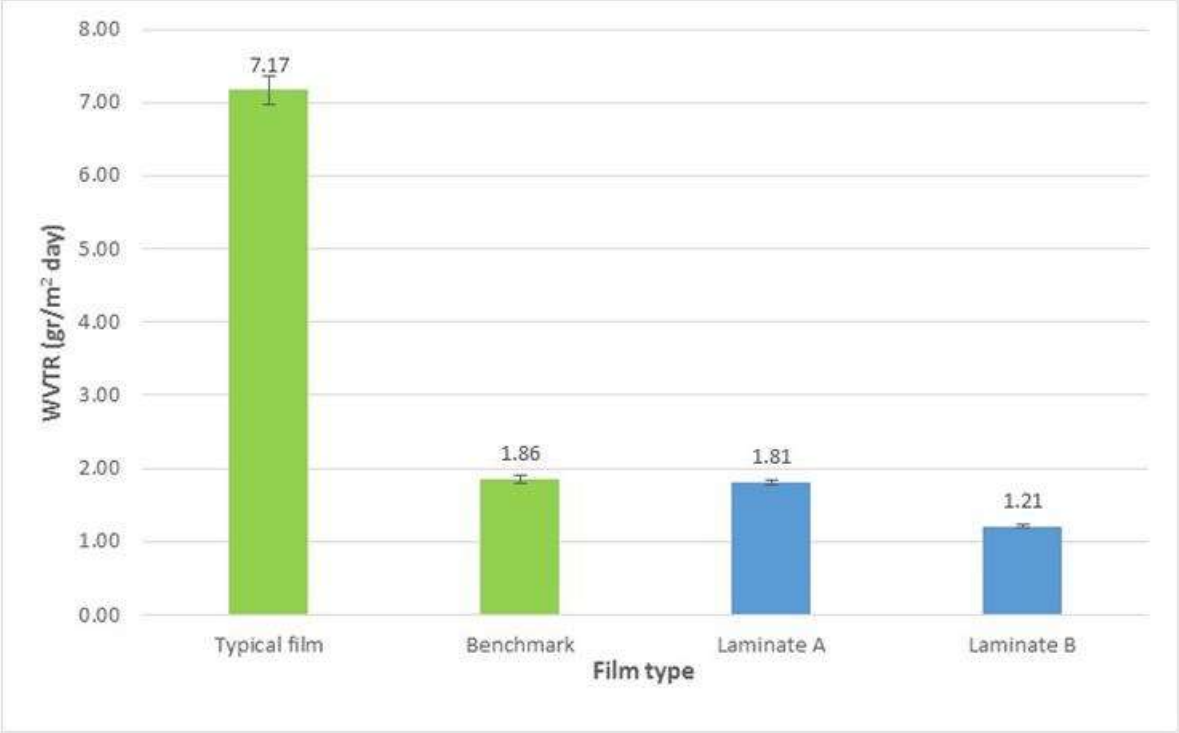

Fig. 6:

Water vapor transmission rate (WVTR) of Valentis coated and laminated films. WVTR values of 2 Valentis laminated films (Laminate A & B) in comparison to an uncoated film (benchmark) and to a typical meat packaging film.