# Damage From Blue Light and Protective Polyethylene Thin Films

**Thin plastic film that has strong absorbance per mil thickness at broad wavelengths is not common in the plastic industry. However, with the known properties discovered from *Spectral Enhancers* we can now expand permanence, wavelengths and absorptivity of the additives in a polymer matrix. The following chart is one of many showing the properties of one spectral enhancer and Maxgard 2000 series UVA. The ability to absorb beyond 400 nm into the blue region and beyond is a special property that has become of value to the global market in packaging and protection of oils and foods.**

**By taking any thickness of a plastic film we can now calculate percent transmission from the Absorbance at that wavelength and determine the properties and protection afforded by the film containing the additives present.**

**The following equations allow for this calculation and much more.**

**Thin film requires more of any additive to provide the appropriate absorbance and transmission while thicker sections do require less of the same additives. Thin films were a challenge until the introduction of Spectral Enhancers. Today inexpensive solutions to real problems are available.**

**Table 1: The Math**

SPECTROMETRY NOMENCLATURE

A = Absorbance (Optical Density)
a = Absorptivity
b = Cell Length in cm
c = Concentration in g/Liter
C = Concentration in Moles/Liter
E = Molar Absorptivity (Extinction Coef.)
T = Transmittance

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$$a = \frac{A}{b\ c}$$

$$E = \frac{A}{b\ C}$$

$$a = \frac{E}{\text{Mol. Wgt.}}$$

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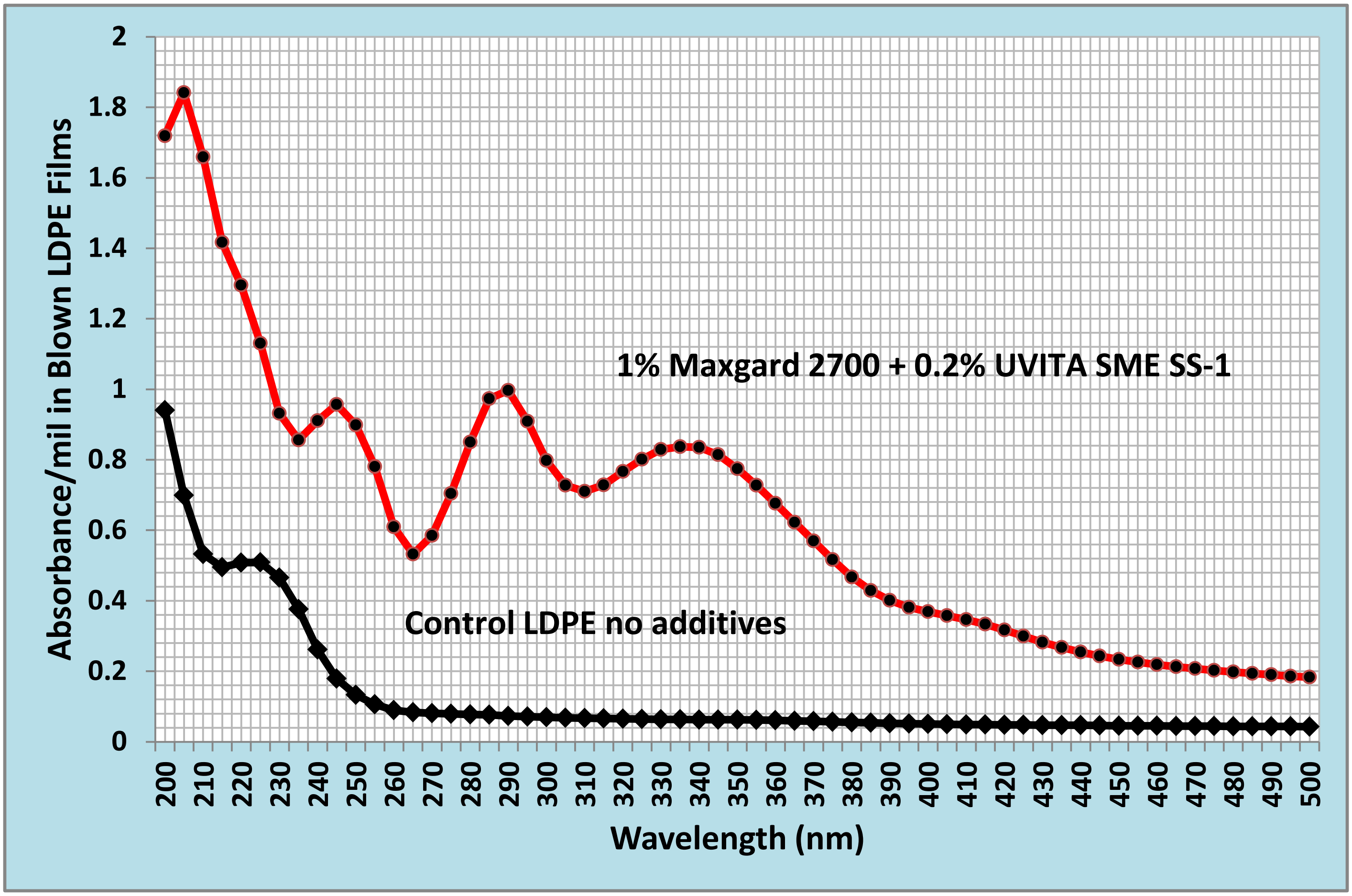
$$A = \log \frac{1}{T}$$

# Thin Film Absorbance



# Thin Film Percent Transmission: