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## WHITE PAPERS & APPLICATION NOTES



### Measuring Absorptance (k) and Refractive Index (n) of Thin Films with the PerkinElmer LAMBDA 1050+ High Performance UV/Vis/NIR Spectrometers

**Introduction**  
An optical coating consists of a combination of thin film layers that cause interference effects used to enhance transmission or reflective properties for an optical system. How well an optical coating performs is dependent upon the number of layers, the thickness of each layer and the differences in refractive index at the layer interfaces. The transmission properties of light are predicted by wave theory. One outcome of the wave properties of light is that waves exhibit interference effects. Light waves that are in phase with each other undergo constructive interference, and their amplitudes are additive. Light waves exactly out of phase with each other (by 180°) undergo destructive interference, and their amplitudes cancel. It is through the principle of optical interference that thin film coatings control the reflection and transmission of light.



## Measuring Absorptance and Refractive Index of Thin Films with UV/Vis/NIR

An optical coating consists of a combination of thin film layers that create interference effects used to enhance transmission or reflection properties for an optical system. In this paper we will show how the absorptance, refractive index, and film thickness of thin films can be calculated from the spectral data.

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