A Precise Method for Comparing Density or Reflectance Spectral Values

William Voglesong*

Abstract:

Light is attenuated in ink-on-paper samples by absorption, scattering and lateral diffusion. This complex phenomenon occurs in varying amounts as light penetrates the sample. Since reflection does not obey the Beer-Lambert law, neither reflectance or density values are linearly related to ink thickness. Two empirical transfer functions have been derived which convert the reflectance or density spectral data to a quasi-linear parameter. Using this methodology spectral values of inks can be compared analytically even though the two sets of spectral data do not have equal peak values. This method provides analytical data in contrast to reflectance and reflection density spectra that are related only to appearance. These data meet the set criteria for eigenvector analysis and linear algebra operations.

*PSI Associates