

# Glossary of Color Measuring Terms

## A

**Achromatic color.** A neutral color (white, gray, or black) that has no hue.

**Attribute.** Distinguishing characteristic of a sensation, perception, or mode of appearance.

## C

**Chromatic.** Perceived as having a hue (not white, gray, or black).

**Chromatic attributes.** Attributes associated with the spectral distribution of light: hue and saturation.

**Chromaticity.** The part of color specification that does not involve illuminance. Chromaticity is two-dimensional and is specified by pairs of numbers for dominant wavelength and purity.

**CIE (Commission Internationale de l'Éclairage).** Translated from French to English as the International Commission on Illumination, CIE is the main international organization concerned with color and color measurement.

**CIE chromaticity coordinates.** The ratios of each of the tristimulus values of a color to the sum of the tristimulus values. In the CIE systems, they are designated by x, y, and z.

**CIE luminosity function (y).** A plot of the relative magnitude of the visual response as a function of wavelength from about 380 nanometers to 780 nanometers, adopted by CIE in 1924.

**CIE 1976 L\*a\*b\* color space.** A uniform color space that uses an Adams-Nickerson cube root formula, adopted

by the CIE in 1976 for measuring small color differences.

**CIE 1976 L\*u\*v\* color space.** A uniform color space adopted in 1976. Used in additive mixing of light (e.g. color TV) and when an associated chromaticity is desired.

**CIE standard observer.** A hypothetical observer having the tristimulus color-mixture data recommended in 1931 by the CIE for a 2° field of vision. A supplementary observer for a larger 10° field was adopted in 1964.

**CIE tristimulus values.** The amounts of the three reference or matching stimuli required to give a match with the color stimulus considered in a given trichromatic system.

**Color attribute.** A three-dimensional characteristic of the appearance of an object. One dimension usually defines the lightness; the other two together define the chromaticity.

**Color difference.** The magnitude and character of the difference between two object colors under specified conditions.

**Colorimeter.** An instrument designed for the direct measurement of color (see also *Tristimulus colorimeter*).

**Color measurement scale.** A system of specifying numerically the perceived attributes of color.

**Color specification.** Tristimulus values, chromaticity coordinates, and luminance value, or other color-scale values, used to designate a color numerically in a specified color system.

## D

**Delta ( $\Delta$ ).** A symbol that indicates deviation or difference.

**Density.** The ability of a material to absorb light; the darker it is, the higher the density.

## H

**Hue.** The attribute of color perception that allows an object to be judged red, blue, green, purple, and so on.

## I

**Illuminant.** Incident luminous energy specified by its spectral distribution.

## L

**Light.** Electromagnetic radiation in the spectral range detectable by the human eye (approximately 380 nanometers to 780 nanometers).

**Lightness.** Perception by which white objects are distinguished from gray objects and light-colored objects are distinguished from dark-colored objects.

**Light source.** The element in an instrument or in the visual observing situation that furnishes light.

## M

**Munsell Color System.** The Munsell color identification of a specimen by its Munsell hue, value, and chroma as visually estimated by comparison with the Munsell Book of Color.

## N

**Nanometer (nm).** Unit of length equal to  $10^{-9}$  meter.

## S

**Saturation.** The attribute of color perception that expresses the degree of departure from the gray of the same lightness.

**Spectrophotometer.** An instrument that measures light at many points on the visual spectrum, resulting in a curve.

**Spectrum.** Spatial arrangement of electromagnetic energy in order of wavelength.

**Standard.** A reference for comparing measurements.

## T

**Tristimulus.** Of or relating to values that give the amounts of the three colored lights, or receptors: red, green, and blue.

**Tristimulus colorimeter.** An instrument that measures tristimulus values and converts them to chromaticity components of color.

*Adapted with the kind permission of X-Rite, Inc. from A guide to Understanding Color Communication (Grandville, Mich.: X-Rite, Inc., 1993).*