Helpful Terms About Ink and its Uses

A

Absorption
The dispersal and decreased transmission of visible light in its interaction with matter, resulting in the change of its color.

Appearance
The nature of objects as visual attributes, such as size, shape, color, texture, glossiness, transparency and opacity.

Attribute
Colors are often described by their attributes of hue, saturation or chroma, and lightness.

B

Banding
Distinct pattern alterations, rather than a smooth transition of colors or other effects in a gradient. Occurs in continuous tone images when displayed using less than 24 bits of digital information or if printing gradients without sufficient color information.

Black
The absence of reflected light; the color that is produced when an object absorbs all wavelengths from the light source. When 100% of cyan, magenta and yellow are combined, the resultant color should be black, but in reality produces a muddy gray or brown. Therefore in four-color process printing, black is one of the process inks. The letter "K" is used to represent black in the CMYK acronym to differentiate it from "B" for blue in RGB.

Brightness
The measurement of the reflective quality of a medium. Different brightness levels can cause changes in the appearance of color on the medium requiring adjustments in calibration to achieve optimum result

C

Chroma
In visual perception, when an area appears saturated with a particular color or hue. For example, a red apple is high in chroma; pastel colors are low. Black, white and gray have no chroma. Part of the color model, L*C*H or lightness, chroma, hue. Also referred to as saturation.

CIE
Commission International de l'Eclairage or the International Commission on Illumination, which is the main world institution concerned with color and color measurement.

CMY
The subtractive primaries cyan, magenta and yellow.

Color Calibration
Coordination of the color matching between two or more digital devices by means by hardware or software.

Color Curve
Visual mechanism in photo and graphics software to display color measurements and make tonal changes in an image.

Color Separation
Photographic or electronic process for creating patterns of plates for each component of a color space. In printing, for example, separating the cyan, magenta, yellow and black components of a page image.

Color Wheel
An arrangement of the visible spectrum's continuum of colors in a circle fashion, that has complementary colors, such as red and green, located opposite from each other.

Colorants
Materials used to create colors, such as dyes, pigments, toners and phosphors.

Colorimeter
Device that measures color values in relation to a specific set of standards, such as CIE. Enables measurement of differences in colors more precisely than the human eye.

Cyan
The "redless" process color. It absorbs all red wavelengths and reflects all blue and green wavelengths of light.

D

Delta-E
Unit of measurement of the perceivable difference in a color by the human eye.

Densitometer
Device used to measure the density of light by means of its absorption by a substrate or surface of paper or film. This is achieved either by reflection or transmission.

Density
The ability of a material to absorb light. The darker the material, the higher the density.

Dithering
A process that simulates shades of gray or color variations by differing sizes and shapes of pixel groups instead of an ordered array of halftone dots. This reduces the contrast between dots of different colors or shades and yields a more flowing, natural impression.

Dot Gain
The effect that is described when individual dots in a halftone screen or other such patterns print out larger than their intended size, resulting in a darkening of the image.

Dots per Inch (DPI)
Measurement that describes the resolution of image files by measuring the number of separate pixels represented either horizontally or vertically in one square inch.

Dye
Colored chemical that dissolves completely in water or other solvent; as opposed to pigments, which are insoluble.

Dye Sublimation
Color printing technology that produces images by means of gaseous dyes through a thermal printing driver.

E

Enhanced Gamut Color
When precisely diluted process colors, usually cyan and magenta, are used with CMYK to create more vibrant colors and a continuous-tone effect.

Expanded Gamut Color
When additional colors, usually green and orange, are printed with CMYK to match a greater number of colors than produced by CMYK alone.

F

Four-Color Process
Printing or other imaging with combinations of the subtractive primaries of cyan, magenta, yellow and black. These are deposited as dots of different sizes, shapes and angles to create the illusion of different colors.

G

Gamut
The range of colors that can be interpreted by a color model or generated by a specific device.

Gradation
The transition between two colors or between black and no color which is created by mixing percentages of the dominant and secondary color and then alternating them to produce the desired effect.

H

Halftone
The process of reproducing an image as a series of variable-sized dots within a fixed grid.

Hexachrome
Color-matching system from Pantone, Inc. that is used with hi-fi color systems and devices.

Hi-Fi Color
Printing process that extends the tonal capabilities of most printing presses by employing stochastic screening, six-color printing and other techniques to expand the possible color gamut beyond the traditional abilities of four-color processes.

Hue
The basic color of an object as defined by its angular position in a cylindrical color space, or on a Color Wheel.

I

Inkjet
Printing process where liquid ink is propelled at a substrate, such as paper or film, to form characters and graphics. There are three kinds of inkjet printing: thermal, piezoelectric and phase change.

Intensity
Saturation, or reflective light, in relation to visible wavelengths of light. The reflectance of wavelengths at high intensity generates high saturation or chroma.

L

Light
Electromagnetic radiation in the spectral range that is detectable by the human eye (approximately 380 to 720 nm).

Light Magenta/Light Cyan (LM-LC)
Muted or diluted forms of the two primary colors. When added to CMYK these shades produce more variety in dot color and natural continuous tone printing.

Luminance
Describes the brightness of an image.

M

Magenta
The "greenless" process color. It absorbs all wavelengths of green from light, while reflecting all red and blue wavelengths.

N

Nanometer (Nm)
The measurement of wavelengths. Unit of length equal to 109 meters, or one millionth of a millimeter.

O

Opacity
Describes the resistance of light passing through a substrate.

P

Pantone™ Matching System (PMS)
Unique numbering system for identifying colors created by combinations of standard SWOP inks.

ph
A value that expresses the degree of acidity or basicity of a solution.

Piezo Inkjet
Inkjet printing process that uses electric pulses from piezoelectric crystals to stimulate and force ink through inkjet nozzles onto substrates.

Pigment
Colorant that cannot be dissolved in a liquid. In inks, produces sharper, darker images on a wider range of plain papers.

Pixel
A tiny picture element that contains red, green and blue information for color rendering on a monitor or scanner. Pixels on a screen are similar to dots of ink on paper. Monitor resolution is described in terms of pixels-per-inch (ppi), while printer resolution is measured in dots-per-inch (dpi).

Pixels per Inch (PPI)
The number of pixels in a rastar image that occur in one line along one inch. The greater the pixels, the higher the resolution.

Primary Color
Colors that are the bases for other colors. In light, the primary colors are red, green and blue (RGB). In color photographic printing, they are cyan, magenta and yellow (CMY). Black or key (K) is added as a fourth ink to CMY printing to produce denser, truer blacks and clearer, sharper images.

Print On Demand
Term for a variety of short-run publishing processes that include copier technologies and direct-to-press applications.

Prism
Triangular-shaped glass or other transparent material through which, when light is passed, its wavelengths refract into a rainbow of colors. A demonstration that light is composed of colors and indication of the arrangement of colors in the visible spectrum.

Process Color
Cyan, magenta, yellow and black combined to create a new color.

R

Reflective
The ability of a surface to bounce back some or all of the wavelengths of light that strikes it.

Resolution
The number of dots or samples-per-inch that a device is capable of recognizing or producing.

RGB
The additive primary colors: red, green and blue.

S

Saturation
Color attribute that expresses the degree of departure from the neutral gray of the same lightness. Also known as chroma.

Sequence
The order in which inks are deposited by a printing device. In CMYK inkjets the sequence is yellow, magenta, cyan and black.

Spectral Curve
A visual representation of a color's spectral data as the color's "fingerprint". A spectral curve is plotted on a grid comprised of a vertical axis of the level of reflectance intensity, and a horizontal axis describing the visible spectrum of wavelengths. The percentage of reflected light at each interval is plotted as points on a curve.

Spectral Data
The most precise description of the color of an object. Since an object's color appearance results from light being changed by it and reflected to the viewer, spectral data describes how that reflected light was changed. The percentage of reflected light is measured at several intervals across its spectrum of wavelengths, which is then visually represented as a spectral curve.

Spectrophotometer
An instrument that measures the characteristics of light that is either reflected from or transmitted through an object.

Spectrum
The spatial arrangement of electromagnetic energy in accordance to size of wavelength.

Subtractive primaries
Cyan, magenta and yellow. The theoretical combination of the three at 100% strength should produce black on white paper. Their combination at varying intensities produces a gamut of colors. Combining two primaries at 100% creates either the red, green or blue additive primary. Cyan+magenta=blue. Cyan+yellow=green. Magenta+yellow=red.

Surface Tension
The forces of cohesion at the surface of a liquid which encourage the tendency of a liquid to reduce its exposed surface to the minimum area. Molecules within a liquid are attracted equally from all sides, but those near the surface experience unequal attractions and are thus drawn towards the center of the liquid mass by this net force.

T

Thermal Drop-on-Demand
Inkjet printing process where inks are heated in a chamber above the print head to a temperature greater than their boiling point. The heat alters and expands the characteristics of the ink, which is then expelled through the head onto the substrate.

V

Viscosity
The internal resistance to flow exhibited by a fluid.

Visible Spectrum
The region in the electromagnetic spectrum between 380 and 720 nanometers. Wavelengths within this span produce color as viewed by the human eye. Shorter wavelengths create violets, purples and blues, while longer wavelengths result in oranges and reds.

W

Wavelength
Measurement of light as a component of electromagnetic waves. The wavelength is the peak-to-peak distance between two adjacent waves.

Y

Yellow
Pure yellow is the "blueless" color. It absorbs all wavelengths of blue from light, and reflects all red and green wavelengths.