COLORMIXING

BASIC

BASIC COLOR AND LIGHT

All objects that are viewed in the course of our every day existence, with the exception of those that are black, have a physical characteristic known as color. This is the ability of the object to reflect some of the light that strikes it. Since black absorbs all light and reflects none, it is said to have no color.

Sunlight is made up of all colors. A blue object is one that reflects the blue color and absorbs light of all other colors. A material that reflects all of the light that strikes it is called white.

REFRACTION OF LIGHT

REFRACTION OF LIGHT

By shining light through a piece of glass called a prism, we are able to break white light down into its individual parts. These parts are what we call the individual colors or hues. According to a basic theory of color there are only three basic, or primary colors: **red, yellow** and **blue**. All other colors are derived from these and are called secondaries and intermediates.

SHADES, TINTS AND TONES

SHADES, TINTS AND TONES

In addition to this, we have shades, tints and tones. When an individual color, or hue, is made darker by the addition of black, this is known as a shade of the original color. A tone is achieved by adding varying amounts of black and white to the color with which we are working; a tint is achieved by adding white.

Important factors that have an affect on the appearance of color are: the light source, the reflectance value and the gloss.

Artificial light does not have the same affect on colors that ordinary daylight would have as it is limited in the colors that it radiates. In addition to this, incandescent and fluorescent light have a tendency to bring out different colors. While there are a variety of different types of fluorescent lights available, these are more inclined to bring out the cool colors, such as blues, greens, and yellows, while incandescent bulbs are more apt to stress the warm colors such as the reds and yellows.

REFLECTANCE AND GLOSS

REFLECTANCE AND GLOSS

Reflectance and gloss are sometimes confusing. However, they are completely different and their individual value can be measured. Simply, gloss is the ability to reflect mirror images, while reflectance is the measure of the ability to reflect light. You may be able to see your reflection in a high gloss

dark color which reflects almost no light. A flat white, which reflects a great amount of the light that strikes it, has no mirror ability.

COLOR WHEEL SYSTEM

Many color systems have been designed to identify, analyze and measure the infinite number of colors perceived by the human eye. One of the most important and widely used color systems in existence today is the color wheel system.

The color wheel system is a simple, pictorial method of studying the relationship of colors and learning the basic principles of color harmony. The color wheel consists of 12 colors:

- 3 primaries (red, yellow, blue)
- 3 secondaries (orange, green, violet) and
- 6 intermediates (red-orange, red-purple, yellow-orange, yellow-green, blue-green, blue-purple).

Harmonious color schemes can be accomplished by applying simple formulas. The most common formulas are known as the monochromatic and various complementary color schemes.

A monochromatic color scheme is formed by using tints and shades of only one color. An example is red, plus black and/or white.

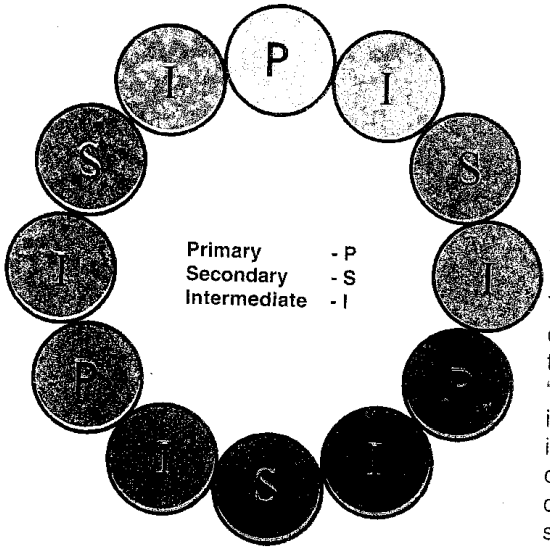

Figure 1 - Complete Twelve Section Color Wheel

A true complementary color scheme is made by using a combination of two colors. Any two colors directly across the color wheel from each other are true complements. For example; red and green.

The split complement color scheme employs three colors. As the name "split" complement implies, this scheme involves splitting one color from the true complement color scheme. An example is red, yellow-green and blue-green.

USE AND COMPOSITION OF UNIVERSAL COLORANTS

USE AND COMPOSITION OF UNIVERSAL COLORANTS

Unlike paints and stains, universal colorants contain no resin or binder. The adhesive and film forming funcitons of resins are supplied by the resin in the paint to which the colorant is added. Therefore, a universal colorant cannot be used as a coating by itself.

The volatile portion of a universal colorant is a blend of water and ethylene glycol, which is the major raw material in automobile antifreeze.

The non-volatiles in a universal colorant are colored pigment powders, some inert (colorless) pigments, and blends of soap-like chemicals called surfactants. Surfactants stabilize the dispersion of pigments in the water/glycol medium, and ensure that the colorant will properly mix into various trade sales paints and stains, both alkyd or oil-based, and latex. Hence the name "Universal" colorant.

Note that this type of colorant is only one of many for coatings, and that is "universal" with regards to trade sales coatings only. Many types of industrial paints are not compatible with trade sales universal colorants.

COLOR MATCHING WITH UNIVERSAL COLORANTS

COLOR MATCHING WITH UNIVERSAL COLORANTS

Universal colorants are a blend of pigment, ethylene glycol, water, and surfactant. There are no resins or binders. The surfactant additive ensures that the colorant will properly mix into latex, alkyd/oil-based paints and stains. Most industrial coatings, wood preservatives, and lacquers are not compatible with universal colorant.

Finish paint colors are a combination of one or more colorants added to a white base. Off-white/paste colors for example, begin from paints with a higher concentration of white pigment. Darker colors and vivid hues result from blending higher volumes of colorant with a paint base containing less white pigment. Each paint base has a limit to the amount of colorants that can be added.

Excessive colorant use decreases paint application performance. Prolonged dry time, loss of color, sheen uniformity, and poor sag resistance are a few of the decreases in performance. Problems with putting it on is just the beginning. The diminished integrity of the paint film leads to accelerated deterioration at all fronts: chalking, fading, blistering, peeling, etc.

Colorants are grouped into two types: Organic and Inorganic.
Organic pigments are synthetically produced to create brilliant reds, yellows, blues, and greens with low opacity (poor hide) and varying degrees of lightfastness (color retention). These are high cost pigments with proportionately poor performance and should be used sparingly.