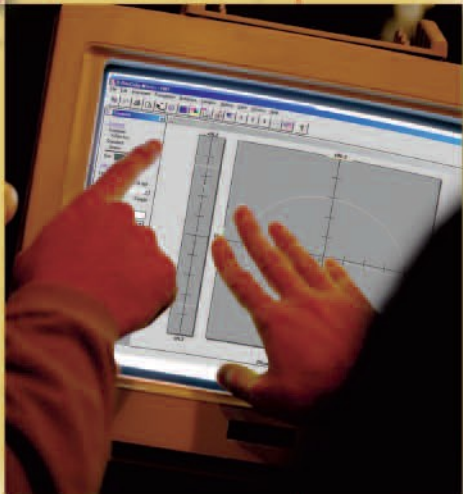
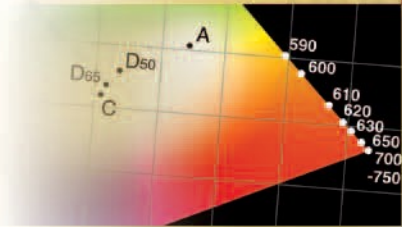


A Guide to Understanding Color Communication Part 1

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Communicating Color

How would you describe the color of this rose? Would you say it's yellow, sort of lemon yellow or maybe a bright canary yellow?

Your perception and interpretation of color are highly subjective. Eye fatigue, age and other physiological factors can influence your color perception.

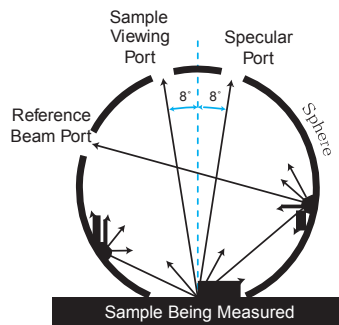
But even without such physical considerations, each observer interprets color based on personal references. Each person also verbally defines an object's color differently.

As a result, objectively communicating a particular color to someone without some type of standard is difficult. There also must be a way to compare one color to the next with accuracy.

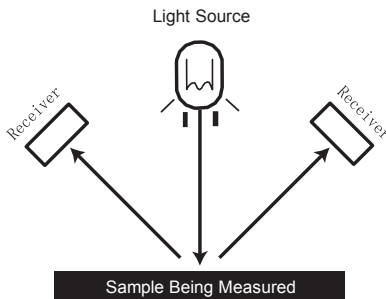
The solution is a measuring instrument that explicitly identifies a color. That is, an instrument that differentiates a color from all others and assigns it a numeric value.



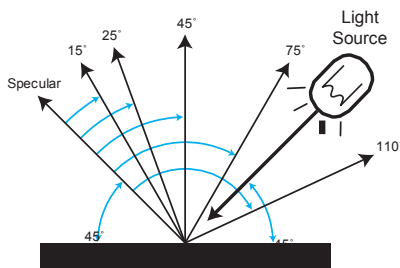
Ways to Measure Color



Spherical



0/45



Multi-angle

Today, the most commonly used instruments for measuring color are spectrophotometers.

Spectro technology measures reflected or transmitted light at many points on the visual spectrum, which results in a curve. Since the curve of each color is as unique as a signature or fingerprint, the curve is an excellent tool for identifying, specifying and matching color.

The following information can help you to understand which type of instrument is the best choice for specific applications.

Spherical

Spherically based instruments have played a major roll in formulation systems for nearly 50 years. Most are capable of including the “specular component” (gloss) while measuring. By opening a small trap door in the sphere, the “specular component” is excluded from the measurement. In most cases, databases for color formulation are more accurate when this component is a part of the measurement. Spheres are also the instrument of choice when the sample is textured, rough, or irregular or approaches the brilliance of a first-surface mirror (Gold or Silver for packaging industry). Textile manufacturers, makers of roofing tiles or acoustic ceiling materials would all likely select spheres as the right tool for the job.

0/45 (or 45/0)

No instrument “sees” color more like the human eye than the 0/45. This simply is because a viewer does everything in his or her power to exclude the “specular component” (gloss) when judging color. When we look at pictures in a glossy magazine, we arrange ourselves so that the gloss does

not reflect back to the eye. A 0/45 instrument, more effectively than any other, will remove gloss from the measurement and measure the appearance of the sample exactly as the human eye would see it.

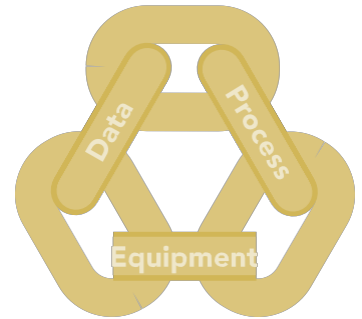
Multi-Angle

In the past 10 or so years, car makers have experimented with special effect colors. They use special additives such as mica, pearlescent materials, ground up seashells, microscopically coated colored pigments and interference pigments to produce different colors at different angles of view. Large and expensive goniometers were traditionally used to measure these colors until X-Rite introduced a battery-powered, hand-held, multi-angle instrument. X-Rite portable multi-angle instruments are used by most auto makers and their colorant supply chain, worldwide.

Colorimeter

Colorimeters are not spectrophotometers. Colorimeters are tristimulus (three-filtered) devices that make use of red, green, and blue filters that emulate the response of the human eye to light and color. In some quality control applications, these tools represent the lowest cost answer. Colorimeters cannot compensate for metamerism (a shift in the appearance of a sample due to the light used to illuminate the surface). As colorimeters use a single type of light (such as incandescent or pulsed xenon) and because they do not record the spectral reflectance of the media, they cannot predict this shift. Spectrophotometers can compensate for this shift, making spectrophotometers a superior choice for accurate, repeatable color measurement.

Integration



Non-Contact Color Measurement



The X-Rite TeleFlash system provides online color measurement and evaluation of color deviation to the running production line. TeleFlash can accurately measure the color of products that are textured, finely patterned or glossy, such as extruded vinyl, bulk goods, coil coatings, synthetic films, paints (wet and dry), textiles, carpeting, granules, food pigments, paper, powders, glass, ceramics, metal, minerals and plaster.

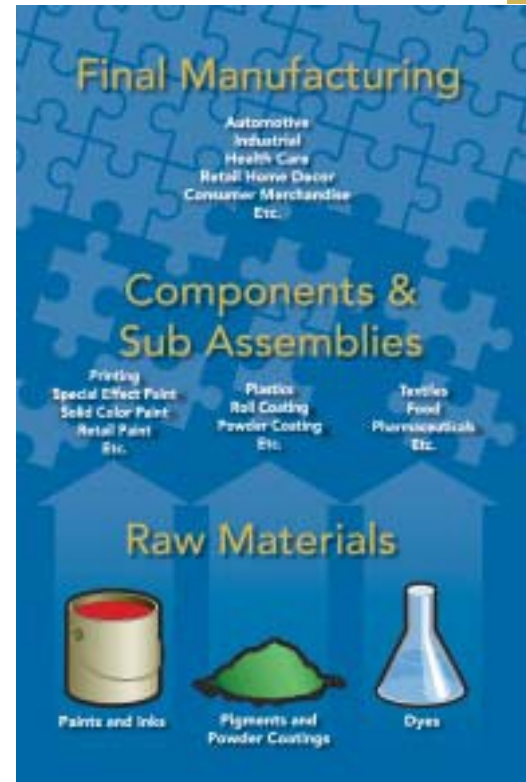
TeleFlash offers a measuring distance of up to five feet, tolerating small variations in the measuring distance from system to sample. The system's thermochromism compensation allows for color measurement without the time usually required for cooling and stabilizing.

Multi-User, Network Installations and Portable Data

The networkability of X-Rite software makes it easy to communicate data and share standards across an enterprise. This ease translates into efficiency which has a direct effect on profitability.

Calibrated, On-Screen Color

X-Rite offers the only color formulation and quality assurance software to use the International Color Consortium's (ICC) standard device profiles for on-screen color. This means that colors will be consistently displayed on different computers, so long as ICC profiles are used. Use X-Rite monitor optimizers for complete color calibration and control on computers, printers and scanners.



Applications

Spectrophotometry's applications are seemingly boundless. Color-matching measurements are made every day by those comparing a reproduced object to a reference point. Spectrophotometry-assisted color measurement can be useful in areas such as:

- Corporate logo standardization
- Color testing of inks
- Color control of paints
- Control of printed colors on packaging material and labels
- Color control of plastics and textiles throughout the development and manufacturing process
- Finished products like printed cans, clothing, shoes, automobile components, plastic components of all types



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