

Why Daylight? ...and, do you struggle with Metamerism?

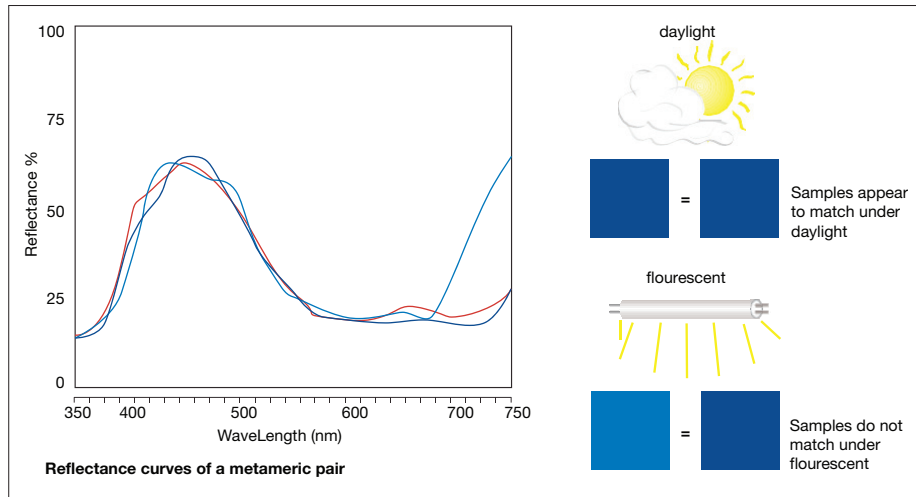


Daylight renders color accurately. However, since natural daylight changes throughout the day and is impacted by the weather, simulated standardized daylight was created to ensure that accurate visual color judgments can be made.

Depending on the light source, color varies. That's because the spectral quality or color content of the light affects how we see color. The spectral quality of natural daylight depends upon atmospheric conditions, geographic location, time of year – even time of day. For example, the color appearance of early morning sunrise and late afternoon sunset can be as low as 2300° Kelvin (also known as horizon daylight*). At noon, the color appearance of light is approximately 5000° Kelvin and can exceed 10,000° Kelvin (on a clear day facing a north sky).

**X-Rite viewing booths
permit accurate color
viewing under all
phases of daylight.**

Metamerism Evaluation



Metamerism is caused when the spectral reflectance or transmittance curves of each object differ.

Daylight is evenly balanced across the visible spectrum – it has equal amounts of red, orange, yellow, green, blue, indigo and violet light energy. That means it more accurately renders color. Without this balance, colors aren't rendered precisely causing the light source to accentuate certain colors while suppressing others. **Even slight deficiencies or excesses in light energy could skew your color perception causing you to approve or reject samples erroneously.**

As consumers become more discriminating and brand owner standards for color quality and consistency rise across markets, the importance of making accurate visual color judgements continues to increase. Controlled lighting, like that provided by the X-Rite SpectralLight QC, ensures that simulated daylight, home light, and store light conditions used for visual quality control are standardized.

Do You Struggle With Metamerism?

Metamerism is the phenomenon of objects having their color match under one set of conditions – real or calculated – and not match under different conditions. Two objects exhibiting metamerism are said to be a metameric pair.

What causes metamerism? It's caused when the spectral reflectance or transmittance curves of each object differ. When the reflectance curves of the two objects cross one another three times or more, metamerism takes place. (See illustration.) For example a mobile telephone consists of several component parts that may be comprised of different resins and colorants. When the parts are assembled into a phone, all the components should visually match under daylight and at least two other light sources giving the phone a uniform appearance. If, for example, the battery housing appears to be a different color than the main phone housing, metamerism could be a factor. Colorants used to create a

product can differ from batch to batch, lot to lot or supplier to supplier. Colorants used in some applications may not work in others. The more colorants added to create a batch or correct a mistint, the greater the risk of metamerism.

Other Forms of Metamerism:

Observer metamerism is when samples that appear to match to one observer do not seem to match to another. Often the cause is differing color vision between the viewers – a fact that can be established with a color vision test such as the Farnsworth-Munsell 100 Hue Test.

Geometric metamerism is when object color matches at one angle of illumination but not when the angle is changed. This situation often occurs with materials that are directional – velvet, suede, broadlooms, plastics, and metals.

How can you avoid metamerism?

The effects of metamerism can be minimized through early detection. It is important to evaluate samples under daylight and at least two other light sources in a controlled environment. Also, samples that may have a directional characteristic, such as textured plastic, must be viewed from the same angle to avoid geometric metamerism.

Interested in learning more about how controlled lighting can benefit your business? Call X-Rite today to learn more about the products and services we offer that can take your color quality control to the next level.

Contact our lighting experts today at 1-888-800-9580