

Seeing Color Clearly: The Science Behind Pigment and Perception

When it comes to paint, color is both a design choice and a science. Pigment and perception combine to play a role in how we experience color in coatings. Color is created when light hits a surface, selectively reflects wavelengths, and is interpreted by the human eye. For example, a red wall absorbs all wavelengths except red—the red is reflected, which gives it that color's appearance. But did you know the same red coating will look different under fluorescent light versus sunlight?

When choosing a coating color for your next project, here are a few color fundamentals every professional should know:

- Hue, chroma, and value are the three dimensions of color. Hue refers to the color family (red, blue, etc.), chroma is the intensity or purity, and value indicates how light or dark it appears.
- Pigments are the source of color in paint. Natural earth pigments (like burnt sienna or yellow oxide) and chemical pigments (like phthalocyanine blue) are blended to create nearly every color we see on the job.
- Base is your primary building block. Deep and clear bases are required to achieve bold colors, while white or neutral bases are best for pastels.
- Colorant must be balanced for best results. Too much can lead to gloss loss, delayed drying, and soft finishes—so always follow formulation guidelines.
- Gloss and light reflectance affect both appearance and performance. Glossy coatings may appear darker and highlight surface imperfections, while flat finishes can look lighter and hide flaws.

Whether you're matching a historic architectural color or aiming for energy-efficient reflectance, understanding the science behind color ensures better results and happier asset owners and building tenants.