

Senergy®



The Science of Color

All of our "stucco look" acrylic and elastomeric textured finish products are sold primarily to add the desired color and the desired texture chosen by owners for the facades of their building. Senergy® offers a wide variety of textures and a complete pallet of colors ranging from very white to very dark.

Light and Color Working Together

Our skilled color matching team can closely match virtually any color.

Light and Color

Color is the visual observation of a specifically colored light spectrum produced by the reflection of that light spectrum off the surface of a light absorbing material. When full spectrum white light hits an object, some of the spectrum is absorbed into the surface of the material while a portion is reflected to the eye of the observer. The color that is produced or perceived is the portion of the white light spectrum that did reflect. This separation of white light into the spectrum of colored light is called refraction. It happens all around us all the time.

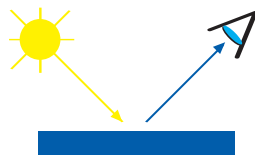


Figure 1

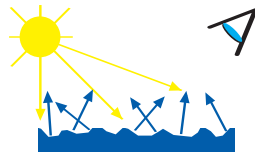


Figure 2

Light is such a critical component of color; different light sources can produce a perceptible difference in the color of an object. This phenomenon is known as metamerism. For instance, a painted wall will exhibit a certain color with natural sunlight, but that color can appear very different under indoor lighting conditions. For example, dark colors are much brighter outdoors than inside. This is due to the pure white light of outdoor natural light refracting and reflecting more of the colored light spectrum to the eye of the observer.

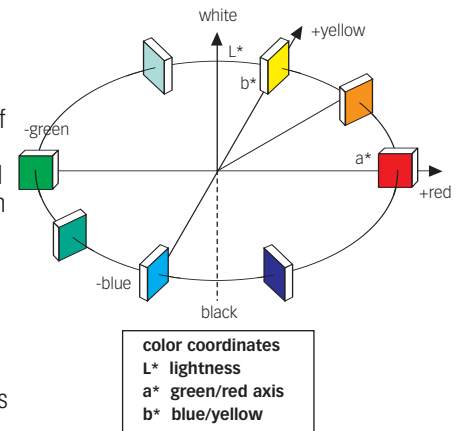
What about Textured Surfaces? In figure 1, the light is refracting and then reflecting off a smooth surface at a 90° angle. A smooth surface will more efficiently reflect light. A textured surface will reflect light in countless directions. Because of this irregular reflection, two things happen. First, the surface of the material does not appear to be glossy. Glossy surfaces are perceived glossy because the light is reflected at a nearly perfect 90° angle. Secondly, because the non-absorbed light spectrum is reflected in many directions, it gets distorted and the result is the perception of a different color. Generally, a textured surface, placed next to a smooth standard of the same color will appear darker than the smooth standard. For instance, acrylic coatings mixed and pigmented in the same pail can be applied smoothly on a flat surface and seen as a certain color. A portion of the original pail can then be applied in a textured manner next to the smooth material and the color will look slightly different to most people.

The Senergy Method of Color Control

How do we produce and control the specified color considering influential factors such as the angle of light reflectance and metamerism?

We do this by utilizing the science of Color Spectrophotometry as measured via a computerized color spectrophotometer.

A color spectrophotometer breaks the light spectrum produced by the reflectance of light off of a colored sample into values of lightness and darkness (L value), red and green (A value) and values of yellow and blue (B value). These values are examined by the computer vs. a standard, and a correlation factor, known as Delta E, is produced. If a Delta E of zero was obtained, that means the test sample matches the standard sample in every way. Typically this does not happen. The higher the Delta E value, the worse the color match is to the standard. Typically a quality control specification states that before a given coating color is accepted and passed for sale, the Delta E has to be less than a predetermined QC value. The paint industry typically uses a QC specification on the Delta E value that must be less than 1.0.



When BASF Wall Systems manufactures a batch of standard colored textured acrylic finish, all color values are produced to a quality control specification of Delta E less than 0.25. Such a tight specification is typically unheard of in the coatings industry. This extra step is taken to ensure customer satisfaction and to comply with the designer's wishes. This type of color control is most helpful on a large construction project. For those projects, we make a batch of acrylic finish for that project, save a portion as a standard, and then match each subsequent manufactured batch to a Delta E of less than 0.25 to the "Project Standard". This ensures the entire envelope of the building will be a very consistent color.

Many of the Senergy distributors tint our products at their facilities. In order to do this, they purchase tint base from us. Tint base is a product that represents all the ingredients of that product, except the final color, which is added by the distributor at the time of purchase. We have trained our distributors on this technique. The key to this successful program has been our training program and our tint base manufacturing process. All of our tint bases are manufactured to a very tight "Tint Strength" specification.

Color Selection by the Specifier



When choosing a color for the Senergy specified project, we first recommend the owner and specifier start the color/texture selection process using our *Color Selection Guide*. You'll note that the *Color Selection Guide* has many color selections and several surface textures to choose from. Select the combinations that are the most appealing, and then call your local Senergy distributor and ask for applied samples of these combinations of texture and color. We recommend you make your color selection from these samples. Review the color by exposing the sample to exterior light as well as interior light. Make sure the sample has the color desired when exposed to exterior light because this is the color you will

see on the façade of the completed project. Finally, always specify that an exterior mock up of the wall system be installed at the job site for final approval before the work begins. When using this procedure we find that the owner's expectations of texture and color of the building are best met.

Please also note that custom colors are certainly available. Our skilled color matching team can closely match virtually any color.



Dark Colors and Reflective Surfaces



The color selection for the exterior cladding is one of many considerations on any project. Dark colors can significantly increase the surface temperature of the wall cladding. For standard expanded polystyrene insulation-based EIFS, finish coat colors with Light Reflective Values (LRV) of 20% or higher will, in typical conditions, result in surface temperatures well within the maximum sustained service temperature of the expanded polystyrene insulation (approximately 165°F).

Project specific factors such as building geometry, sitting/orientation, location, aesthetic features (sills, slopes, etc.), or adjacent reflective surfaces such as metal roofing or reflective glass, etc., can further affect the surface temperature of the cladding. For example, reflective glass adjacent to or reflecting on the cladding can, in some areas, significantly increase the surface temperature and potentially result in localized deformation of the expanded polystyrene insulation. The design professional must consider such factors when designing a project.

Areas subject to elevated, sustained service temperatures can typically be addressed through adjustments to slopes, colors, adjacent materials, etc., as well as through alternative system options such as the following:

- Systems such as Cement-Board Stucco, Stucco, or alternative surfacing systems that do not include an expanded polystyrene insulation board
- Exterior Insulated Systems that incorporate a thick reinforced base coat system such as Senerthik or Senerflex with a thicker, more impact resistant, reinforced base coat (Flexguard 4 & Hi-Impact 20 mesh)

UV Resistance — Will Colors Fade?

Almost 100% of our standard Senergy colors are produced solely using colorants that are composed of inorganic pigments. Inorganic in this respect means that the pigments are derived from non-living sources such as iron oxide. These types of pigments provide excellent UV resistance and will not fade. However, some colors cannot be achieved by the limited range of inorganic pigments available. In those cases small amounts of organic pigment may need to be used. This is the case in deeper reds, blues and yellows. When organic pigment is used to produce the desired color, color stability or fade resistance due to UV exposure cannot be guaranteed.

For questions or more information, contact the BASF Wall Systems Technical Department at 800-221-9255.

BASF Wall Systems

3550 St. Johns Bluff Road South
Jacksonville, FL 32224-2614
Phone 800 • 221 • 9255
Fax 904 • 996 • 6300
www.senergy.cc

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