

Plastics come in a wide array of colors and must undergo various steps of processing to achieve desired results. Measuring color pigment throughout each processing phase is important for maintaining consistency and avoiding product rejection due to color discrepancy. Spectrophotometers allow for the continual monitoring and analysis of color pigments to ensure consistency throughout the supply chain, reducing errors and wasted materials.

Adding Color to Raw Materials

There are [various methods for adding color to plastic products](#), all involved in the early stages of production. These techniques (described below) rely on different methods of color pigment analysis which utilize spectral technology to achieve desired results.

1. **“Masterbatch” Method:** chemically altered, high pigment content pellets are mixed together with naturally colored pellets to achieve desired results.
2. **Pigment Additives:** naturally-colored pellets are mixed together with raw pigments to create colored pellets, which are then used to produce color specific plastic products.
3. **Pigment/Solvent Method:** pigments are first dissolved in a solvent and then sprayed on naturally colored pellets to alter final product color.
4. **Real-time Color Additives:** pigments and natural pellets are molded together simultaneously to develop final color specifications.

Whichever method is used to alter the color of the plastic product, each one will undergo various changes throughout processing. Continual monitoring of color pigment, dissolved pigment, natural raw plastic materials, and final product color is needed to provide valuable data that can alert production changes and guarantee desired results.

Color Pigment Analysis

Plastic pellet color is most often analyzed before the pellets are extruded or molded into final products. Color pigment measurement is an important step towards ensuring that these raw materials will produce the desired color results. Spectrophotometers offer a quick and simple method of color pigment analysis that can be quantified and repeated to help maintain consistency and quality.

These materials often exhibit differences in shape, texture, and transparency. Therefore, color measurement instrumentation must be designed to measure a variety of sample attributes. From powdered color pigment to dissolved liquid samples to plastic pellet materials that vary in transparency, spectrophotometers rely on advanced geometric principles to accurately quantify color and develop the data needed to reproduce these colors effectively. Advanced spectrophotometers allow for rapid, [in-line color process monitoring to continually monitor color changes and provide valuable feedback for processing adjustments and changes](#).

Monitoring Inconsistencies

Spectral data and feedback is highly utilized for its ability to monitor inconsistencies both during production as well as in final product appearance. Spectrophotometers can be used to set color standards at various checkpoints throughout production by assigning numerical values and [establishing color tolerances](#). [These quality standards](#) ensure that products pass final inspections, increase final batch quantities and company profits. Integrating color pigment monitoring with advanced color evaluation instrumentation, creates a system of precise color comparisons that match human eye perception. Using these methods to compare products to manufacturer standards throughout processing will eliminate inconsistencies early on and positively affect final product color.

Full article with photos available here:

<https://www.hunterlab.com/blog/color-plastics/fast-easy-effective-utilizing-spectrophotometers-to-measure-color-pigment-content-in-plastics/>