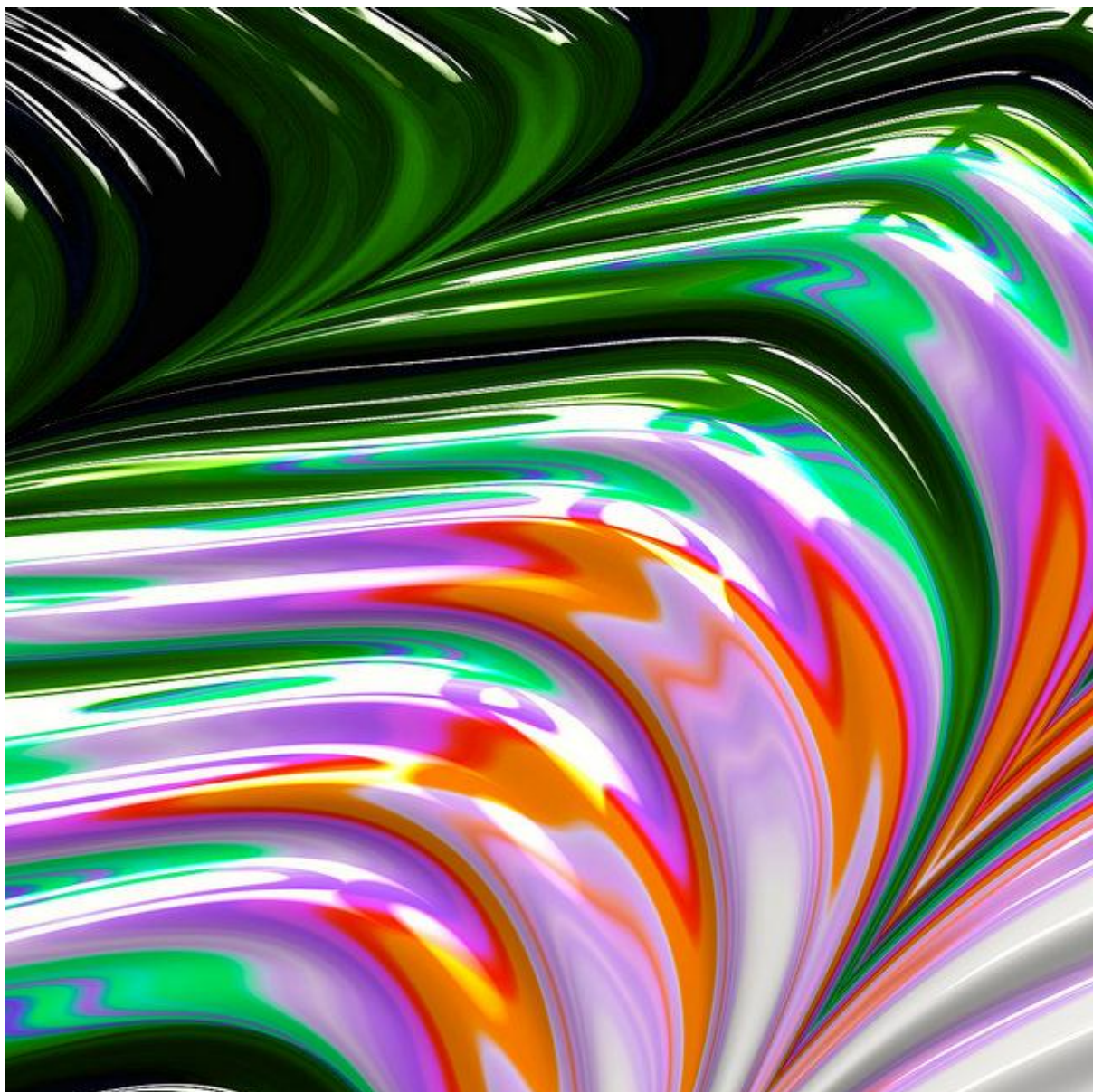


After a recent trip to the store, which yielded plastic bags filled with plastic packages—containing plastic toys, lights, and dinnerware—I’ve become fairly convinced that plastics are taking over the world. Polymer is the material of the future.

The Packaging Science University of Florida explains the reason for this market trend best, stating that “improvements in polymer performance have opened the door for new and innovative ways of production. Numerous additives provide processing and manufacturing performance improvements; others allow materials to have an assortment of enhanced properties”¹. Polymer additives are expanding the use of plastics in manufacturing and are the key ingredient in innovative design.

But the color analysis of plastic and polymer additives also plays a significant role the development of new products. With advancements in spectrophotometric technology, we have seen a huge improvement in the use and functionality of polymer additives across the industry.



Polymer additives have improved the use of plastics in manufacturing and created new innovations solutions with the use of these materials. Image Source: Flickr user Kevin Dooley ([CC BY 2.0](#))

Analysis of Various Polymer Additives

Additives aid both in processing and in enhancing the performance/appearance of materials. But because a wide variety of additives can be used to create new formulations, careful monitoring is a necessary part of development—a way to ensure that your products maintain their stability, uniformity, and consistency.

Color analysis can be used to assess the specific changes needed to improve the performance of your products. Color measurement provides information not only on color-changing additives, but can also measure molecular changes in stabilizers, fillers, processing aids, and antibacterial additives. It's not an exaggeration to say that this technology has revolutionized the polymer manufacturing industry.

Spectrophotometers are the primary tool used for the color analysis of plastic and polymer additives, from [molten samples](#) in polymer melts to [quality control inspection](#) in final product analysis. Advanced color measurement instrumentation monitors light absorption and reflection to determine even the slightest changes in formulation, allowing you to develop a more efficient method of evaluation. Closely monitoring color and/or molecular changes with spectral technology reduces wasted materials and improves final product quality, in turn improving the marketability of your offerings.



Plastic products are now stronger and more versatile than ever thanks to the use of polymer additives. Image Source: K P ([CC BY 2.0](#))

Spectral Technology Leads to New Innovations in Polymer Production

Spectrophotometers can, for instance, be used to monitor polymer stability and breakdown due to thermal changes and UV exposure. Degradation and chemical decomposition of materials are often attributed to these two factors, but color analysis instrumentation allows you to easily monitor UV reflectance values, providing the data necessary to assess changes. The data can then be used to ensure the proper formulation and use of polymer additives, allowing you to maintain product stability.

[Clarification of polymer materials](#) is another concern in the plastic industry since clarifying additives affect the overall structure of the polymer and increase the crystallization rate of your material. A more condensed crystallized structure leads to better clarification and improved visual appearance—and these condensed crystals also exhibit lower reflectance values, which means that color measurement instruments can closely monitor changes in the crystallization process by quantifying reflective value data. This data can then be used to compare the results of changes in your additive formulation or processing.

Fillers are another common additive used in polymer production as a way to reduce costs and increase production quantity. However, these additives can have an excessive effect on color. But spectrophotometers closely monitor color changes throughout product development, allowing for adjustments to color additives during production in order to improve final color quality and reduce wasted materials. Using [color measurement software technology](#), this data can then be stored and used for developing exact formulations that are consistent from batch to batch.



Changes in color and other polymer attributes are easily monitored with spectrophotometric technology. This data can then be used in make changes in formulations and ensure product quality. Image Source: Flickr user Steven Depolo ([CC BY 2.0](#))

Versatility and Options in Color Measurement Tools

The huge variety of polymer additives has revolutionized the plastic industry. But with these new products comes a greater need for versatility in analytical tools. When it comes to color measurement technology and versatility, HunterLab offers a wide range of spectrophotometer options. We specialize in the color measurement of plastic products and offer industry-leading innovation and experience. Our instruments are easy to use and meet the challenges associated with the color analysis of plastic and polymer additives. For more information on our product offerings, [contact HunterLab today](#).

1. "Analysis of Polymer Additives in the Packaging Industry",

2008, <http://www.iopp.org/files/public/FoxFloridaAdditives.pdf>