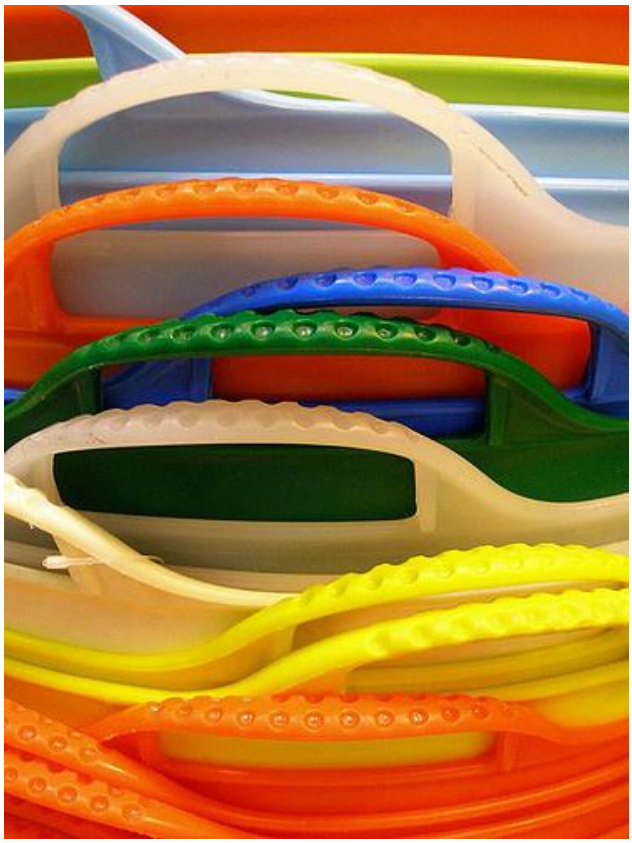
There seems to be no end to the continued growth in plastic manufacturing. According to the data reported on Plastics News[1], 2015 marked yet another monumental year for injection molded plastic sales. Sixty percent reported stable sales overall and among those companies, 15-24 percent showed a significant increase as well. In this booming market, competition with large manufacturers may seem daunting, yet small business continues to thrive.

In order to stay competitive among these giants, choosing the right spectrophotometer for plastics is often the difference in product efficiency and quality. Understanding the value in color measurement for plastic production is the first step towards optimizing growth and increasing sales overall.



New polymer products continue to flood the market and 2015 marked yet another milestone in molded plastic production sales.
Image Source: Flickr user tanakawho

Utilizing Spectrophotometric Instrumentation in Plastic Production

Colorimeters have been used for decades in production and manufacturing, utilizing human eye technology to imitate color perception. However, this technology has now been replaced by more advanced spectrophotometric instrumentation. Outdated colorimetric technology only allows for pure color measurement and does not account for any changes in color perception due to variables such as texture, light source or viewing angle. Because molded plastic products come in a variety of shapes, textures and opacities, the requirements for color measurement extend beyond the capacity of rudimentary color data.

In the measurement of plastic materials, traditional transmission and reflected **spectral data must extend to include yellowness, haze, gloss, texture, and other attributes** to assure accurate color measurement. Newer technology also includes CIE L*a*b* color[2] to fully maximize spectral

measurement capabilities. Various sample types require different techniques for accurate color measurements, so understanding these techniques is the first step to utilizing your color measurement instrumentation.

A directional 45/0° geometry illuminates the sample at a 45° angle with the viewing angle set at 90°. Scientific studies show that these geometric principles provide the truest representation of visual color perception.[3]

Directional 45/0° geometry is ideal for opaque plastic measurement, where product samples are impenetrable by light and the desired results are to quantify a visually perceived color with a numerical value. However, both texture and **gloss can present challenges in color measurement**. In these cases, the best technique for obtaining an accurate measurement for color alone requires diffuse d/8° reflectance instrumentation. If a plastic sample is translucent in appearance, reflectance and transmittance measurements work best but may vary depending on the level of transparency. Transparent samples require transmission spectral instrumentation to achieve the most accurate results.

Plastic materials range in opacity from translucent to opaque. Understanding and applying the right color measurement technique will lead to the most accurate results.
Image Source: Flickr user Franck Michel

Today's spectrophotometers are available in portable, bench-top, and online models, designed to monitor color variations and changes in real-time, from start to finish. Even slight changes in color can be detected easily and allow for simple changes to be made at any stage of production saving wasted materials, time, and money. These simple tools are beneficial for efficiently and effectively creating quality products and increase sales.

Spectrophotometric Applications in Plastic Manufacturing

Not only are spectrophotometers effective for increasing quality and production of molded plastics, but also the versatility of these tools extends to all areas of plastic manufacturing. With the right instrumentation, the non-uniform size of plastic pellet samples can be accurately measured. Color measurement helps to ensure uniform and consistent pellet color, which is used in extrusion and injection molding and directly affects final color quality.

Plastics come in a variety of shapes, sizes, and colors. Non-uniformity, gloss, shape and size can all affect color quantification, so choosing the right instrumentation is the first step in developing consistency and quality in polymer products.
Image Source: Flickr user Steven Depolo

From the beginning stages of plastic production to the final stages of **color analysis in preforms or sample plaques**, spectrophotometry ensures consistency throughout every step of production. The simplicity and accuracy of today's advanced instrumentation take the guesswork out of plastic manufacturing, increasing both production and quality overall.

Choosing the Right Instrumentation to Increase Production and Sales

Spectral technology continues to advance as new materials and applications maintain a constant presence in the plastic industry. In this ever-changing market, spectrophotometers are continually adapting to meet the demands of new materials and increased production needs. Advanced instrumentation not only simplifies production and quality control, but it also offers the versatility to adapt to new challenges and needs. HunterLab has worked together with many of the worlds'

leading polymer producers and is a trusted name in innovative and high-quality color measurement tools.

At HunterLab, we are dedicated to helping you make the most of your spectrophotometric instrumentation and our products are built on more than 60 years of experience in polymer color measurement analysis. We offer affordable solutions for any size business and our friendly staff is dedicated to helping you choose the right solution for your specific needs. For more information, **contact us** today.

1. "Small Injection Molders Report Healthy Growth", June 20, 2016, http://www.plasticsnews.com/article/20160620/BLOG01/160629977/small-injection-molders-report-healthy-growth
2. "Adobe Technical Guides, Color Models CIELAB", 2000, http://dba.med.sc.edu/price/irf/Adobe_tg/models/cielab.html
3. "Color Measuring Equipment", 2006-2014, https://www.sabic-ip.com/staticcxp/user/en/LearnAboutColor/ColorBasicsDetail/color_measuring_equipment.html