Plastics are a prime industry in the United States and are steadily becoming a strong economic force[1] in the global market. That is why many industry leaders are focusing on polymer color monitoring for quality control and improved efficiency. Polymer color process monitoring is a critical part of quality control, and new advancements in color technology offer opportunities to cut costs as well as save time and wasted materials, while creating the highest level product needed for today's competitive global market.

Polymer Technologies

Plastic manufacturing and polymer color technologies have become a major focus of industry growth in plastic manufacturing. The recent 28th International Symposium on Polymer Analysis and Characterization (ISPAC) conference of 2015 brought together top industry leaders to discuss and analyze new technologies for plastic production and quality monitoring. One of the major focuses of this conference centered on the need for controlling color differences and establishing color tolerances in polymer products. Polymer color is key factor in quality control (QC), and finding new methods for monitoring this process both effectively and efficiently are a top priority.

To keep up in a competitive global market, manufacturers must rely on continual real-time polymer color monitoring systems to regulate color differences and variations and to make efficient process changes and alterations to meet stringent color tolerance margins. New technologies included in-line, height variance, and non-contact spectrophotometers that have the ability to monitor the polymer color of various sample types for diverse market applications.

Extruded plastics

Many manufactured plastic materials begin by using an extruded plastic process, and can then used to develop a variety of other products which are marketed for various uses. These products included vinyl siding, wiring duct, roofing materials, window profile, cable channels, WPCs (Wood Plastic Composites such as decking and fencing product), as well as sheet plastic which can be transformed into a variety of other products. Recycled plastic materials can also be transformed into pellet resin materials and are often utilized as an eco-friendly raw material for extrusion.

Colorants and UV inhibitors additives (in either liquid or pellet form) are often used to alter polymer color and can be mixed into the resin prior to arriving at the hopper. The process uses extruder technology that is similar to plastic injection molding, but allows for continuous processing. New technology requires continual process automation technology (cPAT) for accurate polymer color monitoring. cPat provides real-time measurements which can be taken within the process stream to provide continuous information. This permits real-time changes to occur immediately, allowing for timely corrections to be made prior to fail conditions. Defective products can therefore be contained more precisely without the need to sort product later, leading to reduced scrap rates and labor costs.

Advanced instrumentation and technology

Many major plastic manufacturers are making the investment in advanced polymer color technology and reaping the benefits as well. New choices in spectral technology utilize non-contact measurement systems which allow for continual process monitoring at accelerated rates. Advanced instrumentation[2] increases production speeds while reducing errors by continually monitoring color differences and tolerance changes.

Full article with photos available here:

https://www.hunterlab.com/blog/color-plastics/plastic-power-polymer-color-industries-lead-the-economic-revival/