Controlling the Color of Plastics

In the 1967 hit movie "The Graduate", Benjamin Braddock (played by Dustin Hoffman) is given some advice by a family friend Mr. McGuire (played by Walter Brooke) at his graduation party. Mr. McGuire starts by saying to Ben "I just want to say one word to you – just one word". After making sure Ben is in fact prepared to listen to the advice he is about to offer, he sums it up by saying "Plastics." A somewhat unsure Ben replies, "Exactly what do you mean?" To this, Mr. McGuire retorts, "There's a great future in plastics" suggesting that Ben follow his footsteps into the world of plastics. History has proven just how prophetic those words were forty-two years ago. Plastics have revolutionized the way we live.

Just take a look around you on any given day and you will see just how integral a part of your world they have become. From the dashboard and door panels in the car you drive, the bottle that dispenses your ketchup, the housing of your laptop computer, the shower curtain in your bathroom, to the spring water you pull out of your refrigerator, plastics play a role in our everyday lives. According to chemical giant BASF, global plastics consumption will reach over 500 billion pounds in 2010. Per capita consumption in the U.S. alone will be more than 300 pounds in 2010. That is more than 300 pounds for every man, woman and child in the United States. Compare that with a consumption rate of 223 pounds in 2001, we have witnessed a whopping increase of 36% per person in just nine years. That is almost one pound per day, per person of consumed plastic material. These numbers are staggering to say the least.

Up to the point of consumption, an entire chain of events occur that most consumers are oblivious to. Pigments are manufactured, resins are produced, additives are purchased, and injection and blow molding equipment is engineered. All of this comes together to produce the bottle you pour detergent from to wash your clothes or the bottle you drink beer from at a professional football game.

Throughout this entire process, each step of raw material is monitored with a series of checks and balances known as quality control. This encompasses all the steps of the manufacturing process, resins, pigments, and additives as well as the final product. The ultimate plastic product must meet strict specifications before it can be used. Not only must the product meet specifications such as impact resistance, it must also look appealing. When a consumer goes into a store, whether it is a supermarket to buy groceries or a shop that sells bathroom accessories, the first perception of quality comes from the color and appearance of that product. If you go to the drugstore to buy a plastic bottle filled with ibuprofen and the bottles are dented and discolored from one to the other, your perception of the product in those jars is going to be one of poor quality. Without giving it too much thought your immediate reaction will be to buy another brand or go to another pharmacy where the brand of your choosing appears consistent. It is a knee-jerk reaction all of us experience at one time or another. While we at Konica Minolta can't necessarily help with the dented bottles, we can go a long way to help minimize inconsistent color from one jar to another.

One of the final quality control checks completed on most manufactured products (plastics, paints, textiles, printed material, foods and cosmetics) is one that checks the actual color of the product. Not only is the color of the detergent bottle itself checked for consistency, but the detergent that goes into the bottle is verified as well. In doing so, the manufacturer is minimizing the possibility of consumer rejection based on appearance. These color checks, while done visually, are also reinforced using color control instrumentation. Konica Minolta manufactures an entire line of spectrophotometers and colorimeters that are used to numerically control color. We maintain a very vibrant presence throughout the plastics community. This instrumentation is used to ensure that one plastic bottle in a six-pack of energy drinks matches the other five.

Spectrophotometers and colorimeters, accompanied with software or firmware, allows the inspector of the color to numerically quantify the final product. This helps minimize variability in the final product from lot to lot due to differences in the human observer's eyes, the lighting under which they are viewing the samples and the angle at which they are viewed. Instrumentation offers an objective, rather than a subjective approach to color evaluation whether the samples in question are pellets, injection molded chips, bottle pre-forms or vinyl films. Thus when the numbers of a target color are matched within certain specifications using the same model instrument from lot to lot, one can be sure that color consistency and uniformity is maintained.

For more information about how Konica Minolta can assist you in measuring the color plastics, and color matching, visit https://sensing.konicaminolta.asia/solutions/plastics/