Challenge

Ultraviolet (UV) radiation from the sun and other light sources such as fluorescent lighting is harmful to polymer properties. Finished plastic parts exposed to direct or indirect sunlight can display surface chalking as the polymer becomes oxidized, and can lose physical properties and become brittle to the point of no longer being fit for original use. UV light also accelerates the fading of plastic colorants.

Solution

The use of UV stabilizer additives can inhibit or absorb the harmful UV radiation that causes degradation of the polymer. There are two primary types of stabilizers used today: UV absorbers and Hindered Amine Light Stabilizers (HALS). UV absorbers work by absorbing the UV rays and dissipating them into thermal energy. UV absorber chemistries include benzophenones, benztiazoles and hydroxyphenyl triazines. HALS work by scavenging free radical intermediates generated by the UV rays to neutralize the degradation.

In both cases, the damaging effect of the UV light is focused away from the base polymer and colorants due to interaction with the UV additive present in the base polymer. It is important to know the specifics of the end-use environment, polymer base and processing conditions to design the most effective UV stabilization package to meet the performance expectations.

Value

The use of UV stabilizers will retard the harmful effects of UV radiation on polymer properties. This provides several benefits to OEMs, processors and consumers:

- Reduced field failures and returns
- Increase shelf life for end products
- Ability to store parts outside for longer periods
- Protection against premature color fading

Implementation

OnCap™ UV stabilizers are available in concentrated pellet, bead or liquid form. Stabilization packages are available for
PolyOne offers a one-stop source of color concentrates, additive concentrates, color and additive systems, and associated technology and support services. Our expertise extends across a wide variety of industrial and consumer markets. We have more than 20 manufacturing locations in North America, Europe and Asia, with color labs, design centers and sales offices located around the world. Please contact your nearest sales office for assistance in choosing the right solution for your needs.

**Application**

UV stabilizer formulations are available for a variety of thermoplastic processes, including injection molding, blow molding, compression molding, and sheet and film extrusion. UV stabilizers are commonly used in applications where outdoor or indoor light exposure is a concern, including packaging, transportation, consumer goods, outdoor furniture and agricultural films.