

OnCap™ UV Stabilizer Additives

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, benzotriazoles 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



PE, PP, PS and PET resins. Use rates vary based on the situation, with typical rates ranging from 1% to 3% for pellets or beads, and 0.25% to 1% for liquids. Accurate dosing of pellets or beads is achieved via a volumetric in-line feeder or gravimetric weigh scale blender.

The liquid form utilizes a metering pump adapted to the processing equipment.

UV stabilizers can be combined with antioxidant additives into a single concentrate to provide complete polymer protection from UV exposure as well as providing physical, mechanical and thermal stability in production processes. They can also be combined with colorants into a single OnColor™ Smartbatch™ concentrate.

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.

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.

CONTACT INFORMATION

Americas

U.S. – Avon Lake, Ohio
+1 440 930 1000
Argentina – Buenos Aires
+0054 11 4200 5917
Brasil – Campinas
+55 19 3206 0561
Mexico – Toluca
+52 722 2790200

Asia

China – Shanghai
+86 (0) 21 5080 1188
China – Shenzhen
+86 (0) 755 2969 2888

India – Mumbai
+91 9820 194 220
Thailand – Rachatewa,
Bangplee Samutprakarn
+66 (0) 2327 9100

Europe

Belgium – Assesse
+32 (0) 83 660 211
Czech Republic – Praha 1
+420 224 142 214
Denmark – Glostrup
+45 (0) 43 20 6300
France – Saint-Ouen
L'Aumône
+33 (0) 1 34 40 39 50

France – Tossiat
+33 (0) 4 74 42 69 70
Germany – Bendorf
+49 (0) 2622 700 90
Hungary – Gyor
+36 (0) 96 515 610

Italy – Gallarate
+39 03 31 797 448
Poland – Kutno
+48 24 357 47 00
Spain – Oricain, Navarra
+34 (0) 948 331 011
Sweden – Angered
+46 (0) 31 92 84 50



*Beyond Polymers.
Better Business Solutions.™*

www.polyone.com

PolyOne Americas

33587 Walker Road
Avon Lake, Ohio 44012
United States
+1 440 930 1000

PolyOne Asia

Guoshoujing Road No. 88
Z.J Hi-Tech Park, Pudong
Shanghai, 201203, China
+86 (0) 21 5080 1188

PolyOne Europe

Rue Melville Wilson 2
5330 Assesse, Belgium
+32 (0) 83 660 211

Copyright © 2008, PolyOne Corporation. PolyOne makes no representations, guarantees, or warranties of any kind with respect to the Information contained in this document about its accuracy, suitability for particular applications, or the results obtained or obtainable using the information. Some of the Information arises from laboratory work with small-scale equipment which may not provide a reliable indication of performance or properties obtained or obtainable on larger-scale equipment. Values reported as "typical" or stated without a range do not state minimum or maximum properties; consult your sales representative for property ranges and min/max specifications. Processing conditions can cause material properties to shift from the values stated in the Information. PolyOne makes no warranties or guarantees respecting suitability of either PolyOne's products or the Information for your process or end-use application. You have the responsibility to conduct full-scale end-product performance testing to determine suitability in your application, and you assume all risk and liability arising from your use of the Information and/or use or handling of any product. POLYONE MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, either with respect to the Information or products reflected by the Information. This data sheet shall NOT operate as permission, recommendation, or inducement to practice any patented invention without permission of the patent owner.