

Whitepaper

Light Stabilization for Polypropylene and Compounds

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BYK-MAX LS 4125

Product Type

UV/Light Stabilizer

Application

Exterior and interior polypropylene articles exposed to intense light

Key benefits

- Excellent long-term light stabilization
- High concentration of active ingredients
- Easy to handle/feed

The Challenge

Polypropylene is commonly used in the automotive industry, construction materials, agricultural films, consumer and recreational goods as well as fibers and textiles. Polypropylene-based articles are subject to property and surface quality degradation when exposed to light over time. Prolonged exposure from light can cause color and gloss change in addition to physical property degradation.

The Solution

BYK-MAX LS 4125® is a pelletized organic UV stabilizer system that can mitigate the property and surface degradation caused by light exposure. This product is a synergistic blend of highly concentrated stabilizers that inhibit the light-induced reactions leading to decomposition of the material. BYK-MAX LS 4125 also acts

as a radical scavenger and peroxide decomposer. Due to its outstanding UV stability for thick-film PP products, this product is highly recommended for outdoor applications including deck, patio, and garden furniture, automotive interior and exterior parts, carpets, films, tapes, and more.

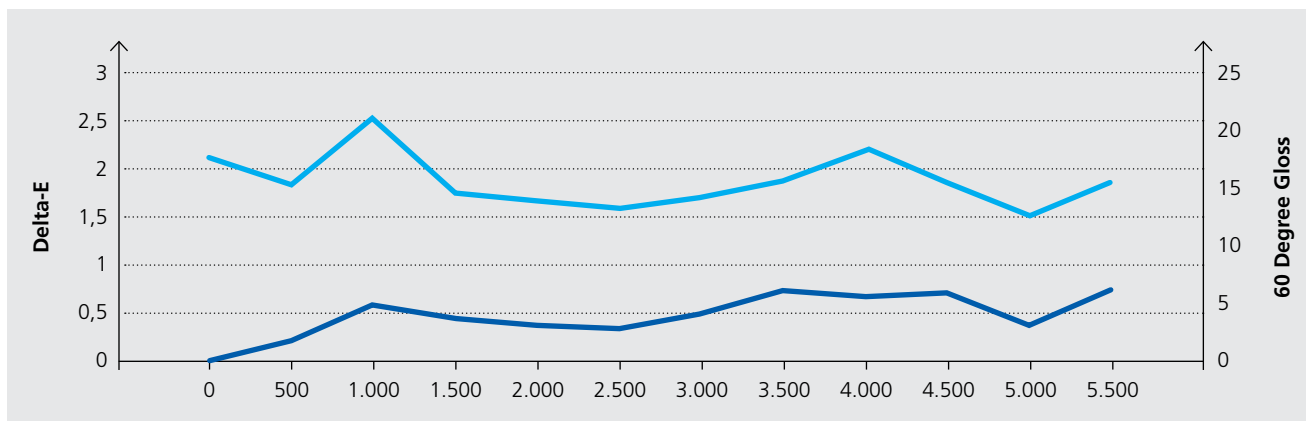
Typical applications require between 0.5 % - 2.0 % dosage depending on durability requirements and color. BYK-MAX LS 4125 can be added via volumetric or gravimetric dosing units during processing in compounding, tape/film extruders, spinning plants, and injection molding machines. It is suitable for processing temperatures up to 290°C (554°F).

Excellent Long-term Stabilization

The combination of stabilization technologies in BYK-MAX LS 4125 work synergistically to provide long-term light stabilization to meet the requirements of both automotive and other markets. Typical automotive testing requires samples to withstand stimulated

outdoor exposure up to 4,000 kJ with color change no greater than a delta E of 3.0. Additionally, significant changes in gloss are also not acceptable. When properly applied, BYK-MAX LS 4125 easily meets and exceeds these requirements.

BYK-MAX LS 4125 Weathering Studies 1% dosage on PP in 30% GFPP Delta-E/Gloss measured using SAE J2527 (Exposure in kJ)

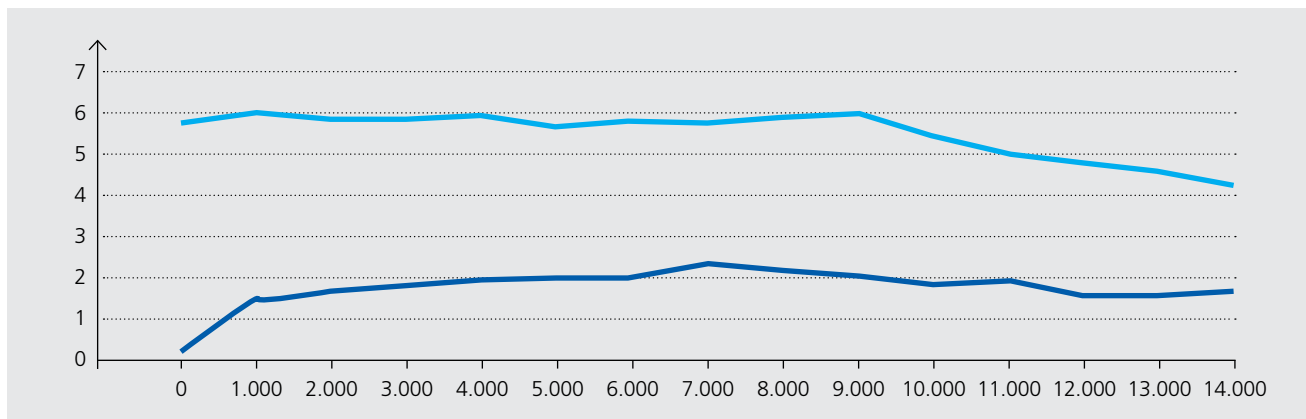


■ Average Delta-E of (3) Samples ■ Average 60-Degree Gloss of (3) Samples

Figure 1

Many non-automotive durable goods markets require weathering in excess of that shown above. BYK-MAX LS 4125 has proven effective in systems requiring exceptionally long-term durability.

BYK-MAX LS 4125 Weathering Studies 2% Dosage on PP in 40% GFPP Delta E/Gloss measured using SAE J1960 (Exposure in Hours)



■ Average Delta-E of 4 Samples Cut From Sheets ■ Average 60-degree Gloss of 4 Samples Cut From Sheets

Figure 2

High Concentration of Active Ingredients

BYK-MAX LS 4125 has a 50 % active ingredient level, minimizing the amount of carrier resin needed. The typical amount of carrier resin required adds unnecessary cost for the customer. Due to the product form of the stabilizers required for this performance, this level

of activity is difficult to achieve using standard manufacturing processes. BYK's proprietary processes minimize the use of carrier resin required to produce these concentrates leading to the lowest total cost.

Easy to Handle

Providing easy to use products is key to customer satisfaction. Controlled migration of key active ingredients to the exposed areas of the article is essential to the performance of BYK-MAX LS 4125. While this migration is necessary and desirable in the molded article, the concentration of these low-melting point ingredients in the concentrate would create challenges in customer manufacturing processes were it not for proprietary BYK manufacturing technology. This technology enables the high active ingredient level of BYK-MAX LS 4125 and minimization of total cost to the customer while maintaining free-flowing and easy to handle finished products.



Conclusion

BYK-MAX LS 4125 is an excellent UV stabilization system for polypropylene-based outdoor articles from furniture to interior and exterior automotive parts. Its high active ingredient level minimizes the amount of carrier resin needed,

reducing total cost for the customer. Due to BYK's proprietary technology, BYK-MAX LS 4125 is a free-flowing, easy to handle product that provides superior long-term performance, minimizing color and gloss change over time.

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