Polystyrene and ABS

with UV – Protection – Stabilizers

An Efficient Protection against UV-rays:

UV Stabilizers
Addition as Masterbatch

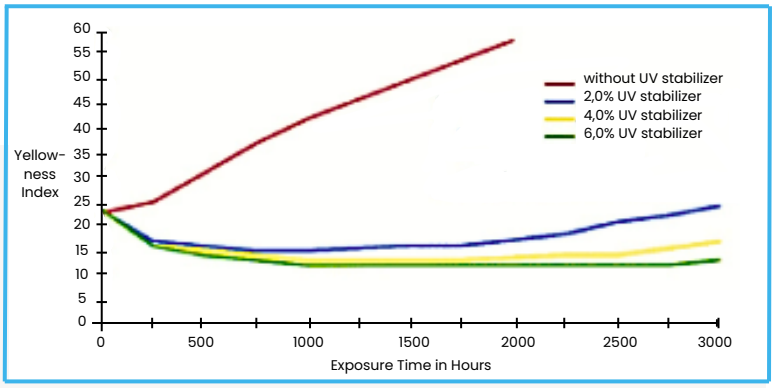
Unstabilized styrene polymers such as polystyrene, their impact-modified types (styrene copolymers) such as SB-styrene butadiene, HIPS, or ABS-acrylonitrile butadiene styrene, as well as terpolymers (SBS-transparent) can be severely damaged by UV radiation.
This damage occurs through photooxidation or a degradation reaction caused by light in the absence of oxygen in the air. The butadiene component is the particularly sensitive part.
UV light initially causes styrene copolymers to lose gloss and yellow. These visual signs indicate the start of polymer degradation on the surface. The mechanical and physical properties then deteriorate. Impact strength decreases and regression and color changes may occur.

UV radiation energy
Iwr measured in kLy (kilo Langley):
1 kLy corresponds to 2 kcal/cm2 or 4,184 kJ/cm2.
The annual dose corresponds to the amount of energy irradiated
In Northern Europe: approx. 80 to 100 kLy
In Central Europe: approx. 100 to 120 kLy
In Southern Europe: approx. 120 to 160 kLy

UV Stabilizers
In Polystyrene, SBS-Clear, ABS

KVS sheets and films can be equipped with UV stabilizers in the form of masterbatch. The slight clouding of the original compounds is compensated for by an appropriate color setting for opaque material types - such as polystyrene, HIPS and ABS.
Transparent materials – such as SBS-Clear or GPS for PS gloss coextrusion – maintain their transparency with an appropriately clear masterbatch.

Dosage
From a dosage of 5% you are practically in the saturation range and achieve long-lasting UV protection, which can delay yellowing or polymer degradation - depending on the climate - for a longer period of time.



Exposure in the Weather-Ometer
Discoloration of impact-resistant polystyrene due to UV radiation.

The Synergistic Active Ingredient Combination of UV Batches:

UV absorber:
Filter the ultraviolet component from the light. The energy of the absorbed light is converted into heat. The strength of UV absorption depends on the active ingredient concentration and the wall thickness of the end product. Basically, the sheet surface does not receive any protection.

Migration:
The very good migration behaviour of the active ingredients used leads to a continuous build-up of a UV protective layer on the product surface.

HALS stabilizers:
Prevent the formation of aggressive photo-oxidation products both on the surface and in the deeper layers. This means that optimal protection is achieved practically regardless of the wall thickness of the end product. The concentration of the active ingredient in the end product represents the measure of the product's lifespan.

Thermal stabilizers:
In addition to photo-oxidation, thermoplastics are subject to attack by atmospheric oxygen in the presence of heat (thermal oxidation); products that are exposed to direct sunlight heat up to over 50°C depending on their colour. That's why, upon request, we use UV batches with additional thermal stabilizers, which simultaneously increase the effect of the UV stabilizers.

Dosage:
Depends on various factors:
The material type, cross section or layer thickness of the later finished parts, but also the fillers and pigments used influence the necessary intensity. Of crucial importance is the future geographical area of application and how exposed the finished part will be to the prevailing UV rays.

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