BRINGING LIFE TO PLASTICS

PP-tapes

LONG LASTING

FOR HEAVY DUTY USE

HIGH PERFORMANCE ADDITIVES

GABRIEL CHEMIE GROUP
If your Big Bags get exposed to the elements ...
... WE HAVE THE PERFECT SURVIVAL KIT.

WHAT YOU NEED TO KNOW ABOUT SUN RADIATION

A good UV stabilization of a PP-tape should enable that after the desired lifetime at least 50% of initial tensile strength is present in the woven fabric. It has to be taken into account that each UV stabilization must be designed regarding to maximum possible annual sun radiation energy which is typical to the geographic area of application where the final product is applied. The solar radiation depends on climatic factors and can show absolutely different values according to geographic location of the exposure.
Therefore, it is of determining importance to design a light stabilizer for PP-tapes according to the geographical area where the final article is applied.

Our product recommendations are based upon solar radiation according to place of the exposure in form of kLy/year - units. Reductive chemical influences, coming from atmosphere or from contact with chemicals, adding of deteriorating colours or additives to the polymer – intended or not, must be considered at our product recommendations and requires specific testing.

THE FOLLOWING SUN RADIATION ENERGY VALUES CAN BE CONSIDERED AS USUAL

The sun radiation energy is usually expressed in kLy (Kilolangely) units. A conversion to other energy units is possible, the conversion into other units can be done as follows:

1 kLy = 1000 Ly (Langely)
1 kLy = 4187,5 J/cm² = 4,19 kJ/cm²
1 kLy = 1,11632 Wh/cm² = 11,63 kWh/m²

<table>
<thead>
<tr>
<th>AREA</th>
<th>KLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scandinavia</td>
<td>60-80</td>
</tr>
<tr>
<td>Central Europe</td>
<td>100-120</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>120-160</td>
</tr>
<tr>
<td>Northern Africa</td>
<td>160-180</td>
</tr>
<tr>
<td>Russia North</td>
<td>80</td>
</tr>
<tr>
<td>Russia South</td>
<td>140</td>
</tr>
<tr>
<td>Australia</td>
<td>180-200</td>
</tr>
</tbody>
</table>
THE RADIATION SPECTRA

<table>
<thead>
<tr>
<th>RANGE</th>
<th>WAVELENGTH</th>
<th>% OF LIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UV-C</td>
<td>&gt; 280 nm</td>
<td>0</td>
</tr>
<tr>
<td>UV-B</td>
<td>280-320 nm</td>
<td>0.5</td>
</tr>
<tr>
<td>UVA-A</td>
<td>320-400 nm</td>
<td>5.6</td>
</tr>
<tr>
<td>VIS - visible</td>
<td>400-800 nm</td>
<td></td>
</tr>
<tr>
<td>IR-A</td>
<td>800-1400 nm</td>
<td>29.4</td>
</tr>
<tr>
<td>IR-B</td>
<td>1400-3000 nm</td>
<td>12.7</td>
</tr>
<tr>
<td>IR-C</td>
<td>&gt; 3000 nm</td>
<td>“Neglectable for testing”</td>
</tr>
</tbody>
</table>

SPECTRAL SENSITIVITIES OF POLYMERS

<table>
<thead>
<tr>
<th>POLYMER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>300-310, 340</td>
</tr>
<tr>
<td>PP</td>
<td>290-300, 330, 370</td>
</tr>
<tr>
<td>PS</td>
<td>320-325</td>
</tr>
<tr>
<td>PA</td>
<td>290-315</td>
</tr>
<tr>
<td>PC</td>
<td>280-310</td>
</tr>
<tr>
<td>SAN</td>
<td>310-330, 290</td>
</tr>
<tr>
<td>ABS</td>
<td>300-310, 370-385</td>
</tr>
<tr>
<td>PMMA</td>
<td>290-315</td>
</tr>
</tbody>
</table>

All indications in nanometer wavelength
Literature: ATLAS MTS
SUNLiGHT VS. FLUORESCENT UV LAMP

Fluorescent UV lamps simulate narrow UV radiation under specific conditions. They do not cause heating effects through visible or infrared light. The comparison to service lifetime performance or correlation to outdoor exposures is not possible.

Literature: ATLAS MTS
SERVICE LIFE OF UV-STABILIZED PP-TAPES IS INFLUENCED SIGNIFICANTLY from the quality of the polymer (or polymer blends) to be stabilized. Once selected, polymers should not be changed. New polymers should be carefully evaluated by tests, if they can deteriorate the light stabilization – same procedure is recommended if new additives are taken.

NEXT TO OTHER CRITERIA’S ESPECIALLY THE WALL-THICKNESS OF THE TAPES to be stabilized is a decisive matter to design a UV stabilizer. Extreme weakening of the wall-thickness through extreme stretching leads to significant shortening of the service life expectation of the tapes.

PIGMENTATION CAN IMPROVE OR DETERIORATE THE UV-STABILITY of a UV-stabilized polymer. In our combination products Colour/UV-Stabilizer we only use compatible pigments which have proven their performance due to long-standing experiences.

SOME CONTACT MEDIA (for example agro-chemicals) can decrease the UV-performance of tapes. In particular sulphur-containing additives and acid splitting halogen-containing flame-retardants also critical packaging-contents with direct contact to tapes can lead to a considerable deterioration of the UV stabilization.

WORST CUTTING QUALITY OF TAPES BY USE OF BLADES having too much abrasive wear will cause during exposure oxidation and degradation to the polymer at outdoor exposure and adds raised vulnerability to the tapes. This further can deteriorate a good light stabilization.

CALCIUM CARBONATE (CaCO₃) IS FREQUENTLY USED IN MASTERBATCH as an Antisplit additive at production of PP tapes offering better weaving properties. It must be taken into consideration that specific impurities in some CaCO₃ grades will cause a considerable deterioration of a UV stabilization. Selection of a CaCO₃-masterbatch with a high purity CaCO₃ grade as used in our MAXITHEN® PP7A7120ASP Antisplit MB is very important.

IT HAS TO BE CONSIDERED THAT DARK COLOURS will absorb more thermal energy during outdoor exposure, which leads to speed up the heat ageing process of the polymer itself, in cases of such colours a higher light stabilizer addition may be necessary.
PP TAPE RANGE

Single Masterbatch

- UV Stabilization
- ASP Antisplit
- AS Antistatic
- AO Antioxidant
- FR Flame Retardant
- White
- Black

Combination Masterbatch

- UV+ASP
- ASP+White

Further products on demand

All in One Masterbatch

- UV+ASP+White

Tailor-made combination possible
UV PROTECTION

PP7AA1570UV: HALS stabiliser of high efficiency, suitable especially for Polypropylene, on PP carrier, for best price/performance ratio. Standard grade for PP tape fabrics for industrial packaging and technical applications

PP7AA1570/11UV: Lower concentrated variation of standard grade PP7AA1570UV, recommended when required service life time/dosage rate of PP7AA1570UV would be too low for proper distribution of active ingredient in the polymer melt

PP7AA7380UV: Oligomeric HALS stabilisers of high efficiency, on PP carrier for best price/performance ratio. Standard grade for PP tape fabrics, suitable for food contact

PP7AA7380/11UV: Lower concentrated variation of standard grade PP7AA7380UV, recommended when required service life time/dosage rate of PP7AA7380UV would be too low for proper distribution of active ingredient in the polymer melt. For PP tape fabrics, suitable for food contact

PP7AA7460UV: Oligomeric HALS stabiliser of high efficiency, suitable especially for Polypropylene, combined with absorber for synergistic effects to increase UV-protection of packed goods additionally, on PP carrier. For PP tape fabrics, suitable for food contact

PP791360UVFR: Special grade for high UV stabilisation performance combined with flame retardancy, halogen free, on PP carrier. For PP tape fabrics
ANTISPLIT

PP7A7120ASP: High loaded (80%) selected high purity Antisplit Calcium Carbonate grade of low abrasivity on PP carrier. Offers smooth surface of the tapes for good and dustless weaving process. For Polypropylene tape fabrics, suitable for food contact

ANTISTATICS

PP791310AS: Fast and efficient Antistatic agent, migrating, on PP carrier, suitable for food contact
UNS7A4420AS: Polymeric permanent Antistatic with immediate effect, non migrating. For fabrics out of Polyethylene and Polypropylene, suitable for food contact

ANTIOXIDANTS

PP792210AO: Synergistic combination of process and long term heat stabiliser, on PP carrier. For all types of woven fabrics out of Polypropylene, suitable for food contact

FLAME RETARDANTS

PP7AA1940UVFR: High performance flame retardant, halogen free, compatible with HALS UV-stabilisers, on PP carrier. For all types of woven fabrics out of Polypropylene

WHITE & BLACK, COLOURS

PP1131/70WHITE: High loaded (70%) weather resistant and HALS compatible TiO₂ pigment on PP carrier, suitable for food contact

HP1139/60, HP1139/70WHITE: High loaded (60%/70%) weather resistant and HALS compatible TiO₂ pigment on PE carrier. For tapes out of Polyethylene and Polypropylene, suitable for food contact

HP98781BLACK: High colour strength UV protection carbon black, good dispersion, excellent compatibility with HALS UV stabilisers. On PE carrier, for tapes out of Polyethylene and Polypropylene, suitable for food contact (EU & FDA)

Tailor-made formulations in each colour shade available upon request.
UV PROTECTION + ANTISPLIT

PP7AA5540UVASP: HALS stabiliser of high efficiency, suitable especially for Polypropylene, combined with selected high purity Antisplit Calcium Carbonate grade of low abrasivity, on PP carrier, for best price/performance ratio. Standard grade for PP tape fabrics for industrial packaging and technical applications.

PP7AA5540/11UVASP: Lower concentrated variation of standard grade PP7AA5540UVASP, recommended when required service life/dosage rate of PP7AA5540UVASP would be too low for proper distribution of active ingredient in the polymer melt.

PP7AA7390UVASP: Oligomeric HALS stabilisers of high efficiency combined with selected high purity Antisplit Calcium Carbonate grade of low abrasivity, on PP carrier, for best price/performance ratio. Standard grade for PP tape fabrics, suitable for food contact.

PP7AA7390/11UVASP: Lower concentrated variation of PP7AA7390UVASP, recommended when required service life/dosage rate of PP7AA7390UVASP would be too low for proper distribution of active ingredient in the polymer melt. For PP tape fabrics, suitable for food contact.

PP1AA4541ASPWHITE: All-in-one formulation of selected high purity Antisplit Calcium Carbonate grade of low abrasivity, combined with weather resistant, HALS compatible TiO₂ pigment, on PP carrier. Offers correct proportion of functional ingredient and white colour at favourable price level, no risk of wrong dosage and mix ups by contrast with use of single components. For PP tape fabrics, on request, tailor-made solutions available as well, suitable for food contact.
ALL IN ONE

PP1AA4531UVASWHITE: All-in-one formulation of HALS stabiliser of high efficiency, suitable especially for Polypropylene, combined with selected high purity Antisplit Calcium Carbonate grade of low abrasivity, and with weather resistant, HALS compatible TiO₂ pigment, on PP carrier. Offers correct proportion of functional ingredients and white colour at favourable price level, no risk of wrong dosage and mix-ups by contrast with use of single components. On request, tailor-made solutions available as well.

PP1AA3671UVASWHITE: All-in-one formulation of HALS stabiliser of high efficiency, suitable especially for Polypropylene, combined with selected high purity Antisplit Calcium Carbonate grade of low abrasivity, and with weather resistant, HALS compatible TiO₂ pigment, on PP carrier. Offers correct proportion of functional ingredients and white colour at favourable price level, no risk of wrong dosage and mix-ups by contrast with use of single components. On request, tailor-made solutions available as well, suitable for food contact.

MiSCELLANEOUS MASTERBATCH

Antimicrobials, temperature & light exposure indicators, on-line-control for wall thickness and masterbatch dosage, counterfeit protection on request/under development.
SLIP, POLYMER PROCESSING AID, ANTIBLOCK & COMBINATIONS

**HP7051E:** High performance Erucamide slip agent, on PE carrier. Standard grade for all types of PE film, suitable for food contact

**HP7A8770PPA:** High performance Polymer Processing Aid for improved processability of Polyolefines. Offers smooth surface of the films, less energy consumption of extrusion lines, reduces dye build-ups. On PE carrier, for all types of PE film, suitable for food contact

**HP7011/65AB:** Natural Silica Antiblock, on PE carrier. For all types of PE film, suitable for food contact

**HP7081ABGLE:** High performance Erucamide slip agent combined with natural Silica Antiblock, on PE carrier. Standard grade for all types of PE film, suitable for food contact

**HP7AA7180ABGLE:** High performance Erucamide slip agent combined with natural Silica Antiblock and Calcium Carbonate, on PE carrier. For all types of PE film, suitable for food contact

UV PROTECTION

**HP79860UV:** Oligomeric HALS stabiliser of high efficiency on PE carrier for best price/performance ratio, standard grade for PE Blown & Cast film and tapes, suitable for food contact

ANTISTATICS

**HP7041/05AS:** Amine based migrating Antistatic agent on PE carrier, good price/performance ratio, suitable for food contact

**HP77571AS:** Amide based migrating Antistatic agent on PE carrier, good price/performance ratio, non-corrosive, suitable for food contact

**UN57A4420AS:** Polymeric permanent Antistatic with immediate effect, non-migrating. For all Polyolefines, suitable for food contact
FLAME RETARDANTS

**HP73940FR**: Halogenated Flame Retardant with good price/performance ratio, on PE carrier, for industrial packaging films

**HP7AA1460FR**: Halogenfree Flame Retardant, on PE carrier, for industrial packaging films

**HP791460UVFR**: Special grade for high UV stabilisation performance combined with flame retardancy, halogen free, on PE carrier, for industrial packaging films

WHITE & BLACK, COLOURS

**HP13301WHITE**: 70% TiO₂ pigment for indoor use, on PE carrier. For films of >60 µ out of Polyethylene and Polypropylene, suitable for food contact

**HP17201WHITE**: 60% TiO₂ pigment for indoor use and 15% high purity chalc. For films of >60 µ out of Polyethylene and Polypropylene, suitable for food contact

**HP100221WHITE**: 25% TiO₂ pigment for indoor use and 50% high purity chalc. For films of >60 µ out of Polyethylene and Polypropylene, suitable for food contact

**HP19201/HP19301WHITE**: 60/70% TiO₂ pigment for indoor use. For multilayer films of >5 µ/layer, out of Polyethylene and Polypropylene. Low lacing grade formulation, suitable for food contact

**HP99611BLACK**: High colour strength UV protection carbon black, good dispersion, excellent compatibility with HALS UV stabilisers. On PE carrier, for tapes out of Polyethylene and Polypropylene, suitable for food contact (EU)

**HP98211BLACK**: High colour strength carbon black for indoor application, good dispersion. On PE carrier, for tapes of >40µ out of Polyethylene and Polypropylene, for industrial packaging

Tailor-made formulations in each colour shade available upon request

MISCELLANEOUS

Antimicrobials, temperature & light exposure indicators, on-line-control for wall thickness and masterbatch dosage, counterfeit protection on request/under development
BUSINESS UNITS OF GABRIEL-CHEMIE GROUP:

- Building & Agriculture
- Home & Lifestyle
- Packaging for Industrial & Consumer Goods
- Cosmetics Packaging
- Food & Beverage Packaging

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