Additives
Polymer Additives

Clariant

Exactly your chemistry.

Stabilizers for Coatings Applications

Overview – Hostavin®*, Hostanox®*

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Light stabilizers protect organic coatings like lacquers, glazes, varnishes etc. against both photolytic and photolytically-induced degradations.

The addition of ***Hostavin*** light stabilizer considerably delays any decomposition of the binder and protects the substrate from the UV light induced degradation. This can be observed by increased gloss retention, reduced blistering and crack formation or chalking, improved long-term adhesion and subsequently will give a longer durability to the applied coating.

As one of the pioneers in the segment of light stabilizers, Clariant offers a comprehensive selection of ***Hostavin*** light stabilizers for application in lacquers and other related organic coatings:

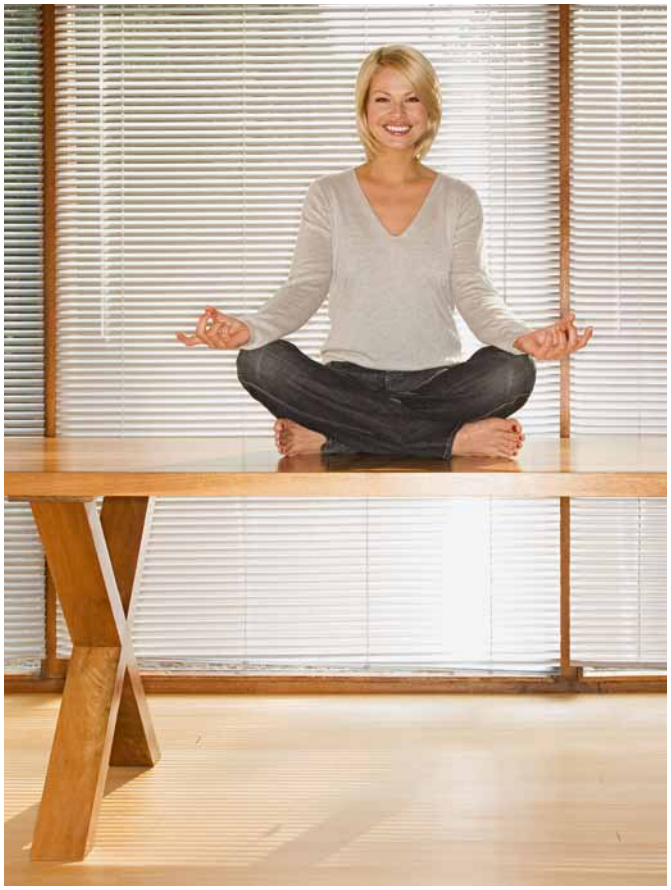
- UV Absorbers
- Hindered Amines Light Stabilizers (HALS)
- Light stabilizer Dispersions
- Optimized light protection systems (blends)
- Graftable HALS

The light stabilizer portfolio is completed with suitable ***Hostanox*** antioxidants for coatings.

Different types of stabilizers are available: each of them providing a special contribution, described as follows:

UV Absorbers

prevent the degradation of coating systems and substrates by filtering the UV radiations from the sunlight and dissipating it into non-destructive heat.



HALS

deactivate the free radicals formed as a result of solar radiation in the coating film, in particular on the immediate surface of the coating.

Some of the sterically hindered amines are strongly basic and can thus have an influence on the curing of the coating. For example, the reaction speed of isocyanates or epoxides is considerably accelerated, whilst the hardening reaction of melamine and comparable resins is strongly decreased. Where this effect is considered disturbing, neutral HALS offers a suitable alternative.

Graftable HALS

remain fixed into the binder matrix and can prevent migration of the additive.

Light stabilizer dispersions

are a range of selected UV Absorbers and HALS pre-dispersed at high loading in a water-based optimized formulation, to offer superior stabilization of waterborne coatings. Easy handling, more favorable environmental profile and extended shelf life are some of the key features.

Blends

represent a synergistic mixture of UV absorber and HALS.

Antioxidants

prevent thermolytical polymer decomposition during production (for example extrusion of powder coatings) or processing (stoving systems), and provide long term heat stability.

Please ask your local office for more information on the performances of our ***Hostavin*** and ***Hostanox*** additives.

These additives are available as:

- Crystalline powder or granulate
- Liquid or solution
- Aqueous dispersion

PRODUCT RANGE

Product	Chemical class	Supply form
UV Absorbers		
Hostavin PR-25 powder	Benzylidene-malonate	100 % powder
Hostavin ARO8 powder	Benzophenone	100 % powder
Hostavin 3041 disp.	Benzophenone	30 % aqueous dispersion
Hostavin 3206 liquid	Oxalanilide	80 % solution in xylene
Hostavin 3310 disp.	Benzotriazole	52 % aqueous dispersion
Hostavin 3310 powder	Benzotriazole	100 % powder
Hostavin 3315 disp. XP	Benzotriazole	52 % aqueous dispersion
Hostavin 3326 disp.	Halogenated benzotriazole	52 % aqueous dispersion
Hostavin 3326 powder	Halogenated benzotriazole	100 % powder
Hostavin VSU powder	Oxalanilide	100 % powder
Radical Scavengers (HALS)		
Hostavin 3050 liquid	Non-substituted HALS	100 % wax-like
Hostavin 3051-2 disp.	Non-substituted HALS	52 % aqueous dispersion
Hostavin 3051 powder	Non-substituted HALS	100 % powder
Hostavin 3053 liquid	Non-substituted HALS	80 % solution in xylene
Hostavin 3055 liquid	Non-substituted HALS	100 % liquid
Hostavin 3058 liquid	Acylated HALS	100 % liquid
Hostavin 3065 liquid	Methylated HALS	100 % liquid
Hostavin 3068 liquid	Acylated HALS	70 % in PMA
Hostavin 3070 disp. XP	Oligomeric HALS	52 % aqueous dispersion
Hostavin N 30 powder	Oligomeric HALS	100 % powder
Blends		
Hostavin 3212 liquid	Mixture oxalanilide with non-substituted HALS (2:1)	86 % solution in xylene
Hostavin 3219 liquid	Mixture oxalanilide with non-substituted HALS (2:1)	100 % liquid
Hostavin 3220 disp.	Mixture benzotriazole with non-substituted HALS (1:2)	52 % aqueous dispersion
Hostavin 3225-2 disp.	Mixture halogenated benzotriazole with non-substituted HALS (2:1)	52 % aqueous dispersion
Hostavin TB-01 liquid	Mixture hydroxyphenyltriazine with non-substituted HALS (1:1)	79 % solution in xylene
Hostavin TB-02 liquid	Mixture hydroxyphenyltriazine with acylated HALS (2:3)	83 % solution in xylene
Graftable HALS		
Hostavin 3052 liquid	Non-substituted HALS, fixation during cross-linking	100 % liquid
Hostavin PR-31 powder	Methylated HALS, fixation during UV exposure	100 % powder
Hostavin PR-31 disp. XP	Methylated HALS, fixation during UV exposure	52 % aqueous dispersion
Antioxidants		
Hostanox®* P-EPQ® powder	Diphosphonite antioxidant	100 % powder
Hostanox O 3 powder	Phenolic antioxidant	100 % powder

APPLICATION OVERVIEW

Product	Water-borne coating	Solvent-borne coating	Powder coating	OEM	Refinish	Coil coating	Wood coating	General industrial coating
Hostavin ARO 8 powder		▬					▬	▬
Hostavin 3041 disp.	▬						▬	▬
Hostavin 3050 liquid		▬			▬	▬		▬
Hostavin 3051 powder		▬	▬				▬	▬
Hostavin 3051-2 disp.	▬			▬	▬		▬	▬
Hostavin 3052 liquid		▬						▬
Hostavin 3053 liquid		▬		▬	▬	▬	▬	▬
Hostavin 3055 liquid		▬		▬	▬	▬	▬	▬
Hostavin 3058 liquid[1)2)]	▬	▬		▬	▬	▬		▬
Hostavin 3065 liquid		▬		▬	▬		▬	▬
Hostavin 3068 liquid[1)2)]	▬	▬		▬	▬	▬		▬
Hostavin 3070 disp. XP	▬			▬	▬		▬	▬
Hostavin 3206 liquid[2)]		▬			▬	▬		▬
Hostavin 3212 liquid[2)]		▬			▬	▬		▬
Hostavin 3219 liquid		▬						▬
Hostavin 3220 disp.	▬			▬	▬		▬	▬
Hostavin 3225-2 disp.	▬						▬	▬
Hostavin 3310 disp.	▬			▬	▬		▬	▬
Hostavin 3310 powder		▬		▬	▬		▬	▬
Hostavin 3315 disp. XP	▬			▬				▬
Hostavin 3326 disp.	▬						▬	▬
Hostavin 3326 powder		▬					▬	▬
Hostavin N 30 powder		▬	▬			▬	▬	▬
Hostavin PR-25 powder		▬						▬
Hostavin PR-31 disp. XP	▬			▬	▬			▬
Hostavin PR-31 powder		▬		▬	▬	▬		▬
Hostavin TB-01 liquid		▬		▬	▬	▬	▬	▬
Hostavin TB-02 liquid[1)2)]	▬	▬		▬		▬	▬	▬
Hostavin VSU powder		▬	▬		▬	▬		▬
Hostanox P-EPQ powder		▬	▬	▬		▬		▬
Hostanox O 3 powder	▬	▬	▬	▬		▬		▬

1) = especially for aminoplasts-crosslinked High Solid and Medium Solid systems
2) = especially for UV curables

APPLICATION AREAS FOR HOSTAVIN AND HOSTANOX

Solvent-borne coatings	Crosslinking with aminoplasts					Crosslinking with isocyanates					Epoxy	
	a	b	c	d	e	a	b	c	d	e	d	e
Hostavin ARO8 pwd.					++					++	○	++
Hostavin 3050 liq.	+	++	++	++	++	++	++	++	++	++	++	++
Hostavin 3052 liq.	○	○	○	○	○	○	○	+	+			
Hostavin 3053 liq.	+	++	+	++	++	++	++	++	++	++	++	++
Hostavin 3055 liq.	+	++	+	++	++	++	++	++	++	++	++	++
Hostavin 3058 liq.	++	++	++	++	++	+	+	+	+	+	+	+
Hostavin 3065 liq.	+	++	+	++	++	++	++	++	++	++	++	++
Hostavin 3068 liq.	++	++	++	++	++	+	+	+	+	+	+	+
Hostavin 3206 liq.	+	+	+	++	++	+	+	+	++	++	○	○
Hostavin 3212 liq.	+	+	+	++	++	+	+	+	++	++	○	○
Hostavin 3219 liq.				+	+				+	+		
Hostavin 3310 pwd.	++	++	++	++	++	++	++	++	++	++	+	+
Hostavin 3326 pwd.	+	+	++	+	++	+	+	++	+	++	++	++
Hostavin N 30 pwd.	+	++	+	++	++	++	++	++	++	++	++	++
Hostavin PR-25 pwd.					○					○		
Hostavin PR-31 pwd.	○	++	+	++	+	++	++	++	++	++	++	++
Hostavin TB-01 liq.	+	++	+	++	+	++	++	++	++	++	++	++
Hostavin TB-02 liq.	++	+	++	+	++	+	+	+	+	+	○	○
Hostavin VSU pwd.	+	+	+	+	++	+	+	++	+	++	○	○
Hostanox O 3 pwd.				+						++	++	
Hostanox P-EPQ pwd.	++	++	++	+		++	++	++	+		+	

Water-borne coatings	Crosslinking with aminoplasts					Crosslinking with isocyanates					Epoxy	
	a	b	c	d	e	a	b	c	d	e	d	e
Hostavin 3041 disp.				+	++				+	++	+	++
Hostavin 3051-2 disp.	+	+	+	++	++	+	+	+	++	++	+	+
Hostavin 3055 liq.	○	○	○	○	○	○	○	○	○	○	○	○
Hostavin 3058 liq.	++	++	++	++	++	○	○	○	○	○	+	+
Hostavin 3068 liq.	++	++	++	++	++	○	○	○	○	○	+	+
Hostavin 3070 disp. XP	+	+	+	+	+	+	+	+	+	+	+	+
Hostavin 3220 disp.			+		++			+		++		++
Hostavin 3225-2 disp.	+	+	++	+	++	+	+	++	+	++	+	++
Hostavin 3310 disp.	++	++	++	++	++	++	++	++	++	++	+	+
Hostavin 3315 disp. XP	++	++	++	++	++	++	++	++	++	++	+	+
Hostavin 3326 disp.	+	+	++	+	++	+	+	++	+	++	++	++
Hostavin PR-31 disp. XP	○	++	+	++	+	++	++	++	++	++	++	++

○ = *Suitable* + = *Recommended* ++ = *Optimal*

a = Highest requirements, high solid, high stoving temperature (e.g. OEM)
b = Highest requirements, medium/low solid, high stoving temperature (e.g. OEM)
c = Highest requirements, low stoving temperature (e.g. car refinish coatings)
d = Standard application, high stoving temperature (e.g. general industrial coatings)
e = Standard application, low stoving temperature (e.g. general industrial coatings)

APPLICATION AREAS FOR HOSTAVIN AND HOSTANOX

Solvent-borne coatings	Autoxidative alkyds	Thermoplasts				Substrate protection
		b	c	d	e	
Hostavin ARO8 pwd.	++		+	○	++	++
Hostavin 3050 liq.	++	++	++	++	++	
Hostavin 3052 liq.	○	○	○	○	○	
Hostavin 3053 liq.	++	++	++	++	++	
Hostavin 3055 liq.	++	++	++	++	++	
Hostavin 3058 liq.	++	+	+	+	+	
Hostavin 3065 liq.		++	++	++	++	
Hostavin 3068 liq.	++	+	+	+	+	
Hostavin 3206 liq.	++	+	+	+	+	++
Hostavin 3212 liq.	++	+	+	+	+	+
Hostavin 3219 liq.		++	++	++	++	+
Hostavin 3310 pwd.	++	++	++	++	++	++
Hostavin 3326 pwd.	++	++	++	++	++	++
Hostavin N 30 pwd.	○	+	○	++	○	
Hostavin PR-25 pwd.	++			○	+	+
Hostavin PR-31 pwd.	+	++	++	++	++	○
Hostavin TB-01 liq.	++	++	++	++	++	++
Hostavin TB-02 liq.	+	+	+	+	+	++
Hostavin VSU pwd.	++	○	+	○	+	++
Hostanox O 3 pwd.		+		+		
Hostanox P-EPQ pwd.		+		+		

Water-borne coatings	Autoxidative alkyds	Thermoplasts				Substrate protection
		b	c	d	e	
Hostavin 3041 disp.	++		++	+	++	++
Hostavin 3051-2 disp.	++	+	+	+	+	
Hostavin 3055 liq.	○	○	○	○	○	
Hostavin 3058 liq.	+	+	+	+	+	
Hostavin 3068 liq.	+	+	+	+	+	
Hostavin 3070 disp. XP	○	+	○	+	○	
Hostavin 3220 disp.	++		+		++	++
Hostavin 3225-2 disp.	++	++	++	++	++	++
Hostavin 3310 disp.	++	++	++	++	++	++
Hostavin 3315 disp. XP	++	+	+	+	+	++
Hostavin 3326 disp.	++	++	++	++	++	++
Hostavin PR-31 disp. XP	○	○	○	○	○	○

"Substrate protection" means the special protection of light-sensitive substrates (e.g. wood) against solar radiation.

DIFFERENTIATION BETWEEN THE VARIOUS RADICAL SCAVENGERS (HALS)

For application in coatings, Clariant offers different types of radical scavengers (HALS). They can be divided into 5 different groups according to their particular characteristics:

Standard HALS

Hostavin 3050 liq., 3053 liq., 3055 liq. and ***3065 liq.*** are all liquid HALS with different structures, allowing different properties such as solubility, compatibility and thus also efficiency.

Hostavin 3051 powder has been specially developed to meet the specific requirements of powder coatings. Here, it is not only acting as a radical scavenger (light stabilizer), but also as an additive for the regulation of electrostatic recharging (e. g. in tribo application). Similarly, it can be used as a thermo stabilizer to improve the gas oven stability of powder coatings.

Hostavin 3051-2 disp. offers an optimal solution in waterborne formulations, due to its easy incorporation.

Non-basic HALS

Certain specific coating systems require non-basic HALS. These are in particular the aminoplast crosslinking high-solid and medium-solid coatings, and to a lesser extent isocyanate crosslinking 2-component coatings.

Hostavin 3058 liq. and ***3068 liq.*** optimally fulfil the specific requirements of these coating systems.

Photo-graftable HALS

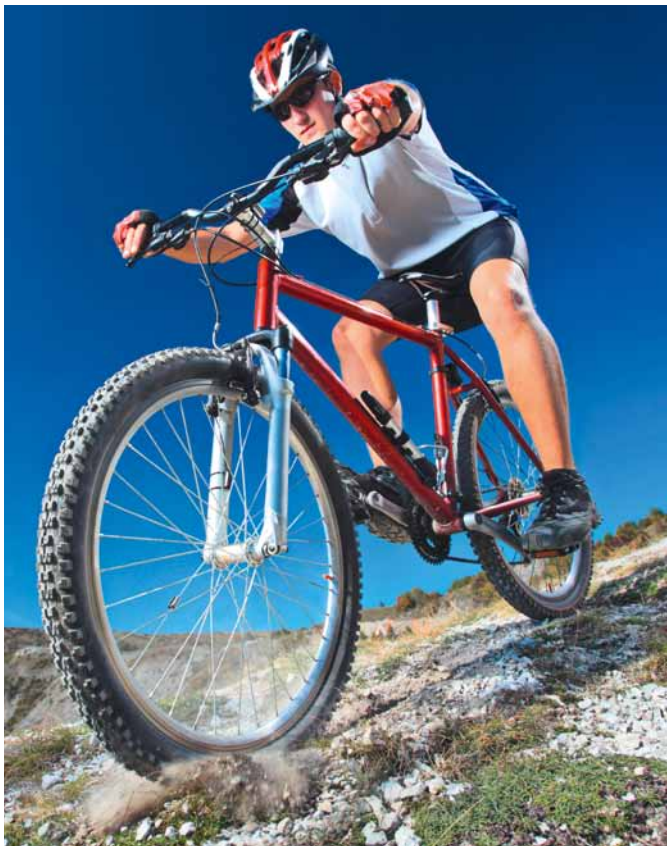
Should highest requirements be placed in respect of permanence, this new class of radical scavenger often offers the only alternative.

Hostavin PR-31 powder (resp. ***Hostavin PR-31 disp. XP)*** are at present the only representative of this highly effective radical scavenger class.

Chemically graftable HALS

Where traditional HALS leads to problems in regards to migration in the undercoat (e.g. plastic coatings), bleeding or evaporation (e.g. anti-fogging coatings), such radical scavengers are recommended.

Hostavin 3052 liq. is the only representative of this class. Its exocyclic free N-H valence is a reaction partner for isocyanate or also etherized methylene groups during the curing reaction.



Oligomeric HALS

The high molecular weight of ***Hostavin N 30 powder*** (resp. ***Hostavin 3070 disp. XP)*** hinders any migration. Thus it offers an alternative to chemically graftable HALS. In addition, it is characterized amongst other things by its neutral feature.

Recommended concentrations by application

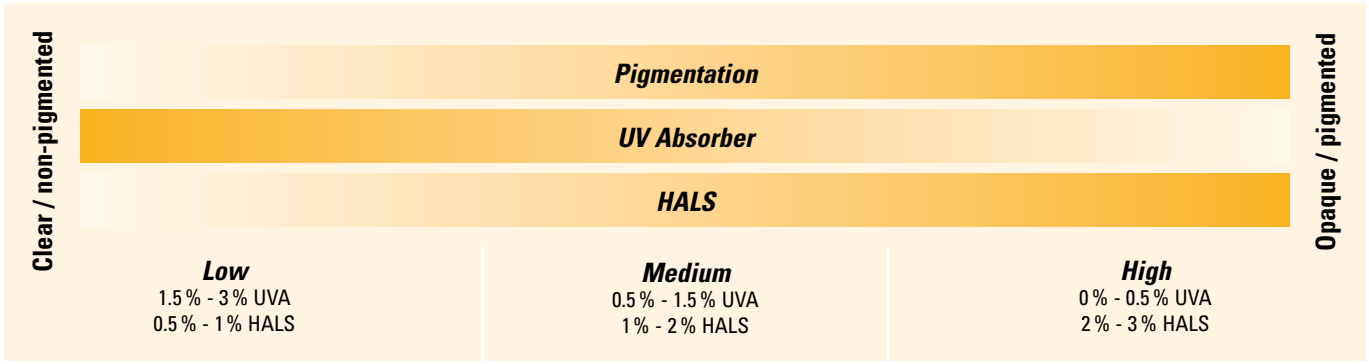
The following basic rules should be observed for a suitable stabilization of coatings:

- ***Clear coats***
  UV absorber and HALS together
- ***Organic-pigmented coatings***
  HALS with less UV absorber
- ***Inorganic-pigmented coatings***
  HALS alone
- ***Protection of sensitive substrate***
  UV absorber alone

Depending on the required degree of stabilization, the additive combinations listed below should be considered to achieve the optimal performances.

These recommendations are understood as the effective additive concentration calculated on the solid resin.

It is important to select carefully the right light stabilizer to use, in order to avoid any bad influence during the curing process or afterwards in the properties of the film. It is also of primary importance to determine the optimal performance of the stabilization by carrying out trials which are covering a concentration range, based on the coating system specifications.



Transport, storage and storage stability

As a general guideline, it is recommended that such products are stored in their original sealed containers, in a cool and dry place, where storage temperature is between +5 °C and +40 °C.

For more detailed information on a specific product, please refer to the corresponding Technical Data Sheet.

By law, a number of light stabilizers must be labelled in respect of transport, storage and handling. Thus corresponding care is a prerequisite for their appropriate handling. Furthermore, local legal regulations may apply. Detailed information is given in the respective Safety Data Sheets.

Upon request, you will receive Safety Data Sheets. They are automatically provided with samples.

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