

Stabilizers for Coatings Applications **OVERVIEW - HOSTAVIN® HOSTANOX®**



Stabilizers for Coatings Applications

OVERVIEW – HOSTAVIN® HOSTANOX®

Light stabilizers protect organic coatings against UV-light induced degradations.



The addition of Hostavin light stabilizers considerably delays any decomposition of the binder and protects the substrate from the UV light induced degradation. This can be observed by higher 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 range of Hostavin light stabilizers for all kind of paints and coating systems:

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

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

Clariant portfolio offers a broad range of stabilizers for coatings.

UV ABSORBERS

prevent the degradation of coating systems and substrates by filtering off the UV radiations and dissipating them into non-destructive heat.

Hostavin ARO 8 powder, being a benzophenone UV absorber, offers low to moderate stabilization performances, for general applications. As such, it is for instance suitable for solventborne wood coatings.

Hostavin VSU powder and 3206 liquid are UV Absorbers based on oxalanilide chemistry, suitable in various solventborne and powder coating systems. As they mostly absorb in the UV-B spectrum, they are particularly recommended for UV curable coatings as well as applications with QUV-B specifications. Moreover, they offer a special advantage of being insensitive to discoloration in presence of metal ions (e. g. from catalysts, impurities, etc.).

Hostavin 3310 powder and 3326 powder are both benzotriazole UV Absorbers. They bring the best UV spectrum coverage and thus are particularly suitable for exterior applications. Hostavin 3326 powder, with its broader UV-A spectrum, allows optimal protection for wood coatings applications vs. standard benzotriazoles in solventborne coatings.

HALS

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

Depending on their organic structure, certain HALS can be strongly basic and thus influence negatively the crosslinking reaction of the coating.

Therefore, the reaction kinetics of isocyanates or epoxides will be significantly increased, whereas the hardening reaction of melamine resins will be strongly reduced. In such cases, neutral or non-basic HALS represent appropriate alternatives.

Clariant offers several types of HALS (radical scavengers) which can be divided into 4 categories, according to their specific features.



Clariant HALS range contains four different types to fit to specific requirements.

NON-SUBSTITUTED HALS

Hostavin 3050 liquid, 3053 liquid, 3055 liquid and 3065 liquid are basic, low molecular weight HALS with different structures, having their own specifications for compatibility, volatility and efficiency.

Hostavin 3051 powder is also a low molecular weight HALS, with the advantage of a low volatility, which makes it especially suitable in powder coatings. In this application, Hostavin 3051 powder act as a radical scavenger, but also as a tribo enhancer to improve the powder coating chargeability, and as a thermo stabilizer to improve gas oven stability during curing.

NON-BASIC HALS

Some specific coating systems require non-basic HALS to avoid further interactions during crosslinking reactions, e. g. amino resins or two-components polyurethane systems.

Hostavin 3058 liquid and 3068 liquid are fulfilling the specific requirements of these coating systems with the advantage of high coatings compatibility (no exudation). Non-Basic HALS are also recommended for coatings on plastic substrates and especially polycarbonate types.

OLIGOMERIC HALS

Hostavin N 30 powder is an oligomeric HALS with a high molecular weight, having an excellent resistance to migration and very low volatility as well as extraction under water or solvent wash, with a neutral character. Hostavin N 30 powder is also recommended for plastic, wood and UV coatings. Its extremely low toxicity profile makes it a unique HALS in coating applications.

GRAFTABLE HALS

remain fixed into the binder matrix and show excellent migration resistance.

Hostavin PR-31 powder is a methylated photo-graftable HALS, reacting with the binder under UV exposure.

Hostavin 3052 liquid is a chemically graftable HALS, reacting with the binder during the crosslinking reaction.





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 water-based coatings. Easy handling, broad compatibility, improved ecological profile and extended shelf life are the key benefits.

Hostavin 3041-2 disp. XP is a benzophenone dispersion for low to moderate UV stabilization requirements.

Hostavin 3310 disp. and 3326 disp. are based on 2 different benzotriazole types, giving them specific properties. Hostavin 3326 disp. is best for wood protection.

Hostavin 3051-2 disp. is a dispersion based on a non-substituted HALS, suitable in most of water-based high performance coatings. When HALS basicity can be an issue, Hostavin 3070 disp. XP offers an excellent alternative; moreover, plastic coatings can be efficiently stabilized with this non-migrating oligomeric HALS dispersion. In addition, Hostavin 3070 disp. doesn't require any labelling, which makes it best compliant for DYI and consumer goods applications.

Hostavin 3220 disp. and 3225-2 disp. are both optimized solutions (UVA + HALS), especially designed to meet the more demanding requirements of UV stabilization for exterior coatings. Hostavin 3225-2 disp. is strongly recommended for exterior wood protective coatings.

Hostavin 3330 disp. XP is based on a triazine class UV absorber which brings an outstanding UV light protection for waterborne systems. It offers high thermal stability and superior durability for effective prolonged service life.

OPTIMIZED LIGHT PROTECTION SYSTEMS

represent a synergistic mixture of UV Absorber and HALS. Along with our solutions for waterborne coatings, these specific combinations are designed to fulfill solventborne systems expectations:

Hostavin 3212 liquid is our mixture based on oxalanilide UV Absorber and is suitable for all kind of industrial coatings, as well as for car refinish.

Hostavin TB-01 liquid and TB-02 liquid are both high performance optimized solutions, recommended for high end applications, e. g. automotive coatings.

ANTIOXIDANTS

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

Hostanox O3 powder and O310 powder are phenolic stabilizers (also called primary antioxidants), acting as radical scavengers and showing high extraction resistance.

Hostanox P-EPQ powder is a highly effective processing stabilizer (also called secondary antioxidant) of the phosphonite class, stabilizing the binders/resins against thermo-oxidative degradation and ensuring excellent colour stability.

Light stabilizers

UV ABSORBERS	CHEMICAL CLASS	MOLECULAR WEIGHT [g/mol]	MELTING RANGE	SUPPLY FORM	STANDARD PACKAGING FORM
HOSTAVIN ARO8 POWDER	benzophenone	326	Min. 48	100 % powder	25 kg Cardboard Box
HOSTAVIN 3041-2 DISP. XP	benzophenone	–	N/A	40 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN 3206 LIQUID	oxalanilide	453	N/A	80 % diluted in xylene	25 kg Steel Drum + 200 kg
HOSTAVIN 3310 POWDER	benzotriazole	351.5	79 - 84	100 % powder	25 kg Cardboard Box
HOSTAVIN 3310 DISP.	benzotriazole	351.5	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN 3326 POWDER	halogenated benzotriazole	316	138 - 141	100 % powder	20 kg Cardboard Box
HOSTAVIN 3326 DISP.	halogenated benzotriazole	316	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN 3330 DISP. XP	triazine	356	243	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN VSU POWDER	oxalanilide	312	126 - 128	100 % powder	50 kg Fiber Drum

HALS	CHEMICAL CLASS	MOLECULAR WEIGHT [g/mol]	MELTING RANGE	SUPPLY FORM	STANDARD PACKAGING FORM
HOSTAVIN 3050 LIQUID	non-substituted HALS	604/632	N/A	100 % wax-like	50 kg Steel Drum
HOSTAVIN 3051 POWDER ¹⁾	non-substituted HALS	364	230	100 % powder	25 kg Cardboard Box
HOSTAVIN 3051-2 DISP. ¹⁾	non-substituted HALS	364	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN 3052 LIQUID	chemically graftable HALS	Average: 408	N/A	100 % liquid	50 kg Steel Drum
HOSTAVIN 3053 LIQUID	non-substituted HALS	604/632	N/A	80 % solution in xylene	50 kg Steel Drum
HOSTAVIN 3055 LIQUID	non-substituted HALS	407	N/A	100 % liquid	50 kg Steel Drum
HOSTAVIN 3058 LIQUID	acylated HALS	449	N/A	100 % liquid	50 kg Steel Drum
HOSTAVIN 3065 LIQUID	non-substituted HALS	370 (mono-ester) 509 (di-ester)	N/A	100 % liquid	50 kg Steel Drum
HOSTAVIN 3068 LIQUID	acylated HALS	449	N/A	70 % solution in PMA	50 kg Steel Drum
HOSTAVIN N 30 POWDER	oligomeric HALS	> 1500	148	100 % powder	25 kg Cardboard Box
HOSTAVIN 3070 DISP.	oligomeric HALS	> 1500	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN PR-31 POWDER	photo-graftable HALS	529	120 - 125	100 % powder	25 kg Fiber Drum

¹⁾ = Non-TSCA registered



OPTIMIZED SOLUTIONS	CHEMICAL CLASS	MELTING RANGE	SUPPLY FORM	STANDARD PACKAGING FORM
HOSTAVIN 3212 LIQUID	2:1 mixture oxalanilide + non-substituted HALS	N/A	86 % solution in xylene	50 kg Steel Drum + 200 kg
HOSTAVIN 3220 DISP.¹⁾	1:2 mixture benzotriazole + non-substituted HALS	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN 3225-2 DISP.¹⁾	2:1 mixture halogenated benzotriazole + non-substituted HALS	N/A	52 % aqueous dispersion	25 kg Plastic Drum
HOSTAVIN TB-01 LIQUID	1:1 mixture triazine + non-substituted HALS	N/A	79 % solution in xylene	50 kg Steel Drum
HOSTAVIN TB-02 LIQUID	2:3 mixture triazine + acylated HALS	N/A	86 % solution in xylene	50 kg Steel Drum

¹⁾ = Non-TSCA registered

Antioxidants

ANTIOXIDANTS	CHEMICAL CLASS	MOLECULAR WEIGHT [g/mol]	MELTING RANGE	SUPPLY FORM	STANDARD PACKAGING FORM
HOSTANOX P-EPQ POWDER	diphosphonite	1035	85 - 95	100 % powder	20 kg Alu Bag
HOSTANOX O 3 POWDER	phenolic	794	167 - 171	100 % powder	25 kg Cardboard Box
HOSTANOX O 310 POWDER	phenolic	–	85 - 92	Micro pills	25 kg Cardboard Box

Application systems FOR HOSTAVIN AND HOSTANOX

SOLVENTBORNE COATINGS	CROSSLINKING WITH AMINOPLASTS					CROSSLINKING WITH ISOCYANATES					EPOXY	
	a	b	c	d	e	a	b	c	d	e	d	e
HOSTAVIN ARO8 POWDER					++					++	○	++
HOSTAVIN 3050 LIQUID	+	++	++	++	++	++	++	++	++	++	++	++
HOSTAVIN 3052 LIQUID	○	○	○	○	○	○	○	+	+			
HOSTAVIN 3053 LIQUID	+	++	+	++	++	++	++	++	++	++	++	++
HOSTAVIN 3055 LIQUID	+	++	+	++	++	++	++	++	++	++	++	++
HOSTAVIN 3058 LIQUID	++	++	++	++	++	+	+	+	+	+	+	+
HOSTAVIN 3065 LIQUID	+	++	+	++	++	++	++	++	++	++	++	++
HOSTAVIN 3068 LIQUID	++	++	++	++	++	+	+	+	+	+	+	+
HOSTAVIN 3206 LIQUID	+	+	+	++	++	+	+	+	++	++	○	○
HOSTAVIN 3212 LIQUID	+	+	+	++	++	+	+	+	++	++	○	○
HOSTAVIN 3310 POWDER	++	++	++	++	++	++	++	++	++	++	+	+
HOSTAVIN 3326 POWDER	+	+	++	+	++	+	+	++	+	++	++	++
HOSTAVIN N 30 POWDER	+	++	+	++	++	++	++	++	++	++	++	++
HOSTAVIN PR-31 POWDER	○	++	+	++	+	++	++	++	++	++	++	++
HOSTAVIN TB-01 LIQUID	+	++	+	++	+	++	++	++	++	++	++	++
HOSTAVIN TB-02 LIQUID	++	+	++	+	++	+	+	+	+	+	○	○
HOSTAVIN VSU POWDER	+	+	+	+	++	+	+	++	+	++	○	○
HOSTANOX O 3 POWDER				+						++	++	
HOSTANOX O 310 POWDER				+						++	++	
HOSTANOX P-EPQ POWDER	++	++	++	+		++	++	++	+		+	



WATERBORNE COATINGS	CROSSLINKING WITH AMINOPLASTS					CROSSLINKING WITH ISOCYANATES					EPOXY	
	a	b	c	d	e	a	b	c	d	e	d	e
HOSTAVIN 3041-2 DISP. XP				+	++				+	++	+	++
HOSTAVIN 3051-2 DISP.	+	+	+	++	++	+	+	+	++	++	+	+
HOSTAVIN 3068 LIQUID	++	++	++	++	++	○	○	○	○	○	+	+
HOSTAVIN 3070 DISP.	+	+	+	+	+	+	+	+	+	+	+	+
HOSTAVIN 3220 DISP.			+		++			+		++		++
HOSTAVIN 3225-2 DISP.	+	+	++	+	++	+	+	++	+	++	+	++
HOSTAVIN 3310 DISP.	++	++	++	++	++	++	++	++	++	++	+	+
HOSTAVIN 3326 DISP.	+	+	++	+	++	+	+	++	+	++	++	++
HOSTAVIN 3330 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 systems FOR HOSTAVIN AND HOSTANOX

SOLVENTBORNE COATINGS	AUTOXIDATIVE ALKYDS	THERMOPLASTS				SUBSTRATE PROTECTION
	a	b	c	d	e	
HOSTAVIN ARO8 POWDER	++		+	○	++	+
HOSTAVIN 3050 LIQUID	++	++	++	++	++	
HOSTAVIN 3052 LIQUID	○	○	○	○	○	
HOSTAVIN 3053 LIQUID	++	++	++	++	++	
HOSTAVIN 3055 LIQUID	++	++	++	++	++	
HOSTAVIN 3058 LIQUID	++	+	+	+	+	
HOSTAVIN 3065 LIQUID		++	++	++	++	
HOSTAVIN 3068 LIQUID	++	+	+	+	+	
HOSTAVIN 3206 LIQUID	++	+	+	+	+	
HOSTAVIN 3212 LIQUID	++	+	+		+	
HOSTAVIN 3310 POWDER	++	++	++	++	++	++
HOSTAVIN 3326 POWDER	++	++	++	++	++	++
HOSTAVIN N 30 POWDER	○	+	○	++	○	
HOSTAVIN PR-31 POWDER	+	++	++	++	++	○
HOSTAVIN TB-01 LIQUID	++	++	++	++	++	++
HOSTAVIN TB-02 LIQUID	+	+	+	+	+	++
HOSTAVIN VSU POWDER	++	○	+	○	+	++
HOSTANOX O 3 POWDER		+		+		
HOSTANOX O 310 POWDER		+		+		
HOSTANOX P-EPQ POWDER		+		+		



WATERBORNE COATINGS	AUTOXIDATIVE ALKYDS	THERMOPLASTS				SUBSTRATE PROTECTION
	a	b	c	d	e	
HOSTAVIN 3041-2 DISP. XP	++		++	+	++	+
HOSTAVIN 3051-2 DISP.	++	+	+	+	+	
HOSTAVIN 3068 LIQUID	+	+	+	+	+	
HOSTAVIN 3070 DISP.	○	+	○	+	○	
HOSTAVIN 3220 DISP.	++		+		++	+
HOSTAVIN 3225-2 DISP.	++	++	++	++	++	++
HOSTAVIN 3310 DISP.	++	++	++	++	++	++
HOSTAVIN 3326 DISP.	++	++	++	++	++	++
HOSTAVIN 3330 DISP. XP	++	++	++	++	++	++

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

- 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 OVERVIEW

PRODUCT	WATER BORNE COATING	SOLVENT BORNE COATING	POWDER COATING	AUTOMOTIVE OEM	CAR REFINISH	COIL COATING	WOOD COATING	GENERAL INDUSTRIAL COATING
HOSTAVIN ARO 8 POWDER	—		—	—	—	—		
HOSTAVIN 3041-2 DISP. XP		—	—	—	—	—		
HOSTAVIN 3050 LIQUID	—		—	—			—	
HOSTAVIN 3051 POWDER ³⁾	—			—	—	—		
HOSTAVIN 3051-2 DISP. ³⁾		—	—			—		
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.		—	—			—		
HOSTAVIN 3206 LIQUID ²⁾	—		—	—			—	
HOSTAVIN 3212 LIQUID ²⁾	—		—	—			—	
HOSTAVIN 3220 DISP. ³⁾		—	—			—	—	
HOSTAVIN 3225-2 DISP. ³⁾		—	—	—	—	—		
HOSTAVIN 3310 DISP.		—	—			—		
HOSTAVIN 3310 POWDER	—		—			—		
HOSTAVIN 3326 DISP.		—	—	—	—	—		
HOSTAVIN 3326 POWDER	—		—	—	—	—		
HOSTAVIN 3330 DISP. XP		—	—			—		
HOSTAVIN N 30 POWDER	—			—	—			
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					—		—	
HOSTANOX O 310 POWDER					—		—	

¹⁾ = Especially for aminoplasts-crosslinked High Solid and Medium Solid systems

²⁾ = Especially for UV curables

³⁾ = Non-TSCA registered



Each application REQUIRES ITS SPECIFIC RECOMMENDATION



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

CLEAR COATS

UV Absorber and HALS combination

ORGANIC-PIGMENTED COATINGS

HALS with less UV Absorber

INORGANIC-PIGMENTED COATINGS

Only HALS

PROTECTION OF SENSITIVE SUBSTRATE

Only UV Absorber

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.

Clear / non-pigmented	PIGMENTATION			Opaque / pigmented
	UV ABSORBER			
	HALS			
	LOW	MEDIUM	HIGH	
	1.5 % - 3 % UVA 0.5 % - 1 % HALS	0.5 % - 1.5 % UVA 1 % - 2 % HALS	0 % - 0.5 % UVA 2 % - 3 % HALS	

Transport AND STORAGE

As a general guideline, it is recommended that the products mentioned in this brochure 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, available online at www.additives.clariant.com.

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.

For more detailed information:

- on a specific product, please refer to the corresponding Technical Data Sheet
- commercial samples can also be ordered via our online Sample Order Form

available at www.additives.clariant.com



CLARIANT INTERNATIONAL LTD

Rothausstrasse 61
4132 Muttenz
Switzerland

BUSINESS LINE POLYMER ADDITIVES

Fon +800 66 9 96 6 99

Fax +41 (0) 61 4 69 75 50

Email Additives4u@clariant.com

WWW.CLARIANT.COM/ADDITIVES

WWW.CLARIANT.COM

This information corresponds to the present state of our knowledge and is intended as a general description of our products and their possible applications. Clariant makes no warranties, express or implied, as to the information's accuracy, adequacy, sufficiency or freedom from defect and assumes no liability in connection with any use of this information. Any user of this product is responsible for determining the suitability of Clariant's products for its particular application. * Nothing included in this information waives any of Clariant's General Terms and Conditions of Sale, which control unless it agrees otherwise in writing. Any existing intellectual/industrial property rights must be observed. Due to possible changes in our products and applicable national and international regulations and laws, the status of our products could change. Material Safety Data Sheets providing safety precautions, that should be observed when handling or storing Clariant products, are available upon request and are provided in compliance with applicable law. You should obtain and review the applicable Material Safety Data Sheet information before handling any of these products. For additional information, please contact Clariant.

* For sales to customers located within the United States and Canada the following applies in addition:
NO EXPRESS OR IMPLIED WARRANTY IS MADE OF THE MERCHANTABILITY, SUITABILITY,
FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE OF ANY PRODUCT OR SERVICE.

® Trademark of Clariant registered in many countries.
© 2015 Clariant International Ltd



DA 6001 E | 03.2015