

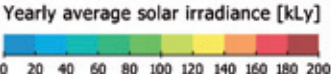
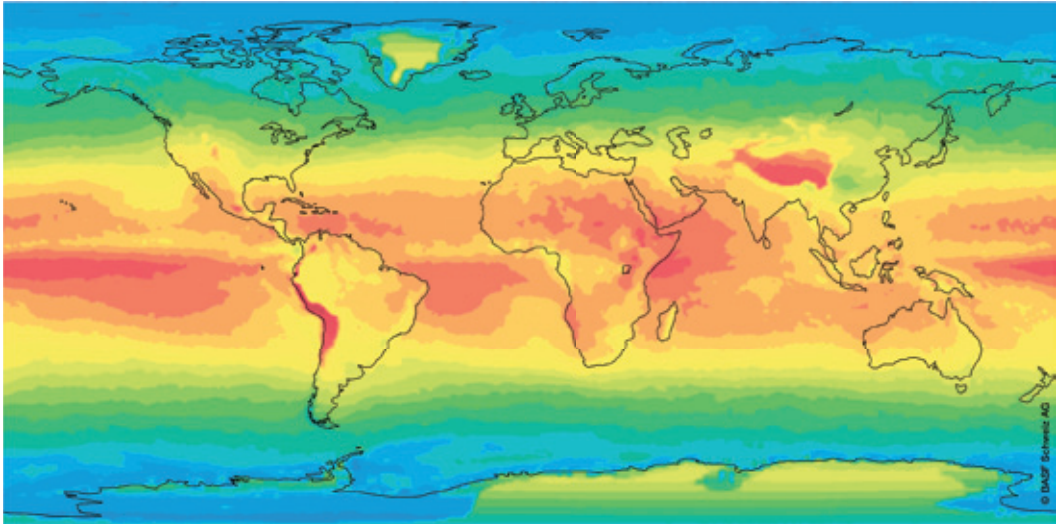
Additives for specialty polymers

Plastic Additives

 **BASF**
The Chemical Company

UV protection of plastics

Global solar irradiance



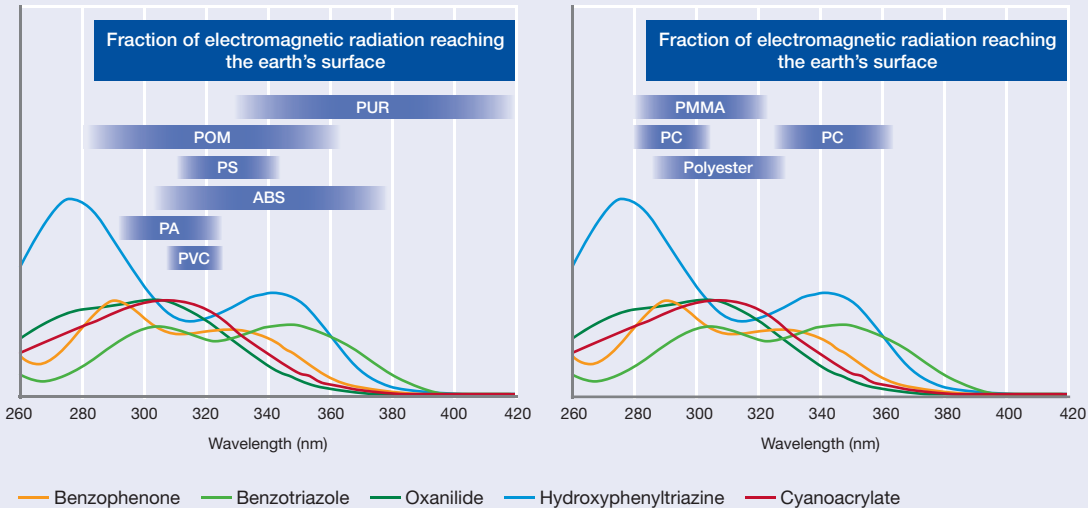
1 kLy = 41.84 MJ/m², Data provided by the Ozone Processing Team at the NASA Goddard Space Flight Center.

This map depicts the global variation of average irradiation energy reaching the earth's surface. UV irradiation energy is responsible for light induced deterioration of plastics and other materials. Therefore, light stabilizer formulations must consider the global location where the final article is used and its expected service life.

Absorption characteristics of UV absorbers

Individual polymers are affected by different wavelengths. Choosing the most effective light stabilizer for a given substrate depends upon matching the right UV absorber with the susceptible wavelength range of the polymer.

UV sensitivity and UV absorbers for specialty polymers



Product form	PVC polymerization	i-PVC	f-PVC	POM	PA	PC	PBT	PET	PMMA	ABS	PS	UPES	PU flexible foam	PU micro-cellular foam	TPU/elastomers	TPE	Synthetic rubber
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Processing & thermal stabilizers

Irgafos® 126	P					■	■	■		■	■					■	
Irgafos® 168	P, FF					■	■	■	■	■	■					■	■
Irganox® 1010	P, FF		■	■	■	■		■	■					■	■	■	■
Irganox® 1035	P, FF																●
Irganox® 1076	P, FD, M	□	■	■			■			■	■	■	■	■	■	●	■
Irganox® 1098	P, ED				□	■										■	■
Irganox® 1135	L												●	●	●		
Irganox® 1330	P															■	
Irganox® 1425	P, FF								●								■
Irganox® 1520	L															■	■
Irganox® 245	P, FF	□			■	■		●		○	■	□		●	●		●
Irganox® 245 DW	AD	■															
Irganox® 259	P				■				●								●
Irganox® 3052	FF										■						●
Irganox® 3114	P, FF										■						
Irganox® 5057	L					○							●				●
Irganox® 565	P, DD															■	■
Irganox® B 1171	P, FF					■											
Irganox® B 215	P, FF															■	■
Irganox® B 225	P, FF					■										■	■
Irganox® B 561	P, FF								■	■							
Irganox® B 900	P, FF									■	■	■					●
Irganox® MD 1024	P, FF					□										■	●
Irganox® PS 800	M, FL										■					■	■
Irganox® PS 802	FL					●					■					■	■
Irgastab® PUR 55	L												●				
Irgastab® PUR 67	L												●				
Irgastab® PUR 68	L												●				
Irgastab® PVC 11	L	■															
Irgastab® PVC 11 EM	AD	■															
Irgastab® PVC 76	AD	■															

Food Contact Approval (FCA)

- no FCA, can be used
- no FCA, recommended
- FCA in at least one country, can be used
- FCA in at least one country, recommended

Product form

- AD Aqueous Dispersion (emulsion or suspension)
- DD/ED Durable Dust Free
- DF Dust Free, Free Flowing
- FB Free Flowing Beads
- FD/FDL Free Flowing Dust Free (large)
- FF Free Flowing
- FL Flakes
- L Liquid
- LD Low Dust
- M Melt
- P Powder
- SF Solid Flowable
- G Granules

Key attributes

High performance, highly compatible phosphite; low color

Hydrolytically stable phosphite, maintains color properties

High molecular weight, phenolic antioxidant (AO); extends long-term thermal stability (LTTS)

Phenolic AO for cross-linked or carbon black containing systems (i.e. cable compounds)

Highly compatible, low-color phenolic AO

Low color phenolic AO, excellent compatibility with PA

Liquid phenolic AO, specifically for PUR

High molecular weight extraction resistant phenolic AO

Multifunctional stabilizer, catalyst, and property modifier

Synergistic, multifunctional AO for elastomers and TPE

Phenolic AO, excellent performance in engineering polymers

Aqueous suspension of Irganox® 245 as AO/chain-stopper for PVC polymerization

Standard phenolic AO

Multifunctional phenolic AO, C-radical scavenger

Non-discoloring phenolic AO; high extraction resistance

Liquid aromatic amine for processing and LTTS

Multifunctional phenolic AO for synthetic rubbers and TPE

Synergistic phenol/phosphite blend for PA

Synergistic phenol/phosphite blend, medium phosphite content

Synergistic phenol/phosphite blend, low phosphite content

Synergistic phenol/phosphite blend, high phosphite content

Synergistic phenol/phosphite blend, high phosphite content

High performance phenolic AO and metal deactivator (Cu passivator)

Synergist extending the LTTS of phenolic AOs

Synergist extending the LTTS of phenolic AOs

Liquid anti-scorch package for polyols, BHT free

Liquid anti-scorch package for polyols, BHT free, low amine

Liquid anti-scorch package for polyols, BHT and amine free

Liquid AO/chain-stopper for PVC polymerization

Aqueous emulsion of Irgastab® PVC 11 as AO/chain-stopper for PVC polymerization

Aqueous emulsion of Irganox® 1076 as AO in PVC polymerization

Product form	PVC polymerization	r-PVC	f-PVC	POM	PA	PC	PBT	PET	PMMA	ABS	PS	UPES	PU flexible foam	PU micro-cellular foam	TPU/elastomers	TPE	Synthetic rubber
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Light stabilizers (HALS)

Chimassorb® 2020	FDL		○ ●		■											○ ○ ○	
Chimassorb® 944	FDL, LD		○ ●		■							□				○ ○ ○	
Tinuvin® 622	SF				■ ■		●									■ ● □	
Tinuvin® 765	L								● ● ●	○ ○	○ ○					○ ○ ○	
Tinuvin® 770	DF				● ●				● ● ●	○ ○						○ ○ ○	
Tinuvin® 783	FDL				●												
Tinuvin® 791	FB				●					○ ○						○ ○	
Uvinul® 4050	FF			○ ●	●		○		● ■ ■							□ ○	
Uvinul® 5050 H	G		○ ●									○				○ ○ ○	
Tinuvin® NOR™ 371	FF																○
Tinuvin® PA 123	L		○ ●						●							○ ○ ●	
Tinuvin® PA 144	P				●				●							● ●	
Tinuvin® XT 833	FF			●													
Tinuvin® XT 850	FF															■ ●	
Tinuvin® B 75	L												● ●	○			
Tinuvin® PUR 866	P															●	

Light stabilizers (UV absorbers)

Chimassorb® 81	P, FL		● ●							□ □	■					● ●	
Tinuvin® P	P		● ●						■ ■ ■	○						● ●	
Tinuvin® 213	L			○			○					● ●	● ●	● ●	● ●	● ●	
Tinuvin® 234	P, FF		○ ○	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	■ ■ ■ ■ ■	● ●					■ ● ● ● ●			
Tinuvin® 312	P		●		■					□ □	■					●	
Tinuvin® 326	P, FL		● ●			○			■ ○ ○					■ ● ● ● ●			
Tinuvin® PA 328	P, FF		○ ○ ○							○ ○ ○				○ ○ ○ ○ ○			
Tinuvin® 329	P					■										● ●	
Tinuvin® 360	P, ED					●			●								
Tinuvin® 571	L			●					●			● ●	● ●	● ●	● ●	● ●	
Tinuvin® 1577	ED					■ ■ ■ ■			■								
Uvinul® 3030	P, FF					■ ■ ■ ■											
Uvinul® 3035	P		■ □		■					■ ■				■ ■			
Uvinul® 3039	L			●								● ●	● ●	● ●	● ●		

Flame retardants

Melapur® 200 range	P				●		○ ○					○			○		
Melapur® MC range	P				●		○					○			●		

Charge control agents

Irgastat® P range	G		■ ■ ■ ■							■ ■					■ ■		
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Optical brightener

Tinopal® OB	P		■ ■ ■ ■ ■					■ ■ ■ ■			□ ■ ■ ■			□			
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Key attributes

High molecular weight HALS

High molecular weight HALS for a wide range of applications

High molecular weight HALS with excellent color, low basicity

Liquid, low molecular weight HALS

Low molecular weight HALS for a wide range of applications

Synergistic blend of high molecular weight HALS

Synergistic blend of high and low molecular weight HALS

Low molecular weight HALS, food contact clearance in styrenic polymers

High molecular weight HALS for a wide range of applications

High molecular weight non-interacting light stabilizer

Liquid non-interacting low molecular weight HALS

Multi-functional light stabilizer/AO

High performance light stabilizer system, mainly for flexible PVC

Non-interacting light stabilizer system

Liquid light stabilizer system for PUR

High performance light stabilizer system for TPU

Benzophenone

Benzotriazole for a wide array of substrates

Liquid benzotriazole

Benzotriazole with low volatility

Oxanilide with low initial color

Benzotriazole with enhanced absorption of long-wave UV radiation

Benzotriazole

Benzotriazole

Benzotriazole with very low volatility

Liquid benzotriazole

Hydroxyphenyltriazine with high performance and low volatility

Cyanoacrylate with low initial color and low volatility

Cyanoacrylate with low initial color

Liquid cyanoacrylate with low initial color

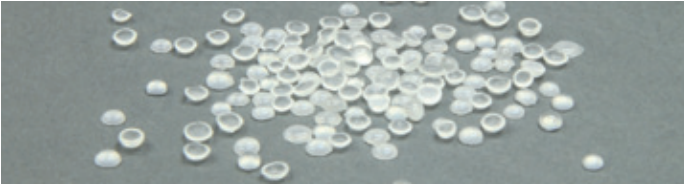
Melamine polyphosphate flame retardant

Melamine cyanurate flame retardant

Permanent antistatic agents

General purpose optical brightener

Typical examples of BASF product forms



FD Free Flowing Dust Free



FF Free Flowing



DD Durable Dust Free



ED Durable Dust Free



G Granules



P Powder



SF Solid Flowable



FL Flakes

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