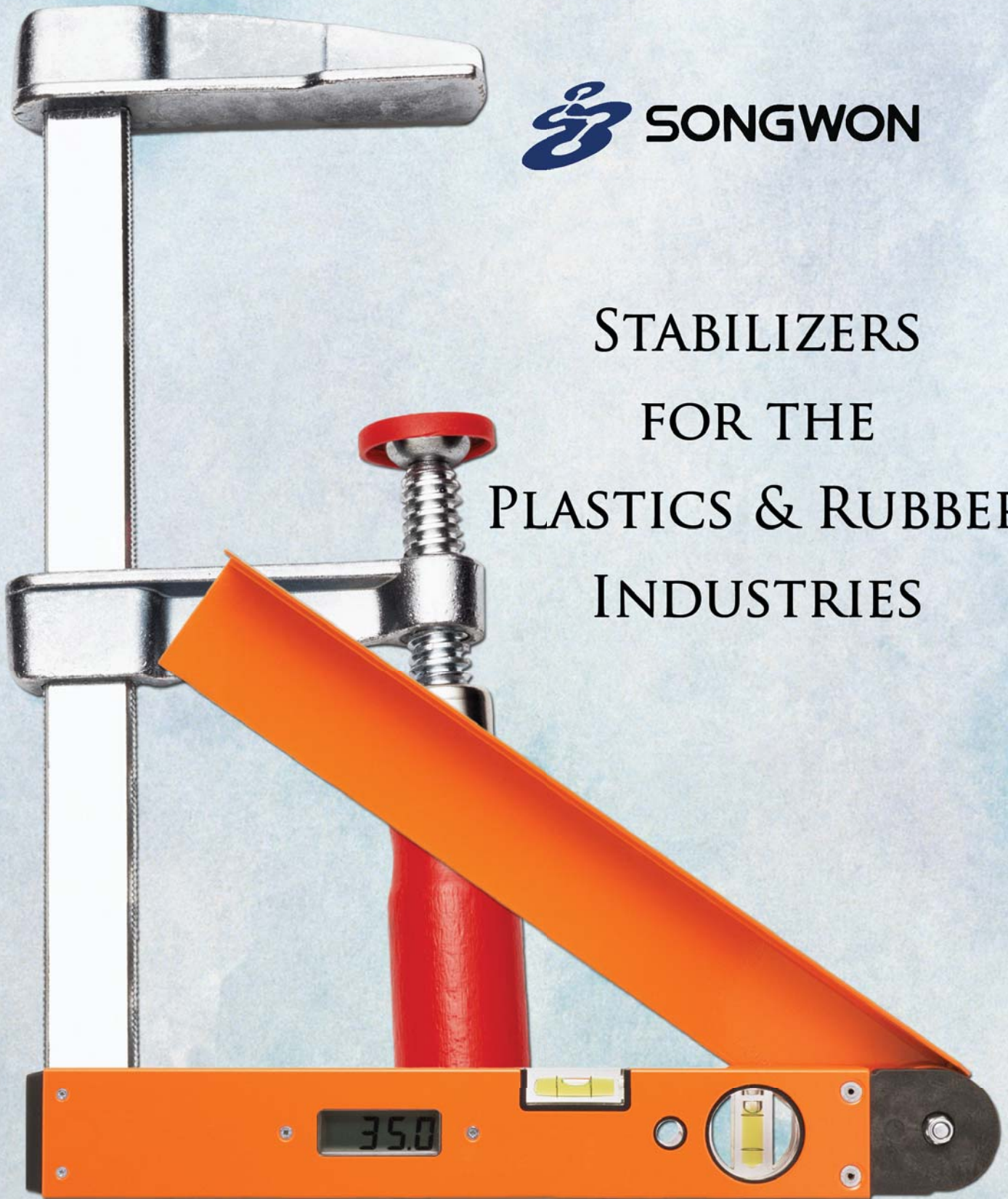




R. T. Vanderbilt Company, Inc.
INDUSTRIAL MINERALS AND CHEMICALS



STABILIZERS
FOR THE
PLASTICS & RUBBER
INDUSTRIES





R. T. Vanderbilt Company, Inc.

INDUSTRIAL MINERALS AND CHEMICALS

A Responsible Care® Company

R.T. Vanderbilt Company, Inc.'s Rubber and Plastics Department prides itself in our ability to work closely with our customers to solve problems associated with compounding and stabilization. Our emphasis on new-product development enables us to respond to the ever-changing needs of today's plastics industry.

We have a wide range of products for the plastics industry, including polymer stabilizers, polymer reinforcing agents, and polymer modifiers. These materials are used extensively to create quality products manufactured from polyethylene, polypropylene, polyurethane, or polyamide.

Vanderbilt was selected in 2007 as the distributor of polymer additives in the U.S. and Canada for Songwon Americas, the U.S.-based affiliate of Songwon Industrial Co., Ltd.

Songwon Industrial was established in Busan, South Korea in 1965. Over the past 40 years, through a combination of process and product development, continuous improvement, and strategic investments, Songwon has grown into a global supplier of essential additives for the polymer markets. Songwon is a leading producer of antioxidants and heat stabilizers for the plastics industry, as well as additives for PVC, plasticizers, lubricants, surface coating agents, polyurethane, alkyl phenols, flocculants, and other chemicals.

Vanderbilt is proud to represent Songwon Industrial's extensive line of stabilizers, including phenolic, phosphite, and thioester antioxidants; hindered amine light stabilizers; UV absorbers, heat stabilizers, and metal deactivators.

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For the most current list of products available, please view online at: www.rtvanderbilt.com

Samples are available for these and all products supplied by R.T. Vanderbilt Company, Inc.

TRADEMARKS

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DISCLAIMER

Before using, read, understand and comply with the information and precautions in the Material Safety Data Sheets, label and other product literature. The information presented herein, while not guaranteed, was prepared by technical personnel and, to the best of our knowledge and belief, is true and accurate as of the date hereof. No warranty, representation or guarantee, express or implied, is made regarding accuracy, performance, stability, reliability or use. This information is not intended to be all-inclusive, because the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. The user is responsible for determining the suitability of any material for a specific purpose and for adopting such safety precautions as may be required. R. T. Vanderbilt Company, Inc. does not warrant the results to be obtained in using any material, and disclaims all liability with respect to the use, handling or further processing of any such material. No suggestion for use is intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patent, trademark or copyright or to violate any federal, state or local law or regulation.

rev 03/26/12

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X= RECOMMENDED ■= SUITABLE
 *= Particle Photos on page 31

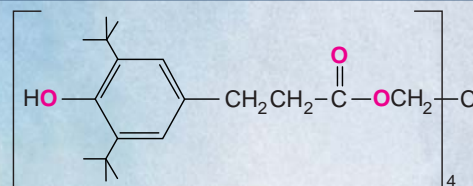
	Page Number	ABS	PC/ABS	PC	PU Fibers	Polyamide	Polyesters	Polyethylene	Polypropylene	Polystyrene	Polyurethane	PVC	Elastomers	Acrylics	Polyacetal	TPU	FDA 178:2010	
Phenolic Antioxidants	SONGNOX® 1010*	1				■	■	X	X				X		■		X	
	SONGNOX® 1035	2						X	X								X	
	SONGNOX® 1076*	3	X	■	X			X		X	X	■	X	X			X	
	SONGNOX® 1077	3						X		■	X		X	X				
	SONGNOX® 1098	4				■	X										X	
	SONGNOX® 1135	4						X		■	X		X	X				
	SONGNOX® 1290	5	X				X	X	■	X	X	X	X	X		X		X
	SONGNOX® 1330	5					■	■	X	X				X				
	SONGNOX® 1520	6												X				X
	SONGNOX® 2450	6	■			■	■	X			X	■	X		X	X	X	X
	SONGNOX® 2590	7						X	X	X		X		X		■		X
	SONGNOX® 3114	8							■	X								X
Phosphite Antioxidants	SONGNOX® 1680*	9	■	■	X		X	X	X	X				X	X	X	X	
	SONGNOX® 6180	9	X	■				X	■	X	■	X	■				X	X
	SONGNOX® 6260	10				X		X	X			■					X	
	SONGNOX® 6280	10				X		X	X			■						
Metal Deactivator	SONGNOX® 1024	11			■		X	X							X		X	
Hydroquinone Antioxidant	SONGNOX® 2500	12								■	■		X	■			X	
Phenol-Phosphite Blends	SONGNOX® 11B	13	A blend of SONGNOX® 1680 and SONGNOX® 1010														X	
	SONGNOX® 21B	13	A blend of SONGNOX® 1680 and SONGNOX® 1010														X	
	SONGNOX® 311B	14	A blend of SONGNOX® 1680 and SONGNOX® 3114														X	
	SONGNOX® 321B	14	A blend of SONGNOX® 1680 and SONGNOX® 3114														X	
	SONGNOX® 417B	15	A blend of SONGNOX® 1680 and SONGNOX® 1076														X	
Thioester Antioxidants	SONGNOX® 4120	16	X	■				X	X		X	X	X					
	SONGNOX® DLTDP	16	■	X				X	X		X	X	X					
	SONGNOX® DSTDP	17	■	X				X	X		X	X	X					
	SONGNOX® DTDP	17	■	X				X	X		X	X	X					
Hindered Amine Light Stabilizers	SONGLIGHT® 1190	19	X	X	■		X	X	X	v	■	X	■	X	■	X	X	
	SONGLIGHT® 2920	20	X				■		X	X	X	X	X			X		
	SONGLIGHT® 6220	20				X	X	■	X	X	■		■	X		X	X	
	SONGLIGHT® 7700	21	X				X	X	X	X	X		■	X		X	X	
	SONGLIGHT® 7830	21	A blend of SONGLIGHT® 6220 and SONGLIGHT® 9440															
	SONGLIGHT® 9440	22	■				X		X	X		X	X			X		X
UV Absorbers	SONGSORB® 1000	24	X	X			X			X		X	X	X			X	
	SONGSORB® 2340	24		X	X	X	X	X		■	■		■	■		X	X	
	SONGSORB® 2908	25						X	X			X	■				X	
	SONGSORB® 3200	25	X	■	■					X		X		X				
	SONGSORB® 3260	26	■					X	X	X	■	■	■	■	X		X	
	SONGSORB® 3270	26	X	X	X	X		X	X	X	X	X	X	■	X			
	SONGSORB® 3280	27	X			X	X	X	X	X			X	X	X	X	X	
	SONGSORB® 3290	27	■	X	X					■				■	X		X	
	SONGSORB® 7120	28	■						X	X		■	X	X	■		■	
	SONGSORB® 8100	28	■	X	X				X	X	X	■	■	X	■			
Heat Stabilizers	SONGSTAB® SC-110	30	X					X	X			X	■				X	
	SONGSTAB® SZ-210	30						X	X	X		X					X	
	SONGSTAB® SM-310	31	X						■				X					
	SONGSTAB® SB-410	31	■									X						

SONGWON Antioxidants

Plastics are expected to withstand many stresses and strains, including heat and long-term storage. Songwon antioxidants and antioxidant synergists supplied by R.T. Vanderbilt Company, Inc. will greatly improve the heat and oxidative resistance of these compounds, which in turn will help with the retention of original physical properties. The additives listed can help to limit, if not eliminate, the damaging effects of these stresses on the performance of your product.

SONGNOX® 1010 Antioxidant

Tetrakis[methylene 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate]methane
 m.w. 1178 CAS 6683-19-8



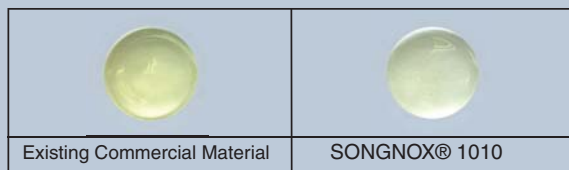
Typical Properties

Physical form/Product #	Free Flow (FF)/37927, Powder (PW)/37913
Color	white
Melting range, °C	110 - 125
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	95.0
500 nm, %, min.	97.0
Assay, %, min.	98.0

Performance Properties: This primary antioxidant is for use in PE, PP, PA, PVC, POM, and elastomers. Its effectiveness in polymer processing is enhanced by its ability to reduce viscosity and gel formation. It provides long-term heat stability and protects physical properties both during storage and use of the end product. It exhibits a synergistic effect when used in combination with secondary antioxidants such as **SONGNOX® 1680**. This product is usable with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications.

COMPARISON TEST OF HEAT STABILITY

NO.1 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 0.5hr



COMPARISON TEST OF HEAT STABILITY

NO.2 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 1.0hr



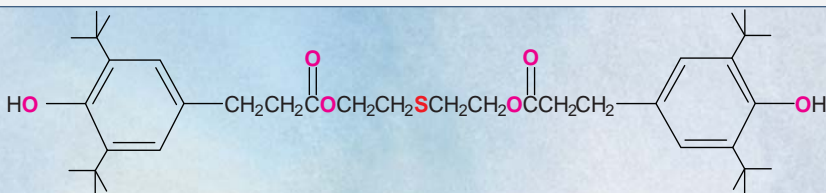
COMPARISON TEST OF HEAT STABILITY

NO.3 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 1.5hr



SONGNOX® 1035 Antioxidant

Thiodiethylene bis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate]
 m.w. 643 CAS 41484-35-9



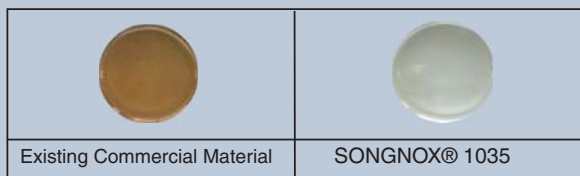
Typical Properties

Physical form/Product #	Free Flow (FF)/37915, Powder (PW)/37911
Color	white
Melting point, °C, min.	65
Ash, %, max.	0.10
Volatile loss, %, max.	0.30
Color of solution at	
425 nm, %, min.	93.0
500 nm, %, min.	98.0
Assay, %, min.	98.0

Performance Properties: This primary and secondary antioxidant is effective in organic polymers—especially PE. It is compatible with a wide range of substrates, and it is usable with a broad range of stabilizers for optimal performance. The high molecular weight and low volatility provide long-term heat stability. It is non-discoloring, non-staining, odorless, and tasteless.

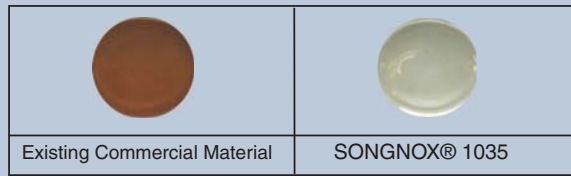
COMPARISON TEST OF HEAT STABILITY

NO.1 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 0.5hr



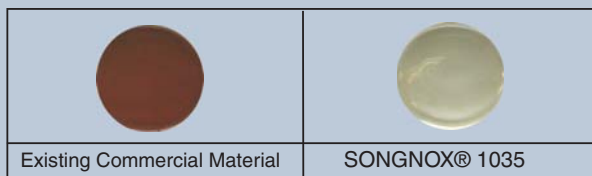
COMPARISON TEST OF HEAT STABILITY

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 TEST CONDITION : 230° C - 1.0hr



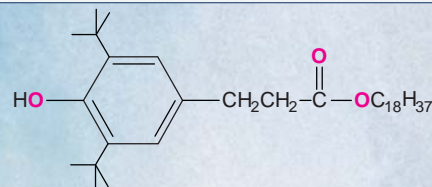
COMPARISON TEST OF HEAT STABILITY

NO.3 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 1.5hr



SONGNOX® 1076 Antioxidant

Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate
 m.w. 531 CAS 2082-79-3

**Typical Properties**

Physical form/Product #

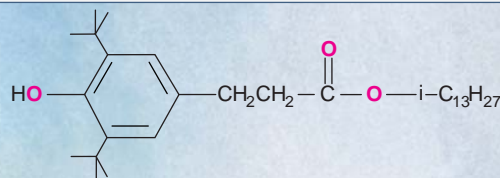
Crystalline Powder (CP)/**37973**,
Powder (PW)/**37909**, Semi Bead (SB)/**37972**

Color	white
Melting point, °C, min.	50 - 55
Ash, %, max.	0.10
Volatile loss, %, max.	0.20
Color of solution at	
425 nm, %, min.	97.0
500 nm, %, min.	98.0
Assay, %, min.	99.0

Performance Properties: This primary antioxidant is usable in PE, PU, PVC, styrenics, PVB, acrylics, and elastomers. It is effective in reducing viscosity change and gel formation during polymer processing. It provides excellent long-term heat stability, and it protects physical properties during storage and use of the end product. It is non-discoloring, non-staining, odorless, and tasteless. It exhibits a synergistic effect when used in combination with secondary antioxidants such as **SONGNOX® 1680**. It is usable with benzotriazoles or **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications.

SONGNOX® 1077 Antioxidant

Isotridecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate
 m.w. 470 CAS 847488-62-4

**Typical Properties**

Physical form/Product #

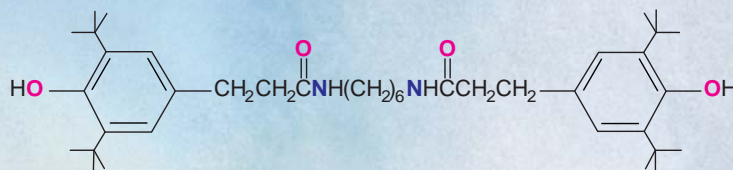
Liquid (LQ)/**37937**

Color	yellowish
Viscosity, cps/25°C, max.	1200
Specific gravity (25°C)	0.932 - 0.952
Refractive index (25°C)	1.480 - 1.500
Ash, %, max.	0.10
Color of solution at	
425 nm, %, min.	93.0
500 nm, %, min.	95.0
Assay, %, min.	92.0

Performance Properties: This product is a liquid, sterically hindered phenol, primary antioxidant that is usable in a range of polymers, including: PE, PVC, ABS, SBR, BR, and NBR. It is an effective, non-discoloring stabilizer that provides excellent long-term stability. It exhibits a synergistic effect when used with phosphites. It is usable with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications

SONGNOX® 1098 Antioxidant

N,N'-Hexamethyl (3,5-di-tert-butyl-4-hydroxyhydrocinnamamide)
m.w. 637 CAS 23128-74-7

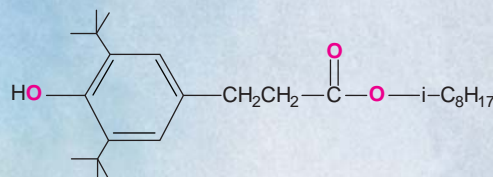
**Typical Properties**

Physical form/Product #	Powder (PW)/37943
Melting point, °C	156 - 162
Ash, %, max.	0.10
Volatile loss, %, max.	0.30
Color of solution at	
425 nm, %, min.	98.0
500 nm, %, min.	99.0
Assay, %, min.	98.0

Performance Properties: This product is a high-molecular-weight, extraction-resistant, multifunctional hindered phenolic antioxidant. In addition to providing effective thermal stability, it also affords excellent metal-deactivation performance in thermoplastic resins. When added at 0.1 to 0.2% prior to polymerization, this product protects polymer color during manufacturing. It is an efficient antioxidant for polyamide fibers, molded articles and films.

SONGNOX® 1135 Antioxidant

Iso-octyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate
m.w. 390 CAS 125643-61-0

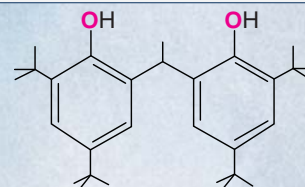
**Typical Properties**

Physical form/Product #	Liquid (LQ)/37969
Color	yellowish
Viscosity, cps/25°C, max.	300 - 500
Specific gravity (25°C)	0.95 - 0.99
Refractive index (25°C)	1.493 - 1.499
Ash, %, max.	0.10
Color of solution at	
425 nm, %, min.	93.0
500 nm, %, min.	95.0
Assay, %, min.	98.0

Performance Properties: This product is a primary antioxidant that is usable in a wide range of polymers, including: PE, PVC, ABS, SBR, BR, and NBR. This product is a sterically hindered phenol and a liquid at room temperature. It is an effective, non-discoloring stabilizer that provides excellent long-term stability. It also exhibits a synergistic effect in combination with phosphites. It is usable with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications.

SONGNOX® 1290 Antioxidant

2,2'-Ethylidenebis-(4,6-di-tert-butylphenol)
 m.w. 438.76 CAS 35958-30-6

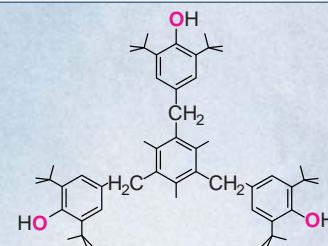
**Typical Properties**

Physical form/Product #	Powder (PW)/ 37921
Color	white to off-white
Melting range, °C	160 - 165
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	95.0
500 nm, %, min.	97.0
Purity, %, min.	99.0

Performance Properties: This primary antioxidant is for use in organic polymers, including: PA, PU, polystyrene, ABS, and PVS. It also is recommended for use in adhesives, elastomers, elastomer blends with polyolefins, and tackifier resins. It is effective in reducing viscosity change and gel formation during polymer processing. It provides long-term heat stability and protects physical properties during storage and use of the end product. It exhibits a synergistic effect when used with secondary antioxidants.

SONGNOX® 1330 Antioxidant

1,3,5-Trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxybenzyl) benzene
 m.w. 775 CAS 1709-70-2

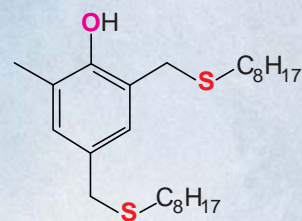
**Typical Properties**

Physical form/Product #	Free Flow (FF)/ 37975 , Powder (PW)/ 37974
Color	white or slightly yellowish
Melting range, °C	241 - 247
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	96.0
500 nm, %, min.	98.0
Purity, %, min.	98.0

Performance Properties: This primary antioxidant for organic polymers exhibits high resistance to thermo-oxidative degradation. As a result of its excellent dielectric properties, it works well in PE and PP cable insulations and films. It is extraction resistant in water-quenched PP film lines and exhibits high performance in controlling degradation of polyolefins. It is not absorbed by fillers in polyolefins. Blends of **SONGNOX® 1330** and **SONGLIGHT®** Light Stabilizers or combinations of HALS and **SONGSORB®** UV Absorbers are usable to improve light stability. It is usable without a metal de-activator. This product is an antioxidant for SBS, PA, synthetic fibers, polyester, and elastomers.

SONGNOX® 1520 Antioxidant

4,6-Bis(octylthiomethyl)-o-cresol
 m.w. 425 CAS 110553-27-0

**Typical Properties**

Physical form/Product #	Liquid (LQ)/37967
Color	yellowish
Color of solution at 425nm, %, min.	95.0
Refractive index (20°C)	1.5262 – 1.5278
Specific gravity (20°C)	0.975 – 0.985
Assay, %, min.	96.0

Performance Properties: This liquid phenolic antioxidant is usable in organic substrates such as elastomers, plastics, adhesives, sealants, oil and lubricants. It is an effective thermo-oxidative stabilizer for solution-polymerized and emulsion-polymerized polymers and for thermoplastic elastomers. It also works in SBS, SIS, SBR, NBR, BR, IR, and NR. It is usable with secondary antioxidants and **SONGLIGHT®** Light Stabilizers, but it is not recommended for odor-sensitive applications.

SONGNOX® 2450 Antioxidant

Triethylene glycol-bis-3-(3-tert-butyl-4-hydroxy-5-methylphenyl)propionate
 m.w. 587 CAS 36443-68-2

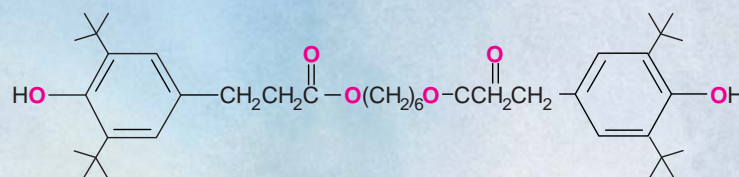
**Typical Properties**

Physical form/Product #	Free Flow (FF)/37906, Powder (PW)/37902
Color	white
Melting range, °C	76 - 80
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at 425 nm, %, min.	95.0
500 nm, %, min.	97.0
Assay, %, min.	97.0

Performance Properties: This high-performance, sterically hindered phenolic antioxidant protects the polymer against thermo-oxidative degradation during its manufacturing process and end-use applications. It is an effective antioxidant for PU, PA, PVC, styrenics, acrylics, MBS, and synthetic rubber. It exhibits low volatility, good color stability, good solubility in polar polymers, extraction resistance, and no odor. It is usable with benzotriazoles and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications, and it is synergistic when used in combination with thioester antioxidants.

SONGNOX® 2590 Antioxidant

Hexamethylenebis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate]
 m.w. 639 CAS 35074-77-2

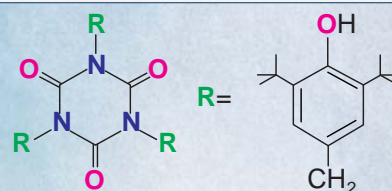
**Typical Properties**

Physical form/Product #	Powder (PW)/37971
Melting point, °C	104 - 108
Ash, %, max.	0.10
Volatile loss, %, max.	0.15
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0
Assay, %, min.	98.0

Performance Properties: This primary antioxidant is usable in organic polymers such as polyolefins, polyols, PU, polyacetals, elastomers and adhesives. It provides excellent processing, long-term thermal stability and excellent initial color. It disperses easily via extrusion compounding and is extraction resistant. This product is usable in combination with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers.

SONGNOX® 3114 Antioxidant

Tris-(3,5-di-tert-butylhydroxybenzyl) isocyanurate
 m.w. 784 CAS 27676-62-6



Typical Properties

Physical form/Product #	Free Flow (FF)/37905, Powder (PW)/37904
Color	white to off-white
Melting point, °C	218 - 223
Ash, %, max.	0.01
Volatile loss, %, max.	0.20
Color of solution at	
425 nm, %, min.	93.0
500 nm, %, min.	97.0
Assay, %, min.	98.0
Fe content, ppm, max.	10

Performance Properties: This high-performance, sterically hindered, primary antioxidant is usable in organic polymers. Its low volatility, good color stability, and high extraction resistance make it ideal for use in color-sensitive applications such as polypropylene fiber. This product exhibits a synergistic effect when used in combination with phosphite antioxidants.

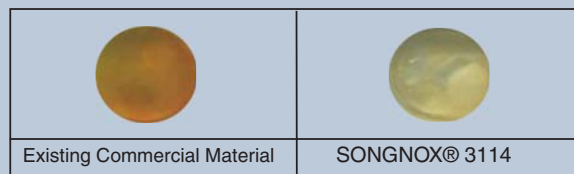
COMPARISON TEST OF HEAT STABILITY

NO.1 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 250° C - 0.5hr



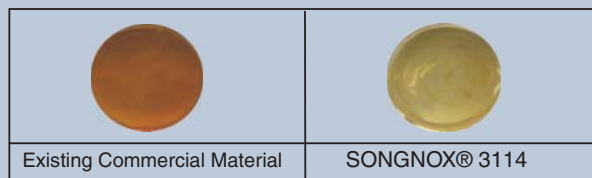
COMPARISON TEST OF HEAT STABILITY

NO.2 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 1.0hr



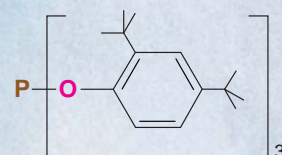
COMPARISON TEST OF HEAT STABILITY

NO.3 May 30, 2006
 TEST EQUIPMENT : GEER OVEN
 TEST CONDITION : 230° C - 1.5hr



SONGNOX® 1680 Antioxidant

Tris(2,4-di-tert-butylphenyl) phosphite
 m.w. 647 CAS 31570-04-4

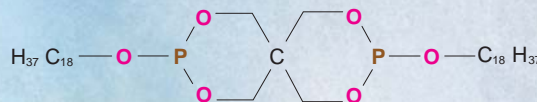
**Typical Properties**

Physical form/Product #	Free Flow (FF)/ 37907 , Powder (PW)/ 37914
Melting point, °C	181 - 187
Volatile loss, %, max.	0.30
Color of solution at	
425 nm, %, min.	98.0
500 nm, %, min.	98.0
Assay, %, min.	99.0
Acid value, mgKOH/g, max.	0.30
2,4-DTBP content, %, max.	0.25

Performance Properties: This secondary antioxidant for organic polymers provides protection to melt flow and color during the thermal processing of polymers. This product is usable for many polymers, including: polyolefins, polycarbonate, polyester, and styrenics. It is usable in combination with hindered phenols to achieve synergistic performance. This product is usable with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications.

SONGNOX® 6180 Antioxidant

Distearyl pentaerythritol diphosphite
 m.w. 732 CAS 3806-34-6

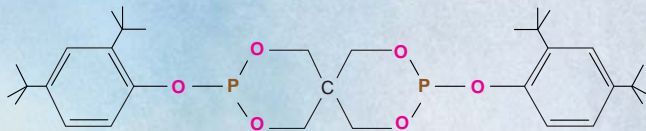
**Typical Properties**

Physical form/Product #	Fusion Crystal (FC)/ 37954
Softening point, °C	50 - 65
Volatile loss, %, max.	0.10
Acid value, mgKOH/g, max.	1.00
P content, %	7.3 - 7.9

Performance Properties: This secondary, high-performance antioxidant, designed for use in organic polymers, offers excellent color protection during thermal processing. Applications include polyolefins, elastomers, polyesters, styrenics, engineering thermoplastics, and adhesive formulations. This product reduces discoloration of polymers containing pigments such as TiO₂, and polymers that are stabilized with sulfur-containing nickel organic complexes and processed at high temperature. It is synergistic when used with **SONGSORB®** UV Absorbers. Note: This product is moisture sensitive, so please consult the MSDS for handling considerations.

SONGNOX® 6260 Antioxidant

Bis(2,4-di-tert-butyl phenyl)pentaerythritol
diphosphite
m.w. 605 CAS 26741-53-7

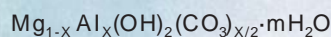
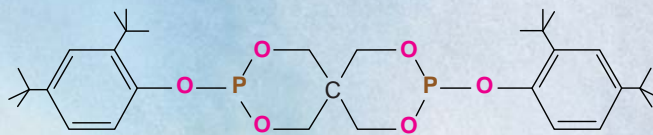
**Typical Properties**

Physical form/Product #	Powder (PW)/37903
Melting point, °C	170 - 180
Volatile loss, %, max.	0.50
Acid value, mgKOH/g, max.	1.00
2,4-DTBP content, %, max.	1.00
P content, %	10.0 - 10.3

Performance Properties: This secondary antioxidant for organic polymers protects melt flow and color during the thermal processing of polymers. This product is usable for many polymers, including: polyolefins, elastomers, polycarbonate, polyester, and styrenics. It is usable in combination with hindered phenols to achieve synergistic performance. It is usable with **SONGSORB®** UV Absorbers and **SONGLIGHT®** Light Stabilizers for thermal and light stabilization in outdoor applications. Note: This product is moisture sensitive, so please consult the MSDS for handling considerations.

SONGNOX® 6280 Antioxidant

Mixture of SONGNOX® 6260 and Mg, Al talcite
CAS 26741-53-7; 11097-59-9

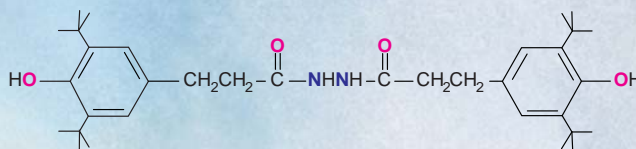
**Typical Properties**

Physical form/Product #	Free Flow (FF)/37964
Volatile loss, %, max.	0.50
Acid value, mgKOH/g, max.	1.00
2,4-DTBP content, %, max.	1.00
P content, %	9.0 - 9.3

Performance Properties: This 90:10 mixture of **SONGNOX® 6260** and magnesium aluminum hydroxide carbonate hydrate is a secondary antioxidant for organic polymers. It is effective in the stabilization of polyolefins, elastomers, engineering plastics, and adhesives. It inhibits discoloration, which provides excellent color stability during compounding and fabrication, and it also improves light stability.

SONGNOX® 1024 Antioxidant

1,2-Bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl)
hydrazine
m.w. 553 CAS 32687-78-8



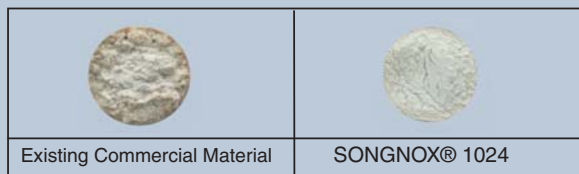
Typical Properties

Physical form/Product #	Free Flow (FF)/ 37947 , Fine Grind (FG)/ 37951 , Powder (PW)/ 37912
Color	white to off-white
Melting range, °C	221 - 232
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	96.0
500 nm, %, min.	97.0
Assay, %, min.	98.0

Performance Properties: This product is an effective metal deactivator and primary antioxidant for wire and cable, powder-coating applications, and hot-melt and solution adhesives. It offers a high level of extraction resistance to oil and aqueous media, and it is effective in PE, PP, XLPE, PA, PU, styrenic copolymers, acrylics, and elastomers. It is usable in combination with hindered phenolic antioxidants (particularly **SONGNOX® 1010**) to achieve synergistic performance.

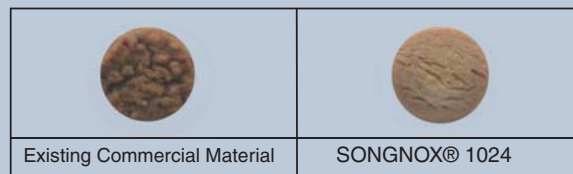
COMPARISON TEST OF HEAT STABILITY

NO.1 May 30, 2006
TEST EQUIPMENT : GEER OVEN
TEST CONDITION : 230° C - 0.5hr



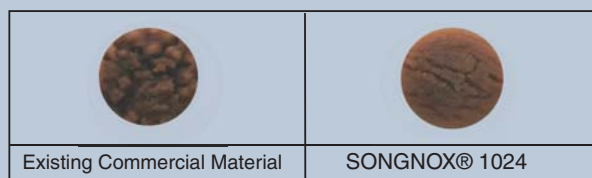
COMPARISON TEST OF HEAT STABILITY

NO.2 May 30, 2006
TEST EQUIPMENT : GEER OVEN
TEST CONDITION : 230° C - 1.0hr



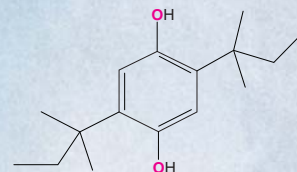
COMPARISON TEST OF HEAT STABILITY

NO.3 May 30, 2006
TEST EQUIPMENT : GEER OVEN
TEST CONDITION : 230° C - 1.5hr



SONGNOX® 2500 Antioxidant

2, 5 -Di-tert-amyl-hydroquinone
 m.w. 250 CAS 79-74-3

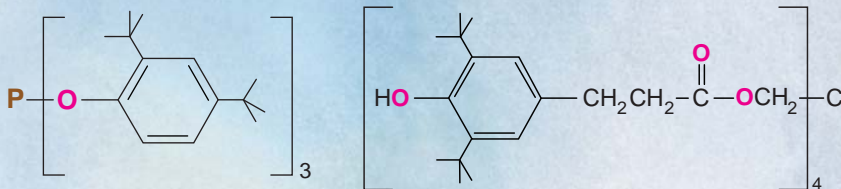
**Typical Properties**

Physical form/Product #	Powder (PW)/37938
Melting point, °C min.	178
Ash, %, max.	0.10
Volatile loss, %, max.	0.30
Color of solution at	
425 nm, %, min.	95.0
500 nm, %, min.	97.0
Assay, %, min.	98.0

Performance Properties: This product is a non-staining, non-discoloring primary antioxidant for natural and synthetic rubbers, providing excellent protection against oxygen and sun cracking. It is an efficient stabilizer for raw polymers, especially acrylonitrile (NBR). By preventing drying and loss of tack, **SONGNOX® 2500** is effective in elastomeric adhesives, tapes, and film. It is used in a variety of coatings and prevents "skinning" by inhibiting oxygen attack on unsaturated paint resins. It is usable with a less-volatile antioxidant to insure lasting protection.

SONGNOX® 11B Antioxidant

A blend of SONGNOX® 1680
and SONGNOX® 1010

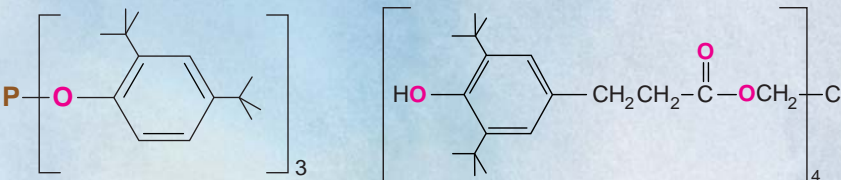
**Typical Properties**

Physical form/Product #	Free Flow (FF)/37955, Powder (PW)/37929
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0

Performance Properties: This 1:1 blend of **SONGNOX® 1010** and **SONGNOX® 1680** works synergistically for processing and long-term thermal stabilization in PE, PP, EVA, and butyl copolymers. This odorless, tasteless, and FDA-compliant blend also is usable in styrenic polymers, PU, and other synthetic polymers.

SONGNOX® 21B Antioxidant

A blend of SONGNOX® 1680
and SONGNOX® 1010

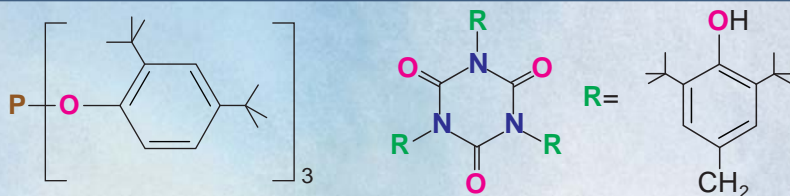
**Typical Properties**

Physical form/Product #	Free Flow (FF)/37930, Powder (PW)/37944
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0

Performance Properties: This product is a blend of **SONGNOX® 1010** (33.3%), a primary high-molecular-weight hindered phenolic antioxidant, with **SONGNOX® 1680** (66.7%), a secondary phosphite antioxidant. It provides excellent melt-flow and color protection during processing of polyolefins, and it provides long-term heat stability, protecting physical properties during storage and in end-use applications. This odorless, tasteless, and FDA-compliant blend also is usable for stabilization of polycarbonate, ABS, and polyesters.

SONGNOX® 311B Antioxidant

A blend of SONGNOX® 1680
and SONGNOX® 3114

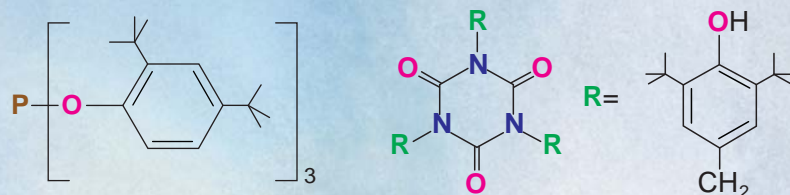
**Typical Properties**

Physical form/Product #	Powder (PW)/37931
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0

Performance Properties: This product is a 1:1 physical blend of **SONGNOX® 3114**, a primary phenolic antioxidant, with **SONGNOX® 1680**, a secondary phosphite antioxidant, that provides excellent melt-flow and color protection during processing of polyolefins. It affords long-term heat stability by protecting physical properties during storage and end-use applications. It provides gas fade resistance in polyolefins and avoids the negative effects of discoloration resulting from exposure to NO_x. Applications include homopolymers and copolymers of PE and PP for the stabilization of fibers, thin films, filled grades, and molded articles. This odorless, tasteless blend is FDA compliant for use in polyolefins.

SONGNOX® 321B Antioxidant

A blend of SONGNOX® 1680
and SONGNOX® 3114

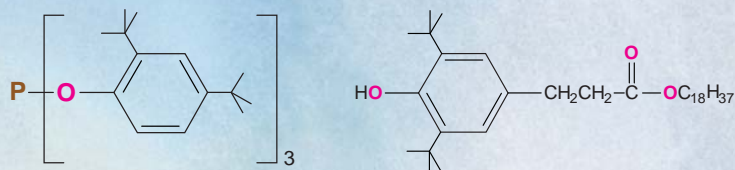
**Typical Properties**

Physical form/Product #	Free Flow (FF)/37924, Powder (PW)/37923
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0

Performance Properties: **SONGNOX® 321B** is a physical blend of **SONGNOX® 3114** (66.7%), a primary phenolic antioxidant, with **SONGNOX® 1680** (33.3%), a secondary phosphite antioxidant. It provides excellent melt-flow and color protection during processing of polyolefins, and affords long-term heat stability by protecting physical properties during storage and end-use applications. It provides gas fade resistance in polyolefins and avoids the negative effects of discoloration resulting from exposure to NO_x. Applications include homopolymers and copolymers of PE and PP for the stabilization of fibers, thin films, filled grades, and molded articles. This odorless, tasteless blend is FDA compliant for use in polyolefins.

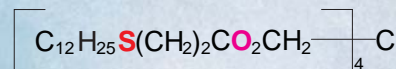
SONGNOX® 417B Antioxidant

A blend of SONGNOX® 1680
and SONGNOX® 1076

**Typical Properties**

Physical form/Product #	Free Flow (FF)/37962, Powder (PW)/37949
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0

Performance Properties: This product is a 4:1 blend of **SONGNOX® 1076**, a primary hindered phenolic antioxidant, with **SONGNOX® 1680**, a secondary phosphite antioxidant. This blend provides excellent melt-flow and color protection to polyolefins during processing, along with long-term heat stability, by protecting physical properties during storage and end-use applications. It is useful stabilization for ABS, PC, and polyesters.

SONGNOX® 4120 Antioxidant

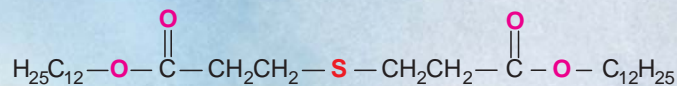
Pentaerythrityl tetrakis(3-laurylthiopropionate)

m.w. 1162 CAS 29598-76-3

Typical Properties

Physical form/Product #	Powder (PW)/37922
Melting point, °C	48.0 - 53.5
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425nm, %, min.	97.0
500nm, %, min.	98.0
Assay, %, min.	98.0

Performance Properties: This product is a secondary antioxidant for organic polymers. It contains sulfur, has a high molecular weight and low volatility. It demonstrates low leaching properties and high heat resistance. **SONGNOX® 4120** is a better-performing synergist with phenolic antioxidants than other thioesters, and it is usable with hindered phenolic antioxidants to achieve synergistic performance. It is recommended as an antioxidant for PP, PE, PC, and ABS, and engineering thermoplastics, but it must be used under controlled temperature and humidity.

SONGNOX® DLTD Antioxidant

Dilauryl thiodipropionate

m.w. 515 CAS 123-28-4

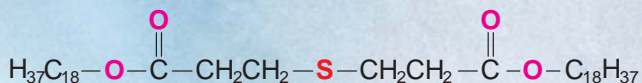
Typical Properties

Physical form/Product #	Powder (PW)/37935
Melting point, °C	38 - 41
Ash, %, max.	0.05
Volatile loss, %, max.	0.50
Color, molten, APHA, max.	60
Acid value, mgKOH/g, max.	0.50
Assay, %, min.	99.0

Performance Properties: This secondary thioester antioxidant decomposes and neutralizes hydroperoxides formed by the auto-oxidation of polymers. It is an excellent antioxidant for thermoplastics, elastomers, synthetic fiber, fat and oils, and petroleum products. It is also an efficient stabilizer for polyolefins, particularly PP and HDPE. **SONGNOX® DLTD** is usable as a synergist in combination with phenolic antioxidants to improve aged physical properties and to improve light stability.

SONGNOX® DSTDP Antioxidant

Distearyl thiodipropionate
m.w. 683 CAS 693-36-7

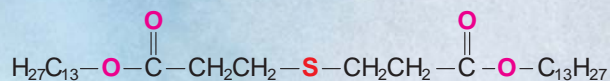
**Typical Properties**

Physical form/Product #	Powder (PW)/37934
Melting point, °C	63.5 - 68.5
Ash, %, max.	0.05
Volatile loss, %, max.	0.50
Color, molten, APHA, max.	50
Acid value, mgKOH/g, max.	0.10
Assay, %, min.	99.0

Performance Properties: This secondary thioester antioxidant decomposes and neutralizes hydroperoxides formed by the auto-oxidation of polymers. It is an excellent antioxidant for thermoplastics, elastomers, synthetic fiber, fat and oils, and petroleum products. It is also an efficient stabilizer for polyolefins, particularly PP and HDPE. It is usable as a synergist in combination with phenolic antioxidants to improve aged physical properties and to improve light stability.

SONGNOX® DTDP Antioxidant

Ditridecyl thiodipropionate
m.w. 543 CAS 10595-72-9

**Typical Properties**

Physical form/Product #	Liquid (LQ)/37970
Color	yellowish
Ash, %, max.	0.10
Color (APHA), max.	40
Acid value, mgKOH/g, max.	0.50

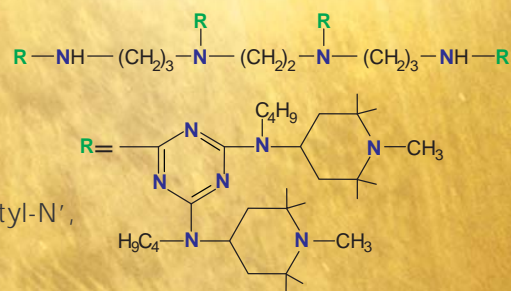
Performance Properties: This secondary thioester antioxidant decomposes and neutralizes hydroperoxides formed by the auto-oxidation of polymers. It is an antioxidant for thermoplastics and elastomers and is an efficient stabilizer for polyolefins, particularly PP and HDPE. It is used primarily in PE, PP, PA, ABS, HIPS, and polyesters. It also is usable as a synergist in combination with phenolic antioxidants to enhance aging and light stabilization.

SONGWON Light Stabilizers

Hindered Amine Light Stabilizers (HALS) are sterically-hindered amines that are extremely effective light stabilizers for most elastomers. These products do not absorb UV light but instead scavenge the free radical intermediates that are formed during photo oxidation.

SONGLIGHT® 1190 Light Stabilizer

1,3,5-Triazine-2,4,6-triamine,N,N''-[1,2-ethanediyl-bis
 [[4,6-bis-[butyl(1,2,2,6,6-pentamethyl-4-piperidiny)amino]
 -1,3,5-triazine-2-yl]imino]-3,1-propanediyl]] bis[N',N''-dibutyl-N',
 N''-bis(1,2,2,6,6-pentamethyl-4-piperidiny)]
 m.w. 2286 CAS 106990-43-6

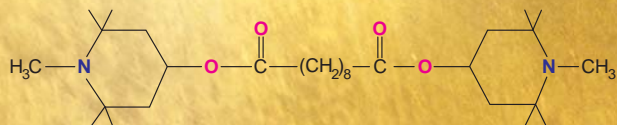
**Typical Properties**

Physical form/Product #	Low Dust (LD)/37950
Melting point, °C	115 – 150
Ash, %, max.	0.10
Color of solution at	
425nm, %, min.	95.0
500nm, %, min.	97.0
Assay, %, min.	98.0
Assay, %, min.	98.0

Performance Properties: This N-CH₃-type HALS protects polymers from degradation caused by UV radiation and long-term heat aging. Its high molecular weight makes it effective in PE and PP and, as part of stabilizer blends, with PE, filled PP, EVA, EPR, ERR, EAA, EVOH. It also is usable in EPDM, SBS, SIS, SEBS, styrenics and alpha-methyl styrenics such as ABS, AES, ASA, IPS, SAN, and SMA, and also with blends or alloys of these polymers with other polymers. It also is usable in PU, PA, flexible and rigid PVC, PVDC, PMMA cast sheet and thermoplastic resin, PET, and PA fibers.

SONGLIGHT® 2920 Light Stabilizer

Bis(1,2,2,6,6-pentamethyl-4-piperidinyloxy) sebacate
 m.w. 509 CAS 41556-26-7



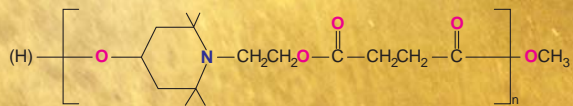
Typical Properties

Physical form/Product #	Liquid (LQ)/37919
Color	slightly yellow clear
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Specific gravity at 25°C	0.977 – 0.997
Viscosity at 25°C, cps	360 – 600
Assay, %, min.	97.0

Performance Properties: This N-CH₃-type liquid HALS protects polymers from degradation resulting from UV radiation and long-term heat aging. This product is usable in PP, PE, unsaturated polyesters, acrylics, vinyl polymers, elastomers, adhesives, sealants and coatings. The liquid form and solubility characteristics of **SONGLIGHT® 2920** make it suitable for coatings, printing ink, and PU lacquer. This product is usable in combination with **SONGSORB®** UV Absorbers and **SONGNOX®** Antioxidants to optimize performance in outdoor applications.

SONGLIGHT® 6220 Light Stabilizer

Polymer of dimethyl succinate and 4-hydroxy-2,2,6,6-tetramethyl-1-piperidine ethanol
 m.w. 3100 - 4000 CAS 65447-77-0



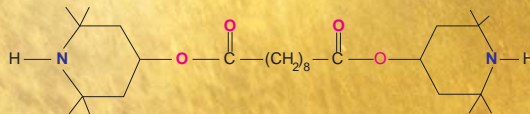
Typical Properties

Physical form/Product #	Low Dust (LD)/37920
Color	white to off-white
Softening point, °C, min.	55
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	97.0
500 nm, %, min.	98.0

Performance Properties: This N-R-type polymeric HALS protects polymers from degradation resulting from UV radiation and long-term heat aging. This product offers good compatibility in a wide range of polymers, very low volatility, and low migration, which results in cleaner surfaces, and excellent thermal stability at normal processing temperatures. It has a low melting point that makes it effective for use in PP, PE, acrylic, elastomers, and adhesives and sealants. This product demonstrates reduced interaction with co-additives such as pigments. This product should be used in combination with the **SONGSORB®** UV Absorbers and **SONGNOX®** Antioxidants products to achieve optimum performance in outdoor applications. The use of this product with sulfur-containing additives such as DSTDP can have a negative influence on its effectiveness.

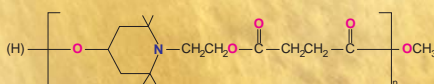
SONGLIGHT® 7700 Light Stabilizer

Bis(2,2,6,6-tetramethyl-4-piperidinyl) sebacate
 m.w. 481 CAS 52829-07-9

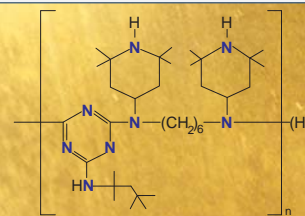
**Typical Properties**

Physical form/Product #	Powder (PW)/ 37918
Color	slightly yellow
Melting point, °C	81 – 85
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
425 nm, %, min.	95.0
500 nm, %, min.	98.0
Purity, %, min.	99.0

Performance Properties: This N-H-type HALS protects polymers from degradation resulting from UV radiation and long-term heat aging. This product is usable in PP, PE, PU, PVC, ethylene-propylene copolymer and terpolymer, ABS, PS, HIPS, and SAN. It is usable alone or in combination with higher-molecular-weight HALS for the UV stabilization of both thick- and thin-cross section articles, including tapes and films. **SONGLIGHT® 7700** is usable in combination with **SONGNOX®** Antioxidants, higher-molecular-weight HALS, and **SONGSORB®** UV Absorbers to optimize performance in outdoor applications. The use of this product with sulfur-containing additives such as DSTDP can have a negative influence on its effectiveness.

SONGLIGHT® 7830 Light Stabilizer

A blend of SONGLIGHT® 6220 and SONGLIGHT® 9440

**Typical Properties**

Physical form/Product #	Semi Bead (SB)/ 37959
Color	slightly yellow
Volatile loss, %, max.	1.0
Color of solution at	
425 nm, %, min.	85.0
500 nm, %, min.	90.0
SONGLIGHT® 6220 Content, %	47.0 - 53.0
SONGLIGHT® 9440 Content, %	53.0 - 47.0

Performance Properties: This 1:1 blend of lower-molecular-weight and higher-molecular-weight HALS optimizes both the short- and long-term protection of the polymer. It is primarily for use in polyolefin applications: PP, PE, and other polymers. It is usable in combination with **SONGNOX®** Antioxidants and **SONGSORB®** UV Absorbers to optimize performance in outdoor applications. The use of this product with sulfur-containing additives such as DSTDP can have a negative influence on its effectiveness.

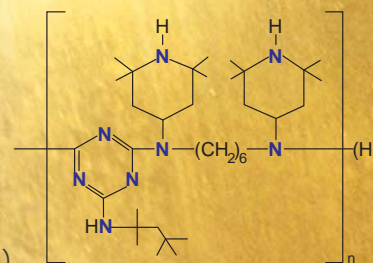
SONGLIGHT® 9440 Light Stabilizer

Poly[[6-[1,1,3,3-tetramethylbutyl)amino]-s-triazine-2,4-dinyl]

[(2,2,6,6-tetramethyl-4-piperidyl)imino] hexamethylene

[2,2,6,6,-tetramethyl-4-piperidyl imino]]

m.w. 2000 - 3100 CAS 70624-18-9 (chemically identical to 71878-19-8)



Typical Properties

Physical form/Product #	Powder (PW)/ 37963 , Semi Bead (SB)/ 37958
Color	slightly yellow
Softening point, °C	100 - 135
Ash, %, max.	0.10
Volatile loss, %, max.	1.0
Color of solution at	
425 nm, %, min.	92.0
500 nm, %, min.	95.0

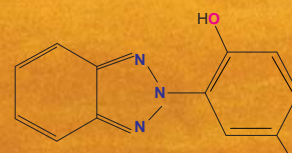
Performance Properties: This N-H-type polymeric HALS protects polymers from degradation resulting from UV radiation and long-term heat aging. This product exhibits low volatility, high thermal stability, and excellent compatibility with many substrates. It also is used in PP, LDPE, HDPE, XLPE, EVA, and PP blends with elastomers. The high molecular weight and polymeric structure of this product makes it particularly effective for use in thin-section articles such as tapes and films. It is used in combination with **SONGNOX**® Antioxidants, lower-molecular-weight HALS, and **SONGSORB**® UV Absorbers to optimize performance in outdoor applications. The use of this product with sulfur-containing additives such as DSTDP can have a negative influence on its effectiveness.

SONGWON UV Absorbers

SONGSORB® UV Absorbers are often used in combination with **SONGLIGHT Light Stabilizers** to shield the polymer from UV Light by absorbing the light energy and converting it to other forms of energy.

SONGSORB® 1000 UV Absorber

2-(2'-Hydroxy-5'-methylphenyl)benzotriazole
 m.w. 225 CAS 2440-22-4



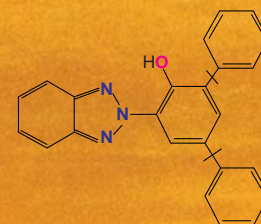
Typical Properties

Physical form/Product #	Powder (PW)/37936
Color	slightly yellow
Melting point, °C	128 – 132
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	98.0
500 nm, %, min.	99.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 290 - 400nm region. This product also has a high degree of photostability. It offers UV light protection to a wide range of polymers, and is usable in combination with **SONGNOX**® Antioxidants and **SONGLIGHT**® Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 2340 UV Absorber

2-[2-Hydroxy-3,5-di(1,1-dimethylbenzyl)phenyl]-2H-benzotriazole
 m.w. 448 CAS 70321-86-7



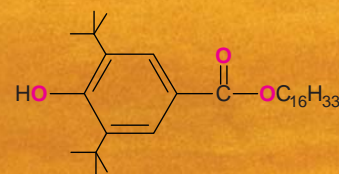
Typical Properties

Physical form/Product #	Powder (PW)/37926
Color	slightly yellow
Melting point, °C	137 – 141
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	98.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 300 - 400nm region. This product has a high degree of photostability. It is particularly suitable for applications characterized by high surface area such as films and fibers. This product has low volatility, which makes it excellent for applications involving high-temperature processing. It is usable in combination with **SONGNOX**® Antioxidants and **SONGLIGHT**® Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 2908 UV Absorber

Hexadecyl-3,5-di-t-butyl-4-hydroxybenzoate
m.w. 475 CAS 67845-93-6



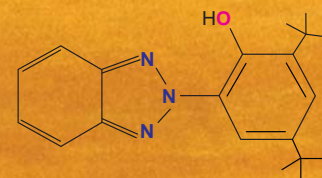
Typical Properties

Physical form/Product #	Powder (PW)/37957
Melting point, °C	55 - 65
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	99.0
Purity, %, min.	99.0

Performance Properties: This product is a substituted benzoate that absorbs UV radiation and, through a reversible chemical rearrangement, dissipates the energy as heat. It provides antioxidant activity both during thermal processing and in moderately elevated temperatures as a result of its radical-scavenging mechanism. This product exhibits excellent compatibility, low color contribution, low volatility, and low toxicity. It is an excellent UV light stabilizer for olefins, particularly pigmented opaque formulations, for applications such as pipes, drums, sheeting, marine, and garden. It is usable in combination with phenolic and phosphite antioxidants, and with **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications. The product synergizes well with UV absorbers and antioxidants that function as hydroperoxide decomposers.

SONGSORB® 3200 UV Absorber

2-(2'-Hydroxy-3',5'-di-t-butylphenyl)benzotriazole
m.w. 323 CAS 3846-71-7



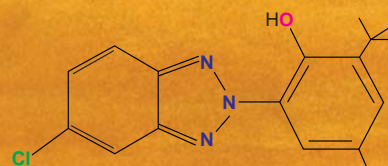
Typical Properties

Physical form/Product #	Powder (PW)/37928
Melting point, °C	152 - 155
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	98.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 300 - 400nm region. It has a high degree of photostability. It is recommended for use in styrenics, vinyls, polycarbonates, polyesters, and acrylics. This product is highly effective in stabilizing coatings such as urethanes and nitrocellulose at a usage level of 0.5 to 2.0%. It is usable in combination with **SONGNOX®** Antioxidants and **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 3260 UV Absorber

2-(2'-hydroxy-3'-t-butyl-5'-methylphenyl)-5-chloro benzotriazole
 m.w. 316 CAS 3896-11-05



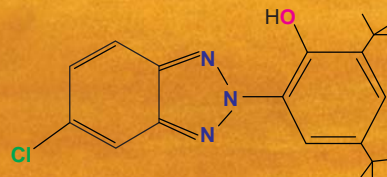
Typical Properties

Physical form/Product #	Powder (PW)/37901
Color	slightly yellow
Melting point, °C	138 – 141
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	95.0
500 nm, %, min.	97.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 300 - 400nm region. It has a high degree of photostability and offers greater absorption of longer wavelengths when compared with **SONGSORB® 1000**. This product is affected less by alkalinity and metals and has less effect on metal driers and metal catalysts because of its higher dissociation constant. It is recommended for use at levels of 0.2 - 1.0% in PP, PE, polybutylene, polyesters, and coatings. This product is usable in combination with **SONGNOX®** Antioxidants and **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 3270 UV Absorber

2-(2'-Hydroxy-3',5'-di-t-butylphenyl)-5-chlorobenzotriazole
 m.w. 358 CAS 3864-99-1



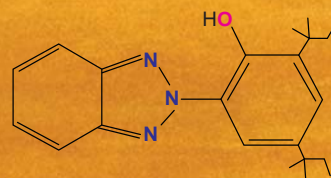
Typical Properties

Physical form/Product #	Powder (PW)/37942
Color	slightly yellow
Melting point, °C	154 – 157
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	98.0
500 nm, %, min.	99.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 290 - 400nm region. It has a high degree of photostability. This product exhibits good initial color, low volatility, excellent stability to heat and light, superior wash fastness, and resistance to gas fading. It is particularly suitable for PE, PP, PU, cold-cured polyesters, dyes, and pigments. The low pKa and high hindrance of the phenolic group result in low sensitivity to metal-containing ingredients in formulations. It is usable in combination with **SONGNOX®** Antioxidants and **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 3280 UV Absorber

2-(2'-Hydroxy-3',5'-di-t-amylphenyl)benzotriazole
 m.w. 352 CAS 25973-55-1



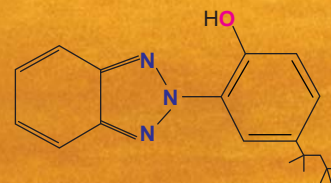
Typical Properties

Physical form/Product #	Powder (PW)/37933
Color	slightly yellow
Melting point, °C	80 – 88
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	98.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 290 - 400nm region. It also has a high degree of photostability. It features strong UV absorption, low initial color, good solubility in plasticizers and monomers, lower volatility, and excellent compatibility in a wide variety of substrates. This product is recommended for use in polyolefins, styrene copolymers, ABS, acrylic polymers, unsaturated polyesters, TPU, moisture-cured PU, polyacetals, polyvinylbutyral, and thermo-setting acrylic enamels. It is usable in combination with **SONGNOX®** Antioxidants and **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 3290 UV Absorber

2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol
 m.w. 323 CAS 3147-75-9



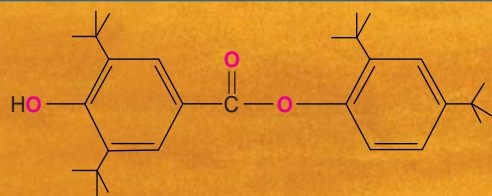
Typical Properties

Physical Form/Product #	Powder (PW)/37932
Color	slightly yellow
Melting point, °C	103 – 105
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	98.0
Purity, %, min.	99.0

Performance Properties: This product is a strong absorber of UV radiation in the 300 - 400nm region. It also has a high degree of photostability. This product protects polymers from UV radiation, helping to preserve the original appearance and physical integrity of molded articles, films, sheets, and fibers during outdoor weathering. It provides effective light stabilization and prevents yellowing and degradation of polymers such as polycarbonate, unsaturated polyesters, and acrylics. It is usable in combination with **SONGNOX®** Antioxidants and **SONGLIGHT®** Light Stabilizers to optimize performance in outdoor applications.

SONGSORB® 7120 UV Absorber

2,4-Di-tert-butylphenyl-4'-hydroxy-3',5'-di-tert-butyl benzoate
 m.w. 439 CAS 4221-80-1



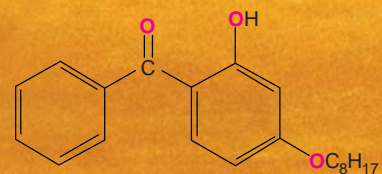
Typical Properties

Physical form/Product #	Powder (PW)/37900
Color	white
Melting point, °C	194 – 197
Ash, %, max.	0.10
Volatile loss, %, max.	0.50
Color of solution at	
460 nm, %, min.	97.0
500 nm, %, min.	99.0
Purity, %, min.	99.5
L value (color meter), min.	94.5
Color (APHA), max.	10

Performance Properties: This product is a substituted benzoate that absorbs UV radiation. It dissipates the energy as heat through a reversible chemical rearrangement. It provides better initial color than benzotriazoles, and it exhibits a synergistic effect when used in combination with HALS. It is usable in combination with **SONGNOX**® Antioxidants and **SONGLIGHT**® Light Stabilizers for thermal and light stabilization in outdoor applications. This product is recommended for usage at levels of 0.2 - 1% in PE, PP, TPO, PVC, EVA, unsaturated polyester, ABS, and AS.

SONGSORB® 8100 UV Absorber

2-Hydroxy-4-n-octoxybenzophenone
 m.w. 326 CAS 1843-05-6



Typical Properties

Physical form/Product #	Powder (PW)/37968
Melting point, °C, min	47
Ash, %, max.	0.10
Volatile loss, %, max.	0.30
Color of solution at	
460nm, %, min.	95.0
500nm, %, min.	97.0
Purity, %, min.	99.0

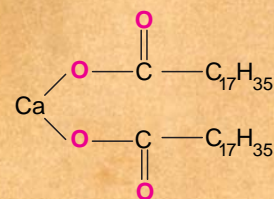
Performance Properties: This product absorbs UV radiation in the 240 - 340nm region. It exhibits a synergistic effect when used in combination with **SONGLIGHT**® Light Stabilizers, and it has excellent solubility and compatibility with high-solids coatings formulations. It is usable for PE, PP, PVC, PS, PC, PP fiber, and EVA. It provides good light stability in paints, powder coatings, PU, and elastomers. Recommended dosage is 0.1 - 0.5% based on polymer weight.

SONGWON Heat Stabilizers

Vanderbilt has a number of **SONGSTAB**[®] Heat Stabilizers stearate and phosphite compounds for the stabilization of polyolefins and PVC films and sheets.

SONGSTAB® SC-110 Heat Stabilizer

Calcium Stearate
m.w. 572 CAS 1592-23-0

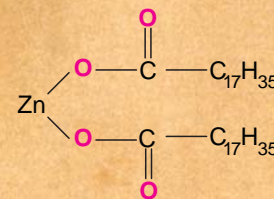
**Typical Properties**

Physical form/Product #	Powder (PW)/ 37939
Color	white
Melting point, °C	145 - 160
Impurity	trace
Moisture, %, max.	3.0
Free acid, %, max.	0.50
Calcium content, %	6.5 - 7.5

Performance Properties: This heat stabilizer is designed for use in PVC applications, including rigid sheet and pipe, as well as in flexible film and sheet. It also is a halogen-acid scavenger and lubricant for thermoplastics. It provides excellent synergistic effects when used in combination with **SONGSTAB® SZ-210** and epoxy stabilizers.

SONGSTAB® SZ-210 Heat Stabilizer

Zinc Stearate
m.w. 597 CAS 557-05-1

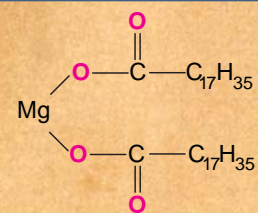
**Typical Properties**

Physical form/Product #	Powder (PW)/ 37925
Color	white
Melting point, °C	116 - 125
Moisture, %, max.	0.50
Impurity	trace
Free acid, %, max.	0.50
Zinc content, %	10.5 - 11.5

Performance Properties: This product is a halogen-acid scavenger and lubricant for thermoplastics. Recommended applications include PVC film and sheet, polyolefin stabilization, paint driers, and mold-release applications in elastomers. It provides excellent synergistic effects when used with calcium and epoxy stabilizers. It has very low moisture and free-acid content. It provides excellent lubricity for PS applications, and its particle size results in higher bulk density and lower dust.

SONGSTAB® SM-310 Heat Stabilizer

Magnesium Stearate
m.w. 552 CAS 557-04-0

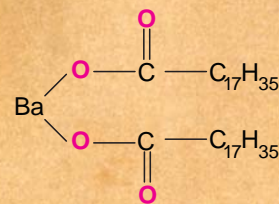
**Typical Properties**

Physical form/Product #	Powder (PW)/37941
Color	white
Melting point, °C	115 - 145
Impurity	trace
Moisture, %, max.	3.0
Free acid, %, max.	1.0
Magnesium content, %	4.2 - 5.0

Performance Properties: This heat stabilizer is intended for PVC applications, including film for food packaging, and for profile extensions. It also is usable in ABS applications and as a halogen-acid scavenger and lubricant for thermoplastics. Its particle size provides higher bulk density and lower dust. It also is non-sulfide staining and provides excellent lubricity.

SONGSTAB® SB-410 Heat Stabilizer

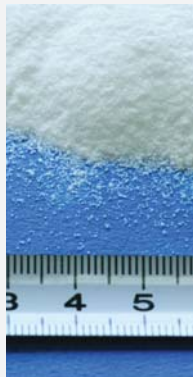
Barium Stearate
m.w. 685 CAS 6865-35-6

**Typical Properties**

Physical form/Product #	Powder (PW)/37940
Color	white
Impurity	trace
Moisture, %, max.	0.50
Free acid, %, max.	1.0
Barium content, %	19.0 - 21.0

Performance Properties: This heat stabilizer provides continuous heat stability for PVC applications, including rigid sheet and pipe, as well as for flexible transparent film and sheets. It provides excellent synergistic effects when used with Cd, Zn, and Pb stabilizers. It offers good transparency, lubricity and electrical properties, and it reduces plate-out caused by lubrication.

Songnox 1010



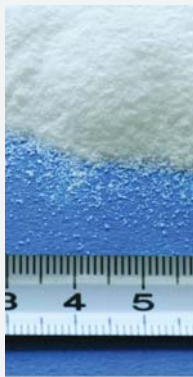
PW



FF

Slide 1

Songnox 1076



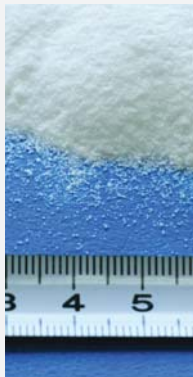
PW



FC

Slide 2

Songnox 1680



PW



FF

Slide 3



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