

# Fuel and Lubricant Antioxidants

Antioxidants improve the resistance to oxidation of transportation and industrial lubricants

Aminic and phenolic antioxidants retard oxidation in the oil by reacting with and stabilizing radicals produced in the lubricant. Phosphite and Thioester antioxidants decompose hydroperoxides.

In engine oils, antioxidants enable drain intervals to be extended. They preserve the integrity of the oil for longer periods, helping to maintain viscosity, reducing deposit and sludge formation, and guarding against the production of corrosion species, whilst protecting oil at higher temperatures.

## A comprehensive range of products that enhance the performance and prolong the life of engines and machinery

With more than 50 years' experience in stabilization, SONGWON offers an extensive portfolio of fuel and lubricant additives for automotive, industrial applications and biofuels including aminic, phenolic, phosphite and thioester antioxidants. Close cooperation with customers allows the development of solutions for today and tomorrow, and the range is constantly being expanded to meet market needs.

By improving the performance of lubricants and fuels to ensure that they last longer and help to protect engines and equipment, SONGWON antioxidants also make an important contribution to environmental sustainability.

SONGWON manufactures fuel and lubricant antioxidants at its plant in South Korea, in which it invests continuously in anticipation of new industry requirements. Backward integration of key raw materials and economies of scale help to guarantee availability and reliable supply.



# Product range selection guide

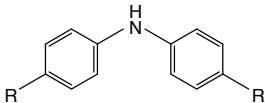
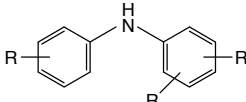
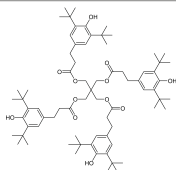
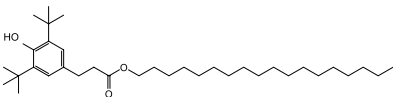
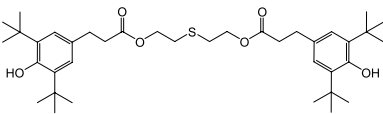
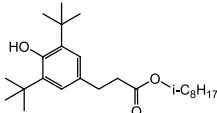
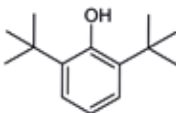
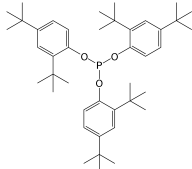
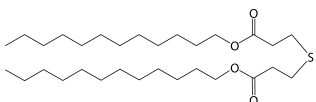
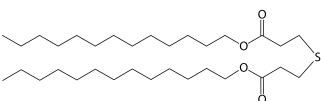
type of Antioxidants			Automotive				Industrial				Speciality & fuels		
			Gasoline engine oils	Diesel engine oils	ATF	Gear & axle oils	Compressor oils	Hydraulic oils	Metalworking fluids	Turbine oils	Greases	Synthetic base oils	Vegetable Fuels
<b>Aminic, Phenolic, Phosphite and Thioester Antioxidants</b>	Aminic	SONGNOX® L570	■	■	■	■	■	■	■	■	■	■	■
		SONGNOX® L670	■	■	■	■	■	■	■	■	■	■	■
	Phenolic	SONGNOX® L101				■			■			■	
		SONGNOX® L107	■	■				■		■		■	
		SONGNOX® L115	■	■						■		■	
		SONGNOX® L135	■	■	■	■	■		■	■	■	■	
		SONGNOX® 2,6-DTBP			■	■	■	■	■	■	■	■	■
	Phosphite	SONGNOX® L416			■	■	■	■	■	■			
	Thioester	SONGNOX® L224				■	■	■	■	■			
		SONGNOX® L226				■	■	■	■	■			

■ Recommended  
□ Suitable

		TGA in air		Solubility* (wt.%) at 20°C					
type of Antioxidants		% mass loss	°C	Group I	Group II	Group III	Group IV (PAO)	Ester	Water
<b>SONGNOX® L570</b>	Aminic	5%	233	> 10.0	> 10.0	> 10.0	> 10.0	> 10.0	< 0.01
		25%	282						
		50%	308						
<b>SONGNOX® L670</b>	Aminic	5%	250	> 10.0	> 10.0	> 10.0	> 10.0	> 10.0	< 0.01
		25%	299						
		50%	329						
<b>SONGNOX® L101</b>	Phenolic	5%	328	< 0.3	< 0.2	< 0.2	< 0.1	> 2.0	< 0.01
		25%	365						
		50%	392						
<b>SONGNOX® L107</b>		5%	297						
		25%	332						
		50%	349						
<b>SONGNOX® L115</b>	Phenolic	5%	307	< 1.0	< 1.0	< 1.0	< 1.0	> 5.0	< 0.01
		25%	341						
		50%	356						
<b>SONGNOX® L135</b>		5%	244	> 10.0	> 10.0	> 10.0	> 10.0	> 10.0	< 0.01
	Phenolic	25%	291						
		50%	315						
<b>SONGNOX® 2,6-DTBP</b>	Phenolic	5%	95	> 5.0	> 5.0	> 5.0	> 5.0	> 10.0	< 0.01
		25%	144						
		50%	167						
<b>SONGNOX® L416</b>	Phosphite	5%	234	> 1.0	< 0.8	< 0.8	< 0.8	> 1.0	< 0.01
	Phosphite	25%	269						
		50%	291						
<b>SONGNOX® L224</b>	Thioester	5%	262	> 2.0	> 2.0	> 2.0	> 2.0	> 5.0	< 0.01
		25%	292						
		50%	311						
<b>SONGNOX® L226</b>	Thioester	5%	282	> 5.0	> 5.0	> 5.0	> 5.0	> 5.0	< 0.01
		25%	327						
		50%	348						

\* Test oils are of ISO 32 viscosity grade or similar

# Aminic, Phenolic, Phosphite and Thioester Antioxidants

		Molecular Weight	Melting Range (°C)
<b>SONGNOX® L570</b> Mixture of butylated & octylated diphenylamine CAS No: 68411-46-1 LQ		butyl, octyl diphenylamine antioxidant	—
<b>SONGNOX® L670</b> Bis(nonylphenyl)amine CAS No: 36878-20-3 LQ		nonyl diphenylamine antioxidant	—
<b>SONGNOX® L101</b> Tetrakis[methylene-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate]methane CAS No: 6683-19-8 PW		1178	110.0 ~ 125.0
<b>SONGNOX® L107</b> Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate CAS No: 2082-79-3 CP		531	50.0 ~ 55.0
<b>SONGNOX® L115</b> Thiodiethylenebis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] CAS No: 41484-35-9 PW, FF		643	> 65.0
<b>SONGNOX® L135</b> Benzenepropanoic acid, 3,5-bis(1,1-dimethyl-ethyl)-4-hydroxy-, C7-9-branched alkyl esters CAS No: 125643-61-0 LQ		390	—
<b>SONGNOX® 2,6-DTBP</b> 2,6-di-tert-butylphenol CAS No: 128-39-2 SL		206	> 34.0
<b>SONGNOX® L416</b> Tris(2,4-di-tert-butylphenyl) phosphite CAS No: 31570-04-4 PW, FF		647	181.0 ~ 187.0
<b>SONGNOX® L224</b> Dilauryl thiodipropionate CAS No: 123-28-4 PW, SB, LQ		515	38.0 ~ 41.0
<b>SONGNOX® L226</b> Ditridecyl thiodipropionate CAS No: 10595-72-9 LQ		543	—

Viscosity at 40°C Kinematic (mm²/s)	Density at 20°C (g/cm³)	Element Content (%)			NSF / FDA¹	LuSc List²	REACH	Kosher	Halal
		S	P	N					
400	0.98	–	–	4.8	0.5 wt. %	Yes	Yes	Yes	Yes
600	0.95	–	–	3.5	–	Yes	Yes	–	–
Solid	Solid	–	–	–	0.5 wt. %	–	Yes	Yes	Yes
Solid	Solid	–	–	–	–	Yes	Yes	Yes	Yes
Solid	Solid	5.0	–	–	0.5 wt. %	Yes	Yes	Yes	Yes
125	0.97	–	–	–	–	Yes	Yes	Yes	Yes
Solid	Solid	–	–	–	–	–	Yes	–	–
Solid	Solid	–	4.8	–	0.5 wt. %	–	Yes	Yes	Yes
Solid	Solid	6.2	–	–	–	–	Yes	–	–
27	0.94	5.9	–	–	–	–	Yes	–	–

1. Approved by NSF / FDA for use in blending food grade lubricants with incidental food contact, at a maximum level as specified.  
2. Meet the European Ecolabel criteria for lubricants and is featured on the Lubricant Substance Classification List (LuSc-list).

# Standard Packaging

- **Antioxidants, Solids:** 20 kg PE Bag
- **Antioxidants, Liquids:** 185 kg Steel Drum  
190 kg Steel Drum  
900 kg IBC  
20 MT ISO Tank

Standard pallet size is CP1 and CP3.

## Key to Abbreviations of Physical Forms

- |                        |                               |                                 |                             |
|------------------------|-------------------------------|---------------------------------|-----------------------------|
| • <b>PW:</b> Powder    | • <b>DW:</b> Dispersion       | • <b>BD:</b> Beads              | • <b>GR:</b> Granule        |
| • <b>SB:</b> Semi Bead | • <b>MB:</b> Micro Beads      | • <b>DF:</b> Dust Free Flow     | • <b>FG:</b> Fine Grind     |
| • <b>SL:</b> Solid     | • <b>FC:</b> Fusion Crystal   | • <b>CP:</b> Crystalline Powder | • <b>VL:</b> Viscous Liquid |
| • <b>FF:</b> Free Flow | • <b>LQ:</b> Liquid or Molten | • <b>PS:</b> Pastilles          |                             |



## Transport and Storage

As a general guideline, we recommend storing the products mentioned in this brochure in their original sealed containers in a cold and dry place. For more detailed information on a specific product, please refer to the corresponding **Technical Data Sheet**.

By law, a number of chemical products must be labeled 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**.



# About SONGWON Industrial Group

SONGWON, which was founded in 1965 and is headquartered in Ulsan, South Korea, is a leader in the development, production and supply of specialty chemicals.

The second largest manufacturer of polymer stabilizers worldwide, SONGWON operates group companies all over the world, offering the combined benefits of a global framework and readily accessible local organizations.

Dedicated experts work closely together with customers to develop tailor-made solutions that meet individual requirements.

For further information, please go to:  
**[www.songwon.com](http://www.songwon.com)**





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official website



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SONGWON provides customers with warranties and representations as to the chemical or technical specifications, compositions and/or the suitability for use for any particular purpose exclusively in individual written agreements.

The facts and figures contained herein have been carefully compiled to the best of SONGWON's knowledge but are essentially intended for informational purposes only.

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