



ETHANOX[®] Antioxidants
ETHAPHOS[®] Antioxidants
ALBlend[®] Polymer Additive Blends

PRODUCT SELECTOR GUIDE

SI Group Provides a range of antioxidants and antioxidant blends for use in polymers such as polyethylene (PE) and polypropylene (PP). ETHANOX® and ETHAPHOS® antioxidants maintain performance integrity and processing stability of plastics, elastomers, adhesives and other materials. ALBlend®—our “antioxidant blends”—combine sterically hindered phenols (i.e., ETHANOX) and phosphites (ETHAPHOS), with ETHANOX antioxidants acting as free radical scavengers and ETHAPHOS antioxidants performing as hydroperoxide decomposers in the polymers. Our polymer antioxidants line includes:

- ETHANOX 310
- ETHANOX 314
- ETHANOX 330
- ETHANOX 376
- ETHAPHOS 326
- ETHAPHOS 368
- ALBlends

ETHANOX, ETHAPHOS and ALBlends form a family of antioxidants used as oxidation inhibitors for a variety of polymer products and are acceptable for use in food contact applications regulated by the U.S. Food and Drug Administration. Several of these products also have food contact clearances in the European Union, Japan and China. This means they can be used to manufacture packaging materials, plastics and coatings that come in contact with food, such as plastic trays, bags and wrappers.

A Multitude of Uses

ETHANOX and ETHAPHOS antioxidants and ALBlend additive blends are safe and effective for use in a wide variety of polymers and polymer systems, such as polyethylene (PE), polypropylene (PP), thermoplastic elastomers (TPE), engineering plastics and alloys to tackifiers. The effectiveness of the antioxidants and ALBlends allows their use in a wide range of polymer processes. They prevent polymer degradation during polymer processing, and improve polymer stability, quality and appearance. Polymers manufactured with ETHANOX, ETHAPHOS and ALBlend products are better suited to demanding and long-term end-use applications.

SI Group antioxidants play an important role in the manufacture of many polymers and resins used in sheet, injection and blow molding applications. Polymers generally go through several processing steps en route to their final form. At each stage, oxidation of the polymer can occur—leading to polymer degradation. The ETHANOX family of hindered phenolic antioxidants and ETHAPHOS family of phosphites work synergistically to protect the polymers from oxidative degradation during processing and end-use.

ETHANOX and ETHAPHOS antioxidants and ALBlend additive blends are used in the manufacture of specialized products in a wide range of industries, including food and medical packaging, automotive, mining, construction and agriculture. Combinations of ETHANOX/ETHAPHOS antioxidants are used to stabilize polypropylene resins for various applications including general-purpose injection molding, thin/thick wall containers, caps/closures, films, fibers, profile extrusion, sheet/thermoforming, automotive and durable appliances.

For example, ETHANOX 330 is an antioxidant of choice for polyolefin water pipe applications because of its resistance to hydrolysis and water extraction. Due to its non-toxicity and non-extractability features, it is also used to stabilize polypropylenes for medical/disposable packaging.

ALBlend free-flowing blends eliminate the feeding and transfer problems associated with some additive forms. They eliminate the need to pre-blend or master-batch antioxidants. This means reduced additives handling,

as well as improved stabilization during compounding and in end-use applications. The result is less downtime for clean-up, and higher equipment operating efficiency. These products are free-flowing, easy-to-handle pellets that, because of minimized dusting, help you improve workplace hygiene.

ALBlend 925P antioxidants are used in a wide range of BOPP films maintaining excellent tensile strength and packaging properties including product freshness when used in food packaging applications. ALBlend 925P was developed specifically for BOPP resins to provide exceptionally good melt flow and color stability at high processing temperatures and can help BOPP resin producers to make high quality BOPP resin with the ease of handling in pellet form. This means improved stabilization for BOPP film resins that help to maintain melt viscosity stability during film conversion/orientation/stretching, prevent web breakage, achieve a wide range processing window and higher output coupled with higher line speeds of BOPP films.

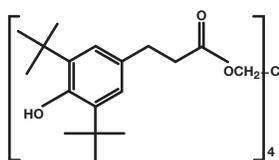
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Description and Properties: All ETHANOX, ETHAPHOS and ALBlend products are white to off-white powders, granules or pellets.

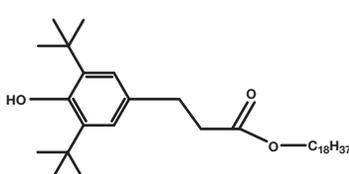
Product Name	Melting Point (°C)	ABS	PC/ABS	EVA	Nylon	Polyester	Polyether Polyols	PE	PP	PS	PU	PVC	Elastomer	PC	POM	TPU
Phenolic																
ETHANOX 310	110-125	■	■	■	■	■		■	■	■	■	■	■	■	■	■
ETHANOX 376	49-54	■	■	■			■	■	■	■		■	■	■		■
ETHANOX 314	218-220			■				■	■							
ETHANOX 330	244				■	■		■	■			■				
Phosphite																
ETHAPHOS 368	180-186	■	■	■	■	■		■	■	■	■	■	■	■	■	■
ETHAPHOS 326	170-175	■	■	■	■	■		■	■	■		■		■	■	■
ETHAPHOS 327	≥170		■	■	■	■		■	■			■		■		
Thio-ethers																
DLTDP	38-41	■					■	■	■		■	■	■			■
DSTDP	63-67	■					■	■	■		■	■	■			■
ALBlend																
ALBlend 181/182/183/184		■	■	■	■			■	■			■		■		
ALBlend 925		■	■	■		■		■	■			■		■		■

CHEMICAL STRUCTURES

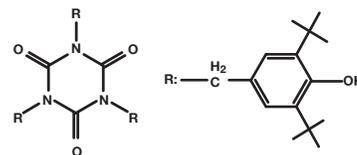
ETHANOX 310 CAS: 6683-19-8



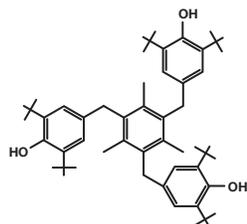
ETHANOX 376 CAS: 2082-79-3



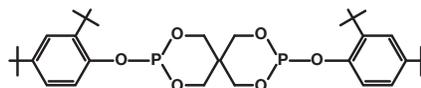
ETHANOX 314 CAS: 27676-62-6



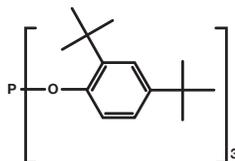
ETHANOX 330 CAS: 1709-70-2



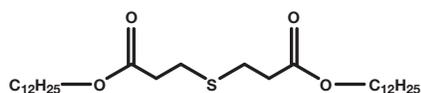
ETHAPHOS 326 CAS: 26741-53-7



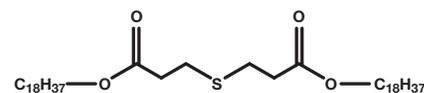
ETHAPHOS 368 CAS: 31570-04-4



DLTDP CAS: 123-28-4



DSTDP CAS: 693-36-7



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