

Anti-Oxidant Masterbatch

POOYESH POLYMER Co.

Antioxidant Masterbatch for Polymer Stabilization

Antioxidants

Polymers will change over time when exposed to radiation, excessive heat, environmental factor and/or oxidation. These changes can have a dramatic effect on the service life and properties of the polymer.

Antioxidants (or polymer stabilizers) are additives used in polymers manufacturing, such as plastics and rubbers, with the intent to inhibit or retard their degradation, by prolonging the life of a lubricant material used by increasing the oxidative resistance of the base oil.

What happens during oxidation of greasing oil?

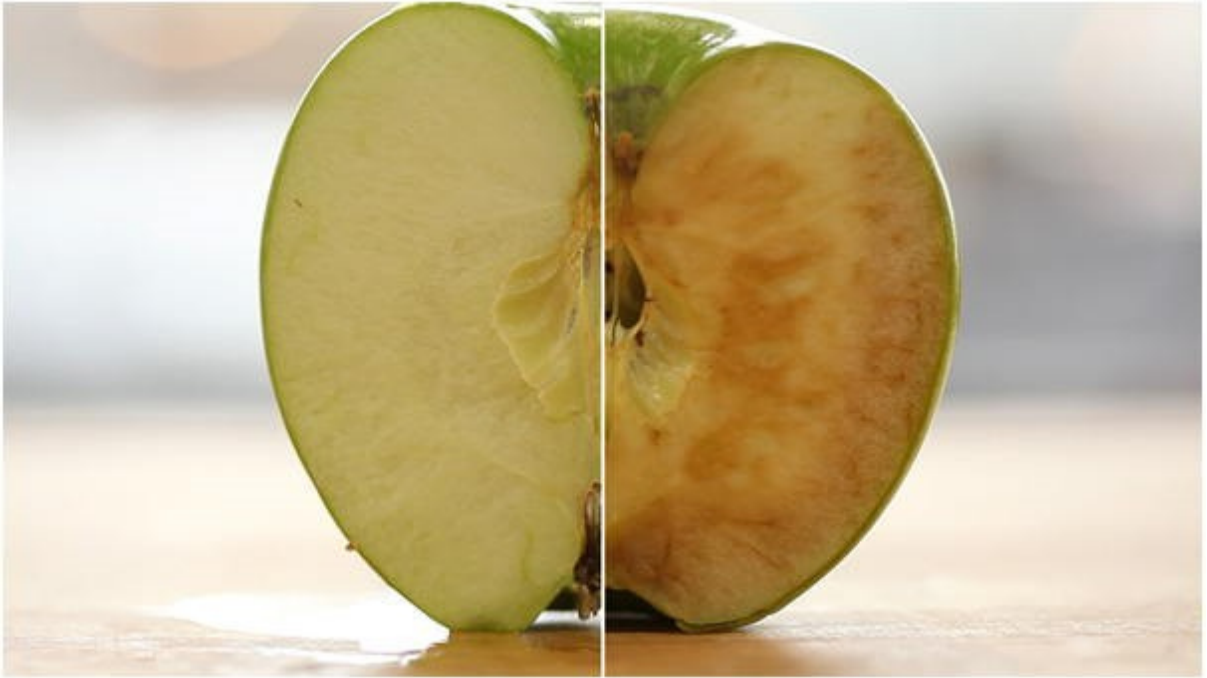
Oxidation lead to degrade the polymer at a chemical level, via chain reaction, uncontrolled recombination and cross-linking, which adversely affects many key properties such as strength, appearance and color.



Antioxidants allow that through the following mechanisms:

Enable lubricants to flow and work at higher temperatures. Usually, synthetic lubricants, especially those that are hydrocarbon-based, are susceptible to degradation by oxygen. This is initiated by the formation of reactive free radicals and peroxides and result in oil thickening and the formation of sludge and varnish in many applications.

1. Enable lubricants to flow and work at higher temperatures. Usually, synthetic lubricants, especially those that are hydrocarbon-based, are susceptible to degradation by oxygen. This is initiated by the formation of reactive free radicals and peroxides and result in oil thickening and the formation of sludge and varnish in many applications.
2. Destructive oxidation of an oil is a cyclical process involving initiation, propagation, branching and termination.
3. Antioxidants help break the cycle by slowing the degradation of the very reactive radicals.
4. Oxidation will continue to occur until the oil is no longer usable.
5. Secondary antioxidants react here with reactive peroxides that are present to break the oxidation cycle.



There are two types of antioxidants:

- Primary antioxidants: “radical scavengers” are typically comprised of aromatic amines and hindered phenolics. Secondary antioxidants react quickly with the free radicals during the propagation phase, slowing down the degradation process by forming new radicals that are more stable.
- Secondary antioxidants: “peroxide scavengers” are typically comprised of phosphites and certain sulfur-containing compounds, such as thioethers and thioesters. Secondary antioxidants react with peroxides which are often present as the lubricating oil reacts with oxygen breaking the oxidation cycle.

* Most often, grease formulators will use a combination of primary and secondary antioxidants to maximize the protection of the oil against oxidative degradation.

** Getting the right combination of antioxidants is critical to the grease’s performance in the conditions for your application.

What are the advantages of the use of antioxidants (stabilizers)?

1. With fewer defects.
2. Extend their useful lifespan.
3. Facilitate their recycling.

What characterizes antioxidants produced by POOYESH POLYMER?

The use of antioxidants in polymer processing can offer better stabilization of the polymer during processing and also prolong its useful life in the end application. POOYESH POLYMER has an extensive range of products which can be used as standalone masterbatches offering gel reductions or die lip build up control in polyethylene film extrusion or process stabilization in the case of polypropylene fiber production where careful control of the MFI is essential to ensure high-quality trouble-free production.

Antioxidant masterbatches include:

- Primary phenolic & secondary phosphate stabilizer packages.
- Products specifically designed for film and fiber producers.
- Process stabilizers to improve outputs.
- Finished product stabilizers to enhance lifetime performance.

Polymer degradation during thermal processing and weathering occurs through an autoxidative free radical chain reaction process. This involves the generation of free radicals, then propagation reactions leading to the formation of hydroperoxide, and finally termination reactions where radicals are consumed. Hydroperoxides are inherently unstable to heat, light, and metal ions, readily decomposing to yield further radicals so continuing the chain reaction.

POOYESH POLYMER CO.

Manufacturer of colored masterbatches and polymer additives

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