



Product Stewardship Summary

Butylated Hydroxy Toluene (BHT)

Introduction:

Butylated Hydroxy Toluene (BHT) is a manufactured antioxidant (preservative) commonly used in plastics, rubber, petroleum products, foods, pharmaceuticals, and cosmetics.



Effective and safe in a great variety of hydrocarbon products, BHT which was patented in 1947, is the most prevalent and approved antioxidant in the world. BHT has been approved for use in foods and food packaging in low concentrations by the Food and Drug Administration (FDA) since 1954. As an antioxidant, BHT preserves organic materials by reducing the effects of time, heat and light.

BHT is generally manufactured by reacting para-cresol and isobutylene in the presence of an acid catalyst.

Merisol BHT is used predominantly by other chemical manufacturers and industrial users that incorporate it into a multitude of products to extend the life of the materials being produced. This preservative effect benefits end consumers through longer lasting goods. The typical American uses countless products which involve BHT somewhere in their manufacture.



Chemical Identity:

Butylated Hydroxy Toluene (BHT)

2,6-di-tert-butyl-p-cresol (DBPC)

2,6-di-tert-butyl-4-methyl-phenol

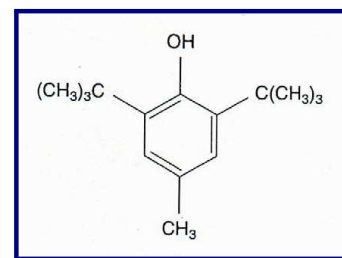
$C_6H_2(C_4H_9)_2(CH_3)OH$

$C_{15}H_{24}O$

Molecular Weight: 220.34

CAS# 128-37-0

EINECS (EU) 204-88-14





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Uses:

Some common uses of BHT include:

- **Plastics**—Comprising over 65% of the worldwide application of BHT, plastics require the BHT antioxidant to stabilize the polymer during processing and protect it throughout the service life of the finished product. It is recognized as safe and is approved for use in plastic food containers and wrappings.
- **Rubbers & Elastomers**—BHT is a non-staining, non-discoloring antioxidant and is used in conjunction with other antioxidants in white and light-colored rubber products.
- **Lubricating & Specialty Oils**—BHT is an effective stabilizer and antioxidant for synthetic oils and fluids such as cutting, spindle, hydraulic and slushing oils, transformer oils, transmission fluids, and brake fluids.
- **Industrial Fats, Oils & Fatty Acids**—BHT prevents the development of rancidity in animal and vegetable fats and oils.
- **Bio-Diesel Fuel Blends**—BHT is an effective antioxidant to prevent rancidity in bio-diesel fuel blends at concentrations of less than 0.1%.
- **Linseed, Soy, & Other Plant-Derived Oils**— BHT is used in various plant-derived oils as an antioxidant for industrial uses such as printing ink bases.



Uses (Continued):

- **Food and Feed**—Food products containing fats and oils are subject to oxidation, which results in rancidity and loss of sensory appeal. BHT is effective in animal feeds as an antioxidant and is internationally recognized as a preservative in animal feeds. BHT has proven to be an excellent antioxidant in foods. Merisol Antioxidants' food-grade BHT meets the FDA's requirements for use in foods and food packaging and the requirements of the U.S. Department of Agriculture for use in animal feeds. Merisol Antioxidants' BHT has been certified **Kosher** by the Union of Orthodox Jewish Congregations of America and has also been certified **Halal** by the Islamic Food Nutrition Council of America (IFANCA). BHT is also considered GRAS (generally recognized as safe) by the FDA .

Description and Properties:

BHT is a white solid at room temperature with a mild odor. When heated above its melting point, BHT is a clear liquid. Merisol produces BHT in the following forms:



- **Crystal BHT**—Composed of random crystalline shapes.
- **Free Flow BHT Crystal**—Composed of small spherical free-flowing shapes (pellets).
- **Molten BHT**—Liquid designed for large volume users (molten due to temperature).
- **BHT Blends**—In various oils.

BHT is slightly soluble in water and quite soluble in organic oils and solvents. BHT is not flammable but will burn. It is stable under recommended storage conditions. BHT dust is explosive.



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Safety & Health Information:

The primary dangers posed in handling BHT are dust explosion and irritation. BHT dust may form an explosive mixture in air and measures must be taken to prevent dust buildup and electrostatic charges.

BHT is slightly irritating to the eyes, mucous membranes, respiratory tract, and the skin. Liquid BHT can cause thermal burns like any hot liquid.

BHT has been tested extensively for toxicity and used widely for many years. It does not contain any ingredient designated as a known, probable, or suspected human carcinogen by IARC, NTP, ACGIH, or OSHA.

The levels of BHT that consumers are exposed to through food and contact with BHT containing products are not known to have any negative health effects.

Exposure Potential:

Because BHT is an irritant, it is regulated as a hazardous material. It is primarily used by other chemical manufacturers; therefore, chemical and transportation workers have the highest risk of exposure. Merisol does not sell BHT for direct consumer use.

Consumer exposure of BHT is low because BHT is bound directly into products such as plastic and rubber and is used at parts-per-million (ppm) levels in foods and food packaging. Consumers should always consult product labels for hazard and safe handling information.

Environmental Information:

BHT has a low acute aquatic toxicity and is only slightly soluble in water. BHT is not readily degradable in the environment and may bioaccumulate in aquatic organisms, so care must be taken to prevent it from entering surface or ground waters. BHT should be disposed of in accordance with applicable federal, state, and local regulations as a non-hazardous waste.



BHT is directly incorporated into products at low levels and does not readily leach or evaporate from preserved materials. Therefore, BHT once incorporated into products essentially has no environmental impact beyond those posed by the products themselves.



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Risk Management:

BHT can be stored, transferred, processed and disposed of safely when proper procedures and safeguards are employed in industrial use. BHT production is carried out in equipment designed to prevent exposure to workers and release to the environment. Tanks, piping, pumps, and other processing equipment are specified for handling of BHT. Secondary containment around tanks, process air combustion, dust collectors, and other means are used to further protect people and the environment.



Good housekeeping, dust collection at machinery, exhaust ventilation, proper grounding of equipment, humidification of use areas, inert gas blanketing, and fire suppression systems are also used to reduce the risk of fires and explosions.

Personal protective equipment such as chemical resistant suits, gloves, goggles, face shields, and respirators must be worn when handling or transferring BHT as dictated by the extent of potential exposure. Bags, drums, and tank trucks are inspected prior to and after loading to ensure that no product is released. Carriers are approved and their performance reviewed as part of our Responsible Care Management System. Merisol has a 24 hour contact number and also utilizes Chemtrec to provide emergency response information to transportation workers and first responders in the case of an accident en route.

Access to the production facility is restricted to employees and approved contractors and visitors.

Risk Management (Continued):

Merisol provides material safety data sheets (MSDS) for each product and practical safe handling information to our customers and carriers so that they are able to use and transport our products safely. These documents include chemical and physical properties, recommended storage conditions and personal protective equipment, fire fighting and first aid information, accidental release measures, exposure guidelines and other regulatory information. Please refer to these documents for additional details.

The image shows a Material Safety Data Sheet (MSDS) for BHT. The document is titled 'BHT Material Safety Data Sheet' and is organized into several sections. Section 1, 'PRODUCT AND COMPANY IDENTIFICATION', lists the trade name as BHT, synonyms as Butylated Hydroxytoluene; 2,6-di-tert-butyl-4-methyl phenol; 2,6-di-tert-butyl-p-cresol, and the manufacturer/supplier as Merisol Antioxidants LLC. It also provides the address (212 State Route 9, Oil City, PA, 16301), telephone numbers for Chemtrec (800) 424-9300 and Chemtrec World Wide (703) 527-3887, and other emergency numbers (814) 677-2028. Section 2, 'COMPOSITION AND INFORMATION ON INGREDIENTS', lists the component as BHT with a CAS number of 75-37-0 and a weight percentage of >=99. Section 3, 'HAZARDS IDENTIFICATION', includes an emergency overview with appearance (white solid at room temperature, colorless liquid when melted), odor (mild), and precautions (CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY IRRITATION; contact with hot product will cause thermal burns; avoid contact with skin, eyes and clothing; wash thoroughly after handling; material will burn in a fire; dust may form explosive mixture in air; take measures to prevent the build up of electrostatic charge). It also includes environmental precautions (do not flush into surface water or sanitary sewer system; low aquatic toxicity; product is slightly soluble in water; according to the results of tests of biodegradability this product is not readily biodegradable; BHT is considered to have a moderate to high bioaccumulation potential (200-2500 (fish, 96-day test)) in aquatic species). Section 4, 'POTENTIAL HEALTH EFFECTS', lists skin (slightly irritating) and eyes (contact with eyes may cause irritation). The document footer includes the version date (04/12/09) and page number (Page 1 of 8).

Regulatory Information:

BHT is classified as hazardous under OSHA due its irritant effects and is regulated under a variety of local, state, federal and international laws requiring exposure and environmental controls, as well as various means of hazard communication such as labeling and material safety data sheets.



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Product Stewardship:

Merisol is firmly committed to the safe manufacture, handling and distribution of our products. We incorporate product stewardship into our operating and business decisions. We actively communicate our product stewardship expectations to new and existing customers and distributors. Our Responsible Care Management System requires evaluation of potential customers with regard to the suitability of the proposed use and the safe handling systems in place prior to establishing a supply relationship. We conduct audits of customers, warehouses, and carriers as appropriate. We perform an annual product risk review, including all customers and shipping locations, to identify actions we can take to further minimize risk with regard to distribution and use of BHT. Progress is tracked in implementing the identified actions. Results of this review are communicated throughout the organization so that employees are aware of the specific ways in which we meet our commitment to product stewardship and how they can support the effort.

We provide material safety data sheets and safe handling information to customers and on our web site. We welcome questions and open communication with customers regarding practical handling and safety practices for our products. Our SHES (safety, health, environmental, & security), operations, maintenance and technical service personnel are ready resources for customers and others involved in using or transporting our products.

Conclusion:

BHT is an important additive for products that consumers use every day at home, in travel, and in the workplace. It has a long history of helping make our lives more comfortable, safe, productive and healthy. BHT is regulated for public safety and measures are in place for its safe manufacture, storage, distribution and use.

References:

Merisol's BHT Brochure, January 2008
Merisol Material Safety Data Sheet
OECD SIDS BHT, March 2002

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This product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the chemical's applicable Material Safety Data Sheet which should be consulted before use of the chemical. The product stewardship summary does not supplant or replace required regulatory and/or legal communication documents. Nothing contained herein is to be construed as a recommendation to use any product, process, equipment or formulation in conflict with any patent, and Merisol makes no representation or warranty, express or implied, that the use thereof will not infringe any patent.

