**ANTIBLAZE®**

**Phosphorus Flame Retardants**

**Introduction**

Albemarle Corporation provides phosphorus flame retardants in our ANTIBLAZE line of products. These flame retardant additives are critical to meeting regulatory requirements in the building and construction industry. They are a growing part of the furniture, automotive, textile, housing, and airline industries, as well. ANTIBLAZE products are added to flexible polyurethane foams, rigid polyurethane foams, spray polyurea, polyurethane coatings and elastomers that are commonly used in a variety of items such as sofa and chair padding, building insulations, and construction panels. These materials are coming under increasing regulatory and public pressure to not only become flame retarded but simultaneously are also undergoing increased scrutiny as to the chemical content and nature of the flame retardants used. Albemarle provides the following phosphorus flame retardants: ANTIBLAZE DMMP, ANTIBLAZE 78, ANTIBLAZE PR-82, ANTIBLAZE 81, ANTIBLAZE TMCP, ANTIBLAZE V490, ANTIBLAZE 140, ANTIBLAZE 180, ANTIBLAZE 190, ANTIBLAZE 195/TDCP, ANTIBLAZE RX 35, ANTIBLAZE VE 95, ANTIBLAZE WR30 LV, ANTIBLAZE BK69, ANTIBLAZE 117HF, ANTIBLAZE 230, ANTIBLAZE TL, ANTIBLAZE V6 LS, ANTIBLAZE V610, ANTIBLAZE V650, ANTIBLAZE V66, ANTIBLAZE V6, ANTIBLAZE V88, ANTIBLAZE FL-76, ANTIBLAZE WR 30-FT, ANTIBLAZE LS-500, and ANTIBLAZE VE-97.
Description and Properties

All of the ANTIBLAZE products are stable liquids. They vary in color from colorless to light yellow to amber to milky white opaque liquid. Almost all of the ANTIBLAZE products are composed of an organic component or multiple organic components attached to a phosphate or phosphonate. They may also contain a halogen. One product (LS-500) is composed of an inorganic particulate dispersed in a liquid, phosphorus-based flame retardant.

Uses

Albemarle’s ANTIBLAZE Phosphorus Flame Retardants are used in a wide variety of resin and polymer systems. They help plastic molders, blenders, and foamers meet or exceed stringent legal and regulatory requirements to protect property. Every one of our flame retardants also helps save lives. To reduce deaths and injuries caused by fires, the United States, Canada and Europe have federal motor vehicle and aviation regulations that require burn resistance for flexible polyurethane foam (FPF) and other materials used in motor vehicles and aircraft cabins. ANTIBLAZE flame retardants are used in these applications as they provide an additional level of combustion resistance with the additional benefits of meeting or exceeding environmental, health and safety objectives, maintaining physical comfort support and durability; protection from excessive discoloration during production; and sustainable economics so that end products remain commercially viable. Controlling the flammability of furniture upholstery, mattresses, and textiles is important for the protection of individuals as well as homes. Sofas that do not meet flammability standards, can ignite quickly, and in minutes, can engulf a room in flames. In addition, dark, dense smoke and toxic gases are generated by the fire. Albemarle’s ANTIBLAZE flame retardant products are recommended for use in these applications. An added benefit is that they also maintain the comfort, support and durability of finished flexible polyurethane foam (FPF) products.

Health Information

The health effects of the ANTIBLAZE flame retardants differ by product. Some are non-toxic. Others can be irritating to the eyes, skin and respiratory tract. Many are considered to be harmful if swallowed. Several of the components in the ANTIBLAZE flame retardants, according to literature data, have other health effects to areas such as the reproductive and nervous systems, gastrointestinal tract, liver, kidney, and possible carcinogenicity.

Please consult the product Material Safety Data Sheet for recommended personal protective equipment and further information.

Exposure Potential

Some of the ANTIBLAZE flame retardants contain a component that has exposure limits established by the Occupational Safety and Health Administration (OSHA) or other organizations. For those products, workplace monitoring must be conducted to ensure that workers are...
not overexposed to the component that has a limit established.

In addition to eye protection, workers should use protective gloves and protective clothing when skin contact or clothing contamination is possible. The use of a National Institute for Occupational Safety and Health (NIOSH) approved respirator is also recommended when exposure to vapors from heated product is possible.

The ANTIBLAZE products are used at a small volume of the resin and polymer systems and, therefore, it is improbable that ingestion or inhalation of the products would occur after they are formulated into foam and other end-use materials.

Please consult the product Material Safety Data Sheet for recommended personal protective equipment and further information.

Environmental Information

The ANTIBLAZE flame retardants vary in their potential environmental impact. Some do not have any toxicity to marine life and others are toxic to aquatic organisms and are considered to be marine pollutants and environmentally hazardous substances. In all cases, release to public waters, such as lakes, streams, ponds and oceans, is not expected when these products are handled properly in transportation, storage and use.

Physical Hazards

The ANTIBLAZE flame retardants are all stable materials under normal handling and storage conditions. Elevated temperatures and sources of ignition, as well as acids, bases, oxidizing and reducing agents should be avoided.

Some of the products are hygroscopic and should be stored in a manner and in areas that will avoid exposure to water or moisture.

Derivation/ Manufacturing

Albemarle manufactures the ANTIBLAZE flame retardants at several different locations such as Orangeburg, SC, Avonmouth, UK, as well as Nanjing, China.

Regulatory Information

Approximately half of the ANTIBLAZE flame retardants are not regulated for transport purposes. The remaining ANTIBLAZE products are considered to be Environmentally Hazardous Substances. Some of those are also classified as Marine Pollutants.

All of the ANTIBLAZE flame retardants that are distributed in the US are in compliance with Toxic Substances Control Act (TSCA). Some of these phosphorus flame retardants are also in compliance with other international countries’ chemical inventories.

All of the ANTIBLAZE flame retardants that are distributed in Canada are either not controlled under the Canadian Workplace Hazardous Material Information System (WHMIS) or they are required to be labeled as Class D materials in Division 2B or 2A.

The Emergency Planning and Community Right-to-Know Act (also known as SARA Title III or EPCRA) classifies most of the ANTIBLAZE flame retardants as being acute hazards and some are also classified as chronic hazards. Five ANTIBLAZE products have not been assigned any SARA 311/312 hazard category.

Three of the ANTIBLAZE phosphorus flame retardants are regulated under the Chemical Weapons Convention as a Schedule 2 chemicals. They are
ANTIBLAZE 230, ANTIBLAZE DMMP and ANTIBLAZE V490. These products are considered “dual use” materials that have legitimate commercial uses as flame retardants, but could be precursors to chemical weapons.

Under the European “REACH” regulation, Albemarle Europe SPRL, acting as the importer, has pre-registered the components of the ANTIBLAZE flame retardants that are brought into the EU. Several ANTIBLAZE flame retardants are not sold in the EU and therefore have not been pre-registered. Albemarle is deeply involved in Industry activities to ensure timely registrations with deadlines depending on volume threshold put on the market and/or substance characteristics.

**Product Stewardship**

Albemarle is committed to manage the ANTIBLAZE flame retardants so that our customers use them safely. Our relationships with our customers encourage communication about safety and environmental stewardship, and we work with them to minimize the risks of personnel exposure and spills.

Albemarle is organized and staffed with experts in toxicology, regulatory compliance, industrial hygiene, and emergency response to investigate and provide advice regarding appropriate corrective actions if such incidents occur.

**Conclusion**

The ANTIBLAZE flame retardants are important compounds added to foam used in furniture, automobiles, bedding, insulation, and other building products.

Seat cushions containing these products resist ignition from cigarettes or other sources, preventing or slowing the spread of the fire and giving people valuable time to escape. The ANTIBLAZE flame retardants help protect lives and property by reducing the risk of deaths, injuries and damage from uncontrolled fires.

**Note**

This document provides general information about ANTIBLAZE flame retardants and does not supplant or replace required regulatory and/or legal communication documents, nor is it intended to provide an in-depth discussion of health and safety information. Always consult the products’ Material Safety Data Sheets, product labels and technical data sheets before using these chemicals.