

PRODUCT STEWARDSHIP SUMMARY

GASOLINE PERFORMANCE ADDITIVES**Introduction**

Gasoline performance additives (GPA) are made up of many functional components for improving performance. Products are formulated to give each customer the performance benefits for their unique offering while covering needed performance for the ever-changing engine hardware, regulatory requirements, and fuel property changes.

Uses and Advantages

Gasoline Performance Additives are used to help marketers meet changing regulatory requirements and to provide enhanced vehicle performance. The primary types of functional components can include detergents, dispersants, solvents, carriers, demulsifiers, and corrosion inhibitors. Specifically, these additives can provide the following benefits:

- **Detergents:** Over time, incomplete fuel combustion, and the presence of certain impurities in the fuel, can lead to deposit buildup on valves, injectors, and combustion chamber areas. These deposits can result in lost power and reduced fuel economy. Detergents work to both clean up these deposits and, with continued use, keep them from coming back, restoring lost power and fuel economy.
- **Dispersants:** As an engine accumulates more mileage and use, the likelihood of unwanted particles from engine wear and fuel contaminants occurs. The added dispersant works with the detergents to keep these particulates dispersed in the fuel, specifically reducing injector deposits.
- **Carriers and Solvents:** These specifically chosen solvents and carrier systems work to keep all components soluble and maintain uniformity. There is a benefit in temperature qualities and enhancement of package performance in cold temperature regions.
- **Demulsifiers:** These are important in non-ethanol fuels and act to help drop out water that may accumulate in fueling station storage tanks.
- **Corrosion Inhibitor:** Reduce rust/corrosion to help increase longevity and proper function of the engine.
- **Physical and Chemical Properties:** The properties of Gasoline Performance Additives vary depending mostly on the amount of solvent needed for different applications. Appearance, viscosity, flashpoint, and density are important characteristics that are considered when developing formulations for safe handling in the work environment and for professional customers, all the way to the end-user customers.

Health Effects

GPA's can cause adverse health effects through skin contact or inhalation from breathing GPA mists or aerosols. Health effects vary depending on the specific components in the GPA package. These effects may include irritation of the skin, eyes, or respiratory tract as well as narcotic effects and skin sensitization. A few GPA packages can be corrosive to the eyes. Some may cause organ toxicity after prolonged exposure to high doses, with the primary effects occurring to the gastrointestinal tract, liver, thymus, and immune system in animals. However, the majority of GPA additive packages are not classified for causing organ effects after chronic exposure. Many GPA's are classified as aspiration hazards if swallowed. A small number of packages may also contain components that cause reproductive or developmental effects following exposure to high doses or for extended periods of time. Additionally, some of the constituents within the solvents are carcinogenic.

Environmental Effects

Many of the Gasoline Performance Additive packages are considered toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment. The aquatic toxicity is primarily due to the solvents used in most GPA additives. Some of Afton's GPA products can contain components that may also be persistent in the environment. However, generally, they are not expected to be PBT (Persistent, Bioaccumulative, and Toxic) or vPvB (very Persistent very Bioaccumulative). A very limited number of GPA products contain an antioxidant, 2,4,6-tri-tert-butylphenol, which is considered to be PBT, but this substance has been phased out of the majority of Afton's products.

Exposure

For industrial workers, the most common route of exposure is via skin contact during manufacturing and processing. The extent of exposure can depend on the type of manufacturing system (open or enclosed), adequacy of engineering controls, material handling practices, and use of personal protective equipment. Handling at elevated temperatures or generating vapors or mists can increase the significance of inhalation exposure.

Consumers are most commonly exposed to gasoline additives when they purchase gasoline. As such, consumers are only potentially exposed to very low (ppm) levels of the hazardous components in the GPA packages through skin contact with the treated gasoline. Afton does sell a limited number of additive packages, which are available to consumers through aftermarket sales.

Risk Management

Gasoline performance additives contain a number of hazardous components which are present at different concentrations across the product portfolio. Most of the primary hazards are associated with the solvents used, making many of the packages flammable or combustible. The health and environmental risks of these products can vary depending on the product as well as the conditions encountered during their use. Information on the safe handling of these products is provided to users through the safety data sheets. Appropriate engineering, administrative controls (work practices), and personal protective equipment are recommended to control exposures during manufacture and use, as well as to manage the risk associated with the flammability of these products.

Products intended for aftermarket consumer use are labeled in accordance with local consumer labeling requirements. Additionally, Afton limits the sale and concentration of certain components in aftermarket products to minimize risk to the consumer.

Conclusion

GPAs provide many benefits to the fuel marketer and the vehicle operator, including helping burn fuel more efficiently, which improves fuel economy and reduces emissions. Afton is committed to providing its customers with the information they need to responsibly manage any safety, health, and environmental risks associated with the intended use of Afton products.

For additional information, contact us at:

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