



## Product Stewardship Summary

### PERFORMANCE FUELS PRODUCT GROUP

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 all health and safety information. Additional information is available through the applicable Material Safety Data Sheet (MSDS) which should be consulted before use of any chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.

#### **Chemical Identity**

There are three aviation test fuels (jet fuels) and Unleaded Test Gasoline in the Performance Fuels product group. These fuels are produced from the refining of petroleum or crude oil and are complex mixtures of aliphatic hydrocarbons (linear-, branched- and cycloparaffins) and aromatic hydrocarbons. Olefins are present in the Unleaded Test Gasoline, but only at low levels in jet fuels (typically <5 percent). Jet fuels, Jet A and A-1, consist mainly of aliphatic and aromatic hydrocarbons from a middle distillate petroleum stream generically known as kerosene, with a carbon number range of C<sub>9</sub> to C<sub>16</sub> and a boiling range from 300 to 572°F (149 to 300°C). Jet Fuel RF (AMS2629 Type I) consists of a mixture of C<sub>6</sub> to C<sub>8</sub> aliphatic (branched and cycloparaffins) and aromatic hydrocarbons with a boiling point range of 180 to 280°F (82 to 139°C). Unleaded Test Gasoline is obtained from various blending streams called naphthas and has a complex mixture of aliphatic, aromatic and olefinic hydrocarbons in the carbon number range of C<sub>4</sub> to C<sub>12</sub> with a boiling point range of 93 to 399°F (34 to 204°C).

#### **Product Uses**

Performance Fuels are generally used as test fuels for emission certification and aviation applications. Products in this group are commercially available to industrial customers only for such testing, primarily including engine component manufacturers, distributors, engine designers and manufacturers, and testing, research and development facilities.

#### **Physical/Chemical Properties**

Performance Fuels are volatile to highly volatile, flammable and combustible liquids, and vapors may readily form flammable mixtures. The flash points for the aviation test fuels are: 100°F (38°C) for Jet A and A-1; and 1°F (-17°C) for Jet Fuel RF (AMS2629 Type I). The flash point for Unleaded Test Gasoline is -35°F (-37°C). These products have the potential to cause fires if they are exposed to an ignitable source. Electrostatic charge can accumulate and create a hazardous condition when handling these materials. Containers can explode under pressurized conditions. Due to their inherent explosive characteristics, there are specific requirements for handling, storage, transportation, labeling and disposal. However, it should be noted that these products are typically stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

#### **Health Information**

Performance Fuels have low acute toxicity. Exposures to vapors or aerosols can be irritating to the eyes and respiratory tract. At high concentrations, vapors and aerosols can also cause central nervous system depression with symptoms such as headaches, dizziness and drowsiness. When there is repeated or prolonged skin contact, these products can cause skin irritation and the use of

chemical resistant gloves is recommended in these situations. The Performance Fuels are not dermal sensitizers.

If accidentally ingested, a small amount of liquid may be aspirated into the lungs which can occur from either swallowing or from vomiting. Aspiration of liquid into the lungs may cause inflammation of the lungs and lung edema. This is a medical emergency and requires immediate and proper treatment.

Kerosene has been shown to be a dermal carcinogen to laboratory animals. The carcinogenic effects of kerosene are due to a mechanism involving repeated skin irritation or damage and regenerative hyperplasia, a situation that is unlikely to be tolerated by humans. Jet fuels and kerosene are not mutagens. No reproductive or developmental effects were seen in laboratory animals exposed to either Jet A or kerosene vapors.

Unleaded gasoline has been shown to be a carcinogen to laboratory animals. Chronic (lifetime) vapor exposures resulted in kidney tumors in male rats and liver tumors in female mice. The male rat kidney tumors occur from a mechanism that is specific to male rats and are not considered relevant to humans. The liver tumors in female mice occurred at a very high vapor concentration. Unleaded gasoline is not a mutagen. No reproductive or developmental effects were seen in laboratory animals exposed to unleaded gasoline vapors.

Some of the jet fuels and the unleaded gasoline contain toluene. Repeated and prolonged inhalation exposures (>1,000 ppm) of pregnant animals have been shown to cause adverse fetal developmental effects. Repeated and prolonged inhalation exposures of toluene can also cause neuropsychological effects, auditory dysfunction and effects on color vision.

Unleaded gasoline contains benzene. Benzene is a human carcinogen. Repeated and prolonged exposure to benzene may cause damage to the blood-forming organs, which can lead to anemia and acute myeloid leukemia (AML).

Unleaded gasoline and some of the jet fuels contain naphthalene. Exposure to high concentrations of naphthalene may cause hemolytic anemia (from destruction of red blood cells) and cataracts. Naphthalene has been shown to be a carcinogen in laboratory animal studies. The relevance of these findings to humans is uncertain.

Unleaded gasoline contains ethylbenzene. Repeated exposures to ethylbenzene have been shown to cause ototoxicity in animal studies. Ethylbenzene has also been shown to be a carcinogen in laboratory animal studies, but the relevance of these findings to humans is uncertain.

### **Environmental Information**

The environmental hazard potential for the Performance Fuels is expected to be varied because their toxicity and fate will depend on the individual components in the product. If accidentally spilled into the environment, these fuels have low solubility in water and are expected to rapidly degrade in air through atmospheric processes. These fuels are also biodegraded to varying degrees but not expected to persist in the environment. Some products however may cause significant harm to aquatic organisms but have a low to moderate potential to bioaccumulate. Due to their potential to cause significant harm to aquatic environments, care should be taken to avoid releases of these products to sewage drainage systems and water bodies. Spillage should be quickly collected and properly disposed of to minimize harm to the environment.

## **Exposure Potential**

The most likely routes of possible exposure to Performance Fuels products are by inhalation and skin contact. The best way to prevent exposure is to work in well-ventilated areas, wear chemical resistant gloves and follow good personal hygiene practices.

### *Workplace use:*

The potentially exposed populations include: (1) workers who manufacture and/or blend these products, or further formulate them with additives to meet technical specifications; (2) quality assurance workers who sample and analyze the products to ensure that they meet specifications; (3) workers involved in distribution and storage of these products; and (4) commercial consumers, in occupational settings, that use these products in intended applications. The most likely routes of exposure to Performance Fuels in a workplace setting are inhalation exposure and skin contact. The probability of exposure to personnel is expected to be low because Performance Fuels are sold to experienced industrial customers that are familiar with their intended applications, safe handling, storage and disposal requirements. Manufacturing, quality assurance, and transportation workers should wear appropriate personal protective equipment (PPE), and should also have access to engineering controls to prevent exposure. Customers should use appropriate PPE during handling and use. In addition, customer facilities typically have risk mitigation measures in place to address potential physical hazards or accidental releases.

### *Consumer use:*

Potential exposure to the general public is not anticipated to be likely for these products as they are not sold to the general population. If a large scale spill or fire occurred near a residential setting, odor complaints and/or inhalation exposures to the general population are possible.

### *Potential Environmental Release:*

There may be some potential for exposure to the environment from accidental releases of Performance Fuels during transportation of large quantities over long distances via trailers and railcars; however, the frequency of distribution incidents involving accidental releases of these products has been low, and reported product volumes spilled have been minimal. Chevron Phillips Chemical is committed to operating in an environmentally responsible manner and has adopted the American Chemistry Council's Responsible Care<sup>®</sup> initiative.

## **Risk Management**

Chevron Phillips Chemical is committed to Product Stewardship and doing business responsibly. We endeavor to provide sufficient information for the safe use and handling of all our products. We begin by ensuring that all of our customers, distributors, carriers and users of the products in the Performance Fuels Product Group are well informed about the properties of each product. To that end, a Material Safety Data Sheet and a certificate of analysis accompany each shipment from our manufacturing plant.

## **Regulatory Information**

Regulations exist that govern the manufacture, sale, transportation, use and disposal of Performance Fuels. These regulations may vary by city, state, country or geographic region. Additional relevant information may be found by consulting the applicable product Material Safety Data Sheet.

### **Sources of Additional Information**

Material Safety Data Sheets (MSDS) at <http://www.cpchem.com> for the following products:

- Jet A Aviation Fuel
- Jet A-1 Aviation Fuel
- Jet RF AMS 2629 Type I
- UTG 96 (unleaded test gasoline)

Organization for Economic Cooperation and Development (OECD): eChemPortal web-based search tool

- <http://www.echemportal.org>

European Chemical Agency (ECHA) Dissemination portal with information on chemical substances registered under REACH

- <http://apps.echa.europa.eu/registered/registered-sub.aspx>

U.S. Environmental Protection Agency: High Production Volume Information System (HPVIS)

- <http://www.epa.gov/chemrtk/hpvis/index.html>

### **Conclusion**

Performance Fuels contain components that are classified as hazardous chemicals. Efforts should be taken to minimize exposure to these products by adhering to safe handling procedures, designated applications and uses, appropriate personal-protective equipment practices, and labeling, storage, and transportation procedures and requirements. The relevant product Material Safety Data Sheet and applicable regulatory guidelines and requirements, including but not limited to Occupational Health and Safety Administration (OSHA) guidelines, should be consulted prior to the use or handling of these products.

### **Contact Information:**

<http://www.cpchem.com/>

December 17, 2012