



## Product Stewardship Summary

### REFERENCE 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 27 products in the Reference Fuels product group. Gas Oil (CAS No. 68783-08-4) is one of the products in the Reference Fuels. It is produced by atmospheric distillation of crude oil and it consists of hydrocarbons having carbon numbers predominantly in the range of C<sub>7</sub> through C<sub>35</sub> and boiling in the range of approximately 239°F to 887°F (115°C to 475°C).

The other Reference Fuels are also produced from petroleum or crude oil and consists of either a single or blend of aliphatic and/or aromatic hydrocarbons. The aliphatic hydrocarbons (linear, branched, or cyclic) range in carbon number from C<sub>6</sub> to C<sub>8</sub>; the aromatic hydrocarbons have carbon numbers of C<sub>7</sub> or C<sub>8</sub>. Tetraethyllead is a constituent in one of the Reference Fuels.

#### **Product Uses**

Reference Fuels products are used to establish the quality or performance characteristics of various fuels used in commercial and industrial applications, as well as destructive testing needs. Reference fuels are not used as fuels in transportation vehicles. The product line includes reference fuels for: gasoline octane analysis; establishing Avgas quality; flashpoint testing; and destructive testing of components or finished products made from polymers, elastomers and some metals.

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

The Reference Fuels (excluding Gas Oil) are highly volatile, flammable, combustible liquids and the vapors from these liquids may readily form flammable mixtures. The flash point for these products range from -4°F (-20°C) to 87°F (27°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.

The Gas Oil product is a flammable and combustible yellow-brown liquid and vapors may readily form flammable mixtures. The flash point for this Gas Oil is 122°F (50°C). Like Reference Fuels, Gas Oil has the potential to cause fires if exposed to an ignitable source and electrostatic charge can accumulate and create a hazardous condition when handling.

## **Health Information**

### *Gas Oil Reference Fuel*

The Gas Oil Reference Fuel is not acutely toxic and not irritating to the eyes, but moderately irritating the skin. High vapor or aerosols may cause central nervous system depression with symptoms such as headaches, dizziness and drowsiness. Gas Oil is not a dermal sensitizer. Repeated dose dermal studies showed toxic effects in the blood, liver, bone marrow and thymus. No reproductive effects were observed in laboratory animals, but developmental effects (decreased litter sizes and liveborns, fetal or pup weights, malformations or increased resorptions) were observed in the presence of maternal toxicity. Gas Oil can contain polycyclic aromatic compounds (PACs), which cause mutations *in vitro* and are carcinogenic in animal studies.

### *C<sub>6</sub> to C<sub>8</sub> Aliphatic/Aromatic Reference Fuels*

These Reference 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 may 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. Reference Fuels are not dermal sensitizers; nor are they considered to have mutagenic or carcinogenic properties.

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.

Reference Fuels may 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 of toluene exposures can also cause neuropsychological effects, auditory dysfunction and effects on color vision.

Tetraethyllead is a constituent in one of the Reference Fuels. Tetraethyllead is acutely toxic by the oral, dermal and inhalation routes of exposure and can affect the central nervous system. Tetraethyllead is also highly absorbed via the skin. Repeated and prolonged inhalation exposures to tetraethyllead cause adverse developmental effects to the fetus and to children.

One of the Reference Fuel products, Paraxylene Flash Point Check Fuel, may contain ethylbenzene. Ethylbenzene has been shown to be a carcinogen in laboratory animal studies. The relevance of these findings to humans is uncertain. In addition, repeated exposures to ethylbenzene have been shown to cause ototoxicity in animal studies.

## **Environmental Information**

The environmental hazard potential for Reference Fuels is expected to be varied because their toxicity and fate will depend on the individual components in the mixture. If accidentally spilled into the environment, these fuels are expected to have low solubility in water and to degrade in the air through atmospheric processes depending on the individual constituents. Reference Fuels also biodegrade to varying degrees, but are not expected to persist in the environment. Due to their potential to cause significant harm to aquatic organisms and bioaccumulate, care should be taken to avoid release 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 the Reference Fuels 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 the Reference Fuels in a workplace setting are inhalation exposure and skin contact. The probability of exposure to personnel is expected to be low because the Reference 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 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 the Reference 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 Reference 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 Reference 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:

- D-2887 Gas Oil Reference Standard
- PRF Octane No. Blends (80, 82, 84, 86, 88, 90, 92, 94, 96, 98)
- PRF Isooctane
- PRF Isooctane + TEL
- n-Heptane Primary Reference Fuel (PRF)
- Toluene Reference, Fuel Grade
- Hydrocarbon Fluid Type I
- Hydrocarbon Fluid Type III
- Hydrocarbon Fluid Type VII
- Reference Fuel A
- Reference Fuel B
- Toluene Standard Fuel (65.1, 75.6, 94.8, 98.3, 102.5)
- Flash Point Check Fuel Para-Xylene
- D-5191 Vapor Pressure Reference Fuel n-Pentane Pure

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>

ATSDR Toxicological Profile for Lead

- <http://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=96&tid=22>

## **Conclusion**

Reference 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/>

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