



FMPNo: 1008  
per ASTM D 910, latest  
version

Marketing Specification

Aviation Gasoline, 100LL

Marketing specification  
All Terminals

<b>Property</b>	<b>TestName</b>	<b>Units</b>	<b>Min</b>	<b>Max</b>	<b>Specific</b>	<b>Note#</b>
Additives - AO	Antioxidants	mg/gal		45.4		
Additives - Conductivity	Conductivity Improver					842
Additives - Dye	Blue Dye	mg/gal		10.2		805
Additives - General Note	General Note					878
API Gravity (60 Deg F)	D 4052 Density & Rel Dens	API	Report			
Appearance	D 4176 Wtr & Part Cont, Proc 1		Pass			841
Color, Visual	D 2392 Color of Dyed Av Gas		Blue			
Copper Strip Corrosion	D 130 Cu Str 2 Hr @ 212 F	Rating		1b		
Dist 10 Vol% Evap	D 86 Dist at Atm Press	Deg F		167		
Dist 10%+50% Evap	D 86 Dist at Atm Press	Deg F	275			
Dist 40 Vol% Evap	D 86 Dist at Atm Press	Deg F	167			
Dist 50 Vol% Evap	D 86 Dist at Atm Press	Deg F		221		
Dist 90 Vol% Evap	D 86 Dist at Atm Press	Deg F		275		
Dist End Pt, corr	D 86 Dist at Atm Press	Deg F		338		
Dist IBP, corr	D 86 Dist at Atm Press	Deg F	Report			
Dist Loss, corr	D 86 Dist at Atm Press	Vol%		1.5		
Dist Recov, corr	D 86 Dist at Atm Press	Vol%	97			
Dist Residue	D 86 Dist at Atm Press	Vol%		1.5		
Freeze Pt	D 2386 Freeze Pt by manual	Deg C		-58		808
Lead (Pb)	D 5059 Lead by X-ray Spec	gPb/gal		2.12		
Lead as TEL eq	D 5059 Lead by X-ray Spec	ml TEL/gal		2.00		
Net Heat of Combustion	D 3338 Net Heat of Comb	BTU/lb	18,720			835
Octane, Lean Number	D 2700 Knock Charac by Motor		99.5			
Octane, Performance No.	D 909 Knock by Supercharge		130.0			809
Ox Stab, Lead Precip	D 873 Ox Stab, 5 hrs aging	mg/100ml		3		851
Ox Stab, Potential Gum	D 873 Ox Stab, 5 hrs aging	mg/100ml		6		851
Sulfur	D 2622 S by X-ray Fluo Spec	Wt%		0.05		
Vapor Pressure (ASTM)	D 5191 VP Grabner (ASTM eq)	psi	5.5	7.1		
Water Rxn Vol Change	D 1094 Water Rxn by manual	ml		+ or - 2		
Other - See Note	Referee Methods					826
Other - See Note	Test Tolerances					855

# ConocoPhillips

## Marketing Specification

Aviation Gasoline, 100LL

Marketing specification  
All Terminals

### **NoteNo** **Note**

- 805 The maximum dye concentrations shown do not include solvent in dyes supplied in liquid form. (ASTM D 910 Table 1 Note E)
- 808 If no crystals have appeared on cooling to -58°C, the freezing point may be reported as less than -58°C. (ASTM D 910 Table 1 Note G)
- 809 A performance number of 130.0 is equivalent to a knock value determined using iso-octane plus 0.34 mL TEL/L. (ASTM D 910 Table 1 Note C)
- 826 Referee Methods for Aviation Gasoline, 100LL, are as follows:  
Net Heat of Combustion, ASTM D 4809; Reid Vapor Pressure, ASTM D 5191; Sulfur, ASTM D 1266 (source ASTM D 910, Table 1)
- 835 For all grades use either Eq 1 or Table 1 in Test Method D 4529 or Eq 2 in Test Method D 3338. Test Method D 4809 may be used as an alternative. In case of dispute, Test Method D 4809 shall be used. (ASTM D 910 Table 1 Note H)
- 841 The aviation gasoline herein specified shall be free from undissolved water, sediment, and suspended matter. The odor of the fuel shall not be nauseating or irritating. No substances of known dangerous toxicity under usual conditions of handling and use shall be present except as permitted in the ASTM specification. (ASTM D 910 Section 8.1)
- 842 A conductivity limit applies only when an electrical conductivity additive is used; when a customer specifies fuel containing conductivity additive, the following conductivity limits shall apply under the condition at point of use: Minimum 50 pS/m; Maximum 450 pS/m. The supplier shall report the amount of additive added. (ASTM D 910 Table 1 Note K)
- 851 If mutually agreed upon between the purchaser and the supplier, a 16 h aging gum requirement may be specified instead of the 5 h aging gum test; in such case the gum content shall not exceed 10 mg/100 mL and the visible lead precipitate shall not exceed 4 mg/100 mL. In such fuel the permissible antioxidant shall not exceed 24 mg/L. (ASTM D 910 Table 1 Note I)
- Test Method D 381 existent gum test can provide a means of detecting quality deterioration or contamination, or both, with heavier products following distribution from refinery to airport. Refer to X1.7.1. of the specification. (ASTM D 910 Table 1 Note J)
- 855 Test results shall not exceed the maximum or be less than the minimum values specified in (the Table). No allowance shall be made for the precision of the test methods. To determine the conformance to the specification requirement, a test result may be rounded to the same number of significant figures as in (the Table) using Practice E 29. Where multiple determinations are made, the average result, rounded according to Practice E 29, shall be used. (ASTM D 910 Table 1 Note A & Section 7.2)
- 878 Only those additives in the amount and of the composition specified in Section 6 of the current edition of ASTM D 910 are allowed. The quantities and types shall be declared by the manufacturer.

## Material Safety Data Sheet

### 1. Product and Company Identification

**Product Name:** Aviation Gasoline, 100 LL

**MSDS Number:** 001769

**Synonyms:** 100 Low Lead Gasoline  
100 Octane Aviation  
ASTM 100/130 Aviation Gasoline  
Avgas  
Avgas 100

**Intended Use:** Fuel

**Manufacturer/Supplier:** ConocoPhillips  
600 N. Dairy Ashford  
Houston, Texas 77079-1175

**Emergency Health and Safety Number:** Chemtrec: 800-424-9300 (24 Hours)

**Customer Service:** 800-640-1956

**Technical Information:** 800-255-9556

**MSDS Information:** Phone: 800-762-0942  
Email: [MSDS@conocophillips.com](mailto:MSDS@conocophillips.com)  
Internet: <http://w3.conocophillips.com/NetMSDS/>

### 2. Hazards Identification

#### Emergency Overview

#### NFPA

#### **DANGER!**

Extremely Flammable Liquid and Vapor  
Skin Irritant  
Aspiration Hazard  
Possible Cancer Hazard



**Appearance:** Blue  
**Physical Form:** Liquid  
**Odor:** Gasoline

#### Potential Health Effects

**Eye:** Contact may cause mild eye irritation including stinging, watering, and redness.

**Skin:** Skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact can defat the skin, causing drying and cracking of the skin, and possibly dermatitis (inflammation). No harmful effects from skin absorption have been reported.

**Inhalation (Breathing):** Not expected to be toxic

**Ingestion (Swallowing):** No harmful effects reported from ingestion. ASPIRATION HAZARD - This material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

**Signs and Symptoms:** Effects of overexposure can include slight irritation of the respiratory tract, nausea, vomiting, and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue). Continued exposure to high concentrations can result in vomiting, cardiac irregularities and sudden loss of consciousness.

**Pre-Existing Medical Conditions:** Conditions which may be aggravated by exposure include skin disorders and respiratory (asthma-like) disorders. Exposure to high concentrations of this material may increase the sensitivity of the heart to certain drugs. Persons with pre-existing heart disorders may be more susceptible to this effect (see Section 4 - Note to Physicians).

See Section 11 for additional Toxicity Information.

### 3. Composition / Information on Ingredients

Component	CASRN	Concentration*
Gasoline	NONE	>99.8
Toluene	108-88-3	1-10
Benzene	71-43-2	<0.5
Tetraethyl Lead	78-00-2	0.13

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

### 4. First Aid Measures

**Eye Contact:** If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

**Skin Contact:** Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse.

**Inhalation (Breathing):** First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

**Ingestion (Swallowing):** Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

**Notes to Physician:** Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene above the action level or PEL (specified in Section (i)(1)(i) of the Standard). In addition, employees exposed in an emergency situation shall, as described in Section (i)(4)(i), provide a urine sample at the end of the shift for measurement of urine phenol.

Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations of hydrocarbon solvents (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

### 5. Fire-Fighting Measures

#### NFPA 704 Hazard Class

**Health:** 1    **Flammability:** 3    **Instability:** 0            (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**Unusual Fire & Explosion Hazards:** Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

**Extinguishing Media:** Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

**Fire Fighting Instructions:** For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

**Hazardous Combustion Products:** Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

## 6. Accidental Release Measures

**Personal Precautions:** Extremely flammable. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons and shipping down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

**Environmental Precautions:** Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

**Methods for Containment and Clean-Up:** Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents).

## 7. Handling and Storage

**Precautions for safe handling:** Wear protective gloves. Wash thoroughly after handling. Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Use good personal hygiene practices and wear appropriate personal protective equipment.

Open container slowly to relieve any pressure. Bond and ground all equipment when transferring from one vessel to another. Can accumulate static charge by flow or agitation. Can be ignited by static discharge. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

**Conditions for safe storage:** Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Portable Containers: Static electricity may ignite gasoline vapors when filling portable containers. To avoid static buildup do not use a nozzle lock open device. Use only approved containers for the storage of gasoline. Place the container on the ground before filling. Keep the nozzle in contact with the container during filling. Do not fill any portable container in or on a vehicle or marine craft. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

## 8. Exposure Controls / Personal Protection

Component	US-ACGIH	OSHA	Other
Gasoline	TWA: 300 ppm TWA: 890 mg/m <sup>3</sup> STEL: 500 ppm STEL: 1480 mg/m <sup>3</sup>	---	---
Toluene	TWA: 20 ppm	Ceiling: 300 ppm TWA: 200 ppm	---
Benzene	STEL: 2.5 ppm Skin TWA: 0.5 ppm	Ceiling: 25 ppm STEL: 5 ppm TWA: 1 ppm TWA: 10 ppm	---
Tetraethyl Lead	Skin TWA: 0.1 mg/m <sup>3</sup>	Skin TWA: 0.075 mg/m <sup>3</sup>	---

**Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.**

**Engineering controls:** If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

**Eye/Face Protection:** The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

**Skin/Hand Protection:** The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

**Respiratory Protection:** Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

If benzene concentrations equal or exceed applicable exposure limits, OSHA requirements for personal protective equipment, exposure monitoring, and training may apply (29CFR1910.1028 - Benzene).

**Other Protective Equipment:** Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

**Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.**

## 9. Physical and Chemical Properties

## 9. Physical and Chemical Properties

**Note:** Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

<b>Appearance:</b>	Blue
<b>Physical Form:</b>	Liquid
<b>Odor:</b>	Gasoline
<b>Odor Threshold:</b>	No data
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	5.5-7.0 psia (Reid VP) @ 100°F / 38°C
<b>Vapor Density (air=1):</b>	>1
<b>Boiling Point/Range:</b>	75-338°F / 24-170°C
<b>Melting/Freezing Point:</b>	<-72°F / <-58°C
<b>Solubility in Water:</b>	No data
<b>Partition Coefficient (n-octanol/water) (Kow):</b>	No data
<b>Specific Gravity:</b>	0.68-0.74 @ 60°F (15.6°C)
<b>Bulk Density:</b>	5.83 lbs/gal
<b>Percent Volatile:</b>	100%
<b>Evaporation Rate (nBuAc=1):</b>	>1
<b>Flash Point:</b>	<-35°F / <-37°C
<b>Test Method:</b>	(estimate)
<b>LEL (vol % in air):</b>	1.5
<b>UEL (vol % in air):</b>	7.6
<b>Autoignition Temperature:</b>	824°F / 440°C

## 10. Stability and Reactivity

**Stability:** Stable under normal ambient and anticipated conditions of use.

**Conditions to Avoid:** Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

**Materials to Avoid (Incompatible Materials):** Avoid contact with strong oxidizing agents and strong reducing agents.

**Hazardous Decomposition Products:** Not anticipated under normal conditions of use.

**Hazardous Polymerization:** Not known to occur.

## 11. Toxicological Information

### Chronic Toxicity:

#### Gasoline

**Carcinogenicity:** Two year inhalation studies of wholly vaporized unleaded gasoline produced increased incidences of kidney tumors in male rats and liver tumors in female mice. Follow-up studies suggest that occurrence of the kidney tumors may be linked to alpha-2-u-globulin nephropathy, and most likely unique to the male rat. Epidemiology data collected from a study of more than 18,000 petroleum marketing and distribution workers showed no increased risk of leukemia, multiple myeloma, or kidney cancer from gasoline exposure. Nevertheless, unleaded gasoline has been identified as a possible carcinogen by IARC. IARC has also categorized gasoline engine exhaust as a possible human cancer hazard because solvent extracts of the exhaust (soot) caused skin cancer in laboratory animals.

**Target Organs:** Two year inhalation studies of wholly vaporized unleaded gasoline, as well as vapors of gasoline, did not produce significant target organ toxicity in laboratory animals. Nephropathy in male rats, characterized by the accumulation of alpha-2-u-globulin in epithelial cells of the proximal tubules was observed, however follow-up studies suggest that these changes are unique to the male rat.

**Reproductive Toxicity:** No evidence of developmental toxicity was found in pregnant laboratory animals (rats and mice) exposed to up to 9,000 ppm vapor of unleaded gasoline via inhalation. Vapor recovery gasoline was evaluated in a two generation reproductive toxicity study at concentrations up to 7400 ppm. No reproductive parameters were adversely affected and no deleterious effects on offspring survival or growth were observed.

**Mutagenicity:** Gasoline was negative in microbial mutagenicity and unscheduled DNA tests in rat hepatocytes. Gasoline did not induce chromosome aberrations in vivo in rat bone marrow cells and was negative in a mouse dominant lethal assay.

#### Xylenes

**Target Organs:** Rats exposed to 800, 1000 or 1200 ppm 14 hours daily for 6 weeks demonstrated high frequency hearing loss. Another study in rats exposed to 1800 ppm 8 hours daily for 5 days demonstrated middle frequency hearing loss.

**Reproductive Toxicity:** Both mixed xylenes and the individual isomers produced limited evidence of developmental toxicity in laboratory animals. Inhalation and oral administration of xylene resulted in decreased fetal weight, increased incidences of delayed ossification, skeletal variations and resorptions, but no evidence of teratogenicity.

#### Toluene

**Carcinogenicity:** Exposure of rats and mice to toluene at concentrations ranging from 120-1200 ppm for two years did not demonstrate evidence of carcinogenicity. Toluene has not been listed as a carcinogen by IARC.

**Target Organs:** Epidemiology studies suggest that chronic occupational overexposure to toluene may damage color vision. Subchronic and chronic inhalation studies with toluene produced kidney and liver damage, hearing loss and central nervous system (brain) damage in laboratory animals. Intentional misuse by deliberate inhalation of high concentrations of toluene has been shown to cause liver, kidney, and central nervous system damage, including hearing loss and visual disturbances.

**Reproductive Toxicity:** Exposure to toluene during pregnancy has demonstrated limited evidence of developmental toxicity in laboratory animals. Decreased fetal body weight and increased skeletal variations in both inhalation and oral studies, but only at doses that were maternally toxic. No fetal toxicity was seen at doses that were not maternally toxic. Decreased sperm counts have been observed in male rats in the absence of a reduction in fertility. Toluene has been reported to cause mental or growth retardation in the children of solvent abusers who directly inhale toluene during pregnancy.

#### Ethyl Benzene

**Carcinogenicity:** Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC. Ethyl benzene has not been listed as a carcinogen by NTP, or OSHA.

#### n-Hexane

**Target Organs:** Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

**Reproductive Toxicity:** Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

#### Cyclohexane

**Reproductive Toxicity:** Two-generation reproduction and developmental toxicity studies using rats and rabbits exposed (whole-body) to atmospheric concentrations up to 7000 ppm cyclohexane did not detect evidence of developmental toxicity in either species.

#### Benzene

**Carcinogenicity:** Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US-Occupational Safety and Health Administration.

**Target Organs:** Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

**Reproductive Toxicity:** Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

**Mutagenicity:** Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells, and DNA damage in mammalian cells in vitro.

#### Tetraethyl Lead

**Carcinogenicity:** While inorganic lead compounds have caused cancer in laboratory animals, organic lead compounds have not been identified as a carcinogen by NTP, IARC or OSHA.

#### Acute Toxicity:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Gasoline	14 g/kg	3.5 g/kg	> 5 mg/L
Tetraethyl Lead	14 mg/kg (Rat)	LDLo = 830 mg/kg	No data

## 12. Ecological Information

**Ecotoxicity:** Experimental studies show that acute aquatic toxicity values are greater than 1 mg/l and mostly in the range 1-100 mg/l. Should be regarded as toxic to aquatic organisms - may cause long term adverse effects in the aquatic environment.

**Mobility:** On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 6.5 days for benzene to 0.5 days for n-dodecane.

**Persistence and degradability:** The hydrocarbons in this material are expected to be inherently biodegradable.

**Bioaccumulation Potential:** Log Kow values measured for the hydrocarbon components of this material are above 3 and therefore regarded as having the potential to bioaccumulate. In practice, metabolic processes or physical properties may prevent this effect or limit bioavailability.

### 13. Disposal Considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

**EPA Waste Number(s)**

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)
- D008 - Toxicity characteristic (Lead)

### 14. Transportation Information

**U.S. Department of Transportation (DOT)**

**Shipping Description:** Gasoline, 3, UN1203, II  
**Non-Bulk Package Marking:** Gasoline, UN1203  
**Non-Bulk Package Labeling:** Flammable liquid  
**Bulk Package/Placard Marking:** Flammable / 1203  
**Packaging - References:** 49 CFR 173.150; 173.202; 173.242

**(Exceptions; Non-bulk; Bulk)**

**Hazardous Substance:** See Section 15 for RQ's  
**Emergency Response Guide:** 128  
**Note:**

*Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.*

**International Maritime Dangerous Goods (IMDG)**

**Shipping Description:** UN1203, Gasoline, 3, II, (FP° C cc), [where FP is the material's flash point in degrees Celsius closed cup]  
**Non-Bulk Package Marking:** Gasoline, UN 1203  
**Labels:** Flammable liquid  
**Placards/Marking (Bulk):** Flammable / 1203  
**Packaging - Non-Bulk:** P001  
**EMS:** F-E, S-E

**International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)**

**UN/ID #:** UN1203  
**Proper Shipping Name:** Gasoline  
**Hazard Class/Division:** 3  
**Packing Group:** II  
**Non-Bulk Package Marking:** Gasoline, UN1203  
**Labels:** Flammable liquid  
**ERG Code:** 3H

**14. Transportation Information**

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y305	305	307
Max. Net Qty. Per Package:	1 L	5 L	60 L

**15. Regulatory Information**

**CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):**

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Tetraethyl Lead	100 lb	10 lb

**CERCLA/SARA - Section 311/312 (Title III Hazard Categories)**

Acute Health: Yes  
 Chronic Health: Yes  
 Fire Hazard: Yes  
 Pressure Hazard: No  
 Reactive Hazard: No

**CERCLA/SARA - Section 313 and 40 CFR 372:**

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Xylenes	1-15	1.0%
Toluene	1-10	1.0%
Ethyl Benzene	1-5	0.1%
1,2,4-Trimethyl Benzene	1-5	1.0%
n-Hexane	<4	1.0%
Cyclohexane	<3	1.0%
Benzene	<0.5	0.1%

**EPA (CERCLA) Reportable Quantity (in pounds):**

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

**California Proposition 65:**

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Unleaded Gasoline (Wholly Vaporized)	Cancer
Ethyl Benzene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Lead / Lead Compounds	Cancer Developmental Toxicant Female Reproductive Toxicant Male Reproductive Toxicant
Ethylene Dibromide	Cancer Developmental Toxicant Male Reproductive Toxicant

**Canadian Regulations:**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class  
B2 - Flammable Liquids  
D2A

**National Chemical Inventories:**

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.  
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

## 16. Other Information

Date of Issue:	26-Mar-2009
Status:	Final
Previous Issue Date:	23-May-2007
Revised Sections or Basis for Revision:	Health Hazard (Section 2) Periodic review and update
MSDS Number:	001769

**Guide to Abbreviations:**

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

**Disclaimer of Expressed and implied Warranties:**

The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.