



FMPNo: 1014
per MIL-DTL-83133E

Marketing Specification

Distillate, JP-8, High Sulfur (3,000 ppm), Nato
Code F-34

Marketing specification
All Terminals

Property	TestName	Units	Min	Max	Specific	Note#
Acid Number	D 3242 Acidity in Turb Fuel	mg KOH/g		0.015		
Additives - AO	Antioxidants					966
Additives - Corr Inhibitor	Corrosion Inhibitor					964
Additives - FSII	D 5006 Fuel System Icing Inhibitors	Vol%	0.10	0.15		960
Additives - General Note	General Note					971
Additives - MD	Metal Deactivators					961
Additives - Premixing	Premixing of Additives					957
Additives - SDA	Static Dissipater Additive					962
Additives - Therm Stab	Thermal Stability Imp Addit					965
Appearance	D 4176 Wtr & Part Cont, Proc 1		Pass			953
Aromatics	D 1319 Hydrocarbon Typ by FIA	Vol%		25.0		
Cetane Index by 2-var	D 976 Cetane Index by 2-var		Report			
Color, Saybolt	D 6045 Color by Auto TriStim		Report			
Copper Strip Corrosion	D 130 Cu Str 2 Hr @ 212 F	Rating		1b		
Density 15C or API 60F	D 4052 Density & Rel Dens	g/ml	0.775	0.840		
Dist 10 Vol% Rec, corr	D 86 Dist at Atm Press	Deg F		401		967
Dist 20 Vol% Rec, corr	D 86 Dist at Atm Press	Deg F	Report			
Dist 50 Vol% Rec, corr	D 86 Dist at Atm Press	Deg F	Report			
Dist 90 Vol% Rec, corr	D 86 Dist at Atm Press	Deg F	Report			
Dist End Pt, corr	D 86 Dist at Atm Press	Deg F		572		
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 Residue	D 86 Dist at Atm Press	Vol%		1.5		
Electrical Conductivity	D 2624 Elec Conductivity	pS/m	150	450		958
Existent Gum	D 381 Gum Content by Jet Evap	mg/100ml		7.0		
Flash Pt	D 93 PMCC Flash Pt	Deg F	100			
Freeze Pt	D 5972 Freeze Pt by Ph Tech	Deg C		-47		
Hydrogen content	D 3343 Hydrogen Cont of Jet	Wt%	13.4			
JFTOT Press Drop	D 3241 JFTOT@ 260 C	mm Hg		25		
JFTOT Tube Rating	D 3241 JFTOT@ 260 C	Rating		<3		
Mercaptan Sulfur	D 3227 Thiol Merc S by Titra	Wt%		0.002		
MSEP	D 3948 Water Sep by MSEP	Rating				963
Naphthalenes	D 1840 Naphthalenes by UV	Vol%		3.0		
Net Heat of Combustion	D 3338 Net Heat of Comb	BTU/lb	18,400			



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Property	TestName	Units	Min	Max	Specific	Note#
Particulates	D 5452 Partic in Av Fuels	mg/L		1.0		959
PartM - Filtration Time	D 5452 Partic in Av Fuels	minutes		15		
Smoke Pt	D 1322 Smoke Pt	mm	19.0			
Sulfur	D 2622 S by X-ray Fluo Spec	Wt%		0.30		
Viscosity @ -4 F (-20 C)	D 445 Kinematic Viscosity	cSt		8.0		
Water Rxn Interface	D 1094 Water Rxn by manual	Rating		1b		
Other - See Note	Additives					952
Other - See Note	Referee Methods					950

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NoteNo **Note**

- 950 Referee Methods for MIL-DTL-83133E (JP-8) are as follows: Density, D-4052; Distillation, D-86; Flash Point, D-93; Freezing Point, D-2386; Net Heat of Combustion, D-4809; Hydrogen Content, D-3701; Particulate Matter, D-5452; Saybolt Color, ASTM D 156; Sulfur, D-4294.
- 952 Additives: Shipper must provide the type and amount of each additive used upon request.
- 953 The fuel shall be clear and bright and free from visual undissolved water, sediment, and suspended matter.
- 957 Premixing of Additives: Additives shall not be premixed with other additives before injection into the fuel so as to prevent possible reactions among the concentrated forms of different additives. (MIL-DTE-83133E, Section 3.3.7)
- 958 The conductivity must be between 150 and 450 pS/m for F-34 (JP-8) at ambient temperature or 85° F, whichever is lower, unless otherwise directed by the procuring activity. In the case of JP-8+100, JP-8 with the thermal stability improver additive, the conductivity limit must be between 150 to 700 pS/m at ambient temperature or 85° F, whichever is lower, unless otherwise directed by the procuring activity. (MIL-DTE-83133E, Table 1, Note 11)
- 959 A minimum sample size of 3.79 liters (one gallon) shall be filtered. Filtration time must be determined per Appendix A, Mil-T-83133E (or most current version); this procedure may be used to determine the particulate matter as an alternate to ASTM D 5452 or ASTM D 2276. (MIL-DTE-83133E, Table 1, Note 8)
- 960 Fuel System Icing Inhibitor (FSII): The use of a fuel system icing inhibitor shall be mandatory for NATO F-34 (JP-8) and shall conform to MIL-DTL-85470. The point of injection of the additive shall be determined by agreement between the Purchasing Authority and the supplier. (MIL-DTE-83133E, Section 3.3.5)
- FSII testing shall be performed using the DiEGME scale of the refractometer. (MIL-DTE-83133E, Table 1, Note 10)
- 961 Metal Deactivator: A metal deactivator, N,N'-disalicylidene-1,2-propanediamine, may be blended into the fuel. The concentration of active material used on initial batching of the fuel at the refinery shall not exceed 2.0 mg/L. Cumulative addition of metal deactivator when redoping the fuel, shall not exceed 5.7 mg/L. Metal deactivator additive shall not be used in JP-8 unless the supplier has obtained written consent from the Procuring Activity and user.
- 962 Static Dissipater Additive: An additive shall be blended into the fuels in sufficient concentration to increase the conductivity of the fuel to within the range specified in (the specifications) at the point of injection. The point of injection of the additive shall be determined by agreement between the purchasing authority and the supplier. The following electrical conductivity additive is approved: Stadis 450 marketed by Octel America. Inc., Newark, DE 19702. (MIL-DTE-83133E, Section 3.3.3)

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NoteNo **Note**

963 The minimum microseparator rating shall be as follows:

Antioxidant (AO)*, Metal Deactivator (MDA)*; MSEP minimum Rating is 90.

Antioxidant (AO)*, (MDA)*, and Fuel System Icing Inhibitor (FSII); MSEP minimum Rating is 85

Antioxidant (AO)*, (MDA)*, and Corrosion Inhibitor/Lubricity Improver (CI/LI); MSEP minimum
Rating is 80

Antioxidant (AO)*, (MDA)*, FSII, and CI/LI; MSEP minimum Rating is 70

*Even though the presence or absence does not change these limits, samples submitted for specification conformance testing shall contain the same additives present in the refinery batch. Regardless of which minimum the refiner elects to meet, the refiner shall report the MSEP rating on a laboratory hand blend of the fuel with all additives required by the specification.

(MIL-DTE-83133E, Table 1, Note 9)

964 Corrosion Inhibitor: A corrosion inhibitor conforming to MIL-PRF-25017 shall be blended into the F-34 (JP-8) grade fuel by the contractor. The corrosion inhibitor additive is optional for F-35. The amount added shall be equal to or greater than the minimum effective concentration and shall not exceed the maximum allowable concentration listed in the latest revision of QPL-25017. The contractor or transporting agency, or both, shall maintain and upon request shall make available to the Government evidence that the corrosion inhibitors used are equal in every respect to the qualification products listed in QPL-25017. The point of injection of the corrosion inhibitor shall be determined by agreement between the purchasing authority and the supplier.
(MIL-DTE-83133E, Section 3.3.4)

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NoteNo **Note**

965 Thermal stability improver additive: Due to logistical concern, personnel at the operating location shall request written approval from the cognizant activity to add a thermal stability improver additive to the fuel. If approval is given, the concentration of the additive and location of injection shall be specified by the cognizant service activity found in MIL-DTL-8133E section 3.3.6. JP-8 fuel with an approved thermal stability improver additive at the required concentration shall be designated as JP-8+100. Thermal stability improver additive shall not be used in JP-8 without approval, in writing, from:

Cognizant Activity for the Navy and Marine Corps: Naval Air Systems Command, AIR-4.4.5, Bldg 2360 PSEF, 22229 Elmer Road, Patuxent River, MD 20670-1534.

Cognizant Activity for the Air Force and all other DoD agencies: AFRL/PRSF, Bldg 490, 1790 Loop Road N, WPAFB, OH 45433-7103.

Cognizant Activity for the Army: US Army Tank-automotive and Armaments Command, AMSTA-TR/210, Warren, MI 48397-5000.
(MIL-DTE-83133E, Section 3.3.6)

Qualified thermal stability improver additives:

SPEC AID 8Q462, AFRL/PRSF Ltr, 9 Dec 97, BetzDearborn, 9669 Grogan Mill Road, PO Box 4300, The Woodlands, TX 77387

AeroShell Performance Additive 101, AFRL/PRSF Ltr, 13 Jan 98, Shell Aviation Ltd., Shell-Mex House Strand, London WC2R 0ZA
(MIL-DTE-83133E, Section 3.3.6.1)

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NoteNo **Note**

966 Antioxidants: Immediately after processing, and before the fuel is exposed to the atmosphere (i.e. during rundown into feed/batch tankage), add an approved antioxidant from the following list in order to prevent the formation of gums and peroxides after manufacture. The concentration of antioxidant to be added shall be:

a. Not less than 17.2 mg nor more than 24.0 mg of active ingredient per liter of fuel (6.0 to 8.4 lb/1000 barrels) to all JP-8 fuel that contains blending stocks that have been hydrogen treated.

b. At the option of the supplier, not more than 24.0 mg of active ingredient per liter of fuel (8.4 lb/1000 barrels) may be added to JP-8 fuels that do not contain hydrogen treated blending stocks.

(MIL-DTE-83133E, Section 3.3.1)

Approved Antioxidants:

a. 2, 6-di-tert-butyl-4-methylphenol

b. 6-tert-butyl-2,4-dimethylphenol

c. 2, 6-di-tert-butylphenol

d. 75% minimum: 2,6-di-tert-butylphenol

25% maximum: tert-butyl phenols and tri-tert-butylphenols

e. 72% minimum: 6-tert-butyl-2,4-dimethylphenol

28% maximum: tert-butyl-methylphenols and tert-butyl-dimethylphenols

f. 55% minimum: 2,4-dimethyl-6-tert-butylphenol and

15% minimum: 2,6-di-tert-butyl-4-methylphenol and

30% maximum mixed methyl and dimethyl tert-butylphenols

(MIL-DTE-83133E, Section 3.3.1.1)

967 A condenser temperature of 32 to 40 F must be used for D-86 distillations. (MIL-DTE-83133E, Table 1, Note 3)

971 Only those additives specified and within the concentrations noted in Section 3 of MIL-DTL-83133E are permitted. The use of any other additive is prohibited.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: JP-8 Aviation Turbine Fuel

MSDS Code: 169130

Synonyms: MTF JP8 30 WOPA
JP8 LS30

Intended Use: Aviation Turbine Fuel

Responsible Party: 66 Aviation Products
A Division of ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

Customer Service: 800-234-6603

Technical Information: 918-661-6991

MSDS Information: Internet: <http://w3.conocophillips.com/NetMSDS/>

Emergency Telephone Numbers: Chemtrec: 800-424-9300 (24 Hours)
California Poison Control System: 800-356-3219

2. HAZARDS IDENTIFICATION

Emergency Overview

WARNING!

Flammable Liquid and Vapor
Skin Irritant
Aspiration Hazard
Cancer Hazard (Component)

NFPA



Appearance: Colorless

Physical Form: Liquid

Odor: Kerosene

Potential Health Effects

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

Skin: Mild to moderate skin irritant. Contact may cause redness, itching, a burning sensation, and skin damage. Prolonged or repeated contact may cause drying and cracking of the skin, dermatitis (inflammation), burns, and severe skin damage. No harmful effects from skin absorption have been reported.

Inhalation (Breathing): Expected to have a low degree of toxicity by inhalation.

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 may include irritation of the respiratory tract, irritation of the digestive tract, nausea, vomiting and signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue).

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders and respiratory (asthma-like) disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS	Concentration (wt %)
Kerosene ..C9-16	8008-20-6	100
Naphthalene	91-20-3	<1

4. FIRST AID MEASURES

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

Skin: 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.

Inhalation (Breathing): First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air. 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.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

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

Unusual Fire & Explosion Hazards: 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 incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, 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 with minimal risk. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Avoid spreading burning liquid with water used for cooling purposes. Cool equipment exposed to fire with water, if it can be done with minimal risk.

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

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Notify persons 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 with minimal risk. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors (see Section 5). Use water sparingly to minimize environmental contamination and reduce disposal requirements.

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 fire authorities and appropriate federal, state, and local agencies. 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.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear protective gloves. Wash thoroughly after handling. 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.

"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.

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. Post area "No Smoking or Open Flame." Store only in approved containers. 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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	ACGIH	OSHA	Other:
Kerosene ..C9-16	TWA: 200 mg/m ³ Skin	---	---
Naphthalene	TWA: 10 ppm STEL: 15 ppm Skin	TWA: 10 ppm TWA: 50 mg/m ³	TWA: 0.2 mg/m ³ (as total of 17 PNA's measured by NIOSH Method 5506) (ConocoPhillips Guidelines)

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.

Personal Protective Equipment (PPE):

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

Respiratory: 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 (MUC) as directed by regulation or the manufacturer's instructions, in oxygen deficient (less than 19.5 percent oxygen) situations, or other conditions that are immediately dangerous to life and health (IDLH).

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

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.

Appearance:	Colorless
Physical Form:	Liquid
Odor:	Kerosene
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	<1
Vapor Density (air=1):	>1
Boiling Point/Range:	>90°F / >32°C
Melting/Freezing Point:	No data
Solubility in Water:	Negligible
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	0.80 @ 60°F (15.6°C)
Bulk Density:	6.67 lbs/gal
Percent Volatile:	100% @ 545°F (285°C)
Evaporation Rate (nBuAc=1):	>1
Flash Point:	>115°F / >46°C
Test Method:	Tag Closed Cup (TCC), ASTM D56
LEL (vol % in air):	0.7
UEL (vol % in air):	5.0
Autoignition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of storage and handling. Flammable liquid and vapor. Vapor can cause flash fire.

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

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc..

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

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Cancer mortality and morbidity were followed in a cohort of 2182 men exposed to jet fuel in the Swedish Armed Forces. No increase in the frequency of total neoplasms or cancers at specific sites was seen, even when the duration of employment, latency, occupation, or type of exposure were considered. IARC has concluded that there is inadequate evidence for the carcinogenicity of jet fuel in both animals and humans.

Jet-A and kerosene were negative in skin sensitization studies in animals. JP-8, a similar material, has been shown to be a weak skin sensitizer, and to suppress cellular immunity in laboratory animal studies.

In an epidemiology study comparing 30 exposed and 60 unexposed workers, those exposed to jet fuel (average 300 mg/m³, average employment 17 years) did not perform as well in some psychological and motor skills tests.

Kerosene ..C9-16

Carcinogenicity: Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation. Animal studies have also shown that washing the skin with soap and water can reduce the tumor response. Middle distillates with low polynuclear aromatic hydrocarbon content have not been identified as a carcinogen by NTP, IARC or OSHA. Diesel exhaust has been identified as a probable cancer hazard by IARC

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Kerosene ..C9-16	>5 g/kg (Rat)	>2,000 mg/kg (Rabbit)	>5000 ppm (rat)

12. ECOLOGICAL INFORMATION

When No 1 distillates (kerosene, jet fuels, heating oils) escape into the environment due to leaks or spills, most of their constituent hydrocarbons will evaporate and be photodegraded by reaction with hydroxyl radicals in the atmosphere. The half-lives in air for many of the individual hydrocarbons is less than one day. Less volatile hydrocarbons can persist in the aqueous environment for longer periods. They remain floating on the surface of the water; those that reach soil or sediment biodegrade relatively slowly. Soil contaminated with jet fuel can develop adapted microbial species able to use the fuel as a carbon source; soil aeration and nutrient supplementation can enhance this biodegradation.

Reported LC50/EC50 values for water-soluble fractions of kerosenes and jet fuels are usually in the range of 10 to 100 mg/liter. Adverse effects on the gills, pseudobranch, kidney and nasal mucosa have been reported in fish involved in spills of jet fuel. Juvenile clams may be particularly sensitive to marine sediments contaminated as a result of spilled jet fuel. Direct toxicity and fouling of sea birds from jet fuel can occur if birds dive through floating layers of spilled fuel.

Phytotoxic effects of jet fuel have been reported following exposure of plants to sprays or vapors. Lack of seed germination and inhibition of seedling growth may also occur. There is evidence for moderate bioaccumulation of the water-soluble hydrocarbons present in jet fuels.

Since paraffinic hydrocarbons have low solubility in water and exhibit moderate to rapid rates of biodegradation, they are not expected to persist or accumulate in the environment. Mobility in aquatic and terrestrial environments is estimated to be low due to the low water solubility and high vapor pressure. If spilled, the more volatile components will evaporate rapidly.

It is estimated, based on testing of other materials, that the water-accommodated fraction (WAF) would cause moderate toxicity in fish (96 hr LC 50 about 8 mg/L), aquatic invertebrates (48 hr EC 50 about 32 mg/L in Daphnia), and algae (96 hr EC 50 about 10 mg/L).

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description: Fuel, aviation, turbine engine, Combustible liquid *or* 3, UN1863, III
Non-Bulk Package Marking: None *or* Fuel, aviation, turbine engine, UN1863
Non-Bulk Package Labeling: None *or* Flammable liquid
Bulk Package/Placard Marking: Combustible *or* Flammable/1863
Packaging - References: None; None; 49 CFR 173.241 *or* 49 CFR 173.150, 173.203, 173.241
Hazardous Substance: No
Emergency Response Guide: 128
Note: This product may be classified as a Combustible Liquid for domestic land transportation under 49 CFR 173.150(f).

International Maritime Dangerous Goods (IMDG)

Shipping Description: *Not regulated if flashpoint is >60° C closed-cup*
 UN1863, Fuel, aviation, turbine engine, 3, III, (
Non-Bulk Package Marking: Fuel, aviation, turbine engine, UN1863
Labels: Flammable liquid
Placards/Marking (Bulk): Flammable/1863
Packaging - Non-Bulk: P001
EMS: F-E, S-E
Note: Federal compliance requirements may apply. See 49 CFR 171.12.

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

UN/ID #: *Not regulated if flashpoint is >60° C closed-cup*
 UN1863
Proper Shipping Name: Fuel, aviation, turbine engine
Hazard Class/Division: 3
Subsidiary risk: None
Packing Group: III
Non-Bulk Package Marking: Fuel, aviation, turbine engine, UN1863
Labels: Flammable liquid
ERG Code: 3L
Note: Additional Federal compliance requirements may apply. See 49 CFR 171.11

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y309	309	310
Max. Net Qty. Per Package:	10 L	60 L	220 L

15. REGULATORY INFORMATION

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

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

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 (wt %)	de minimis
Naphthalene	<1	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
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant
Naphthalene	Cancer

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
B3 - Combustible Liquids

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: ITAR 121.1, C5 S4

16. OTHER INFORMATION

Issue Date: 11-Dec-2007
Status: Final
Previous Issue Date: 22-Oct-2007
Revised Sections or Basis for Revision: Exposure limits (Section 8)
MSDS Code: 169130

MSDS Legend:

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service Registry; 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:

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