

MATERIAL SAFETY DATA SHEET

JET FUELS

PHIBRO ENERGY USA, INC.

BASIS PETROLEUM, INC.

500 DALLAS AVE., SUITE 3200
HOUSTON, TX 77002

Emergency Phone Numbers

24 Hour Emergency: 713-923-6641
Chemtrec Emergency: 800-424-9300

General Assistance

General Assistance: 713-646-5127

I. GENERAL INFORMATION

Trade Name:

Jet Fuel

CAS Registry Number:

8008-20-6

Chemical Family:

Petroleum Distillate
Aliphatic & Aromatic Hydrocarbon

DOT Proper Shipping Name:

Fuel, Aviation, Turbine Engine

Synonyms:

Jet Fuel, Jet Fuel Stock
Jet A, Aviation Fuel Jet A
JP-5, JP-8, DERD

DOT Hazard Class:

3

DOT Identification Number/Packaging Group:

UN 1863/III

Marine Pollutants:

No

II. SUMMARY OF HAZARDS

Danger! Exhaust fumes have been reported to be an occupational hazard due to NIOSH-reported potential carcinogenic properties.

May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Avoid prolonged or repeated skin contact. Flammable Liquid. Vapors may explode.

Danger! Untreated Product May Contain or Release Hydrogen Sulfide. H₂S is a highly toxic, highly flammable gas which can be fatal if inhaled at certain concentrations.

III. HAZARDOUS INGREDIENTS

Jet Fuel is a complex blend of primarily aliphatic and aromatic hydrocarbons derived from petroleum processing. The composition varies according to specifications.

<u>Component</u>	<u>CAS No.</u>	<u>Concentration (%)</u>
Benzene	71-43-2	<0.1 - 1%
Naphthalene	91-20-3	<1 - 3%

MATERIAL SAFETY DATA SHEET

VI. REACTIVITY INFORMATION (Cont'd.)

Hazardous Reactions/Decomposition Products: Combustion may produce carbon monoxide, carbon dioxide and reactive hydrocarbons (aldehydes, aromatics, etc.) compounds

Conditions to Avoid: Heat, sparks, open flame, static electricity or any other potential ignition sources should be avoided. Prevent vapor accumulation. Do not switch load.

VII. HEALTH HAZARD INFORMATION

Product Listed as a Carcinogen or Potential Carcinogen by:

NTP - Yes* IARC - Yes* OSHA - Yes* Other - Yes*

*Benzene present in jet fuel is considered a carcinogen.

NIOSH Current Intelligence Bulletin 50 reports a potential occupational carcinogenic hazard exists due to human exposure to diesel exhaust fumes.

Target Organs: Skin, respiratory system.

Primary Routes of Entry: Eye or skin contact, ingestion, inhalation.

This product is included in the current TSCA inventory.

WARNING: This product contains benzene and toluene, chemicals known to the State of California to cause birth defects and other reproductive harm.

Occupational Exposure Limits

<u>Compound</u>	<u>Source</u>	<u>Year</u>	<u>Adopted Value for Time Period</u>		
Benzene	OSHA-PEL	1989	TWA	1 ppm	8 hour
	ACGIH-TLV	1994	TWA	0.1 ppm	8 hour
	OSHA-PEL	1989	STEL	5 ppm	15 min
	NIOSH-REL	1989	CL	1 ppm	15 min
Hydrogen Sulfide	OSHA-PEL	1993	CL	20 ppm	10 min
	ACGIH-TLV	1989	TWA	10 ppm	8 hour
	ACGIH-TLV	1989	STEL	15 ppm	15 min
	NIOSH-REL	1989	CL	10 ppm	10 min
	OSHA-PEL	1993	PEAK	50 ppm	10 min
Naphtha (Coal Tar)	OSHA-PEL	1993	TWA	100 ppm	8 hour
	NIOSH-REL	1989	TWA	350 mg/m ³	8 hour
	NIOSH-REL	1989	CL	1800 mg/m ³	15 min
Naphthalene	OSHA-PEL	1993	TWA	10 ppm	8 hour
	ACGIH-TLV	1989	TWA	10 ppm	8 hour
	ACGIH-TLV	1989	STEL	15 ppm	15 min

Effects and Hazards of Eye Contact

May cause severe irritation, redness, tearing, blurred vision and conjunctivitis.

MATERIAL SAFETY DATA SHEET

VII. HEALTH HAZARD INFORMATION (Cont'd.)

Effects and Hazards of Skin Contact

Prolonged or repeated contact may cause moderate irritation, defatting (cracking), redness, itching, inflammation, dermatitis and possible secondary infection. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Injury may not appear serious at first. Within a few hours, tissues will become swollen, discolored and extremely painful. See Notes to Physician section.

Effects and Hazards of Inhalation

Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm. Repeated or prolonged exposure may cause behavioral changes. NIOSH Current Intelligence Bulletin 50 reports a potential occupational carcinogenic hazard exists due to human exposure to diesel exhaust.

Effects and Hazards of Ingestion

This product may be harmful or fatal if swallowed. This product may cause nausea, vomiting, diarrhea and restlessness. **DO NOT INDUCE VOMITING**. Aspiration into the lungs can cause severe chemical pneumonitis or pulmonary edema/hemorrhage, which can be fatal. May cause gastrointestinal disturbances. Symptoms may include irritation, depression, vomiting and diarrhea. May cause harmful central nervous system effects, similar to those listed under "inhalation".

Medical Conditions Aggravated by Exposure

Preexisting eye, skin, heart, central nervous system and respiratory disorders may be aggravated by exposure to this product.

Toxicological Information

BENZENE is considered to be a carcinogen to humans, and may cause adverse health effects following exposure via inhalation, ingestion or dermal or eye contact. Acute inhalation of benzene by rats, mice or rabbits caused narcosis, spontaneous heart contractions (ventricular fibrillation) and death due to respiratory paralysis. Subchronic inhalation of benzene by rats produced decreased white blood cell counts, decreased bone marrow cell activity, increased red blood cell activity and cataracts. In rats, chronic inhalation or oral administration of benzene produced cancers of the liver, mouth and Zymbal gland. Acute inhalation exposure of benzene in humans has caused nerve inflammation (polyneuritis), central nervous system depression and cardiac sensitization. Chronic exposure to benzene has produced anorexia and irreversible injury to the blood forming organs. Effects include aplastic anemia and leukemia. Animal studies have demonstrated testicular effects, alterations in reproductive cycles, chromosomal aberrations, and embryo/fetotoxicity. No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother.

DIESEL EXHAUST FUMES have been reported to be a potential occupational carcinogen in humans by NIOSH Current Intelligence Bulletin 50.

NAPHTHALENE can affect the body if it is inhaled, comes into contact with the eyes or the skin or if it is swallowed. Naphthalene vapor causes hemolysis and eye irritation, it may cause cataracts. Severe intoxication from ingestion of the solid results in characteristic manifestations of marked intravascular hemolysis and its consequences, including potentially fatal hyperkalemia. Initial symptoms include eye irritation, headache, confusion, excitement, malaise, profuse sweating,

MATERIAL SAFETY DATA SHEET

VII. HEALTH HAZARD INFORMATION (Cont'd.)

Toxicological Information (Cont'd.)

nausea, vomiting, abdominal pain, and irritation of the bladder. There may be progression to jaundice, hematuria, hemoglobinuria, renal tubular blockage, and acute renal shutdown. Hematologic features include red cell fragmentation, icterus, severe anemia with nucleated red cells, leukocytosis, and dramatic decreases in hemoglobin, hematocrit and red cell count; sometimes there is formation of Heinz bodies and methemoglobin. Individuals with a deficiency of glucose-6-phosphate dehydrogenase in erythrocytes may be more susceptible to hemolysis by naphthalene. Cataracts and ocular irritation have been produced experimentally in animals and have been described in humans. Of 21 workers exposed to high concentrations of fume or vapor for 5 years, 8 had peripheral lens opacities; in other studies, no abnormalities of the eyes have been detected in workers exposed to naphthalene for several years. The vapor causes eye irritation at 15 ppm. Eye contact with the solid may result in conjunctivitis, superficial injury to the cornea, chorioretinitis, scotoma, and diminished visual acuity. Naphthalene on the skin may cause hypersensitivity dermatitis, chronic dermatitis is rare.

PETROLEUM DISTILLATES can affect the body if they are inhaled, come in contact with the eyes or skin or are swallowed. The vapors of petroleum distillates are mild narcotics and mucous membrane irritants. There have been few toxicologic studies, either on animals or man. While 4000 to 7000 ppm are tolerated for 1 hour by human subjects, symptoms of narcosis, such as dizziness and drowsiness, occur at these concentrations. Continuing exposure may produce signs of inebriation, followed by headache or nausea. Exposure at 10,000 to 20,000 ppm is regarded as immediately hazardous to life. The higher boiling fractions may produce irritation of the eyes, nose and throat in addition to symptoms of mild narcosis. Mouse skin painting studies have shown that middle distillates can cause skin cancer when repeatedly applied and never washed from the skin. A few studies have shown that washing the animal's skin between applications greatly reduces the carcinogenic effect of some distillates. Some components of distillates have produced kidney damage in oral and inhalation exposure studies. Middle distillates were found to be mutagenic in some tests and negative in the majority of others. The exact relationship between these results and human health is not known. Chronic health effects would not be expected as long as good personal hygiene and proper safety precautions are used. No chronic systemic effects have been reported from widespread industrial use.

If this material is handled as a refinery intermediate stream versus sold as a finished product, the following additional health hazard warning information may be pertinent.

HYDROGEN SULFIDE can affect the body if it is inhaled or if it comes into contact with the eyes, skin, nose or throat. It can also affect the body if it is swallowed. It is colorless and has the odor of rotten eggs. However, its odor cannot be used as an indication of its presence since one of the first effects of H₂S exposure is the loss of the sense of smell. Inhalation of high concentrations of hydrogen sulfide, 1000 to 2000 ppm, may cause coma after a single breath and may be rapidly fatal, convulsions can also occur. Hydrogen sulfide gas is a rapidly acting systemic poison which causes respiratory paralysis with consequent asphyxia at high concentrations (500 to 1000 ppm). A case of polyneuritis and encephalopathy from one day's exposure to a concentration insufficient to cause loss of consciousness has been reported. It irritates the eyes and respiratory tract at lower concentrations (50 to 500 ppm). Pulmonary edema and bronchial pneumonia may follow prolonged exposure at concentrations exceeding 250 ppm. Exposure to concentrations of hydrogen sulfide around 50 ppm for one hour may produce rhinitis, pharyngitis, bronchitis, pneumonitis, acute conjunctivitis with pain, lacrimation and photophobia, in severe form this may progress to keratoconjunctivitis and vesiculation of the corneal epithelium. In lower concentrations, hydrogen sulfide may cause headache, fatigue, irritability, insomnia, and gastrointestinal disturbances, as well as central nervous system disturbances, causing excitation and dizziness. Repeated exposure to hydrogen sulfide results in increased susceptibility, so that eye irritation, cough and systemic effects may result from concentrations previously tolerated without any effect.

MATERIAL SAFETY DATA SHEET

VIII. EMERGENCY AND FIRST AID INFORMATION

Special H₂S Warning

Care must be taken by those who are rendering aid to the victim because H₂S may be in the area and may also overcome the rescuers. Supplied air breathing equipment should be used by rescuers unless it has been determined that the area is free of hydrogen sulfide.

Treatment for Eye Contact

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical advice if pain or redness continues.

Treatment for Skin Contact

Wash exposed area thoroughly with soap and water. Remove contaminated clothing promptly and launder before reuse. Contaminated leather goods should be discarded. If irritation persists or symptoms described in the MSDS develop, seek medical attention. High pressure skin injections are **SERIOUS MEDICAL EMERGENCIES**. Get immediate medical attention.

Treatment for Inhalation

Remove to fresh air. If breathing is difficult, ensure clear airway and administer oxygen. If not breathing, apply artificial respiration or cardiopulmonary resuscitation. Keep person warm, quiet and get medical attention.

Treatment for Ingestion

Never give anything by mouth to an unconscious person. **DO NOT** induce vomiting. Aspiration of material into the lungs due to vomiting can cause chemical pneumonitis which can be fatal. Give vegetable oil or charcoal slurry to retard absorption. If spontaneous vomiting occurs, keep head below hips to prevent aspiration of liquid into lungs and monitor for breathing difficulty. **SEEK IMMEDIATE MEDICAL ATTENTION**. Keep person warm and quiet.

Notes to Physician

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Irregular heart beat may occur, use of adrenalin is not advisable. Individuals intoxicated by the product should be hospitalized immediately, with acute and continuing attention to neurological and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

MATERIAL SAFETY DATA SHEET

IX. PRECAUTIONARY MEASURES

Respiratory Protection

If workplace exposure limits for product or components are exceeded, NIOSH equipment should be worn. Proper respirator selection should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. This equipment should be available for nonroutine and emergency use.

Eye Protection

Keep away from eyes. Eye contact can be avoided by wearing safety glasses or chemical splash goggles.

Skin Protection

Keep away from skin. Skin contact can be minimized by wearing protective gloves such as neoprene, nitrile-butadiene rubber, etc. and, where necessary, impervious clothing and boots. Leather goods contaminated with this product should be discarded. A source of clean water should be available in the work area for flushing eyes and skin.

Ventilation

Avoid breathing mists and vapor. Use in well ventilated area. In confined space, mechanical ventilation may be necessary to reduce vapor concentrations to levels below the allowable exposure limits.

Other Precautionary Measures

Tanks, vessels, or other confined spaces which have contained product should be freed of vapors before entering. Because H₂S can accumulate in tanks, vessels, and bulk transport compartments, personnel should stand upwind, keep their faces at least two feet from compartment openings, and avoid breathing vapors when opening hatches and dome covers. The container should be checked with an explosimeter for safety and an oxygen meter to ensure a safe breathing atmosphere before entry. Empty containers may contain toxic, flammable/combustible or explosive residues or vapors. Do not cut, grind, drill, weld, or reuse empty containers that contained this product. Do not transfer this product to another container unless the container receiving the product is labeled with proper DOT shipping name, hazard class and other information that describes the product and its hazards.

Precautions to be Taken in Handling and Storing

Store in tightly closed containers in cool, dry, isolated and well ventilated area away from heat, sources of ignition and incompatible materials. Use non-sparking tools and explosion proof equipment. Ground lines, containers, and other equipment used during product transfer to reduce the possibility of a static induced spark. Do not "switch" load (load into containers which previously contained gasoline or other low flash material) because of possible accumulation of a static charge resulting in a source of ignition. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, smoking or using toilet facilities.

MATERIAL SAFETY DATA SHEET

X. SPILL AND LEAK PROCEDURES

Precautions in Case of a Spill or Release

If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Combustible Liquid. Review Fire and Explosion Hazard Data before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways.

Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424- 8802. For highway or railway spills, contact Chemtrec at 800-424-9300.

Waste Disposal Method

Dispose of material in accordance with local, county, state and federal regulations. Contact state and federal regulators to determine whether the material should be classified as a hazardous waste or industrial waste and handled accordingly. Use licensed transporter and disposal facility.

XI. SARA TITLE III INFORMATION

Section 302/304 Extremely Hazardous Substances

Hydrogen Sulfide

Section 311 Hazard Category

<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Pressure</u>	<u>Reactive</u>	<u>Not Applicable</u>
X	X	X			

Section 313 Toxic Chemicals

Benzene	1% Maximum
Naphthalene	3% Maximum

XII. LABELING INFORMATION

Danger! Exhaust fumes have been Reported to be an Occupational hazard due to NIOSH-reported potential carcinogenic properties.

May cause irritation to eyes, skin and respiratory system. Avoid liquid, mist and vapor contact. Harmful or fatal if swallowed. Aspiration hazard, can enter lungs and cause damage. May cause irritation or be harmful if inhaled or absorbed through the skin. Avoid prolonged or repeated skin contact. Flammable Liquid. Vapors may explode.

MATERIAL SAFETY DATA SHEET

XII. LABELING INFORMATION (Cont'd.)

If swallowed, do not induce vomiting, aspiration hazard. Call physician immediately. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Wash skin with soap and plenty of water. Product soaked clothing should be removed and laundered before reuse. Read Emergency and First Aid Information section of the MSDS.

Use only in well ventilated locations. Keep away from heat, spark and flames. In case of fire, use water spray, foam, dry chemical or carbon dioxide as described in the Fire and Explosion Hazard Data section of the MSDS. Do not pressurize, cut, weld, braze, solder, drill on or near this container. "Empty" container contains residue (liquid and/or vapor) and may explode in heat of a fire.

For industrial use only. Keep out of reach of children. Failure to use caution may cause serious injury or illness. Never siphon by mouth. Do not use as a cleaning solvent.

Danger! Untreated Product May Contain or Release Hydrogen Sulfide. H₂S is a highly toxic, highly flammable gas which can be fatal if inhaled at certain concentrations.

DISCLAIMER

The information, recommendations and suggestions herein were compiled from reference material and other sources believed to be reliable. However, the MSDS's accuracy or completeness is not guaranteed by Phibro Energy USA, Inc., nor is any responsibility assumed or implied for any loss or damage resulting from inaccuracies or omissions. Since conditions of use are beyond our control, no warranties of merchantability or fitness for a particular purpose are expressed or implied. This MSDS is not intended as a license to operate under, or recommendation to infringe on, any patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.

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