

Safety Data Sheet

Jet A-1**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING**

Product Type/Use Fuel for aviation turbine engines fitted to aircraft.

Other Names

Name
F-35
Avtur
Aviation Turbine Fuel

Supplier
Shell Company of Australia Ltd.
Level 2, 8 Redfern Road,
Hawthorn East, Victoria 3123
(ABN 46 004 610 459)
AUSTRALIA

Telephone Numbers
Emergency Tel.
1800 651 818 (within Australia) +61 3 9663 2130 (International)
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Tel:+61 (0)3 9666 5444/Fax:+61 (0)3 8823 4800

2. COMPOSITION/INFORMATION ON INGREDIENTS**Preparation Description**

Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C9 to C16 range. May also contain several additives at <0.1% v/v each. Total aromatic hydrocarbons present are typically in the range of 10-20%v/v.

Name	CAS	EINECS	Proportion	Hazard	R Phrase
Kerosine (petroleum), hydrodesulphurised	64742-81-0	265-184-9	0-100 %	Xi, Xn, N	R10, R38, R65, R51/53
Kerosine (petroleum)	8008-20-6	232-366-4	0-100 %	Xi, Xn, N	R10, R38, R65, R51/53

Other Information

See Section 16 'Other Information' for full text of each relevant Risk Phrase.

3. HAZARDS IDENTIFICATION**Hazards Identification**

HAZARDOUS SUBSTANCE.

DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.

Dangerous goods classification according to the Australia Dangerous Goods Code.

Human Health Hazards

Harmful, may cause lung damage if swallowed. Irritating to skin. Aspiration into the lungs may cause chemical pneumonitis which can be fatal.



Safety Hazards

Flammable. Liquid evaporates quickly and can ignite leading to a flash fire, or an explosion in a confined space. May ignite on surfaces at temperatures above auto-ignition temperature. Vapour in the headspace of tanks and containers may ignite and explode at temperatures exceeding auto-ignition temperature, where vapour concentrations are within the flammability range.

Environmental Hazards

Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

Other Information

This product is intended for use as a fuel in a closed system.

4. FIRST AID MEASURES

Symptoms and Effects

Not expected to give rise to an acute hazard under normal conditions of use. Irritating to skin. Aspiration into the lungs may occur directly or following ingestion. This may cause chemical pneumonitis which may be fatal. Splashes into the eye may cause irritation. Prolonged exposure to vapour concentrations above the recommended occupational exposure standard may cause headache, dizziness, nausea, irritation of the eyes, upper respiratory tract, asphyxiation, unconsciousness and even death.

Inhalation

Remove to fresh air. If breathing but unconscious, place in the recovery position. If breathing has stopped, apply artificial respiration. If heartbeat absent, give external cardiac compression. Monitor breathing and pulse. Seek urgent medical advice.

Skin

Wash skin with water using soap if available. Note that contaminated clothing may be a fire hazard. Contaminated clothing should be soaked with water before being removed. It must be laundered before reuse. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

Eye

Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

Ingestion

DO NOT INDUCE VOMITING. Protect airway if vomiting begins. Give nothing by mouth. If breathing but unconscious, place in recovery position. If breathing has stopped, apply artificial respiration. OBTAIN MEDICAL ATTENTION IMMEDIATELY.

Advice to Doctor

Treat symptomatically. In cases of ingestion, consider gastric lavage. Gastric lavage must only be undertaken after cuffed endotracheal intubation in view of the risk of aspiration. Administration of carbon for medicinal use (carbo medicinalis) may reduce absorption from the digestive tract. In cases of chemical pneumonitis, antibiotic and corticosteroid therapy should be considered, but only under expert guidance and with special care facilities. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function.

5. FIRE FIGHTING MEASURES

Specific Hazards

Combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates (smoke), and gases, including carbon monoxide, oxides of sulphur, and unidentified organic and inorganic compounds. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Will float and may be re-ignited on surface water. Flammable vapours may be present even at temperatures below the flash point.



Extinguishing Media

Foam, fine water spray and dry chemical powder. Carbon dioxide, Clean Agents (e.g. Inergen, Argonite etc.), sand or earth may be used for small fires only.

Unsuitable Extinguishing Media

Do not use water in a jet.

Protective Equipment

Proper protective equipment must be worn, this should include breathing apparatus when approaching a fire in a confined space.

Other Information

Keep adjacent drums and tanks cool by spraying with water from a safe location. If possible remove them from the danger zone. If adequate cooling cannot be achieved, the area needs to be evacuated, and further fire fighting and cooling attempts should be carried out from safe location.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Remove all possible sources of ignition in the surrounding area. Evacuate all personnel. Do not breathe fumes, vapour. Do not operate electrical equipment. Avoid contact with skin, eyes, clothing. Ventilate contaminated area thoroughly. Wear chemical resistant knee length safety boots and PVC jacket and trousers. Wear safety glasses or full face shield if splashes are likely to occur.

Environmental Precautions

Prevent from spreading or entering into drains and surface waters (e.g. lakes, ponds, ditches, rivers and streams) by using sand, earth, or other appropriate non-combustible barriers. Inform local authorities if impacts cannot be prevented.

Clean-up Methods - Small Spillages

To minimize soil and groundwater contamination, absorb liquid with sand earth or other recommended sorbent material, as soon as possible. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations. Do not disperse using water.

Clean-up Methods - Large Spillages

Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Dispose of as for small spills.

Maritime Spillages

Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

Other Information

Local authorities should be advised if significant spillages cannot be contained. Observe all relevant local regulations. If contamination of sites occurs remediation may require specialist advice.

7. HANDLING AND STORAGE

Exposures in Normal Use

Maintenance and Fuelling Activities - Avoid inhalation of vapours and contact with skin.



Handling

Avoid naked flames. The vapour is heavier than air, spreads along the ground and distant ignition is possible. Avoid prolonged or repeated contact with skin. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Never siphon by mouth. When using do not eat, drink or smoke. Avoid contact with skin, eyes and respiratory system. If using pressurised equipment, take extra care to avoid injection under the skin. Only use in well-ventilated areas. Take precautionary measures against static discharges. Ensure all equipment is properly bonded. Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Prevent spillages. Cloth, paper and other materials that are used to absorb spills present a fire hazard. Avoid their accumulation by disposing of them safely and immediately. In addition to any specific recommendations given for controls of risks to health, safety and the environment, an assessment of risks must be made to help determine controls appropriate to local circumstances.

During aircraft re-fuelling and all other operations extreme care must be taken to avoid any source of ignition.

Storage

This product must never be stored in buildings occupied by people. Drums and small containers should be stored in well-ventilated areas, flameproof cabinets or stores. Keep container tightly closed in a dry, well-ventilated place away from direct sunlight and other sources of heat or ignition. Keep in a bunded area with a sealed (low permeability) floor, to provide containment against spillage. Stack drums to a height not exceeding 3 metres without the use of racking. Locate tanks away from heat and other sources of ignition. Seek specialist advice for the design, construction and operation of bulk storage facilities.

In the interests of air safety, aviation fuels are subject to strict quality requirements and product integrity is of paramount importance. Precautions should be taken to avoid water coming into contact with aviation fuels.

Storage Temperatures

Ambient.

Product Transfer

Electrostatic charges may be generated during pumping. Ensure electrical continuity by bonding all equipment. Avoid splash filling. Wait 2 minutes after tank filling (for tanks such as those on road tanker vehicles) before opening hatches or manholes. Wait 30 minutes after tank filling (for large storage tanks) before opening hatches or manholes. When filling tanks there is always a danger of static discharge leading to explosion. This is particularly hazardous when switch loading tanks.

Product transfer may give rise to light hydrocarbon vapour in the headspace of tanks. This vapour may explode if there is a source of ignition such as static discharge.

Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care. Conditions, such as filling empty Filter Water Separator vessels, that lead to the formation of hydrocarbon mists are also particularly hazardous.

Tank Cleaning

Cleaning, inspection and maintenance of storage tanks is a specialist operation that requires the implementation of strict procedures and precautions. These include issuing of work permits, gas-freeing of tanks, using a manned harness, lifelines, and wearing air-supplied breathing apparatus. Prior to entry and whilst cleaning is underway, the atmosphere within the tank must be monitored using an oxygen meter and explosimeter. Additional precautions are required where the tank may previously have contained leaded gasoline.

Recommended Materials

For containers use mild steel, stainless steel or aluminium. For mild steel applications, internal lining may be required using an aviation approved coating.

For seals and gaskets consult manufacturer's literature for suitability.

Unsuitable Materials

Synthetic materials such as plastics and fibreglass may be unsuitable for containers or container linings depending on the material specification and intended use. Examples of materials to avoid are: natural rubber (NR), nitrile rubber (NBR), ethylene propylene rubber (EPDM), polymethyl methacrylate (PMMA), polystyrene, polyvinyl chloride (PVC), polyisobutylene. However, some may be suitable for glove materials.

Avoid contact with copper and copper alloys, as this may cause thermal stability to deteriorate. Avoid contact with galvanized materials.

Other Information

In the interests of air safety, aviation fuels are subject to strict quality requirements and product integrity is of paramount importance. For one source of information on international standards for the quality assurance of aviation fuels, see www.jointinspectiongroup.org. Ensure that all local regulations regarding handling and storage facilities are followed.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits

Substance	Regulations	Exposure Duration	Exposure Limit	Units	Notes
Kerosine (petroleum), hydrodesulphurised	ACGIH	TWA	200	mg/m ³	as total hydrocarbon vapour
Kerosine (petroleum)	ACGIH	TWA	200	mg/m ³	as total hydrocarbon vapour

ACGIH ACGIH Threshold Limit Values.

Exposure Controls

The level of personal protection and the types of controls necessary will vary depending on exposure conditions. Select controls based on a risk assessment of local circumstances. Use sealed systems as far as possible. Use local, intrinsically safe, exhaust ventilation if there is a risk of inhalation of vapours, mists, or aerosols. Provide eye washes and showers for emergency use.

Respiratory Protection

Care should be taken to keep exposures below applicable occupational exposure limits. If this cannot be achieved, use of a respirator fitted with an organic vapour cartridge combined with a particulate pre-filter should be considered. Where air-filtering respirators are unsuitable (e.g. where airborne concentrations are high, there is a confined space or a risk of oxygen deficiency) use appropriate positive pressure breathing apparatus.

Hand Protection

Select gloves tested to a relevant standard (e.g. Europe EN374, US F739). When prolonged or frequent repeated contact occurs, Nitrile, Neoprene or PVC gloves may be suitable. (Breakthrough time of > 240 minutes). Breakthrough times for gloves vary depending on, e.g. chemical resistance, material thickness, frequency and duration of contact. Selection should also take into account other usage requirements, e.g. dexterity, heat resistance, other chemical substances handled. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye Protection

Wear safety glasses or full face shield if splashes are likely to occur.

Body Protection

Minimise all forms of skin contact. In the event of risk from splashing wear e.g. Nitrile, PVC, or neoprene rubber apron. Wear safety shoes or boots which are chemical and petroleum distillate resistant.

Environmental Exposure Controls

Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

Exposure Measurement Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an Occupational Exposure Limit and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Information on suitable methods is available on request.

9. PHYSICAL AND CHEMICAL PROPERTIES

Colour	Colourless. Pale straw.
Physical State	Liquid.
Odour	Characteristic.
pH Value	Data not available.
Vapour Pressure	<0.1 kPa at 20°C.
Initial Boiling Point	circa 150°C.
Final Boiling Point	circa 300°C.
Solubility in Water	Negligible.
Density	775 to 840 kg/m ³ at 15°C.
Flash Point	38°C minimum (Method: Abel Setaflash).
Flammable Limits - Upper	6%(V/V) maximum.
Flammable Limits - Lower	1%(V/V) minimum.
Auto-Ignition Temperature	>220°C.
Kinematic Viscosity	1 to 2 mm ² /s at 40°C.
Vapour Density (Air=1)	Greater than 5.
Partition co-efficient, n-octanol/water	log Pow 2 to 6.
Other Information	The above properties are generic.

10. STABILITY AND REACTIVITY**Stability**

Stable under normal use conditions.

Conditions to Avoid

Heat, flames and sparks.

Materials to Avoid

Strong oxidizing agents e.g. chlorates and ammonium nitrate.

Hazardous Decomposition Products

Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION**Basis for Assessment**

Toxicological studies have been carried out on the blended hydrocarbon streams but not containing additives. Information given is based on a knowledge of available data on the hydrocarbon blends and on a knowledge of the constituents.

Acute Toxicity - Oral

LD50 > 5000 mg/kg. Ingestion may lead to vomiting and aspiration into the lungs, this may result in chemical pneumonitis, which may be fatal.

Acute Toxicity - Dermal

LD50 > 2000 mg/kg.



Acute Toxicity - Inhalation

LC50 expected to be >5mg/l. Vapours may cause drowsiness and dizziness.

Eye Irritation

Slightly irritating.

Skin Irritation

Irritating. Prolonged exposure causes irritation which can cause skin tumours in mice.

Respiratory Irritation

Expected to be slightly irritating.

Skin Sensitisation

Not a skin sensitizer.

Carcinogenicity

Not a carcinogen.

Mutagenicity

Both in vitro and in vivo assays were negative.

Reproductive Toxicity

Does not impair fertility, and is not a developmental toxicant.

Human Effects

Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis and may make the skin more susceptible to irritation and penetration by other materials. Under conditions of poor personal hygiene, excessive exposure may lead to irritation.

Other Information

High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

12. ECOLOGICAL INFORMATION

Basis for Assessment

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Mobility

Floats on water. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. If it enters soil, it will adsorb to soil particles and will not be mobile. Large volumes may penetrate soil and could contaminate groundwater.

Persistence / Degradability

Oxidises rapidly by photochemical reactions in air. Major components are inherently biodegradable. Persists under anaerobic conditions. The volatile components oxidise rapidly by photochemical reactions in air.

Bioaccumulation

Contains components with the potential to bioaccumulate. May cause tainting of fish and shellfish.

Ecotoxicity

Poorly soluble mixture. Product is classified as toxic to aquatic organisms, LL/EL50 1 -10 mg/l. (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). Films formed on water may affect oxygen transfer and damage organisms.



13. DISPOSAL CONSIDERATIONS

Waste Disposal

Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor to deal satisfactorily with this type of product should be established beforehand. Do not dispose into the environment, in drains or in water courses. Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.

Product Disposal

As for waste disposal.

Container Disposal

Recycle or dispose of in accordance with the legislation in force with a recognised collector or contractor. Do not pollute the soil, water or environment with the waste product.

14. TRANSPORT INFORMATION

ADG U.N. Number

1863

ADG UN Class

3

ADG Packing Group

III

ADG Hazchem Code

3[Y]

ADG Proper Shipping Name

FUEL, AVIATION TURBINE ENGINE

IMDG UN No

1863

IMDG Hazard Class

3

IMDG Packing Group

III

IMDG Proper Shipping Name

FUEL, AVIATION, TURBINE ENGINE

UN Number (Air Transport, IATA)

1863

IATA Hazard Class

3

IATA Packing Group

III

IATA Proper Shipping Name

FUEL, AVIATION, TURBINE ENGINE

Packaging Method

5.9.3RT1

Other Information

Not a Marine Pollutant under IMDG. MARPOL rules apply for bulk shipments by sea.



15. REGULATORY INFORMATION

EC Symbols	Xn N
EC Risk Phrase	R10 Flammable. R38 Irritating to skin. R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. R65 Harmful: may cause lung damage if swallowed.
EC Safety Phrase	S2 Keep out of reach of children. S23(4) Do not breathe vapour. S24 Avoid contact with skin. S29 Do not empty into drains. S43(1) In case of fire use alcohol resistant foam/dry powder/CO2. Never use water. S61 Avoid release to the environment. Refer to special instructions/safety data sheet. S62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

National Legislation

National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011]

List of Designated Hazardous Substances [NOHSC:10005].

Approved Criteria for Classifying Hazardous Substances [NOHSC:1008].

Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003].

Australian Dangerous Goods Code.

Standard Uniform Scheduling of Drugs and Poisons.

Hazard Category

Harmful, Irritant, Dangerous for the environment, Flammable

Packaging & Labelling

Contains kerosine.

16. OTHER INFORMATION

Revisions Highlighted

No amendments made to information.

SDS Distribution

This document contains important information to ensure the safe storage, handling and use of this product. The information in this document should be brought to the attention of the person in your organisation responsible for advising on safety matters.

References

For detailed advice on Personal Protective equipment, refer to the following Australian Standards :-

HB 9 (Handbook 9) Manual of industrial personal protection.

AS/NZS 1337 Eye protectors for industrial applications.

AS/NZS 1715 Selection, use and maintenance of respiratory protective devices.

AS/NZS 1716 Respiratory protective devices.

Poisons Schedule

NS.

Restrictions

This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

This product is not to be used as a solvent or cleaning agent, for lighting or brightening fires, or as a skin cleanser.

Not to be used as a fuel for automotive vehicles.

Not to be used to prevent waxing in diesel fuel.



List of R Phrases in Section 2

R10 Flammable.

R38 Irritating to skin.

R65 Harmful: may cause lung damage if swallowed.

R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further Information

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It does not constitute a guarantee for any specific property of the product.

... **End Of SDS** ...

