SECTION 1: NAME OF SUBSTANCE AND COMPANY

1.1 Product Identification

Name of Substance: Jet Fuel JET A-1
EC No.: 294-799-5
REACH Registration No.: 01-2119502385-46-0009
CAS No.: 91770-15-9

1.2 Product Use:

Established use**:** fuel

1.3 Detailed Information on MSDS Supplier

Manufacturer:

Public Company *ORLEN Lietuva*
Juodeikiai, LT-89467 Mažeikiai District, Lithuania
Tel.: +370 443 92121
Telefax: +370 443 92525
E-mail address: info@orlenlietuva.lt

1.4. Emergency telephone

Public Company ORLEN Lietuva (24 hours a day): +370 443 92510
Poison Information Bureau. In case of poisoning (24 hours a day): +370 52362052

SECTION 2: POSSIBLE HAZARDS

2.1 Classification

Classification according to Regulation (EC) No. 1272/2008:
Flam. Liq. 3, H226
Asp. Tox. 1, H304
Skin Irrit. 2, H315
STOT SE 3, H336
Aquatic Chronic 2, H411

2.2 Labeling

Labeling and classification according to Regulation (EC) No. 1272/2008
Hazard pictograms

GHS02 GHS08 GHS07 GHS09

Signal word:

DANGER

Hazard statements:
H226: Flammable liquid and vapour**.**
H304: May be fatal if swallowed and enters airways.
H315: Irritating to skin.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:
P102: Keep out of reach of children.
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310**:** IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.

2.3 Other hazards

Jet Fuel (kerosene) is flammable liquid. Light hydrocarbons evaporate slowly. Vapour irritates eyes and respiratory tract. Liquid product splashes irritate eyes and skin. Long-term and repeated contact causes skin dryness and irritation. May cause chemical pneumonia if inhaled to lungs.
Toxic to aquatic organisms. May cause long-term adverse effects to aquatic environment. Risk of soil and ground water contamination.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical composition:
Jet Fuel.

3.1 Components according to Regulation (EC) No. 1272/2008:

Component name	CAS No.	EC No.	Concentration, % m/m
Hydrotreatment kerosene	91770-15-9	294-799-5	Up to 100
Antioxidant	128-39-2, 732-26-3, 98-54-4, 88-18-6	204-884-0, 211-989-5, 202-679-0, 201-807-2	0 – 0,0031
Anti-static agents Stadis (R) 450	no date	no date	0 – 0,0002

SECTION 4: FIRST-AID MEASURES

4.1 Description of first aid measures

General Information
Spillages make surface slippery.
Before attempting to rescue casualties, isolate area from all potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that a safe, breathable atmosphere is present before entry into confined spaces.
Drench contaminated clothing with water before removing to avoid risk of sparks from static electricity.

Inhalation
Inhalation is unlikely because of the low vapour pressure of the substance at ambient temperature. Exposure to vapours may however occur when the substance is handled at high temperatures with poor ventilation. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
If the casualty is unconscious and:
- Not breathing – ensure that there is no obstruction to breathing and give artificial respiration by trained personnel. If necessary, give external cardiac massage and obtain medical assistance.

- Breathing - place in the recovery position and keep the head below the level of the torso. Administer oxygen if necessary.
Obtain medical attention if casualty has an altered state of consciousness or if symptoms do not resolve.

Skin Contact
Immediately remove contaminated clothing and footwear and dispose of safely. Wash affected area thoroughly with soap and water. Seek medical attention if skin irritation, swelling or redness develops and persists.
When using high-pressure equipment, injection of product can occur. If high-pressure injuries occur, immediately seek professional medical attention. Do not wait for symptoms to develop.
For minor thermal burns: Cool the burn. Hold the burned area under cold running water for at least five minutes, or until the pain subsides. However, body hypothermia must be avoided.

Eye Contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. If irritation, blurred vision or swelling occurs and persists, obtain medical advice from a specialist.

Ingestion
The casualty should be sent immediately to a hospital. Do not wait for symptoms to develop. Do not induce vomiting as there is high risk of aspiration (chemical pneumonia). Gastric lavage should be undertaken only after endotracheal intubation.
Do not give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects
Inhalation of vapours may cause headache, nausea, vomiting and an altered state of consciousness. Skin contact – reddening, irritation. Eye contact – slight irritation (unspecific). Ingestion – few or no symptoms expected. If any, nausea and diarrhoea might occur. In case of ingestion, always assume that aspiration has occurred.

4.3 Information to doctor or other competent person providing first aid.
Treatment according to symptoms. In case of ingestion, always assume that aspiration has occurred.

SECTION 5: FIRE-FIGHTING MEASURES

Flammability
Flammable liquid**.**

5.1 Extinguishing Media
Suitable Extinquishing Media
- Foam (specifically trained personnel only),
- Water fog (specifically trained personnel only),
- Dry chemical powder,
- Carbon dioxide,
- Inert gases (subject to regulations),
- Sand or earth,
- Steam.

Unsuitable Extinguishing Media
Do not use direct water jets on the burning product; they could cause splattering and spread the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.

5.2 Hazards arising from the substance

Combustion Products

Incomplete combustion is likely to give rise to a complex mixture of airborne solid and liquid particulates and gases, including carbon monoxide and unidentified organic and inorganic compounds (H_2S, SOx).

Specific Hazards

If tanks or containers with product are exposed to fire, there is danger of explosion due to increased pressure inside the vessel. If spillage of product occurs, the mixture of hydrocarbon vapours and air may explode or ignite of sparks or heated surfaces. Tank cars and storage with product, which are in the direct vicinity of the fire, should be cooled by water jets from the safe distance.

5.3 Protective Equipment for Firefighters and Emergency Responders

Use adequate breathing apparatus, self-contained gas masks and impervious protective clothes. In case of a large fire or in confined or poorly ventilated spaces wear full fire resistant protective clothing and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Protective Equipment and Emergency Procedures

Small spillages: normal antistatic working clothes are usually adequate. Large spillages: full body suit of chemically resistant and antistatic material. Work gloves providing adequate chemical resistance, specifically to aromatic hydrocarbons.

NOTE: Gloves made of PVA are not water-resistant, and are not suitable for emergency use.

Work helmet. Antistatic non-skid safety shoes or boots. Goggles or face shield, if splashes or contact with eyes is possible or anticipated.

Respiratory protection: A half or full-face respirator with filter(s) for organic vapours or a Self Contained Breathing Apparatus (SCBA) can be used according to the extent of spill and predictable amount of exposure. If the situation cannot be completely assessed, or if an oxygen deficiency is possible, only SCBA's should be used.

Kerosene is flammable liquid, any spillage or leak is a severe fire or explosion hazard. Stop or contain leak at the source if safe to do so. Avoid direct contact with released material. Stay upwind. In case of large spillages, alert residents in downwind areas. Keep non-involved personnel away from the area of spillage. Alert emergency personnel. Except in case of small spillages, the feasibility of any actions should always be assessed and advised, if possible, by a trained, competent person in charge of managing the emergency. Eliminate all ignition sources if safe to do so (e.g. electricity, sparks, fires, flares).

If required, notify relevant authorities according to all applicable regulations.

6.2 Environmental Measures and Cleaning Methods

Spillages on to Land

Stop leak at the source if safe to do so. Prevent product from entering sewers, rivers, waterways or other bodies of water. If necessary, dike the product with dry earth, sand or similar non-combustible materials. Large spillages may be cautiously covered with foam, if available, to limit fire risk. Do not use direct jets.

When inside buildings or confined spaces, ensure adequate ventilation.

Spillages on Water or at Sea

Stop leak at the source if safe to do so. In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment.

If possible, large spillages in open waters should be contained with floating barriers or other mechanical means.

6.3 Cleaning Methods and Procedures

Spillages on to Land

Absorb spilled product with suitable non-combustible materials. Collect free product with suitable means. Transfer collected product and other contaminated materials to suitable containers for recycle, recovery or safe disposal.

In case soil contamination, remove contaminated soil and treat this in accordance with local regulations.

Spillages on Water or at Sea

Collect spilled product by absorbing with specific floating absorbents. If this is not possible, control the spreading of the spillage and collect the product by skimming or other suitable mechanical means, only if fire/explosion risks can be adequately prevented. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other materials in suitable tanks or containers for recovery or safe disposal.

Additional Information

NOTE: Recommended measures are based on the most likely spillage scenarios for this material; however, local conditions (wind, air temperature, wave/current direction and speed) may significantly influence the choice of appropriate actions. For this reason, local experts should be consulted when necessary. Local regulations may also prescribe or limit actions to be taken.

Spillages of limited amounts of products, especially in the open air when vapours will be usually quickly dispersed, are dynamic situations, which are unlikely to entail exposure to dangerous concentrations. However, the build-up of dangerous concentrations may occur in specific spots, like trenches, depressions or confined spaces. In all these circumstances, however, the correct actions should be assessed on a case-by-case basis.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid release to the environment. Ensure that all relevant regulations regarding handling and storage facilities of flammable products are followed.

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Use and store only outdoors or in a well-ventilated area. Avoid contact with the product.

7.2 Conditions for safe storage and handling

Handling

During product transfer activities (loading and unloading of mobile tanks) and during sampling there is a risk of static electrical discharge, therefore precautionary measures against static electricity shall be taken.

Properly sealed mobile tank cars should be used for Jet Fuel transportation. Do not use compressed air for filling, discharging, or handling operations.

Ground/bond containers, tanks and transfer/receiving equipment. Use only non-sparking tools.

The vapour is heavier than the air. Beware of accumulation in pits and confined spaces. Use personal protective equipment. Avoid contact with skin and eyesDo not ingest. Avoid breathing vapours.

Storage

Storage area layout, tank design, equipment and operating procedures must comply with the relevant European, national or local legislation. Store product only in tanks or containers designed

for flammable liquids. Storage installations should be designed with adequate bunds so as to prevent ground and water pollution in case of leaks or spills.
Cleaning, inspection and maintenance of internal structure of storage tanks must be done only by properly equipped and qualified personnel as defined by national, local or company regulations. Before entering storage tanks and commencing any operation in a confined area check the atmosphere for oxygen content and flammability.
Kerosene vapours (gaseous hydrocarbons) can build up in the headspace of tanks, they may ignite at temperatures below flash point, therefore, care should be taken to avoid static electrical discharge and all ignition sources during product gauging or sampling from storage tanks.
Store separately from oxidizing agents.

Recommended and Unsuitable Materials for Storage
Recommended materials: For containers (tanks), or container linings use mild steel, stainless steel.
Unsuitable materials: some synthetic materials may be unsuitable for containers or container linings depending on the material specification and intended use. Compatibility should be checked with the manufacturer.

Container Advice lf the Product is Supplied in Containers
Keep only in the original container or in a suitable container for this kind of product. Keep containers tightly closed and properly labeled. Protect from the sunlight.
Light hydrocarbon vapours can build up in the headspace of containers. These can cause flammability/explosion hazards. Empty containers may contain flammable product residues. Do not weld, solder, drill, cut or incinerate empty containers, unless they have been properly cleaned.

7.3 Specific end use
The product is used as jet fuel in jet engines and aviation turbines.

SECTION 8: EXPOSURE CONTROL/ PERSONAL PROTECTION

8.1 Control parameters
Exposure Limits
National occupational exposure limits allowed should be observed. Where not established, the following short-term exposure limit is recommended – 500 mg/m^3.

8.2 Exposure controls
8.2.2 Technical measures
At ambient temperatures kerosene emits small quantities of vapour, however, during various technical and process operations kerosene vapours may be emitted into the environment, therefore the concentration in working environment air shall be controlled to the minimum allowed limit.

8.2.2 Personal Protective Equipment
Respiratory Protection
If during operations the exposure of employees to large amounts of product vapour and gas is inevitable, then suitable respiratory protective equipment, such as A2 filtering mask or analogous should be applied (e.g. acc. to EN 14387). When working in vessel internals or other confined spaces **do not** use filtering masks but the special self-contained protective equipment. Respiratory protection equipment should be selected and used in accordance with the manufacturer's instructions and requirements established by the law.

Eye Protection
Wear safety goggles in circumstances where eye contact may occur (e.g. acc. to EN 166).

Skin and Body Protection
Hand Protection

Wear petroleum product resistant gloves (e.g. acc. to EN 420, EN 388, EN 374-2, EN 374-3).

Other Protective Measures

It is necessary to wear protective clothes (e.g. acc. to EN 465) and other protection equipment. Protective clothing should be regularly inspected and maintained.

Special Hygienic Recommendations

Wash hands before breaks and after work.

8.2.3 Environmental Impact Control

To ensure the compliance of ventilation and process equipment with requirements of environmental legal acts, emissions of such equipment are subject to check ups. In some cases vapour filtering installations or process equipment modifications may be necessary for the reduction of emission to allowed limit.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	clear liquid with low viscosity.
Odour	liquid with a typical odour of hydrocarbons.
pH	insignificant information.
Freezing point	max minus 47 ^{o}C.
Distillation temperature range	150 – 300 ^{o}C.
Flash point	> 40 ^{o}C.
Explosion concentration in air	0.6 – 6.0 % v/v;
Vapour pressure	approximately 2 kPa (at 38 ^{o}C).
Vapour density rel. to air	> 3.
Density at 15^{o}C	775 – 840 kg/m^{3}.
Solubility in water	low solubility (< 50 mg/l at 20 ^{o}C).
Self-ignition temperature	> 220 ^{o}C.
Viscosity at minus 20 ^{o}C	< 8 mm^{2}/s.

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

No hazardous reaction when handled and stored according to provisions.

10.2 Stability

Stable in typical conditions and at ambient temperatures.

10.3 Possibility of hazardous reactions

No known hazardous reactions

10.4 Conditions to Avoid

High ambient temperature. Avoid static electrical discharges and other ignition sources.

10.5 Materials to Avoid

Avoid contact with strong oxidizing agents.

10.6 Hazardous Decomposition Products

Thermal decomposition products vary depending on conditions.
Partial decomposition produces fume, carbon dioxide, carbon monoxide and other harmful gases. Concentration of toxic gas in a confined space or premises may reach a hazardous limit.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Sources of Exposure

The substance may affect human body through skin, if inhaled or swallowed.

Acute toxicity

Experimental acute toxicity data:

Acute oral $LD_{50} > 5000$ mg/kg,
Acute inhalation $LC_{50} > 5200$ mg/m^3,
Acute dermal $LD_{50} > 2000$ mg/kg.

Prolonged and sub-chronic toxicity

Experimental chronic toxicity data:

Sub-chronic repeat dose dermal NOAEL ≥ 400 mg/kg/bw,
Sub-chronic repeat dose inhalation NOAEC ≥ 1000 mg/m^3,
Sub-chronic repeat dose oral NOAEL ≥ 750 mg/kg/bw.

Acute Health Effects

Kerosene vapour slightly irritates eyes and respiratory tract. Liquid product splashes irritate eyes and skin. Irritating to digestive tract if swallowed. May cause chemical pneumonia if liquid product is inhaled to lungs. In case of ingestion assume that aspiration has occurred.

Chronic Health Effects

Prolonged or repeated contact with the product causes drying and irritation of the skin. Vapour irritates eyes and respiratory tract. Prolonged contact with kerosene vapour may cause renal failure.

Reproductive Toxicity

Experimental Data:

Oral NOAEL ≥ 3000 mg/kg/day,
Dermal NOAEL ≥ 494 g/kg/day,
Inhalation NOAEC ≥ 1000 mg/m^3.

NOTE: Handling kerosene under usual conditions causes no toxic hazard.

SECTION 12 ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Hydrocarbons of kerosene (liquid) are harmful to aquatic life; may cause long-term adverse effects in the aquatic environment. Spills may form a film on water surfaces causing physical damage to aquatic fauna and flora. Kerosene vapour is of low toxicity. Absorbed hydrocarbon residues can be harmful to organisms found in organic water sediments.

Experimental Data:

Acute aquatic invertebrate EL_{50} – 1,4 mg/l,
Acute aquatic algae EL_{50} – 1–3 mg/l; NOEL – 1 mg/l,
Acute fish LL_{50} – 2–5 mg/l; NOEL – 2 mg/l,
Long-term aquatic invertebrate EL_{50} – 0,89 mg/l; $NOEL_{50}$ – 0,48 mg/l,
Long-term fish $NOEL_{50}$ – 0,098 mg/l.

12.2 Durability and Degradability

Low biodegradability of kerosene hydrocarbons. Non-biodegradable in the water. Volatile hydrocarbons disperse in the atmosphere.

12.3 Bio-Accumulative Potential

Kerosene hydrocarbons are possibly accumulative in living organisms (tests with fish, hydrocarbon concentrations decline noticeably when fish are transferred into pure water).

12.4 Mobility
Spilled kerosene evaporates slowly from surface soil and water. Dissolves slightly in water. Product may penetrate the soil causing ground water contamination. Degradation occurs extremely slowly under anaerobic (non-oxygen) conditions. Kerosene hydrocarbons can be absorbed in organic materials of soil or water sediments.

12.5 Results of PBT and vPvB assessment
This substance no contains representative hydrocarbons structure were found to meet the PBT or vPvB.

SECTION 13: WASTE MANAGEMENT

13.1 Waste Disposal Methods
Waste is disposed of by de-harming it in accordance with national requirements and local regulations or via a licensed waste disposal contractor. Identify the hazards of waste handling and undertake required safety measures. Personal protective equipment is necessary for waste managing personnel.
Empty tanks and tank cars may contain some remaining product; therefore, hazard-warning labels are to be retained as a guide to the safe tank handling and waste disposal**.** Empty containers represent a fire hazard as they may contain flammable product residues and vapour.

SECTION 14: TRANSPORT INFORMATION

14.1 UN number	1863
14.2 UN proper shipping name	UN 1863, Fuel, aviation, turbine engine, 3, III.
14.3 Transport hazard class	3
14.4 Packing group	III
14.5 Environmental hazard	Environmentally hazardous, sea pollutant.
14.6 Special precautions for users	Not applicable.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No date.

SECTION 15: REGULATORY INFORMATION

15.1 Legislation
Lithuanian:
Commission Regulation (EU) No. 2015/830; Commission Regulation (EU) No. 453/2010; Regulation (EC) No. 1907/2006 of the European Parliament and of the Council; Regulation (EC) No. 1272/2008 of the European Parliament and of the Council; Law on Chemical Substances and Preparations of the Republic of Lithuania (*Official Gazette (Valstybės Žinios)*, 2000, No. 36-987; 2004, No. 116-4329; 2005, No. 79-2846; 2006, No. 65-2381; 2008, No. 76-3000); Order No. 532 /742; 2010, Nr. 145-7434; 2010, Nr. 157-7967; 2012, Nr. 132-6648; Teisės aktų registras, Nr. 2015-11085); Law of the Republic of Lithuania on Packing and Packing Wastes Management (*Official Gazette*, 2001, No. 85-2968; 2005, No.86-3206; 2008, No.71-2699; 2011, Nr. 138-6526; 2012, Nr. 6-191; 2013, Nr. 110-5429; 2013, Teisės aktų registras, Nr. 2014-00038; Nr. 2014-05579; Nr. 2016-00088); Lithuanian Hygienic Norm HN 23:2011 „Concentration Limit Values of

Hazardous Chemicals in Working Environment Air. General Requirements" (*Official Gazette*, 2011, Nr. 38-1804) approved by Order No. V-824/A1-389 of the Minister of Health Care and the Minister of Social Security and Labour of the Republic of Lithuania on 1 September 2011.

15.2 Chemical Safety Assessment
Jet Fuel JET A-1 chemical safety assessment has been conducted.

SECTION 16: OTHER INFORMATION

The Material Safety Data Sheet has been reviewed and the data therein were revised and laid out according the requirements of the Commission Regulation (EU) No. 2015/830.

Abbreviations and acronyms

CAS	Chemical Abstracts Service
EC No	EINECS and ELINCS Number
EL_{50}	Effect Level to 50 % of a test population
EN	European Standard
EU	European Union
LC_{50}	Lethal Concentration to 50 % of a test population
LD_{50}	Lethal Dose to 50% of a test population (Median Lethal Dose)
LL_{50}	Lethal Level to 50 % of a test population
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No Observed Adverse Effect Level
NOEL	No Observed Effect Level
PBT	Persistent, Bioaccumulative and Toxic substance
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation
STOT	Specific Target Organ Toxicity
UN	United Nations
vPvB	Very Persistent and Very Bioaccumulative

Hazard statements:
H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Irritating to skin.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long lasting effects.

Precautionary statements:
P102: Keep out of reach of children.
P210**:** Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.

Do not use Jet Fuel for purposes other than indicated in the manufacturer's information. During such use the user may be exposed to unforeseen hazards.

Should you have any questions or doubts regarding the MSDS, its contents or other issues related to the material safety, please contact us at the address: *info@orlenlietuva.lt*

NOTE. Information provided herein is considered to be accurate as of the date specified below. No warranty is made as to the accuracy or completeness of the data and information provided in this data sheet. Information provided herein serves only as guidelines for safe work, use, processing, storage, and waste management. It cannot be considered as a warranty or quality certificate. This information applies only to specific material designated and may not be suitable for such material used in combination with any other materials or in any other manner not described in this document.

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