

Material Safety Data Sheet

According to the Controlled Product Regulations

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : **AeroShell Fluid 4 (US)**
Uses : Mineral hydraulic fluid for aircraft. For further details consult the AeroShell Book on www.shell.com/aviation.
Product Code : 001E6019

Manufacturer/Supplier : **Shell Canada Products**
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Calgary AB T2P 0J4
Canada

Telephone : (+1) 8006611600
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: CHEMTREC (24 hr): (+1) 800-424-9300
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2. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture Description : Highly refined mineral oils and additives.

The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Refer to Chapter 8 for Occupational Exposure Guidelines.

3. HAZARDS IDENTIFICATION

Routes of Exposure : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Health Hazards : Not expected to be a health hazard when used under normal conditions. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal. High-pressure injection under the skin may cause serious damage including local necrosis. Used oil may contain harmful impurities.

Signs and Symptoms : If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection. Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.

Safety Hazards : Not classified as flammable but will burn.

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Environmental Hazards : Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

Inhalation : No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.

Skin Contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention. 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. Obtain medical attention even in the absence of apparent wounds.

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

Ingestion : If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.

Advice to Physician : Treat symptomatically. Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal. High pressure injection injuries require prompt surgical intervention and possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential. Call a doctor or poison control center for guidance.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : Typical 105 °C / 221 °F (PMCC / ASTM D93)

Upper / lower Flammability or Explosion limits : Typical 1 - 10 %(V)(based on mineral oil)

Auto ignition temperature : > 320 °C / 608 °F

Hazardous Combustion Products and Specific : Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases

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| Hazards | : | (smoke). Carbon monoxide. Unidentified organic and inorganic compounds. |
| Suitable Extinguishing Media | : | Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. |
| Unsuitable Extinguishing Media | : | Do not use water in a jet. |
| Protective Equipment for Firefighters | : | Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space. |

6. ACCIDENTAL RELEASE MEASURES

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| Protective Measures | : | Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. |
| Clean Up Methods | : | Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly. |
| Additional Advice | : | Local authorities should be advised if significant spillages cannot be contained. |

7. HANDLING AND STORAGE

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| General Precautions | : | Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. |
| Handling | : | Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. |
| Storage | : | Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Storage Temperature: -50 - 50 °C / -58 - 122 °F |
| Recommended Materials | : | For containers or container linings, use mild steel or high density polyethylene. |
| Unsuitable Materials | : | PVC. |
| Additional Information | : | Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion. |

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

If the American Conference of Governmental Industrial Hygienists (ACGIH) value is provided on this document, it is provided for information only.

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Occupational Exposure Limits

| Material | Source | Type | ppm | mg/m3 | Notation |
|-------------------|--------|--------------------------|-----|---------|----------|
| Oil mist, mineral | ACGIH | TWA(Inhalable fraction.) | | 5 mg/m3 | |

Consult local authorities for acceptable exposure limits within their jurisdiction.

- Exposure Controls** : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
- Personal Protective Equipment** : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.
- Respiratory Protection** : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].
- Hand Protection** : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. 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.
- Protective Clothing** : Skin protection is not required under normal conditions of use. It is good practice to wear chemical resistant gloves.
- Monitoring 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 OEL and adequacy of exposure

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controls. For some substances biological monitoring may also be appropriate.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Red. Liquid at room temperature.
 Odour : Slight hydrocarbon.
 Odour threshold : Data not available
 pH : Not applicable.
 Initial Boiling Point and Boiling Range : > 280 °C / 536 °F estimated value(s)
 Pour point : < -60 °C / -76 °F

Vapour pressure : < 0.5 Pa at 20 °C / 68 °F (estimated value(s))
 Specific gravity : Typical 0.874 at 15 °C / 59 °F

Density : Typical 874 kg/m³ at 15 °C / 59 °F
 Water solubility : Negligible.
 n-octanol/water partition coefficient (log Pow) : > 6 (based on information on similar products)
 Kinematic viscosity : Typical 14 - 17 mm²/s at 40 °C / 104 °F
 Vapour density (air=1) : > 1 (estimated value(s))
 Evaporation rate (nBuAc=1) : Data not available

10. STABILITY AND REACTIVITY

Stability : Stable.
Conditions to Avoid : Extremes of temperature and direct sunlight.
Materials to Avoid : Strong oxidising agents.
Hazardous Decomposition Products : Hazardous decomposition products are not expected to form during normal storage.
Hazardous Polymerisation : No
Sensitivity to Mechanical Impact : No
Sensitivity to Static Discharge : No

11. TOXICOLOGICAL INFORMATION

Basis for Assessment : Information given is based on data on the components and the toxicology of similar products.
Routes of Exposure : Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.
Acute Oral Toxicity : Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat. Aspiration into the lungs may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity : Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit.

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| Acute Inhalation Toxicity | : Not considered to be an inhalation hazard under normal conditions of use. |
| Skin Irritation | : Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis. |
| Eye Irritation | : Expected to be slightly irritating. |
| Respiratory Irritation | : Inhalation of vapours or mists may cause irritation. |
| Sensitisation | : Not expected to be a skin sensitiser. |
| Repeated Dose Toxicity | : Not expected to be a hazard. |
| Mutagenicity | : Not considered a mutagenic hazard. |
| Carcinogenicity | : Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies. Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC). Other components are not known to be associated with carcinogenic effects. |
| Reproductive and Developmental Toxicity | : Not expected to be a hazard. |
| Additional Information | : Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible. High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed. |

12. ECOLOGICAL INFORMATION

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.

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| Acute Toxicity | : Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be harmful: LL/EL/IL50 10-100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract.) |
| Mobility | : Liquid under most environmental conditions. Floats on water. If it enters soil, it will adsorb to soil particles and will not be mobile. |
| Persistence/degradability | : Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment. |
| Bioaccumulation | : Contains components with the potential to bioaccumulate. |
| Other Adverse Effects | : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential. |

13. DISPOSAL CONSIDERATIONS

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- Material Disposal** : Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
- Container Disposal** : Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
- Local Legislation** : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION**Canadian Road and Rail Shipping Classification**

This product is not regulated under the Canadian Transportation of Dangerous Goods Regulations for transport by road and rail.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

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 CPR.

Inventory Status

- EINECS : All components listed or polymer exempt.
- TSCA : All components listed.
- DSL : All components listed.

16. OTHER INFORMATION

- MSDS Version Number** : 1.0
- MSDS Effective Date** : 02-08-2012
- MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.
- MSDS Regulation** : The content and format of this (M)SDS is in accordance with the Controlled Product Regulations.
- MSDS Prepared By** : Shell Product Stewardship; 1-800-661-1600

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- Uses and Restrictions** : Not to be used as an engine lubricating oil. This product must not be used in systems incorporating natural rubber. This product must be used, handled and applied in accordance with the requirements of the equipment manufacturer's manuals, bulletins and other documentation.
- MSDS Distribution** : The information in this document should be made available to all who may handle the product.
- Disclaimer** : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.