SECTION 1. IDENTIFICATION

Product name: GAS OIL

Synonyms: Straight-Run Gas Oil, Atmospheric Gas Oil (AGO), Hydrocracked Gas Oil, Light Vacuum Gas Oil (LVGO), Heavy Vacuum Gas Oil (HVGO), Virgin Light Gas Oil (VLGO), HVGO/LVGO, vacuum gas oils, light gas oil, heavy gas oil, hydrotreated gas oil, ER52

Manufacturer or supplier's details
SUNCOR ENERGY INC.
P.O. Box 2844, 150 - 6th Avenue South-West
Calgary Alberta T2P 3E3
Canada

Emergency telephone number
Suncor Energy: +1 403-296-3000;
Canutec Transportation: 1-888-226-8832 (toll-free) or 613-996-6666;
Poison Control Centre: Consult local telephone directory for emergency number(s).

Recommended use of the chemical and restrictions on use
Recommended use: Gas Oils are complex mixtures of paraffinic crude petroleum process oils, produced in the crude primary distillation tower and the hydrocracker. They are used as feed to other refinery units.

Prepared by: Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Viscous liquid or waxy solid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Light amber to dark green</td>
</tr>
<tr>
<td>Odour</td>
<td>Gasoline like or waxy, hydrocarbon-like, &quot;Rotten egg&quot; if H2S present, but odour is an unreliable warning, since it may deaden the sense of smell.</td>
</tr>
</tbody>
</table>

GHS Classification
Flammable liquids: Category 4
Acute toxicity (Inhalation): Category 4
Skin irritation: Category 2
Skin sensitisation: Category 1
Germ cell mutagenicity: Category 1B
Carcinogenicity: Category 1B
Reproductive toxicity: Category 1B
Specific target organ toxicity - repeated exposure: Category 2 (Liver, Blood, thymus, Bone marrow)

GHS label elements
Hazard pictograms:

Signal word: Danger
Hazard statements: Combustible liquid.
Causes skin irritation.
May cause an allergic skin reaction.
Harmful if inhaled.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause damage to organs (Liver, Blood, thymus, Bone marrow) through prolonged or repeated exposure.

Precautionary statements: Prevention:
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF ON SKIN: Wash with plenty of water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/ attention.
If skin irritation or rash occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place.
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.
Potential Health Effects
Primary Routes of Entry : Eye contact
                        : Ingestion
                        : Inhalation
                        : Skin contact

Aggravated Medical Condition : None known.

Other hazards
None known.

IARC
Group 1: Carcinogenic to humans
Polynuclear aromatic hydrocarbon 130498-29-2

Group 2A: Probably carcinogenic to humans
Gas oils, petroleum, heavy vacuum 64741-57-7
Gas oils, petroleum, light vacuum 64741-58-8

ACGIH
Suspected human carcinogen
Polynuclear aromatic hydrocarbon 130498-29-2

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>gas oils (petroleum), heavy vacuum</td>
<td>64741-57-7</td>
<td>100 %</td>
</tr>
<tr>
<td>Gas oils (petroleum), light vacuum</td>
<td>64741-58-8</td>
<td></td>
</tr>
<tr>
<td>Gas oils (petroleum), straight-run</td>
<td>64741-43-1</td>
<td></td>
</tr>
<tr>
<td>distillates (petroleum), vacuum</td>
<td>70592-78-8</td>
<td></td>
</tr>
<tr>
<td>Polycyclicaromatic hydrocarbons</td>
<td>130498-29-2</td>
<td>&lt; 10 %</td>
</tr>
<tr>
<td>hydrogen sulphide</td>
<td>7783-06-4</td>
<td>0.005 %</td>
</tr>
</tbody>
</table>

All above concentrations are in percent by weight.

SECTION 4. FIRST AID MEASURES
If inhaled: Move to fresh air. Artificial respiration and/or oxygen may be necessary. Seek medical advice.

In case of skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Wash clothing before reuse. Seek medical advice.

In case of eye contact: Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

If swallowed: Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.

Most important symptoms and effects, both acute and delayed: Respiratory, skin and eye irritation; nausea; cancer. Inhalation may cause central nervous system effects. Contact with hot product will cause thermal burns. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Exposure to very high levels of hydrogen sulphide (> 500 ppm) will result in unconsciousness and death. Symptoms of hydrogen sulphide overexposure include respiratory tract irritation and shortness of breath.

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media: Dry chemical Carbon dioxide (CO2) Water fog Foam

Unsuitable extinguishing media: Do NOT use water jet.

Specific hazards during firefighting: Cool closed containers exposed to fire with water spray.

Hazardous combustion products: Carbon oxides (CO, CO2), reactive hydrocarbons, smoke and irritating vapours as products of incomplete combustion.

Further information: Prevent fire extinguishing water from contaminating surface
water or the ground water system.

Special protective equipment for firefighters:
- Wear self-contained breathing apparatus and full protective wear.
- Wear a positive-pressure supplied-air respirator with full face-piece.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:
- For personal protection see section 8.
- Ensure adequate ventilation.
- Evacuate personnel to safe areas.
- In case of inadequate ventilation wear respiratory protection.
- Avoid breathing vapour or mist.

Environmental precautions:
- If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up:
- Prevent further leakage or spillage if safe to do so.
- Clean up promptly by sweeping or vacuum.
- Remove all sources of ignition.
- Soak up with inert absorbent material.
- Non-sparking tools should be used.
- Ensure adequate ventilation.
- Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling:
- For personal protection see section 8.
- Smoking, eating and drinking should be prohibited in the application area.
- In case of insufficient ventilation, wear suitable respiratory equipment.
- Avoid contact with skin, eyes and clothing.
- Do not ingest.
- Avoid exposure - obtain special instructions before use.
- Avoid contact during pregnancy/while nursing.
- Use only with adequate ventilation.
- Do not enter places where used or stored until adequately ventilated.
- Use explosion-proof equipment.
- Hydrogen sulphide may accumulate in enclosed spaces.
- Open tank car hatches with caution.
- Do not use sparking tools.
- Ensure all equipment is electrically grounded before beginning transfer operations.
- Empty containers retain product residue and can be hazardous.

Conditions for safe storage:
- Store in original container.
- Containers which are opened must be carefully resealed and kept upright to prevent leakage.
- Keep in a dry, cool and well-ventilated place.
- Keep in properly labelled containers.
To maintain product quality, do not store in heat or direct sunlight. Ensure the storage containers are grounded/bonded. Hydrogen sulphide may accumulate in enclosed spaces. Open tank car hatches with caution.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrogen sulphide</td>
<td>7783-06-4</td>
<td>TWA</td>
<td>10 ppm&lt;br&gt;14 mg/m³</td>
<td>CA AB OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling</td>
<td>15 ppm&lt;br&gt;21 mg/m³</td>
<td>CA AB OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling</td>
<td>10 ppm</td>
<td>CA BC OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>10 ppm</td>
<td>CA ON OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>15 ppm</td>
<td>CA ON OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWAEV</td>
<td>10 ppm&lt;br&gt;14 mg/m³</td>
<td>CA QC OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEV</td>
<td>15 ppm&lt;br&gt;21 mg/m³</td>
<td>CA QC OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>1 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>5 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Engineering measures: Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded. Use only in well-ventilated areas. Use explosion-proof ventilation equipment.

Personal protective equipment

Respiratory protection: Concentration in air determines protection needed. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. If hydrogen sulphide is present full-face supplied air respirator with escape bottle or SCBA is required.

Filter type: A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection. Wear a NIOSH-approved respirator/breathing apparatus in situations where there may be potential for airborne exposure.
Hand protection
Material: polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Remarks: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection: Wear face-shield and protective suit for abnormal processing problems.

Skin and body protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Protective measures: Wash contaminated clothing before re-use. Wear suitable protective equipment.

Hygiene measures: Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Viscous liquid or waxy solid.

Colour: Light amber to dark green

Odour: Gasoline like or waxy, hydrocarbon-like, "Rotten egg" if H2S present, but odour is an unreliable warning, since it may deaden the sense of smell.

Odour Threshold: No data available

pH: No data available

Melting point: 0 - 50 °C (32 - 122 °F)(approx)

Boiling point/boiling range: 205 - 600 °C (401 - 1112 °F)

Decomposition temperature: No data available

Flash point: > 80 °C (176 °F)
Method: Pensky-Martens closed cup

Auto-Ignition Temperature: 355 °C (671 °F)
Edmonton Hydrotreated Gas Oil

Evaporation rate : No data available
Flammability : Combustible.
Upper explosion limit : No data available
Lower explosion limit : No data available
Vapour pressure : negligible
Relative vapour density : No data available
Relative density : No data available
Density : 0.88 - 0.94 kg/l (15 °C / 59 °F)

Solubility(ies)
Water solubility : insoluble
Partition coefficient: n-octanol/water : No data available

Viscosity
Viscosity, kinematic : > 20.5 mm2/s (40 °C / 104 °F)
Varies with crude sources.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No dangerous reaction known under conditions of normal use.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions : Hazardous polymerisation does not occur.
Conditions to avoid : Extremes of temperature and direct sunlight.
Incompatible materials : Reactive with oxidising agents and acids.
Hazardous decomposition products : May release COx, SOx, reactive hydrocarbons, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Eye contact
Ingestion
Inhalation
Skin contact

Acute toxicity
SAFETY DATA SHEET

GAS OIL

000003000814

Version 5.0  Revision Date 2019/05/21  Print Date 2019/05/21

Product:
Acute oral toxicity: Remarks: Based on available data, the classification criteria are not met.
Acute inhalation toxicity: Remarks: Harmful if inhaled.
Acute dermal toxicity: Remarks: Based on available data, the classification criteria are not met.

Components:
gas oils (petroleum), heavy vacuum:
Acute inhalation toxicity: LC50 (Rat): 4.1 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Gas oils (petroleum), light vacuum:
Acute inhalation toxicity: LC50 (Rat): 4.1 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

hydrogen sulphide:
Acute inhalation toxicity: LC50 (Rat): 444 ppm
Exposure time: 4 h
Test atmosphere: gas

Skin corrosion/irritation
Product:
Remarks: Causes skin irritation.

Serious eye damage/eye irritation
Product:
Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation
Product:
Remarks: May cause an allergic skin reaction.

Germ cell mutagenicity
Product:
Germ cell mutagenicity-Assessment: May cause genetic defects.

Carcinogenicity
Product:
Carcinogenicity - Assessment: May cause cancer.

Reproductive toxicity
Product:
Reproductive toxicity - Assessment
May damage fertility or the unborn child.

STOT - single exposure
Product:
Remarks: Based on available data, the classification criteria are not met.

STOT - repeated exposure
Product:
Target Organs: Liver, Blood, thymus, Bone marrow
Remarks: May cause damage to organs through prolonged or repeated exposure.

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:
Toxicity to fish : Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available
Toxicity to algae : Remarks: No data available
Toxicity to bacteria : Remarks: No data available

Persistence and degradability

Product:
Biodegradability : Remarks: No data available

Bioaccumulative potential
No data available
Mobility in soil
No data available
Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Internet: www.petro-canada.ca/msds
**SECTION 14. TRANSPORT INFORMATION**

**International Regulations**

**IATA-DGR**
- **UN/ID No.**: UN 3082
- **Proper shipping name**: Environmentally hazardous substance, liquid, n.o.s.
  (Gas oils (petroleum), heavy vacuum)
- **Class**: 9
- **Packing group**: III
- **Labels**: Class 9 - Miscellaneous Dangerous Goods
- **Packing instruction (cargo aircraft)**: 964

**IMDG-Code**
- **UN number**: UN 3082
- **Proper shipping name**: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
  (Gas oils (petroleum), heavy vacuum)
- **Class**: 9
- **Packing group**: III
- **Labels**: 9
- **EmS Code**: F-A, S-F
- **Marine pollutant**: yes

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

**National Regulations**

**TDG**
- **Not regulated as a dangerous good**
- **Proper shipping name**:
- **Marine pollutant**: yes

If this product is shipped over water, TDG classification would be the same as IMDG classification.
This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.

The components of this product are reported in the following inventories:
DSL On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

For Copy of SDS : Internet: www.petro-canada.ca/msds
Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228
For Product Safety Information: 1 905-804-4752

Prepared by : Product Safety: +1 905-804-4752
Revision Date : 2019/05/21

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.