ARTHURS FUEL
FIRE SAFETY PLAN

202350 Dufferin County Road 109,
East Garafraxa, Ontario

April 7, 2020

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A. OUTLINE

Arthurs Fuel has prepared this Fire Safety Plan to provide the Grand Valley and District Fire Department with information regarding the hazardous products stored and handled at the facility at 202350 Dufferin County Road 109, East Garafraxa, Ontario. The plan has been prepared in accordance with the Ontario Fire Marshall Guidelines for Fire Safety Planning for Industrial Occupancies. The plan also identifies the safety features, operating principles, emergency equipment, contact information and emergency response plan of the facility such that the fire department can confidently respond to emergencies at the facility should they arise.

The plan will be reviewed on an annual basis and any changes would be submitted as they occur to the Grand Valley and District Fire Department:

2 Industrial Drive
Grand Valley, Ontario
L9W 6N9
519-928-3460

B. OWNER/OPERATOR

Owner

Arthurs Fuel
202350 Dufferin County Road 109
East Garafraxa, Ontario L9W 7N1
Telephone: 519-941-0004
Toll Free: 866-644-9326
Fax: 519-928-1100
Primary Contact: Brian Arthurs

Operator

Arthurs Fuel
202350 Dufferin County Road 109
East Garafraxa, Ontario L9W 7N1
Telephone: 519-941-0004
Toll Free: 866-644-9326
Fax: 519-928-1100
Primary Contact: Brian Arthurs

Alternate Contact: Scott Arthurs
Telephone: 519-939-0750

C. FACILITY OPERATIONS

The Arthurs Fuel Bulk Storage and Propane Filling Plant in the Township of East Garafraxa is in an agricultural area with some commercial and residential properties located to the north and west of the property in the Township of East Garafraxa. The site is at the intersection of Dufferin County Road 109 and Concession Road 5 on the south east corner. The propane operation is part of a bulk fueling depot and administration, commercial and warehouse complex. The propane operation is confined to the south east corner of the yard and is some distance away from the petroleum loading and distribution facility on the property.

At the western entrance there are customer parking facilities in front of the main building operating as a "Home Hardware". The building is used for administrative purposes as well as for a showroom displaying Home Hardware's products. The back of the building is used for storage and for pick-up and delivery services. The building also houses an electrical room where the main electric equipment and panels are located. The power is distributed to the pumps and compressor operation and various control stations. Two greenhouses are located adjacent to the Home Hardware building that are used as a garden centre.

The warehouse building houses equipment and parts for the heating and air-conditioning business of Arthurs Fuel's business and is also used as a shop for millwrights to work with ducting and metals for use in the heating and air-conditioning operation. A portable building is located behind the warehouse that is used as a dispatch building. Storage trailers and shipping containers are located within the fenced area and are used to store new and old equipment and parts for the HVAC business.

A well is used for potable water and a septic tank and bed are used for sanitary services. The buildings are insulated and heated using propane and fuel oil. A stand-by diesel generator is installed adjacent to the main administration building inside the yard. This is used for back-up power in the case of an electrical outage.

The facility also includes a retail petroleum station with dispenser islands under a canopy located in the north east area of the site. The propane bulk plant conducts transfer operations to and from tank trucks within the fenced compound east of the buildings, as well as filling of cylinders of various sizes. Bulk propane vehicles enter and exit the compound through the south gate.

Bulk propane is received from Sarnia, Ontario in specialized propane trailers. Product is pumped from the propane transport (single or dual trailer), using on board vehicle pumps into four 30,000 USWG horizontal propane storage tanks. The transport driver will park the tank trailer at the unloading bulkheads, connect the bulk plant unloading hoses to the pumping system on the bottom of the tank trailers. The location of the two unloading bulkheads will allow dual trailers to connect the main trailer and pup trailer at the same time. Propane can also be unloaded at a third unloading bulkhead if needed. The process piping downstream of the bulkheads is equipped with backcheck valves in the liquid fill lines and Emergency Shut-off Valves (ESVs) in the vapour equalization piping. These valves are designed to reduce the amount of product lost in the event of a pull away. All bulkheads are equipped with cables that are connected to a limit switch or "microswitch" for pull away protection. In the event of a pull away, the cable pulls the pin from the microswitch. This sends an electrical signal to the Programmable Logic Controller (PLC) panel to initiate the emergency shutdown sequence.

Propane is delivered to the facility by third party propane transport trucks and in propane transport trucks owned and operated by Arthurs Fuel. Tank trucks (or bobtails) are loaded at one of two loading bulkheads on the south side of the tanks. The loading bulkheads will operate independently of each other but are piped so they can both be supplied by one of two centrifugal pumps. Both pumps run simultaneously to feed the western bulkhead while only one pump is used to feed the eastern bulkhead. Both loading bulkheads are equipped with Weights & Measures approved meter for third parties who purchase propane from Arthurs Fuel. Propane is pumped using pumps that are controlled using a start/stop button. The liquid filling lines are equipped with ESVs. The driver will position the tank truck at the loading bulkhead, connect the transfer hoses, and activate the loading pump. The driver is responsible to ensure the truck is not overfilled. The piping system is equipped with a differential pressure bypass valve. The bypass valve opens when there is a blockage downstream of the pump. Propane that flows through the bypass returns to the storage tanks.

All tank openings are equipped with Internal Safety Control Valves (ISCs). ISCs are valves that are either threaded into or connected by flange to the tank openings and allow product to exit the tanks when they are pneumatically actuated. ISCs also have an excess flow feature, where even if the ISCs were held open pneumatically during a significant leak, the ISCs would be forced to close. Both ISCs and ESVs are pneumatically actuated by a central nitrogen cylinder source near the storage tanks. Solenoid valves controlled by the PLC system control the pressurization of specific pneumatic lines to open the required ESVs and ISC valves for transfer operations. The release of pressure by the solenoid valves inside the enclosures at the tank piers will automatically close all the ISCs and the ESVs. Loss of pressure inside the nitrogen lines will also close all the ISCs and ESVs, mitigating any damage caused during a leak and when no bulk plant staff are present.

The main storage tanks are equipped with liquid level float gauge transmitters that allow for constant monitoring of the volume of product in the tanks. The PLC control monitors when the tanks are being filled and if a tank exceeds the maximum limit, a visual alarm will be initiated at the bulkhead. This will inform the driver that the contents of the tank are at the maximum permissible amount. The transmitters are also used to monitor the tank inventory so the administration staff can see what volume remains in the tanks. Tank levels are displayed on Precision Digital Display on the control panel inside the electrical room.

Cylinders are filled in a 10’x10’ cylinder fill building located west of the propane tanks. Empty cylinders are filled with liquid propane by weight using scales equipped with automatic shut off valves to ensure cylinders are not overfilled. Propane is supplied to the cylinder fill dock by a turbine pump near the tanks. The pump is protected with a bypass valve that allows over pressurized product to return to the storage tanks. This pump can be started and stopped from the cylinder fill building. Transient tanks and cylinders are stored along the northern and eastern fence line of the facility, at the centre of the yard, and in cylinder cabinets behind the garden centre. All fuel and propane vehicles are parked within the fenced in area on the north side of the yard and behind the warehouse building.

The facility has the capability to evacuate partially full tanks and cylinders for service or maintenance. The 1,000 USWG nurse tank is located near the main storage tanks and is used to evacuate the transient tanks and small cylinders returning from customers. The evacuation equipment is permanently piped to the nurse tank. In evacuation mode, a compressor depressurizes the nurse tank (compressing vapour to the main storage tank). This reduces the pressure in the nurse tank and allows liquid propane from the transient tanks or cylinders to flow to the nurse tank. Once evacuation has stopped or the nurse tank is full, the compressor’s 4-way valve is

positioned such that the compressor pressurizes the nurse tank, allowing liquid propane to flow from the nurse tank to the main storage tanks.

Retail customer cylinders, motor vehicles, and RV's are refueled at a propane dispenser with a 1,996 USWG storage tank located outside the fenced compound in the customer parking lot adjacent to the Home Hardware. This is a completely independent stand-alone operation located in the retail section of the facility. Vehicle refueling and cylinder filling are carried out only by authorized and trained personnel. Once a person is trained, they are given access to activate the dispensing system via a card-lock unit. A pull away valve is used to protect the hose from vehicles accidentally driving off with the hose connected. Any person with the proper training certificate can operate the dispenser. All propane dispensed through the automotive fuel dispenser is metered using a meter approved by Weights and Measures Canada. Cylinders are filled by weight using a scale. Propane is pumped to the cylinder cabinet or fuel dispenser from the 1,966 USWG tank using a small pump. The tank liquid outlet is equipped with an ISC. The piping also utilizes a bypass line that can return product to the tank through a separate opening. The 1,996 USWG tank is filled by company bobtail trucks when required.

All piping systems conform to all provincial and federal codes, standards, and regulations. All ESVs and back checks are installed within the appropriate distances required by the CSA B149.2 standard. All sections of piping intended for liquid service that can be isolated with positive shut-off valves are equipped with Hydrostatic Relief Valves (HRVs). HRVs are set to release propane vapour to atmosphere when the pressure in the piping segment is above the design pressure. The propane storage tanks are equipped with all required appurtenances including fixed liquid level gauges, thermometers, rotary gauges, and pressure relief valves. All electrical equipment (including pump motors) are appropriately classified according the hazardous location they are in, either Class 1 Zone 1, or Class 1 Zone 2 Group D. Tank trucks are grounded using ground clamps at each bulkhead during transfer operations, and grounding rods are installed on the 30,000 USWG storage tanks and bulkheads.

Fire extinguishers are located near all transfer areas and within the buildings. There is also an emergency stop system that will shut-down the pumps and compressor, sound an alarm and close all pneumatic actuators and solenoid valves. The emergency stop system is activated using push buttons, or when the pneumatic system detects a leak after it has charged. Each ESV and ISC actuator is equipped with a thermal plug that will melt in the event of a fire causing all actuated ESV and ISC valves in the system to close, mitigating product loss. This will also sound the alarm and shutdown motors.

There are 50 employees working out of the facility. The hours of operation for the office are 7:00 AM to 5:00 PM, Monday to Friday throughout the year. The gasoline operation will be manned until 10:00 PM most evenings and 8:00 am to 7:00 pm on Saturdays and Sundays. The facility is completely enclosed by a 1.8 m high chain link fence. Security cameras are located at the retail areas and storage yard to monitor activity in and around the plant and to detect intruders or problems after hours. The facility contains a primary vehicle access gate that are closed at all times when the plant is unattended and is accessed by authorized personnel with PIN access. All pneumatic valves are closed when propane equipment is not in use. Any visitors to the bulk plant must sign in and sign out and must be accompanied by company personnel within the facility. Service contractors are trained on emergency procedures if working at the facility unattended by Arthurs Fuel personnel. Liquid fuel and propane trucks are parked within the fenced yard and employees park in designated areas.

Only minor repairs to cylinders and tanks are made at this facility. New tanks and cylinders are prepared for service. Most new containers are vacuum purged prior to

arriving on site, those that are not are purged by venting conducted in accordance with CAN/CSA B149.2. Cylinders are purged within the cylinder fill area, while tanks are purged on site using bobtails.

In addition to the propane storage, the facility stores 1-25,000L premium, 1-80,000L Regular, 2-80,000L Diesel, and 2-80,000L Dyed Diesel in above ground double walled steel tanks inside the fenced area. The fuel tanks are separated from the propane main storage tanks by approximately 40 m. The facility also stores 1-2,200L Furnace Oil, 1-4,500L Furnace Oil, 1-2,200L Kerosene, 1-2,200L Dyed Diesel, 1-4,500L Dyed Diesel, 1-2,200L Scrap Furnace Oil, 1,300L Scrap Anti Freeze, and 1-2,200L Used Motor Oil in above ground double walled steel tanks inside the fenced area, behind the warehouse building. A 2,270L fuel oil tank is located behind the garden centre. The fuel oil tank feeds the oil furnace in the garden centre.

The facility also stores small amount of compressed gases located near the overhead door of the warehouse building such as acetylene, oxygen & nitrogen. Lubricants, small quantities of methanol, empty propane cylinders, and small quantities of Diesel Exhaust Fluid (DEF) are stored inside the buildings. DEF is not considered a hazardous substance and can be handled and stored safely.

D. OFM GUIDLINE FIRE SAFETY PLAN FOR INDUSTRIAL OCCUPANCIES

1.0 FIRE SAFETY AUDIT

1.1 Site Plan (see Appendix A)

a. The property size is approximately 6.2 acres in size, fronting on County Road 5
b. 1.8 m high chain link fence encloses the propane and petroleum operations
c. Two truck gates into facility, one at the southern end, one at the north western end. A fire department information box and lock box are installed at the office building main entrance
d. Neighbouring sites
    i. North – Agricultural, residential and commercial
    ii. South – Industrial
    iii. East – Commercial and agricultural
    iv. West – Agricultural
e. Point of entry for fire vehicles
    i. South entrance off of County Road 5
f. Other points of entry
    i. Nil
g. Fire access roadway
    i. Paved entrance into facility,
    ii. Heavy duty graveled roadways within fenced area for 70 ton capacity vehicles, and
    iii. Snow is removed from all trafficked areas
h. Buildings on site
    i. 850.8 m^2 showroom, office and warehouse building – showroom is single storey, office is two storey, warehouse is single storey, material of construction is wood frame with concrete block and metal siding, outside of fenced area

ii. 443.8 m^2 shop/warehouse – single story, material of construction is wood frame with concrete block and metal siding, inside of fenced area
iii. 167.6 m^2 greenhouse – single story, aluminum frame with plastic panels, inside of fenced area
iv. 9.3 m^2 cylinder filling building - wood frame, metal siding on concrete foundation, inside of fenced area
v. 37.9 m^2 portable building – wood frame, metal and glass clad, inside of fenced area
vi. Six 14.9 m^2 shipping containers used for storage
vii. Five 41.8 m^2 trailers used for storage –metal clad

i. Water supplies
    i. Well is located on site for potable water use only. In the event of a fire, water will be supplied on a limited basis by the Grand Valley and District Fire Department

j. Outdoor storage areas
    i. Petroleum products such as diesel, gasoline and propane
    ii. Compressed gases such as acetylene, oxygen & nitrogen

k. Hazardous materials
    i. Four 30,000 USG tanks designed as per CSA B51 Code containing propane (PIN UN1075) with piping as per CAN/CSA B149.1 and B149.2 Codes
        1. Capacity when full (88.6% at 15 ºC) is approximately 402,465 litres
        2. Permanently mounted storage vessels with steel saddles above ground on concrete piers
    ii. One 1,996 USG tank for dispenser designed as per CSA B51 Code containing propane (PIN UN1075) with piping as per CAN/CSA B149.1 and B149.2 Codes
        1. Capacity when full (80%) is approximately 6,045 litres
    iii. One 1,000 USG heating tank
    iv. One 420 lb propane heating cylinder and power the backup generator
    v. No underground tanks
    vi. Bulk trucks containing propane (PIN UN 1075) and fuel trucks are parked along the northern fence and behind the warehouse building
    vii. Quantities of propane cylinders and propane tanks for customer applications are stored at the facility in designated areas with appropriate clearances and setbacks as per CAN/CSA B149.2
    viii. One 25,000 litres premium, one 80,000 litres regular, two 80,000 litres diesel, two 80,000 litres dyed diesel, one 2,200 litres furnace oil, one 4,500 litres furnace oil, one 2,200 litres kerosene, one 2,200 litres dyed diesel, one 4,500 litres dyed diesel, one 2,200 litres scrap furnace oil, one 1,300 litres scrap anti freeze, one 2,200L used motor oil, and one 2,270 litres furnace oil in above ground double walled steel tanks
    ix. Small amount of compressed gases located near the overhead door of the warehouse building such as acetylene, oxygen & nitrogen
    x. Two nitrogen cylinders located near the storage tank supply emergency shut down systems
    xi. No retail/consumer access to yard.

l. Waterways, dikes, drains, sewer and manholes
    i. Surface drainage sloping to the road ditches that are located along County Road 109 and County Road 5,
    ii. An oil/water separator installed at the site for capture and retention of any oil or gasoline spills in an underground tank. The water collected in the oil/water separator is pumped out to the ditch along County Road 109. The residual oil and petroleum material collected is checked routinely. A vacuum truck empties the tank of product for proper disposal
m. Gas shut-off valves and other isolation valves
    i. Emergency shutdown buttons are located throughout the facility for shutting down transfer operations and sounding the emergency siren
    ii. Isolation valves for piping from the 1,000 USG tank and 420 lb cylinder for building heat
    iii. No natural gas service to property
n. Electrical facilities
    i. Power lines are located along County Road 109 and County Road 5, an underground service line supplies power to the electrical service panel
    ii. Main electrical room and panels are located inside the office/showroom building

1.2 Buildings

Office and Showroom

a. Building construction
    i. Wood frame with concrete block and metal siding, outside of fenced area
b. Building size
    i. 850.8 m^2
c. Number of stories
    i. Showroom is single storey, office area is two storey, warehouse is single storey, no basement
d. Use and Occupancy of building
    i. Office space, showroom, electrical room, washroom, warehouse, and customer reception
e. Fire walls, fire separators
    i. Nil
f. Explosion relief vents
    i. Nil
g. Fire department access points
    i. Eight man doors
    ii. Two overhead doors
h. Portable fire extinguishers
    i. Eight fire extinguishers within the building
i. Emergency notification system
    i. Nil
j. Sprinkler system
    i. Nil
k. Fire standpipe (hose) system
    i. Nil
l. Fire department pumper connections
    i. Nil
m. Water supply control valves and fire pumps
    i. Nil

n. Exits
    i. Eight man doors
    ii. Two overhead door
o. Emergency power and lighting equipment
    i. Emergency exit lighting
p. Storage areas
    i. Lubricants
q. Gas shut off valves and other important isolation valves
    i. Propane system shutoff inside of electrical room
    ii. No natural gas service
r. Electrical Facilities
    i. Main electrical shut-off and control panel

Shop/Warehouse

a. Building construction
    i. Wood frame with concrete block and metal siding, inside of fenced area
b. Building size
    i. 443.8 m^2
c. Number of stories
    i. Single story, no basement
d. Use and Occupancy of building
    i. Storage of HVAC and propane appliances and equipment
    ii. Repairing HVAC and propane appliances
e. Fire walls, fire separators
    i. Nil
f. Explosion relief vents
    i. Nil
g. Fire department access points
    i. Four man doors
    ii. Two overhead doors
h. Portable fire extinguishers
    i. Four fire extinguishers within the building
i. Emergency notification system
    i. Nil
j. Sprinkler system
    i. Nil
k. Fire standpipe (hose) system
    i. Nil
l. Fire department pumper connections
    i. Nil
m. Water supply control valves and fire pumps
    i. Nil
n. Exits
    i. Four man doors
    ii. Two overhead doors
o. Emergency power and lighting equipment
    i. Emergency exit lighting
p. Hazardous Material processing areas
    i. Nil
q. Storage areas
    i. Lubricants
    ii. Two methanol drums
r. Gas shut off valves and other important isolation valves
    i. No natural gas service

s. Electrical Facilities
    i. None

Greenhouse

a. Building construction
    i. Aluminum frame with plastic panels
    ii. No basement
b. Building size
    i. 167.6 m^2
c. Number of stories
    i. Single storey, no basement
d. Use and Occupancy of building
    i. Storage of garden tools, hoses, soil and fertilizers, pesticides (including RoundUp / stump remover), seasonal home décor, pet supplies / food, generators heaters, fans / dehumidifier / humidifier, chimney sweeping logs, bbq section including wood chips and charcoal, fire starters, sump pumps, pool chemicals, butane fuel for gas stoves/lanterns 1lb propane canisters, picnic products (paper) / coolers, automotive
e. Fire walls, fire separators
    i. Nil
f. Explosion relief vents
    i. Nil
g. Fire department access points
    i. Two man doors
h. Portable fire extinguishers
    i. Nil
i. Emergency notification system
    i. Nil
j. Sprinkler system
    i. Nil
k. Fire standpipe (hose) system
    i. Nil
l. Fire department pumper connections
    i. Nil
m. Water supply control valves and fire pumps
    i. Nil
n. Exits
    i. Two man doors
o. Emergency power and lighting equipment
    i. Nil
p. Hazardous Material processing areas
    i. Nil
q. Storage areas
    i. Nil
r. Gas shut off valves and other important isolation valves
    i. No natural gas service
s. Electrical Facilities
    i. Nil

Cylinder Fill Building

a. Building construction
    i. Wood frame, steel siding on concrete foundation, inside of fenced area
b. Building size

i. 9.3 m^2

c. Number of stories
   i. Single storey, no basement
d. Use and Occupancy of building
   i. Cylinder filling
   ii. Equipped with a scale and filling equipment
e. Fire walls, fire separators
   i. Nil
f. Explosion relief vents
   i. Explosion relief provided by a lightweight door
g. Fire department access points
   i. One man door
h. Portable fire extinguishers
   i. In cylinder fill building
i. Emergency notification system
   i. On-site emergency siren
j. Sprinkler system
   i. Nil
k. Fire standpipe (hose) system
   i. Nil
l. Fire department pumper connections
   i. Nil
m. Water supply control valves and fire pumps
   i. Nil
n. Exits
   i. One man door
o. Emergency power and lighting equipment
   i. Nil
p. Hazardous Material processing areas
   i. Filling of propane cylinders – 20 lb. to 100 lb. capacity – non retail
   ii. Loading/unloading of propane cylinders onto trucks for transport
q. Storage areas
   i. Empty propane cylinder and tank storage adjacent to building
r. Gas shut off valves and other important isolation valves
   i. E stop and manual shutoff in cylinder fill building
s. Electrical Facilities
   i. Nil

Portable Dispatch Building

a. Building construction
   i. Wood frame, metal and glass clad, inside of fenced area
b. Building size
   i. 37.9 m^2
c. Number of stories
   i. Single storey, no basement
d. Use and Occupancy of building
   i. Drivers room
e. Fire walls, fire separators
   i. Nil
f. Explosion relief vents
   i. Nil
g. Fire department access points
   i. One man door

h. Portable fire extinguishers
    i. Nil
i. Emergency notification system
    i. On-site emergency siren
j. Sprinkler system
    i. Nil
k. Fire standpipe (hose) system
    i. Nil
l. Fire department pumper connections
    i. Nil
m. Water supply control valves and fire pumps
    i. Nil
n. Exits
    i. One man door
o. Emergency power and lighting equipment
    i. Nil
p. Hazardous Material processing areas
    i. Nil
q. Storage areas
    i. Nil
r. Gas shut off valves and other important isolation valves
    i. Nil
s. Electrical Facilities
    i. Nil

Storage Trailers

a. Building construction
    i. Steel frame, metal clad, inside of fenced area
b. Building size
    i. 41.8 m^2
c. Number of stories
    i. Single storey, no basement
d. Use and Occupancy of building
    i. Equipment and parts storage
e. Fire walls, fire separators
    i. Nil
f. Explosion relief vents
    i. Nil
g. Fire department access points
    i. One man door
h. Portable fire extinguishers
    i. Nil
i. Emergency notification system
    i. On-site emergency siren
j. Sprinkler system
    i. Nil
k. Fire standpipe (hose) system
    i. Nil
l. Fire department pumper connections
    i. Nil
m. Water supply control valves and fire pumps
    i. Nil
n. Exits
    i. One man door
o. Emergency power and lighting equipment
    i. Nil

p. Hazardous Material processing areas
    i. Nil
q. Storage areas
    i. Nil
r. Gas shut off valves and other important isolation valves
    i. Nil
s. Electrical Facilities
    i. Nil

1.3 Human Resources

a. Full time employees
    i. There are currently 50 full time employees
        1. Three management
        2. Thirteen drivers
        3. Two salesmen
        4. Twenty-one service techs
        5. Eleven Arthurs Fuel staff
    ii. All personnel loading and unloading are trained at the terminal and have all necessary Records of Training and regulatory certificates in accordance with O.Reg 215/01 and O.Reg 211/01 in place before being authorized to handle propane at the facility.
    iii. The Senior Driver/Service Manager conducts training to drivers on the use of the terminal. The office will ensure all licencing and certification requirements for employees are met and maintained.
    iv. Repairs to the propane facility are performed by appropriate licenced and certified personnel.
    v. The Service Manager also ensures any contractors or visitors to the facility are properly informed of the safety rules and regulations at the facility in addition to informing them of the emergency procedures.
b. Shift workers
    i. There are no shift workers at this time, all staff work during the same daytime hours with overtime during periods of peak demand
c. Accommodation needs of employees
    i. There are no special needs identified for employees
d. Security Personnel
    i. There are no security personnel
e. Emergency Personnel with Telephone Numbers
    i. Bev Arkema – Office/Plant Emergency Coordinator
    Responsible for handling on site emergency duties such as ensuring all personnel are evacuated.
    Cell: 519-939-1684
    ii. Brian Arthurs – Emergency Coordinator
    Responsible for activating emergency response plan (if necessary), advising and co-coordinating on equipment and additional resources through the Emergency Response Assistance Canada (ERAC) and assisting emergency responders.
    Cell: 519-216-0554
    iii. Scott Arthurs – Assistant Emergency Coordinator
    Responsible for activating emergency response plan (if necessary), advising and co-coordinating on equipment and resources through the Emergency Response

Assistance Canada (ERAC) and assisting emergency responders.
Cell: 519-939-0750

iv. Third Party Emergency Responder
Emergency Response Assistance Canada 1-800-265-0212 to activate the plan. The ERAC is available 24/7 and initial consultation and advice is provided by Response Managers (RM's). Remedial Measures Advisors (RMA's) and Response Teams with necessary equipment are dispatched as required. All response personnel are extensively trained in the storage, handling and/or transportation of propane products and containers.

1.4 Hazardous Materials, Stored Handled or Processed

a. Compressed gases

The facility is operated as a fuel bulk storage and propane filling plant. Propane and fuel products are transferred from transport trailers into the fixed storage tanks on site and then product is transferred via pumps into bulk delivery trucks, cylinders, and vehicles.

Volume of propane in tanks:

i. Four 30,000 US gallon pressure vessel
    1. Maximum fill (at 88.6% at 15ºC) is approximately 402,465 litres
ii. One 1,996 US gallon pressure vessel for dispenser
    1. Maximum fill (at 80%) is approximately 6,045 litres
iii. Propane in Bulk Trucks parked/loaded on site approximately 20,000 litre capacity each
iv. One 1,000 US gallon heating tank
v. One 420 lb propane heating cylinder and power the backup generator
vi. Propane in cylinders and tanks for customer use.

There are two nitrogen cylinders at the tank used to activate the emergency shutdown system. Volume of nitrogen in the 2 cylinders, 912 ft^3. There are also small amount of compressed gases located near the overhead door of the warehouse building such as acetylene, oxygen & nitrogen

b. Flammable/combustible liquids

i. One 25,000 litres premium, one 80,000 litres regular, two 80,000 litres diesel, two 80,000 litres dyed diesel, one 2,200 litres used motor oil, one 1,300 litres furnace oil, one 2,200 litres furnace oil, one 2,200 litres diesel low sulphur, one 2,200 litres dyed diesel, one 2,200 litres kerosene fuel, one 2,270 litres fuel oil above ground double walled steel tanks
ii. No underground storage tanks

iii. Diesel exhaust fluid stored inside warehouse building
iv. Small quantities of methanol inside warehouse building
v. Maintenance supplies not exceeding 200 litres

c. Liquid/solid chemicals, organic oils/solvents
    i. No other chemicals/solvents will be distributed at the facility

d. None of the following materials are distributed/located at the facility as part of the business
    i. reactive substances
    ii. oxidizing substances
    iii. explosives
    iv. plastics
    v. rubber
    vi. combustible metals
    vii. wood products (other than pallets under tanks or cylinders)
    viii. paper, cardboard, aerosol cans (except in small quantities as maintenance supplies)

1.5 Codes and Regulations

a. The facility is designed and built in accordance with the Technical Standards and Safety Act in conjunction with the CSA B149 Codes series which governs the storage and handling of propane. Facility drawings are submitted to the TSSA and approved. The buildings and electrical conform to the Ontario Building Code and Ontario Electrical Safety Code respectively.

b. A fire safety analysis in accordance with NFPA 58 utilizing the Fire Safety Analysis Manual for LP-Gas Storage facilities has been performed. The fundamental premise on which the requirements of NFPA 58 is based on the following – if product release can be either controlled or eliminated, safety is effectively addressed. The fire safety analysis will be maintained in the RSMP.

c. The terminal is equipped with a number of emergency shutdown systems:
    i. Emergency Stop Buttons
        1. Propane Emergency stop buttons are labelled by signage and when the system is activated, it will shut down all pneumatic and solenoid valves, turn off the power to the pumps and activate the alarm siren.

    ii. Pull Away Protection
        1. All bulkheads are equipped with cables that are connected to a limit switch or "microswitch" for pull away protection. In the event of a pull away, the cable pulls the pin from the microswitch. This sends an electrical signal to the Programmable

Logic Controller (PLC) panel to initiate the emergency shutdown sequence.

iii. Emergency Shutdown Valves
    1. The propane loading/unloading points are equipped with emergency shutdown valves that can be closed in the event of an incident at the loading/unloading point. These are activated by the emergency stop or breakaway system to minimize product escape at loading and unloading points. The valve is also equipped with thermal protection to shut down in the event of a fire.

iv. Internal Safety Control Valves
    1. All propane liquid and vapour tank openings are protected with a combination excess flow and positive shut-off valve to prevent major spills/leaks from the propane storage vessels.

v. Thermal Protection
    1. The internal and emergency shutdown valves are all equipped with nitrogen charged actuators with fusible plugs. Should a fire occur the fusible plugs melt and the all the plant valves shutdown minimizing the release of propane. Fusible plugs are located at all emergency shutdown valves and internal safety control valves.

1.6 Fire Hazards

a. Propane, diesel, and gasoline are handled and stored on site. Transport trailers unload into the facility and bulk delivery trucks as well as cylinders and vehicles are filled at the facility.
b. No aerosols are used or stored on site
c. No combustible dusts, fibres or metals are present or produced on site
d. All electrical has been installed and inspected in accordance with the code. The electrical equipment and installation around the propane storage and transfer areas as per the classifications as defined in the B149.2 Code.
e. There is a forced air propane furnace in the office and a fuel oil heater in the garden centre.
f. There are no cutting, welding or other related activities at the facility
g. There are no oxidizing or reactive substances stored or used at the facility
h. Smoking is prohibited within the fenced area and in the building; signs are posted throughout the facility and at the entrances to the facility.

2.0 SUPERVISORY STAFF AND EMERGENCY RESPONDERS

2.1 Supervisory Staff

a) Bev Arkema – Office/Plant Emergency Coordinator
Responsible for handling on site emergency duties
Cell: 519-939-1684

b) Brian Arthurs – Emergency Coordinator
Responsible for activating emergency response plan (if necessary).
Cell: 519-216-0554

c) Scott Arthurs – Assistant Emergency Coordinator
Cell: 519-939-0750

d) Third Party Emergency Responder
Emergency Response Assistance Canada (ERAC)
Telephone: 1-800-265-0212

2.2 Employees

a) Drivers loading and unloading at the facility
Orientation training includes:
   i. Access to facility – verify ROT, etc
   ii. Rules and regulations of facility – no smoking, personal protective equipment, vehicle positioning and shut off, filling density, etc.
   iii. What to do in case of incident (leak, fire)
   iv. What to do in case of alarm
   v. Rules minimizing/preventing fire hazards
   vi. Location of emergency stops
   vii. Location of emergency equipment
   viii. Emergency response numbers and directions
   ix. Facility operations and safety features

b) Service Manager
Responsibilities include:
   i. Ensure safety and operating systems are working properly
   ii. Identify and rectify fire or other hazards
   iii. Ensure fire access routes are maintained
   iv. Ensure fire equipment is in place
   v. Contractors/visitors – ensure that personnel are aware of rules and regulations and emergency procedures

2.3 Owner/Manager

a) Fire Safety Plan
   i. Develop, maintain and implement fire safety plan
   ii. Maintain copy on site

b) Emergency Supervisory staff
   i. Organize and train emergency supervisory staff on fire safety duties and emergency response and document
   ii. Ensure personnel accessing facility are certified, maintain records

c) Fire Drills and emergency response
   i. Hold annual fire drills

ii. Annual training for emergency supervisory staff on fire safety duties and emergency response and document
iii. Audit records to ensure compliance

d) Identify, document and eliminate Fire Hazards
   i. Regular management reviews
   ii. Annual Facility Inspection and fire drill
e) Provide Alternate measures for fire safety during temporary shutdown of fire protection equipment
   i. Co-ordinate with Fire Department
f) Checks, tests, inspections, documentation and maintenance of fire prevention equipment
   i. Preventative Maintenance program
g) Maintain records of tests and corrective measures for two years
   i. Maintenance records
h) Maintain records of training and fire drills for at least one year
   i. Annual fire drills
   ii. Annual training for emergency supervisory staff

3.0 EMERGENCY PROCEDURES

3.1 Sounding the siren

a) The on-site siren will sound when any of the emergency stop buttons are pressed and the propane safety valves will shut down.

3.2 Notifying the Fire Department

a) The person initiating the alarm will use a cellular phone to initiate a call to the fire department at 911 and then to the Emergency Coordinator (or assistant). Personnel are instructed to call 911 first.
b) The Emergency Coordinator (or assistant) will determine how to activate plan and who to call.

3.3 Provisions for Access for Fire Fighting

a) Should the gates be closed when the fire department arrives, the fire department can open the gates by accessing the lock box at the main building entrance or cutting the locks.
b) Arthurs Fuel will maintain the driveways and the fire access route to allow access for the emergency vehicles.
c) Arthurs Fuel will maintain the fire access route free of snow and obstructions allowing the fire department access to the facility.

3.4 Instructions when on-site siren sounds

a) Facility Emergency Siren

When the facility emergency siren sounds the drivers and other on-site personnel have been instructed to:

i. Stop loading/unloading product to/from the bulk trucks. If possible close valves and shut-off truck engines.
ii. Assess the situation and be prepared to evacuate the area.

iii. Call 911 in case of fire or incident. Dispatch will notify the nearby Public Receptors (Appendix B) and instruct them to evacuate the area, if necessary.
iv. If there is no imminent hazard and with caution disconnect the hoses – if there is no fire in the immediate area.
v. Remove the chock blocks (if applicable)
vi. Remove the ground strap (if applicable)
vii. Inform the Emergency Coordinator (or assistant)
viii. If necessary evacuate the area, meet at the front of the property by the driveway.
ix. Wait for alarm to stop and wait for authorization from supervisory staff before commencing to load.
x. Drivers may resume loading when authorized by supervisory personnel.

3.5 Evacuation Procedures

a) On-site Evacuation Procedures
In case of fire, personnel have been instructed to act with caution, press the emergency shutdown button and evacuate. Evacuation procedures are posted on the site plan in the office and in the warehouse. Personnel have been instructed to evacuate the area and meet at the front of the property by the driveway.

b) Off-site Evacuation Procedures
Arthurs Fuel staff will notify the Grand Valley and District Fire Department. Once the Fire Department arrives they will be responsible for occupancies beyond the facility.

Arthurs Fuel has completed an EPA Scenario 2 Analysis for the worst case scenario. The 1.0 psi blast radius as defined by the December 22, 2010 TSSA Advisory Formula is approximately 1003 meters (0.63 miles) – a map showing the blast radius in with public receptors is shown in Appendix B.

3.6 Fire control and extinguishing

a) In case of fire, personnel have been instructed to act with caution, press the emergency shutdown button, evacuate the area immediately and call 911. If the fire is small use the facility extinguishers or extinguishers on the truck to control or extinguish the fire.
b) In case of leak or rupture and escape of product, personnel have been instructed to act with caution and press the emergency shutdown button. If manual shutdown valves can be accessed prudently, close the valves. If the product escape is unmanageable evacuate the area and call 911 as well as the Emergency Coordinator or the 24 hour emergency number.

4.0 FIRE DRILL PROCEDURES AND TRAINING

a) An annual review of the emergency procedures and Fire Safety Plan will be performed. An annual fire drill will be performed in conjunction with the review. Supervisory personnel will be present and time, date, attendees and

issues/events will be recorded and maintained for at least one year.

b) The Fire Department will be notified in advance of a fire drill.
c) The safety systems will be activated and procedures for activating and resetting the emergency system and siren alarm will be reviewed.
d) Any changes to emergency procedures will be updated in the Fire Safety Plan and changes communicated to personnel accessing the terminal.
e) The fire drills will be scheduled with supervisory personnel.
f) The supervisory employees will be trained on the emergency shutdown procedures.
g) Contractors to the site will have the emergency procedures reviewed with them similar to the drivers accessing the terminal.
h) Once the fire drill has been accomplished a review of the emergency procedures and Fire Safety Plan will occur by the supervisory employees. Any necessary changes to the plan will be made and new plans will be submitted to the Fire Department and kept at the site.

5.0 MAINTENANCE OF FACILITIES AND FIRE PROTECTION EQUIPMENT

a) A preventative maintenance program for the facility will be implemented.
b) Fire extinguisher inspections will be carried out annually by a certified service provider. Extinguishers not meeting the inspection criteria will be removed from service and replaced with acceptable units.

6.0 ALTERNATE MEASURES FOR TEMPORARY SHUTDOWN OF FIRE PROTECTION EQUIPMENT OR SYSTEMS

a) Fire extinguishers
    i. Fire extinguishers shall not be removed from service without having a replacement extinguisher available
    ii. Fire extinguishers shall be recharged and inspected and replaced as soon as practical after being discharged
    iii. Any lost or stolen fire extinguishers shall be replaced as soon as practical

b) Emergency siren
    i. The emergency siren is to be tested monthly. If the siren is malfunctioning or not working it is to be replaced as soon as practical.
    ii. The emergency siren is not to be removed without a replacement available and in place.

7.0 CONTROL OF FIRE HAZARDS

a) Propane Storage and Handling
    i. Minimize risk of propane spills/leaks
        1. design and integrity of piping and valving systems
        2. emergency shut down systems
        3. emergency break away systems
        4. safety hoses

5. training and certification of personnel
6. maintenance program
7. authorized access only
8. emergency procedures in place
9. siren alarm system

ii. Minimize risk of sources of ignition

1. no smoking on property
2. proper apparel
3. grounding systems
4. safety signage
5. training and certification of personnel
6. maintenance program
7. authorized access only
8. vegetation and trash removal
9. fire extinguishers in place
10. siren alarm system
11. emergency procedures in place
12. contractor policy

8.0 FIRE DEPARTMENT ACCESS AND INFORMATION

a) Access

i. The gates will be open when personnel are present at the facility.
ii. If the gates are closed when the fire department arrives, the fire department can open the gates by accessing the fire department lock box or by cutting the locks.
iii. Arthurs Fuel will maintain the driveways and the fire access route in good condition to allow access for the emergency vehicles.
iv. Arthurs Fuel will maintain the fire access route free of snow and obstructions allowing the fire department access to the facility.

b) Information

The following information will be made available in a box mounted on the outside of the office.

i. Site drawing showing emergency shutdown systems and fire extinguishers as per Appendix A.
ii. The surrounding public receptors as per Appendix B.
iii. Inventory sheet as per Appendix C.
iv. SDS for Odorized propane as per Appendix E.
v. SDS for Nitrogen as per Appendix F.
vi. SDS for Premium Gasoline as per Appendix G.
vii. SDS for Regular Gasoline as per Appendix H.
viii. SDS for Diesel as per Appendix I.
ix. SDS for Dyed Diesel as per Appendix J.
x. SDS for Acetylene as per Appendix K.
xi. SDS for Oxygen as per Appendix L.
xii. SDS for Methanol as per Appendix M.
xiii. SDS for Kerosene as per Appendix N.
xiv. SDS for Furnace Oil as per Appendix O.

9.0 SITE PLAN

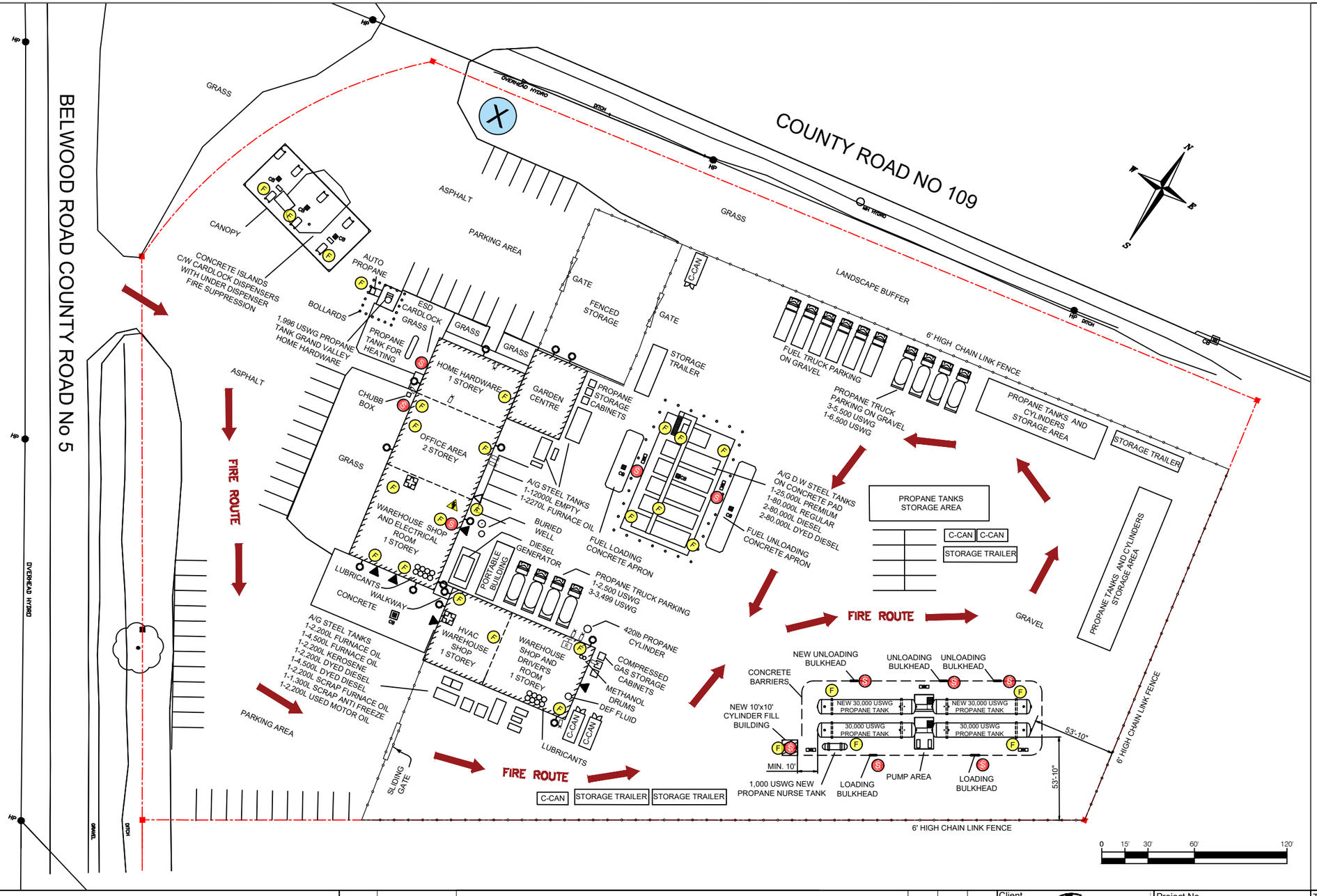
a) A fire safety site plan has been prepared that is attached in Appendix A and is provided in the Fire Department Information Box.
b) The following items are shown on the site plan:
    i. General arrangement of site including fencing and gates
    ii. Propane storage vessels
    iii. Diesel fuel storage
    iv. Buildings
    v. Electrical panel
    vi. Fire access route
    vii. Emergency shutdown buttons
    viii. Fire extinguishers
    ix. Evacuation area for personnel

10.0 EMERGENCY PROCEDURES AND PHONE NUMBERS

a) Emergency procedures are posted in the office and in the shop/warehouse.
b) A copy of the Fire Safety Plan will be maintained in the fire department information box.
c) The fire safety site plan will be posted in the office and will be available in the Fire Department information box.
d) A location map with hazard distance shown and public receptors shown is shown in Appendix B.
e) A current list of emergency phone numbers is included in Appendix D.

E. LIST OF APPENDICES

APPENDIX A
SITE PLAN



NOTES

1) ADDRESS:
202350 DUFFERIN COUNTY ROAD 109,
EAST GARAFRAXA, ON

2) LEGAL DESCRIPTION:
EAST GARAFRAXA CON 13 PT;LOTS 19 AND 20 RP 7R6029;PART 1

3) ZONING:
HIGHWAY COMMERCIAL CH-2

4) PROPANE STORAGE:
[2] EXISTING 30,000 USWG PROPANE STORAGE TANKS
[2] NEW 30,000 USWG PROPANE STORAGE TANKS
[1] EXISTING 1,996 USWG PROPANE DISPENSER
[1] NEW 1,000 USWG NURSE TANK
[1] EXISTING 1,000 USWG PROPANE HEATING TANK

5) APPROXIMATE TANK SETBACKS TO PROPERTY LINE:
NORTH: 236'-4" (72.1m)
SOUTH: 53'-10" (16.4m)
EAST: 53'-10" (16.4m)
WEST: 437'-7" (133.4m)

6) PROPANE STORAGE AND HANDLING AND PIPING PER CSA B149.1, CSA B149.2

7) FENCING:
6' HIGH AND CHAIN LINK FENCE

8) VEHICLE PROTECTION:
- CONCRETE BARRIERS
- BOLLARDS

9) APPROXIMATE AREAS:
PROPERTY AREA: 270,508 ft² (6.21 ACRES)
BUILDING AREA: 15,724 ft² (1460.8m²)

LEGEND

- PROPERTY LINE
- FENCE LINE
- FIRE EXTINGUISHER
- EMERGENCY SHUT OFF
- ELECTRICAL EQUIPMENT
- EMERGENCY MUSTER POINT
- LIGHT POST
- SECURITY CAMERA
- FIRE ROUTE
- FIRST AID KIT
- OVERHEAD DOOR
- MAN DOOR
- ESD RESET
- EMERGENCY SIREN

Drawing No.	Reference Drawing	Rev	Date	Revision Notes	DRW	CHK	APP
		0	03/17/2020	INITIAL RELEASE	MH	AB	AF

Client: ARTHURS FUEL

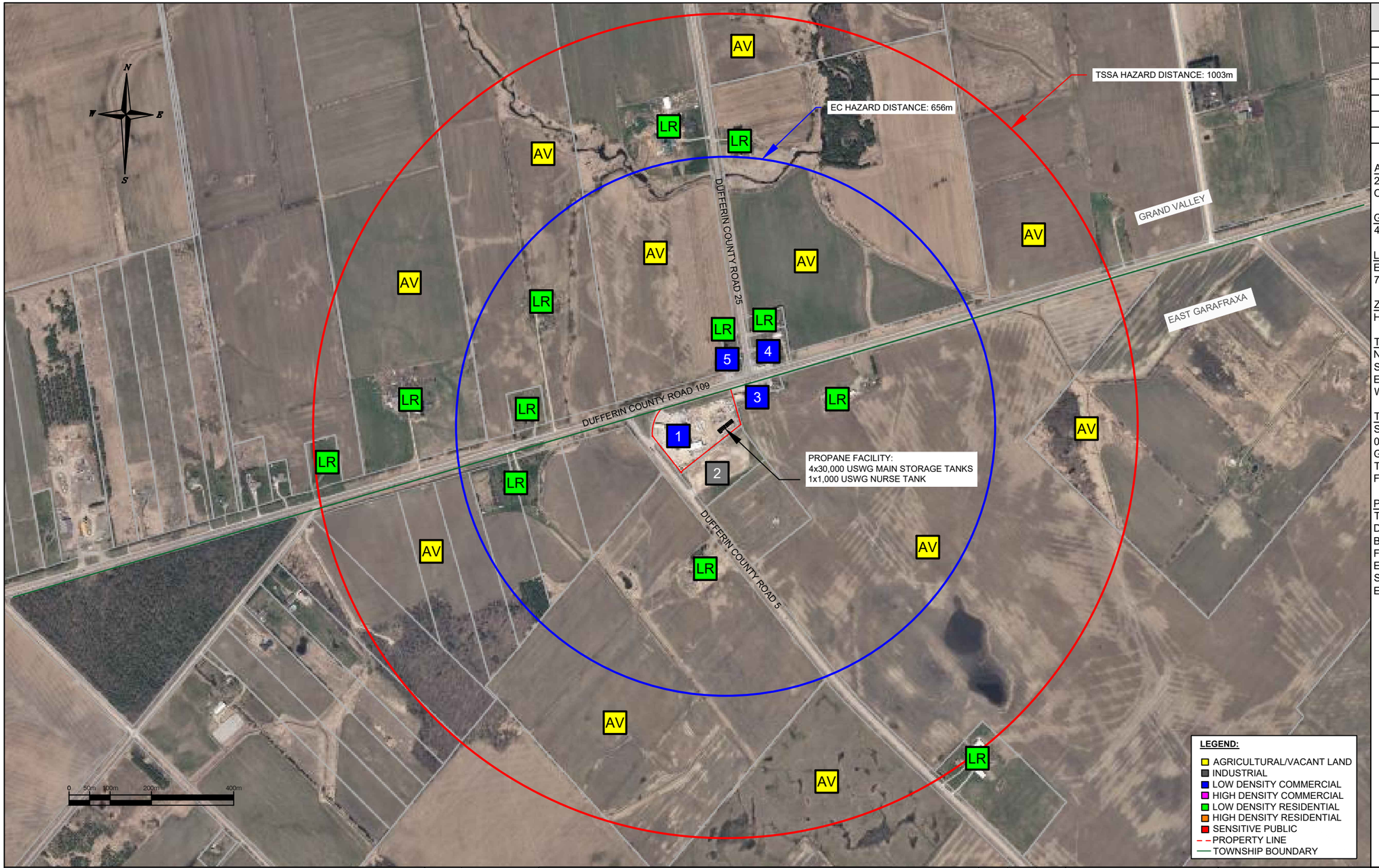
Project No: JRS20001
Plot Size: ANSI B
Scale: AS SHOWN

SLEEGERS ENGINEERED PRODUCTS INC.
5 Cuddy Blvd., London, Ontario, Canada N5V 3Y3 Phone (519) 685-7444 Fax (519) 685-2882

Title: ARTHURS FUEL
GRAND VALLEY
FIRE SAFETY PLAN

Drawing No: ART-GRV-FSP-01
Revision No.: 0
Sheet: 1 of 1

APPENDIX B
LOCATION MAP WITH HAZARD DISTANCES



PUBLIC RECEPTORS

1	GRAND VALLEY HOME HARDWARE
2	FS PARTNERS
3	CANADIAN CLEAR-OUT
4	ULTRAMAR
5	KELLY'S KORNER RESTAURANT
LR	LOW DENSITY RESIDENTIAL
AV	AGRICULTURAL / VACANT LAND

ADDRESS:
202350 DUFFERIN COUNTY ROAD 109, EAST GARAFRAXA, ON

GPS COORDINATES:
43°52'24.8"N; 80°18'37.9"W

LEGAL DESCRIPTION:
EAST GARAFRAXA CON 13 PT;LOTS 19 AND 20 RP 7R6029;PART 1

ZONING:
HIGHWAY COMMERCIAL CH-2

TANK SETBACKS TO PROPERTY LINES:
NORTH: 236'-4" (72.1m)
SOUTH: 53'-10" (16.4m)
EAST: 53'-10" (16.4m)
WEST: 437'-7" (133.4m)

TOWNSHIP CONTACT INFORMATION:
SUSAN M. STONE, CAO/CLERK-TREASURER
065371 DUFFERIN COUNTY ROAD 3, UNIT 2, EAST GARAFRAXA ON, L9W 7J8,
T: 226-259-9400, EXT 202
F: 226-212-9812

PLANNING ACT REQUIREMENTS:
THE ARTHURS FUEL FACILITY RESIDES ALL WITHIN DUFFERIN COUNTY. THE HAZARD DISTANCE AS DEFINED BY THE TSSA ADVISORY FS-155-09, AT 88.6% CAPACITY FOR THE TSSA HAZARD DISTANCE, AND 100% FOR THE ENVIRONMENT CANADA HAZARD DISTANCE FOR THE SINGLE LARGEST CONTAINER. THE HAZARD DISTANCE EXTENDS INTO THE TOWN OF GRAND VALLEY.

Drawing No.	Reference Drawing	Rev	Date	Revision Notes	DRW	CHK	APP
		0	01/13/2020	INITIAL RELEASE	MH	JP	AF

Client: ARTHURS FUEL
Project No: JRS20001
Plot Size: ANSI B
Scale: AS SHOWN

SLEEGERS ENGINEERED PRODUCTS INC.
5 Cuddy Blvd., London, Ontario, Canada N5V 3Y3 Phone (519) 685-7444 Fax (519) 685-2882

Title: ARTHURS FUEL
GRAND VALLEY
PUBLIC RECEPTORS DRAWING

Drawing No	Revision No.	Sheet
ART-GRV-PRD-01	0	1 of 1

APPENDIX C
Hazardous Material Inventory

HAZARDOUS MATERIALS INVENTORY STATEMENT

1. **Business name: Arthurs Fuel Inc.**

2. **Business location: 202350 County Road 109 East Garafraxa, Ontario L9W 7N1**

3. **Date: March 17, 2020**

Common Name	Chemical Name Components & Concentration	Physical State	Quantity on Hand		TDG Class (UN)	NFPA Code			Location
			Maximum Stored	Container Size		H	F	R	
PROPANE	Liquefied Petroleum Gas (C3H8)	Liquid under pressure, vapour at atmospheric pressure.	833,074 litres	Various	2.1 (UN1075)	1	4	0	Fixed storage located at southeast area of yard; Dispenser near northwest corner of main building; Transient and mobile storage within fenced compound; Heating tank near western wall of main building.
GASOLINE	Premium Gasoline and Regular Gasoline	Flammable Liquid	105,000 litres	80,000 and 25,000 litres	3 (UN1203)	1	3	0	Above ground tanks near centre of yard
DIESEL	Low Sulphur Diesel and Dyed Diesel	Flammable Liquid	326,700 Litres	80,000 4,500 and 2,200 Litres	3 (UN1202)	1	2	0	Above ground tanks near centre of yard and behind warehouse building
KEROSENE	Kerosene	Flammable Liquid	2,200 Litres	2,200 Litres	3 (UN1223)	2	2	0	Above ground tank behind warehouse building
FURNACE OIL	Furnace Oil	Flammable Liquid	11,170 litres	Various	3 (UN1202)	1	2	0	Above ground tank behind warehouse building and behind the garden centre

METHANOL	**Methanol (CH3OH)**	**Flammable Liquid**	**108 USG (410 litres)**	**54 gal (205 litres)**	**3 (UN1230)**	**1**	**3**	**0**	**Inside the warehouse building**
NITROGEN	**Nitrogen Gaseous**	**Vapour**	**98 litres**	**13 gal**	**2.2 (UN1066)**	**0**	**0**	**0**	**Two cylinders located near main propane storage tanks**

APPENDIX D
LIST OF EMERGENCY PHONE NUMBERS

ARTHURS FUEL

ADDRESS:
202350 DUFFERIN COUNTY ROAD 109, EAST GARAFRAXA,
ON

EMERGENCY PHONE NUMBERS:

	Emergency Number	**Phone Number**
Fire Department	911	519-928-3460
Police Department	911	1-888-310-1122
Ambulance Services	911	519-941-2410
Arthurs Fuel	Direct: 519-941-0004 Toll Free: 866-644-9326	Direct: 519-941-0004 Toll Free: 866-644-9326
ERAC Emergency Responder	1-800-265-0212	
MOE – Spills Action Centre	1-800-268-6060	
Canutec	(613) 996-6666	(613) 992-4624
Canutec by Cell Phone	*666	

APPENDIX E
SDS FOR PROPANE

Section 1: IDENTIFICATION

Product Name:	Propane
Synonyms:	Propane HD-5; Propane Odorized; Propane Non-Odorized.
Product Use:	Industrial applications.
Restrictions on Use:	Not available.
Manufacturer/Supplier:	Plains Midstream Canada ULC, and Affiliates Suite 1400, 607 – 8th Avenue SW Calgary, Alberta T2P 0A7
Phone Number:	1-866-875-2554
Emergency Phone:	USA - CHEMTREC 1-800-424-9300 / CANADA - CANUTEC 1-888-CAN-UTEC (226-8832), 613-996-6666 or *666 on a cellular phone
Date of Preparation of SDS:	April 11, 2016

Section 2: HAZARD(S) IDENTIFICATION

GHS INFORMATION

Classification: Flammable Gases, Category 1
Gases Under Pressure - Compressed Gas
Simple Asphyxiant

LABEL ELEMENTS

Hazard Pictogram(s):

Signal Word: Danger

Hazard Statements:
Extremely flammable gas.
Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary Statements

Prevention: Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.

Response: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.

Storage: Store in a well-ventilated place.
Protect from sunlight.

Disposal: Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients with Unknown Toxicity: None.

This material is considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200). This material is considered hazardous by the Hazardous Products Regulations.

Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredient(s)	Common name / Synonyms	CAS No.	% vol./vol.
Propane	Not available.	74-98-6	90 - 100
Ethane	Not available.	74-84-0	1 - 5
1-Propene	Propylene	115-07-1	1 - 10
Butane	Not available.	106-97-8	0.25 - 2.5
Methane	Not available.	74-82-8	0 - 0.5

Section 4: FIRST-AID MEASURES

Inhalation: If inhaled: Call a poison center or doctor if you feel unwell.

Acute and delayed symptoms and effects: May displace oxygen and cause rapid suffocation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Eye Contact: If in eyes: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.

Acute and delayed symptoms and effects: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result. May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin Contact: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. If on skin: Wash with plenty of water. Get immediate medical advice/attention. Do not rub affected area. Remove non-adhering contaminated clothing. Do not remove adherent material or clothing.

Acute and delayed symptoms and effects: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside. May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: Not a normal route of exposure.

Acute and delayed symptoms and effects: Not a normal route of exposure.

General Advice: In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible).

Note to Physicians: Symptoms may not appear immediately.

Section 5: FIRE-FIGHTING MEASURES

FLAMMABILITY AND EXPLOSION INFORMATION

Extremely flammable gas. Contains gas under pressure; may explode if heated. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground. Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through

pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.

If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.
Sensitivity to Static Discharge: This material is sensitive to static discharge.

MEANS OF EXTINCTION

Suitable Extinguishing Media: Small Fire: Dry chemical or CO2.

Large Fire: Water spray or fog. Move containers from fire area if you can do it without risk.

Unsuitable Extinguishing Media: Not available.

Products of Combustion: Oxides of carbon. Oxides of sulphur.

Protection of Firefighters: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so. Vapors may cause dizziness or asphyxiation without warning. Some may be irritating if inhaled at high concentrations. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.

Section 6: ACCIDENTAL RELEASE MEASURES

Emergency Procedures: As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Keep out of low areas. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.

Personal Precautions: Do not touch or walk through spilled material. Use personal protection recommended in Section 8.

Environmental Precautions: Not normally required.

Methods for Containment: Stop leak if you can do it without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray

	to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak.
Methods for Clean-Up:	Prevent spreading of vapors through sewers, ventilation systems and confined areas. Isolate area until gas has dispersed. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.
Other Information:	See Section 13 for disposal considerations.

Section 7: HANDLING AND STORAGE

Handling:
Keep away from heat, sparks, open flames, and hot surfaces. – No smoking. Pressurized container: Do not pierce or burn, even after use. See Section 8 for information on Personal Protective Equipment.

Storage:
Store in a well-ventilated place. Protect from sunlight. Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines
Component

Propane [CAS No. 74-98-6]
ACGIH: Asphyxia
OSHA: 1000 ppm (TWA), 1800 mg/m³ (TWA);

Ethane [CAS No. 74-84-0]
ACGIH: Asphyxia
OSHA: No PEL established.

Propylene [CAS No. 115-07-1]
ACGIH: 500 ppm (TWA); A4 (2005)
OSHA: No PEL established.

Butane [CAS No. 106-97-8]
ACGIH: 1000 ppm (TWA); (2012)
OSHA: 800 ppm (TWA) [Vacated];

Methane [CAS No. 74-82-8]
ACGIH: Asphyxia
OSHA: No PEL established.

PEL: Permissible Exposure Limit
TWA: Time-Weighted Average
C: Ceiling

Engineering Controls:	Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye/Face Protection:	Safety glasses are required. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.
Hand Protection:	Wear protective gloves. Wear cold insulating gloves. Consult manufacturer specifications for further information.
Skin and Body Protection:	Wear protective clothing.
Respiratory Protection:	If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA-Z94.4-11, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.
General Hygiene Considerations:	Handle according to established industrial hygiene and safety practices.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquefied gas.
Colour:	Colourless.
Odour:	Odourless, unless odourized with ethyl mercaptan (skunky odour).
Odour Threshold:	Not available.
Physical State:	Gas.
pH:	Not available.
Melting Point / Freezing Point:	-185.6 °C (-302 °F)
Initial Boiling Point:	-42.2 °C (-44 °F)
Boiling Point:	-42 °C (-43.6 °F)
Flash Point:	-104.4 °C (-155.9 °F) (Closed Cup)
Evaporation Rate:	Not available.
Flammability (solid, gas):	Extremely flammable gas.
Lower Flammability Limit:	2.1 %
Upper Flammability Limit:	9.5 %

Vapor Pressure:	192 psig at 37.8 °C (100 °F)
Vapor Density:	1.52 to 1.6 (Air = 1)
Relative Density:	0.51 to 0.59 (Water = 1)
Solubilities:	Insoluble in water.
Partition Coefficient: n-Octanol/Water:	Not available.
Auto-ignition Temperature:	449.9 °C (841.82 °F)
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.
Density:	0.5035 g/cm^3
Coefficient of Water/Oil Distribution:	Not available.

Section 10: STABILITY AND REACTIVITY

Reactivity:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Chemical Stability:	Stable under normal storage conditions.
Possibility of Hazardous Reactions:	Not available.
Conditions to Avoid:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Incompatible Materials:	Strong acids. Strong bases. Oxidizers. Oxides of nitrogen. Chlorine. Halogens.

Hazardous Decomposition Products: Not available.

Section 11: TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE
Product Toxicity

Oral: Not available.

Dermal: Not available.

Inhalation: Not available.

Component Toxicity

Component	CAS No.	LD_{50} oral	LD_{50} dermal	LC_{50}
Propane	74-98-6	Not available.	Not available.	Not available.
Ethane	74-84-0	Not available.	Not available.	Not available.
Propylene	115-07-1	Not available.	Not available.	86000 mg/m^3 (rat); 4H
Butane	106-97-8	Not available.	Not available.	658000 mg/m^3 (rat); 4H

Methane	74-82-8	Not available.	Not available.	Not available.

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation.

Target Organs: Skin. Eyes. Respiratory system. Blood. Cardiovascular system. Liver. Kidneys. Nervous system.

Symptoms (including delayed and immediate effects)

Inhalation: May displace oxygen and cause rapid suffocation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Eye: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. The pain after contact with liquid can quickly subside. Permanent eye damage or blindness could result. May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with liquid can quickly subside. May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: Not a normal route of exposure.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.

Medical Conditions Aggravated By Exposure: Not available.

EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)

Target Organs: Skin. Eyes. Respiratory system. Blood. Cardiovascular system. Liver. Kidneys. Nervous system.

Chronic Effects: Not available.

Carcinogenicity: Product is not classified as a carcinogen. See Component Carcinogenicity table below for information on individual components.

Component Carcinogenicity

Component	ACGIH	IARC	NTP	OSHA	Prop 65
Propylene	A4	Group 3	Not listed.	Not listed.	Not listed.

Mutagenicity: Not available.

Reproductive Effects: Not available.

Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Not available.

Toxicologically Synergistic Materials: Not available.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Other Adverse Effects: Not available.

Section 13: DISPOSAL CONSIDERATIONS

Disposal Instructions: Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

Section 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT)

Proper Shipping Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

Class: 2.1

UN Number: UN1075

Packing Group: Not applicable.

Label Code:

Canada Transportation of Dangerous Goods (TDG)

Proper Shipping Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

Class: 2.1

UN Number: UN1075

Packing Group: Not applicable.

Label Code:

Section 15: REGULATORY INFORMATION

Chemical Inventories

US (TSCA)
The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL)
The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

Federal Regulations
United States
This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

Component	Section 302 (EHS) TPQ (lbs.)	Section 304 EHS RQ (lbs.)	CERCLA RQ (lbs.)	Section 313	RCRA CODE	CAA 112(r) TQ (lbs.)
Propane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Ethane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Propylene	Not listed.	Not listed.	Not listed.	313	Not listed.	10000
Butane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000
Methane	Not listed.	Not listed.	Not listed.	Not listed.	Not listed.	10000

State Regulations
Massachusetts
US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Component	CAS No.	RTK List
Propane	74-98-6	Listed.
Ethane	74-84-0	Listed.
Propylene	115-07-1	Listed.
Butane	106-97-8	Listed.
Methane	74-82-8	Listed.

New Jersey
US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Component	CAS No.	RTK List
Propane	74-98-6	SHHS
Ethane	74-84-0	SHHS
Propylene	115-07-1	SHHS
Butane	106-97-8	SHHS
Methane	74-82-8	SHHS

Note: SHHS = Special Health Hazard Substance

Pennsylvania
US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Component	CAS No.	RTK List
Propane	74-98-6	Listed.
Ethane	74-84-0	Listed.
Propylene	115-07-1	E
Butane	106-97-8	Listed.
Methane	74-82-8	Listed.

Note: E = Environmental Hazard

California

California Prop 65: This product does not contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Section 16: OTHER INFORMATION

Disclaimer:

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. It is the user's responsibility to satisfy oneself as to the suitability and completeness of this information for their own particular use.

Date of Preparation of SDS:	April 11, 2016
Version:	2.1
GHS SDS Prepared by:	**Deerfoot Consulting Inc.**
	Phone: (403) 720-3700

APPENDIX F
SDS FOR NITROGEN

Nitrogen

Safety Data Sheet E-4631

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-03-2016 Supersedes: 10-15-2013

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Name	:	Nitrogen
CAS No	:	7727-37-9
Formula	:	N2
Other means of identification	:	Dinitrogen, Refrigerant R728, Nitrogen, Medipure® Nitrogen, Extendapak Nitrogen, Nitrogen - Diving Grade
Product group	:	Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Medical applications Industrial use Diving Gas (Underwater Breathing)

1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number	:	1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Simple asphyxiant	H380
Compressed gas	H280

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :

GHS04

Signal word : WARNING

Hazard statements : CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

Precautionary statements : Do not handle until all safety precautions have been read and understood
Use and store only outdoors or in a well-ventilated area
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Close valve after each use and when empty
Use only with equipment rated for cylinder pressure
Obtain special instructions before use

2.3. Other hazards

Other hazards not contributing to the classification : Asphyxiant in high concentrations. May cause suffocation by reducing oxygen available for breathing.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Nitrogen (Main constituent)	(CAS No) 7727-37-9	100	Nitrogen (liquified) / Nitrogen gas / Nitrogen, liquefied / Nitrogen, compressed / NITROGEN

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Immediately remove to fresh air. If not breathing, clear airways of any slurry or caked material and give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Adverse effects not expected from this product. In case of eye irritation: Rinse immediately with plenty of water. Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Explosion hazard : PRESSURISED CONTAINER: MAY BURST IF HEATED.

Reactivity : Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium (above 1472°F/800°C), or magnesium to form nitrides. At high temperature, it can also combine with oxygen and hydrogen.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems

Stop flow of product if safe to do so

Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.2. Methods and materials for containment and cleaning up

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

Safe use of the product : **The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : In case of splash hazard: safety glasses. Face shield. Gloves.

Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Skin and body protection : As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere.

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colourless gas.
Molecular mass	:	28 g/mol
Colour	:	Colourless.
Odour	:	No odour warning properties.
Odour threshold	:	No data available
pH	:	Not applicable.
pH solution	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-210 °C
Freezing point	:	No data available
Boiling point	:	-195.8 °C
Flash point	:	No data available
Critical temperature	:	-149.9 °C
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Vapour pressure	:	Not applicable.
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	3390 kPa
Relative vapour density at 20 °C	:	0.00115 (≥ 21.1)
Relative density	:	No data available
Relative density of saturated gas/air mixture	:	No data available
Density	:	1.16 kg/m³
Relative gas density	:	0.97

Solubility	:	Water: 20 mg/l
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	:	No data available
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Flammability (solid, gas)	:	Non flammable

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	None

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium (above 1472°F/800°C), or magnesium to form nitrides. At high temperature, it can also combine with oxygen and hydrogen.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	May occur.
Conditions to avoid	:	None under recommended storage and handling conditions (see section 7).
Incompatible materials	:	None.
Hazardous decomposition products	:	None.

SECTION 11: Toxicological information

Likely routes of exposure : Inhalation.

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Nitrogen (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Nitrogen (7727-37-9)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Nitrogen (7727-37-9)	
Mobility in soil	No data available.
Log Pow	Not applicable.
Log Kow	Not applicable.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on the ozone layer : None

Effect on global warming : None

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1066

TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.

Proper shipping name : NITROGEN, COMPRESSED

Explosive Limit and Limited Quantity Index : 0.125 L

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 75 L

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1066

Proper Shipping Name (IMDG) : NITROGEN, COMPRESSED

Class (IMDG) : 2 - Gases

MFAG-No : 121

IATA

UN-No. (IATA) : 1066

Proper Shipping Name (IATA) : Nitrogen, compressed

Class (IATA) : 2

SECTION 15: Regulatory information

15.1. National regulations

Nitrogen (7727-37-9)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Nitrogen (7727-37-9)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on INSQ (Mexican national Inventory of Chemical Substances)

SECTION 16: Other information

Date of issue : 15/10/1979

Revision date : 03/08/2016

Supersedes : 15/10/2013

Indication of changes:

Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Other information : Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

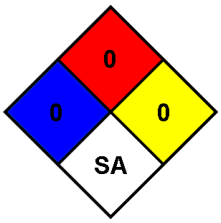
The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard : SA - This denotes gases which are simple asphyxiants.



HMIS III Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 3 Serious Hazard - Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion

SDS Canada (GHS) - Praxair

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 should not therefore be construed as guaranteeing any specific property of the product.

APPENDIX G
SDS FOR PREMIUM GASOLINE

SECTION 1. IDENTIFICATION

Product name	:	GASOLINE, UNLEADED
Synonyms	:	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending, Conventional Gasoline, RUL, MUL, SUL, PUL.
Product code	:	100127, 100126, 101823, 100507, 101811, 101814, 100141, 101813, 101810, 101812, 100063, 101822, 100138, 101821, 100064, 101820, 101819, 100506, 101818, 101816, 101817, 100488
Manufacturer or supplier's details		Petro-Canada 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	:	Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Clear liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Gasoline

GHS Classification

Flammable liquids	:	Category 1
Skin irritation	:	Category 2

Germ cell mutagenicity	:	Category 1B
Carcinogenicity	:	Category 1A
Reproductive toxicity	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	:	Category 1
Aspiration hazard	:	Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Extremely flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause drowsiness or dizziness.
May cause genetic defects.
May cause cancer.
Suspected of damaging the unborn child.
Causes damage to organs () 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/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting/ equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
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
Target Organs	:	Blood Immune system
Inhalation	:	Inhalation may cause central nervous system effects. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.
Skin	:	Causes skin irritation.
Eyes	:	May irritate eyes.
Ingestion	:	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed - can enter lungs and cause damage.
Chronic Exposure	:	Chronic exposure to benzene may result in increased risk of leukemia and other blood disorders.
Aggravated Medical Condition	:	None known.

Other hazards

None known.

IARC	Group 1: Carcinogenic to humans	
	Benzene	71-43-2
OSHA	OSHA specifically regulated carcinogen	
	Benzene	71-43-2

NTP	Known to be human carcinogen	
	Benzene	71-43-2

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
gasoline, natural	8006-61-9	95 - 100 %
toluene	108-88-3	1 - 40 %
benzene	71-43-2	0.5 - 1.5 %
ethanol	64-17-5	0.1 - 0.3 %

SECTION 4. FIRST AID MEASURES

If inhaled : Artificial respiration and/or oxygen may be necessary.
Move to fresh air.
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 : None known.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

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 fire-fighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
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. 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. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Avoid contact with skin, eyes and clothing. Do not ingest. Keep away from heat and sources of ignition. Keep container closed when not in use.

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.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
gasoline, natural	8006-61-9	TWA	300 ppm 900 mg/m3	OSHA P0
		STEL	500 ppm 1,500 mg/m3	OSHA P0
		TWA	500 ppm 2,000 mg/m3	OSHA Z-1
		STEL	500 ppm 1,500 mg/m3	CAL PEL
		PEL	300 ppm 900 mg/m3	CAL PEL
toluene	108-88-3	TWA	20 ppm	ACGIH
		TWA	100 ppm 375 mg/m3	NIOSH REL
		ST	150 ppm 560 mg/m3	NIOSH REL
		TWA	200 ppm	OSHA Z-2
		CEIL	300 ppm	OSHA Z-2
		Peak	500 ppm (10 minutes)	OSHA Z-2
		TWA	100 ppm 375 mg/m3	OSHA P0
		STEL	150 ppm 560 mg/m3	OSHA P0
		PEL	10 ppm 37 mg/m3	CAL PEL
		C	500 ppm	CAL PEL
		STEL	150 ppm 560 mg/m3	CAL PEL
benzene	71-43-2	TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
		TWA	0.1 ppm	NIOSH REL
		ST	1 ppm	NIOSH REL
		TWA	10 ppm	OSHA Z-2
		CEIL	25 ppm	OSHA Z-2
		Peak	50 ppm (10 minutes)	OSHA Z-2
		PEL	1 ppm	OSHA CARC
		STEL	5 ppm	OSHA CARC

		PEL	1 ppm	CAL PEL
		STEL	5 ppm	CAL PEL
ethanol	64-17-5	TWA	1,000 ppm 1,900 mg/m3	NIOSH REL
		TWA	1,000 ppm 1,900 mg/m3	OSHA Z-1
		TWA	1,000 ppm 1,900 mg/m3	OSHA P0
		STEL	1,000 ppm	ACGIH
		PEL	1,000 ppm 1,900 mg/m3	CAL PEL

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sam-pling time	Permissible concentra-tion	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of work-week	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI

Engineering measures : Use only in well-ventilated areas.
Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. 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.

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 circum-stances where air-purifying respirators may not provide ade-quate protection.

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.
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	:	Clear liquid.
Colour	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	:	Gasoline
Odour Threshold	:	No data available
pH	:	No data available
Pour point	:	No data available
Boiling point/boiling range	:	25 - 225 °C (77 - 437 °F)
Flash point	:	-50 - -38 °C (-58 - -36 °F) Method: Tagliabue.
Auto-Ignition Temperature	:	257 °C (495 °F)
Evaporation rate	:	No data available
Flammability	:	Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
Upper explosion limit	:	7.6 %(V)

Lower explosion limit	:	1.3 %(V)
Vapour pressure	:	< 802.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	3
Relative density	:	0.685 - 0.8
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Explosive properties	:	Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents, acids and interhalogens.
Hazardous decomposition products	:	May release COx, NOx, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, 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

Product:

Acute oral toxicity	:	Remarks: No data available
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	Remarks: No data available

Components:

toluene:

Acute oral toxicity	:	LD50 (Rat): 5,580 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): 7585 ppm Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): 12,125 mg/kg,

benzene:

Acute oral toxicity	:	LD50 (Rat): 2,990 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): 13700 ppm Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 8,240 mg/kg,

ethanol:

Acute oral toxicity	:	LD50 (Rat): 7,060 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): > 32380 ppm Exposure time: 4 h Test atmosphere: vapour

Skin corrosion/irritation

Product:

Remarks: No data available

Serious eye damage/eye irritation

Product:

Remarks: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - 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

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1203
Proper shipping name	:	Gasoline
Class	:	3
Packing group	:	II
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	364

IMDG-Code

UN number	:	UN 1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

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

National Regulations

49 CFR

UN/ID/NA number	:	UN 1203
Proper shipping name	:	Gasoline
Class	:	3
Packing group	:	II
Labels	:	Class 3 - Flammable Liquid
ERG Code	:	128
Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

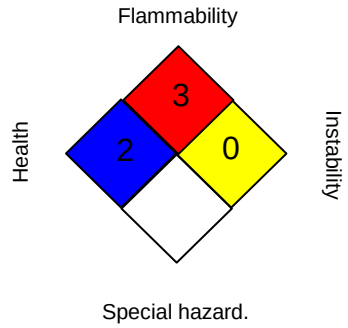
The components of this product are reported in the following inventories:

DSL	On the inventory, or in compliance with the inventory
TSCA	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
EINECS	On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	3*
FLAMMABILITY	3
PHYSICAL HAZARD	0
PERSONAL PROTECTION	H

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

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 : 2017/04/20

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.

APPENDIX H
SDS FOR REGULAR GASOLINE

SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	**Regular Gasoline**
Other means of identification	Not available
Recommended use	Fuel
Recommended restrictions	None known.
Manufacturer information	Irving Oil Refining G.P. Box 1260 Saint John, NB E2L 4H6 CA Phone: (506) 202-2000 Refinery: (506) 202-3000 Emergency Phone: 1-800-424-9300 (CHEMTREC)
Supplier	See above.

2. Hazards Identification

Physical hazards	Flammable liquids	Category 1
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Germ cell mutagenicity	Category 1
	Carcinogenicity	Category 1A
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 1
	Aspiration hazard	Category 1
Environmental hazards	Not classified.	
WHMIS 2015 defined hazards	Not classified	

Label elements

Signal word Danger

Hazard statement

Extremely flammable liquid and vapor.
May be fatal if swallowed and enters airways.
Causes skin irritation.
Causes serious eye irritation.
May cause drowsiness or dizziness.
May cause genetic defects.
May cause cancer.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist or vapor.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

Response	In case of fire: Use appropriate media to extinguish. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Specific treatment (see this label). IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER if you feel unwell. IF exposed or concerned: Get medical advice/attention.
Storage	Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
WHMIS 2015: Health Hazard(s) not otherwise classified (HHNOC)	None known
WHMIS 2015: Physical Hazard(s) not otherwise classified (PHNOC)	None known
Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	Not applicable.

3. Composition/Information on Ingredients

Mixture

Chemical name	Common name and synonyms	CAS number	%
Gasoline		8006-61-9	60-100
Benzene		71-43-2	0.5-1.5

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments	Gasoline is a complex mixture of hydrocarbons. Its exact composition depends on the source of the crude oil from which it was produced and the refining methods used. Gasoline contains hundreds of individual organic chemicals. This section identifies only some of the well-known chemical constituents.

4. First Aid Measures

Inhalation	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
Skin contact	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Specific treatment (see information on this label).
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
Most important symptoms/effects, acute and delayed	Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Prolonged exposure may cause chronic effects.
Indication of immediate medical attention and special treatment needed	Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Take off all contaminated clothing immediately. Wash contaminated clothing before reuse. Keep away from sources of ignition. No smoking. Avoid contact with eyes and skin. Wear rubber gloves and safety glasses with side shields. Keep out of reach of children.

5. Fire Fighting Measures

Suitable extinguishing media	Carbon dioxide. Alcohol foam. Dry chemical.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical	Container may explode in heat of fire. Vapors may form explosive mixtures with air. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Firefighters should wear full protective clothing including self-contained breathing apparatus.
Fire-fighting equipment/instructions	Move containers from fire area if you can do so without risk.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	Extremely flammable liquid and vapor.
Hazardous combustion products	May include and are not limited to: Oxides of nitrogen. Polycyclic aromatic hydrocarbons (PAHs). Phenols. Aromatic hydrocarbons. Oxides of carbon.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep out of low areas. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not breathe mist or vapor. Avoid inhalation of vapors or mists. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop leak if you can do so without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Never return spills to original containers for re-use. Following product recovery, flush area with water. Clean surface thoroughly to remove residual contamination. For waste disposal, see section 13 of the SDS. Prevent entry into waterways, sewer, basements or confined areas.
Environmental precautions	Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Use non-sparking tools and explosion-proof equipment. Avoid contact with eyes, skin and clothing. Wear personal protective equipment. Do not breathe mist or vapor. Use only with adequate ventilation. Avoid prolonged exposure. Use good industrial hygiene practices in handling this material. Wash thoroughly after handling. When using, do not eat, drink or smoke.
Conditions for safe storage, including any incompatibilities	Store locked up. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Keep away from heat, open flames or other sources of ignition. Store away from incompatible materials (see Section 10 of the SDS). Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	8 mg/m3 2.5 ppm
	TWA	1.6 mg/m3 0.5 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	15.5 mg/m3 5 ppm
	TWA	3 mg/m3 1 ppm
Gasoline (CAS 8006-61-9)	STEL	1480 mg/m3 500 ppm
	TWA	890 mg/m3 300 ppm

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	5 ppm
	TWA	1 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Benzene (CAS 71-43-2)	Ceiling	25 ppm
	TWA	10 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	1 ppm
	TWA	0.1 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Benzene (CAS 71-43-2)	25 µg/g	S-Phenylmercapturic acid	Creatinine in urine	*

* - For sampling details, please see the source document.

Exposure guidelines

Canada - Alberta OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - British Columbia OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - Manitoba OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Canada - Ontario OELs: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Benzene (CAS 71-43-2) Can be absorbed through the skin.

Appropriate engineering controls Mechanical ventilation should be used when handling this product in enclosed spaces. Local exhaust ventilation may be necessary.

Individual protection measures, such as personal protective equipment

Eye/face protection Face shield or chemical goggles.

Skin protection	
Hand protection	Viton™. or Viton™. / Butyl rubber
Other	Wear appropriate chemical resistant clothing. Use of protective coveralls and long sleeves is recommended. If clothing or footwear becomes contaminated with the product, remove it immediately and completely decontaminate it before re-use, or discard it.
Respiratory protection	For confined spaces, wear a NIOSH-approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions. Respirator should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134), CAN/CSA-Z94.4 and ANSI's standard for respiratory protection (Z88.2).
Thermal hazards	Not applicable.
General hygiene considerations	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Appearance	Clear
Physical state	Liquid.
Form	Liquid
Color	Clear
Odor	Characteristic Gasoline
Odor threshold	Not available.
pH	Not applicable
Melting point/freezing point	-112 °F (-80 °C)
Initial boiling point and boiling range	70 - 410 °F (21.11 - 210 °C) (Typical)
Pour point	Not available.
Specific gravity	0.69 - 0.75 @ 15°C (Typical)
Partition coefficient (n-octanol/water)	Expected to be >1
Flash point	-45.4 °F (-43.0 °C) Closed Cup (Typical)
Evaporation rate	4 (butyl acetate = 1)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	> 1.4 (Typical)
Flammability limit - upper (%)	< 7.6 (Typical)
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	400 - 775 mmHg @ 20°C
Vapor density	2.5 - 3.7 (air = 1)
Relative density	Not available.
Solubility(ies)	Not available.
Auto-ignition temperature	494.6 °F (257 °C) (Typical)
Decomposition temperature	Not available.
Viscosity	Not available.

10. Stability and Reactivity

Reactivity	May react with incompatible materials.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Heat, open flames, static discharge, sparks and other ignition sources. Do not mix with other chemicals.
Incompatible materials	Acids. Oxidizers.

Hazardous decomposition products	May include and are not limited to: Oxides of nitrogen. Aromatic hydrocarbons. Oxides of carbon. Polycyclic aromatic hydrocarbons (PAHs). Phenols

11. Toxicological Information

Routes of exposure Eye, Skin contact, Skin absorption, Inhalation, Ingestion.

Information on likely routes of exposure

Ingestion May be fatal if swallowed and enters airways.

Inhalation Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Prolonged inhalation may be harmful. May cause damage to organs by inhalation.

Skin contact Causes skin irritation.

Eye contact Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

Information on toxicological effects

Acute toxicity May be fatal if swallowed and enters airways. Narcotic effects.

Components	Species	Test Results
Benzene (CAS 71-43-2)		
Acute		
Dermal		
LD50	Guinea pig	> 8260 mg/kg, HSDB
	Guinea pig; Rabbit	> 9.4 ml/kg, 24 Hours, ECHA
Inhalation		
LC50	Mouse	9980 ppm, 7 Hours, ECHA
	Rat	43767 mg/m3, 4 Hours, ECHA
		13700 ppm, 4 Hours, ECHA
		10000 ppm, 7 Hours, HSDB
		31.8 mg/l/4h, HSDB
Oral		
LD50	Mouse	4700 mg/kg, HSDB
	Rat	> 2000 mg/kg, ECHA
		5970 mg/kg, ECHA
		4700 mg/kg, HSDB
		3306 mg/kg, HSDB
Gasoline (CAS 8006-61-9)		
Acute		
Dermal		
LD50	Rabbit	> 1900 mg/kg, 24 Hours
		3750 mg/kg
Inhalation		
LC50	Rat	> 4980 mg/m3, 4 Hours
		> 5 mg/L, 4 Hours
		5.2 mg/l/4h
Oral		
LD50	Rat	13600 mg/kg
		4820 mg/kg

Skin corrosion/irritation Causes skin irritation.

Exposure minutes Not available.

Erythema value Not available.

Oedema value Not available.

Serious eye damage/eye irritation Causes serious eye irritation.

Corneal opacity value Not available.

Iris lesion value Not available.

Conjunctival reddening value Not available.

Conjunctival oedema value Not available.

Recover days Not available.

Respiratory or skin sensitization

Respiratory sensitization Not available.

Skin sensitization This product is not expected to cause skin sensitization.

Mutagenicity May cause genetic defects. The mutagenicity of benzene has been extensively studied in rats and mice using inhalation and oral exposure techniques. Positive results have been obtained for many tests including and not limited to chromosome aberrations, micronuclei, sister chromatid exchanges, point mutations, DNA adducts, DNA repair, DNA damage, aneuploidy and sperm head abnormalities.

Carcinogenicity May cause cancer. Exposure of rats and mice to benzene by inhalation or ingestion routes has caused cancer of the lymph system (lymphoma), the blood (leukemia), and the bone marrow (myeloma). It has also caused tumours of the liver, zymbal gland, mammary gland, lungs, thymus, nasal and oral cavities.

ACGIH Carcinogens

Benzene (CAS 71-43-2) A1 Confirmed human carcinogen.

Canada - Alberta OELs: Carcinogen category

Benzene (CAS 71-43-2) Confirmed human carcinogen.

Canada - Manitoba OELs: carcinogenicity

BENZENE (CAS 71-43-2) Confirmed human carcinogen.

Canada - Quebec OELs: Carcinogen category

Benzene (CAS 71-43-2) Detected carcinogenic effect in humans.

Gasoline (CAS 8006-61-9) Detected carcinogenic effect in animals.

IARC Monographs. Overall Evaluation of Carcinogenicity

Benzene (CAS 71-43-2) Volume 29, Supplement 7, Volume 100F 1 Carcinogenic to humans.

Gasoline (CAS 8006-61-9) Volume 45 - 2B Possibly carcinogenic to humans.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzene (CAS 71-43-2)

US NTP Report on Carcinogens: Known carcinogen

Benzene (CAS 71-43-2) Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Benzene (CAS 71-43-2) Cancer

Reproductive toxicity Not classified.

Teratogenicity Not classified.

Specific target organ toxicity - single exposure Narcotic effects.

Specific target organ toxicity - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard May be fatal if swallowed and enters airways.

Chronic effects Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects. Causes damage to organs through prolonged or repeated exposure. Prolonged or repeated overexposure can cause liver and kidney damage.

12. Ecological Information

Ecotoxicity See below

Ecotoxicological data

Components		Species	Test Results
Benzene (CAS 71-43-2)			
Algae	IC50	Algae	29 mg/L, 72 Hours
Crustacea	EC50	Daphnia	12.18 mg/L, 48 Hours
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	8.76 - 15.6 mg/L, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	7.2 - 11.7 mg/L, 96 hours
Gasoline (CAS 8006-61-9)			
Algae	IC50	Algae	4700 mg/L, 72 Hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Mobility in general	Not available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal Considerations

Disposal instructions	Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

Transport of Dangerous Goods (TDG) Proof of Classification	Classification Method: Classified as per Part 2, Sections 2.1 – 2.8 of the Transportation of Dangerous Goods Regulations. If applicable, the technical name and the classification of the product will appear below.

U.S. Department of Transportation (DOT)

Basic shipping requirements:

UN number	UN1203
Proper shipping name	Gasoline
Hazard class	3
Packing group	II
Special provisions	144, 177, B1, B33, IB2, T4
Packaging exceptions	150

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

UN number	UN1203
Proper shipping name	GASOLINE
Hazard class	3
Packing group	II
Special provisions	17, 88, 91, 98, 150

DOT

TDG

15. Regulatory Information

Canadian federal regulations	This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (SOR/2015-17) and the SDS contains all the information required by the HPR.

Canada CEPA Schedule I: Listed substance

Benzene (CAS 71-43-2)	Listed.

Canada NPRI VOCs with Additional Reporting Requirements: Mass reporting threshold/Identification Number

Benzene (CAS 71-43-2)	1 TONNES

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

WHMIS 2015 Exemptions Controlled

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Benzene (CAS 71-43-2)	Listed.
Gasoline (CAS 8006-61-9)	Listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Benzene (CAS 71-43-2)	Cancer Central nervous system Blood Aspiration Skin Eye respiratory tract irritation Flammability

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Benzene	71-43-2	0.5-1.5

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Benzene (CAS 71-43-2)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)	Hazardous substance Priority pollutant Toxic pollutant

US state regulations See below

US - California Hazardous Substances (Director's): Listed substance

Benzene (CAS 71-43-2)	Listed.
Gasoline (CAS 8006-61-9)	Listed.

US - Illinois Chemical Safety Act: Listed substance

Benzene (CAS 71-43-2)
Gasoline (CAS 8006-61-9)

US - Louisiana Spill Reporting: Listed substance

Benzene (CAS 71-43-2)	Listed.
Gasoline (CAS 8006-61-9)	Listed.

US - Michigan Critical Materials Register: Parameter number

Benzene (CAS 71-43-2)	BENZENE

US - Minnesota Haz Subs: Listed substance

Benzene (CAS 71-43-2)	Listed.
Gasoline (CAS 8006-61-9)	Listed.

US - New Jersey RTK - Substances: Listed substance

Benzene (CAS 71-43-2)
Gasoline (CAS 8006-61-9)

US - North Carolina Toxic Air Pollutants: Listed substance

Benzene (CAS 71-43-2)

US - Pennsylvania RTK - Hazardous Substances: Special hazard

Benzene (CAS 71-43-2)

US - Texas Effects Screening Levels: Listed substance

Benzene (CAS 71-43-2)	Listed.
Gasoline (CAS 8006-61-9)	Listed.

US - Washington Chemical of High Concern to Children: Listed substance

Benzene (CAS 71-43-2)

US. Massachusetts RTK - Substance List

Benzene (CAS 71-43-2)
Gasoline (CAS 8006-61-9)

US. New Jersey Worker and Community Right-to-Know Act

Benzene (CAS 71-43-2)
Gasoline (CAS 8006-61-9)

US. Pennsylvania Worker and Community Right-to-Know Law

Benzene (CAS 71-43-2)

US. Rhode Island RTK

Benzene (CAS 71-43-2)
Gasoline (CAS 8006-61-9)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzene (CAS 71-43-2)	Listed: February 27, 1987

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997

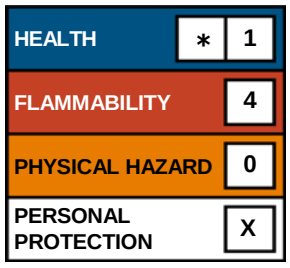
Inventory status

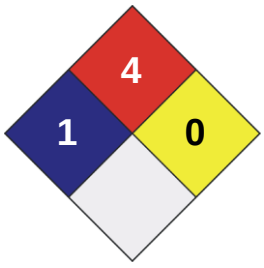
Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

LEGEND	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0





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Issue date 11-October-2018

Version # 02

Effective date 14-February-2017

Prepared by Dell Tech Laboratories, Ltd. Phone: (519) 858-5021

Other information

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (SOR/2015-17) and the SDS contains all the information required by the HPR. For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

APPENDIX I
SDS FOR DIESEL

SAFETY DATA SHEET
According to the Hazardous Products Regulations
ULS Diesel

Version	Revision Date:	SDS Number:	Print Date: 2016-08-27
2.0	2016-08-26	800001031676	Date of last issue: 04.10.2013
			Date of first issue: 26.08.2016

SECTION 1. IDENTIFICATION

Product name : ULS Diesel

Product code : 002D1899

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Trading Canada**
400 - 4th Avenue S.W.
Calgary-Alberta T2P 0J4
Canada

Telephone : (+1) 800-661-1600 ;
Telefax :

Emergency telephone number : Shell Canada: (+1) 800-661-7378
CANUTEC (24 hr): (+1) 613-996-6666

Recommended use of the chemical and restrictions on use

Recommended use : Fuel for on-road diesel-powered engines.

Restrictions on use :
This product must not be used in applications other than those listed 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; as a skin cleanser.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 3

Aspiration hazard : Category 1

Acute Toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Carcinogenicity : Category 2

Specific target organ toxicity - repeated exposure : Category 2 (Blood, thymus, Liver.)

Chronic aquatic toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : PHYSICAL HAZARDS:
H226 Flammable liquid and vapour.
HEALTH HAZARDS:
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H332 Harmful if inhaled.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.
Blood.
thymus
Liver.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P331 Do NOT induce vomiting.

Other hazards which do not result in classification
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.
This material is a static accumulator.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
This product is intended for use in closed systems only.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name : ULS Diesel

Chemical nature : Complex mixture of hydrocarbons consisting of paraffins, cycloparaffins, aromatic and olefinic hydrocarbons with carbon numbers predominantly in the C9 to C25 range.
May also contain several additives at <0.1% v/v each.
May contain cetane improver (Ethyl Hexyl Nitrate) at <0.2% v/v.

May contain methyl and ethyl esters from lipid sources

May contain catalytically cracked oils in which polycyclic aromatic compounds, mainly 3-ring but some 4- to 6-ring species are present.

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Fuels, diesel	68334-30-5	0 - 100
Distillates (Fischer-Tropsch), C8-26 - Branched and Linear	848301-67-7	0 - 50
Alkanes, C10-20, branched and linear	928771-01-1	0 - 30

Dyes and markers can be used to indicate tax status and prevent fraud.

Further information

Contains:

Chemical name	Identification number	Concentration [%]
cumene	98-82-8, 202-704-5	0 - 0.5
Naphthalene	91-20-3, 202-049-5	0 - 0.5

SECTION 4. FIRST-AID MEASURES

If inhaled : Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.
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.

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

If swallowed : 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.
Give nothing by mouth.

Most important symptoms and effects, both acute and delayed	:	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. Skin irritation signs and symptoms may include a burning sensation, redness, or swelling.
Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

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 direct water jets on the burning product as they could cause a steam explosion and spread of the fire. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.
Specific hazards during fire-fighting	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Oxides of sulphur. Unidentified organic and inorganic compounds. Carbon monoxide may be evolved if incomplete combustion occurs. Will float and can be reignited on surface water. Flammable vapours may be present even at temperatures below the flash point. The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Further information	:	Clear fire area of all non-emergency personnel. Keep adjacent containers cool by spraying with water.

If possible remove containers from the danger zone.
If the fire cannot be extinguished the only course of action is to evacuate immediately.
Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.

Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Do not breathe fumes, vapour.
Do not operate electrical equipment.
Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.

Environmental precautions : Take measures to minimise the effects on groundwater.
Contain residual material at affected sites to prevent material from entering drains (sewers), ditches, and waterways.
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Methods and materials for containment and cleaning up : For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely Remove contaminated soil and dispose of safely.
For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely
Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Observe all relevant local and international regulations.
Evacuate the area of all non-essential personnel.
Ventilate contaminated area thoroughly.

Additional advice : For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.
Local authorities should be advised if significant spillages cannot be contained.
Maritime spillages should be dealt with using a Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex 1 Regulation 26.

SECTION 7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
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.
Air-dry contaminated clothing in a well-ventilated area before laundering.
Prevent spillages.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Never siphon by mouth.
Contaminated leather articles including shoes cannot be decontaminated and should be destroyed to prevent reuse.

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

Advice on safe handling : Ensure that all local regulations regarding handling and storage facilities are followed.
Avoid inhaling vapour and/or mists.
Avoid prolonged or repeated contact with skin.
When using do not eat or drink.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
Earth all equipment.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.

The vapour is heavier than air, spreads along the ground and distant ignition is possible.

Avoidance of contact : Strong oxidising agents.

Product Transfer : 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. Keep containers closed when not in use. Contamination resulting from product transfer may give rise to light hydrocarbon vapour in the headspace of tanks that have previously contained gasoline. This vapour may explode if there is a source of ignition. Partly filled containers present a greater hazard than those that are full, therefore handling, transfer and sampling activities need special care. Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur. Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges. These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements. These activities may lead to static discharge e.g. spark formation. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations.

Storage

Other data : Drum and small container storage:
Drums should be stacked to a maximum of 3 high.
Use properly labeled and closable containers.
Tank storage:
Tanks must be specifically designed for use with this product.
Bulk storage tanks should be diked (bunded).
Locate tanks away from heat and other sources of ignition.
Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat.
Vapours from tanks should not be released to atmosphere.
Breathing losses during storage should be controlled by a suitable vapour treatment system.
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Keep container tightly closed and in a cool, well-ventilated place.
Keep in a cool place.
Electrostatic charges will be generated during pumping.
Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.

Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
Keep in a bunded area with a sealed (low permeability) floor, to provide containment against spillage.
Prevent ingress of water.

Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel., Aluminium may also be used for applications where it does not present an unnecessary fire hazard., Examples of suitable materials are: high density polyethylene (HDPE) and Viton (FKM), which have been specifically tested for compatibility with this product., For container linings, use amine-adduct cured epoxy paint., For seals and gaskets use: graphite, PTFE, Viton A, Viton B.
Unsuitable material: Some synthetic materials 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.

Specific use(s) : See additional references that provide safe handling practices for liquids that are determined to be static accumulators: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance
Ensure that all local regulations regarding handling and storage facilities are followed.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Fuels, diesel	68334-30-5	X ((inhalable fraction))		US. ACGIH Threshold Limit Values
		TWA ((inhalable fraction))		US. ACGIH Threshold Limit Values
		TWA	100 mg/m3 (total hydrocarbons)	CA AB OEL
		TWA (Inhal-	100 mg/m3	CA BC OEL

		able vapour and aerosols)	(total hydrocarbons)	
		TWA (Inhalable fraction and vapor)	100 mg/m3 (total hydrocarbons)	ACGIH
Naphthalene	91-20-3	TWA	10 ppm 50 mg/m3	OSHA Z-1
		TWA	10 ppm	ACGIH
cumene	98-82-8	TWA	50 ppm 245 mg/m3	OSHA Z-1
		TWA	50 ppm	ACGIH

Biological occupational exposure limits

No biological limit allocated.

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 controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp

Engineering measures : 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:
Use sealed systems as far as possible.
Firewater monitors and deluge systems are recommended.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Eye washes and showers for emergency use.

General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and

protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Do not ingest. If swallowed then seek immediate medical assistance

Personal protective equipment

Respiratory protection : 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 unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
All respiratory protection equipment and use must be in accordance with local regulations.

Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : 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. When prolonged or frequent repeated contact occurs. Nitrile rubber. For incidental contact/splash protection Neoprene, PVC gloves may be suitable. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not

a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, 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 : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.
If a local risk assessment deems it so then chemical splash goggles may not be required and safety glasses may provide adequate eye protection.

Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.

Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Hygiene measures : Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Do not ingest. If swallowed then seek immediate medical assistance.
If repeated and/or prolonged skin exposure to the substance is likely, then wear suitable gloves tested to EN374 and provide employee skin care programmes.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing

vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	liquid
Colour	:	Undyed
Odour	:	Stenched
Odour Threshold	:	Data not available
pH	:	Not applicable
Melting point/freezing point	:	Data not available
Initial boiling point and boiling range	:	150 - 400 °C / 302 - 752 °F
Flash point	:	40 - 60 °C / 104 - 140 °F
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Not applicable
Upper explosion limit	:	6 %(V)
Lower explosion limit	:	1 %(V)
Vapour pressure	:	<= 0.4 kPa (38.0 °C / 100.4 °F)
		<= 0.6 kPa (50.0 °C / 122.0 °F)
Relative vapour density	:	Data not available
Relative density	:	Data not available
Density	:	820 - 860 kg/m3 (15.0 °C / 59.0 °F)
Solubility(ies)		
Water solubility	:	Data not available
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	log Pow: ca. 2 - 15

Auto-ignition temperature	:	> 220 °C / 428 °F
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, kinematic	:	1.3 - 4.1 mm2/s (40 °C / 104 °F)
Explosive properties	:	Classification Code: Not classified.
Oxidizing properties	:	Not applicable
Conductivity	:	Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m., Whether a liquid is nonconductive or semiconductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	Stable under normal use conditions.
Possibility of hazardous reactions	:	No hazardous reaction is expected when handled and stored according to provisions
Conditions to avoid	:	Avoid heat, sparks, open flames and other ignition sources. In certain circumstances product can ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage. Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment : Information given is based on product data, a knowledge of the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur through inhalation or following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity : LD50 (rat): > 5,000 mg/kg
Remarks: Low toxicity:

Acute inhalation toxicity : LC 50 (rat): > 1 - <=5 mg/l
Exposure time: 4 h
Remarks: Harmful if inhaled.

Acute dermal toxicity : LD 50 (Rabbit): > 2,000 mg/kg
Remarks: Low toxicity:

Skin corrosion/irritation

Product:
Remarks: Irritating to skin.

Serious eye damage/eye irritation

Product:
Remarks: Expected to be slightly irritating.

Respiratory or skin sensitisation

Product:
Remarks: Not expected to be a sensitiser.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: Positive in in-vitro, but negative in in-vivo mutagenicity assays.

Carcinogenicity

Product:
Remarks: Limited evidence of carcinogenic effect
Repeated skin contact has resulted in irritation and skin cancer in animals.

IARC	Group 2B: Possibly carcinogenic to humans	
	cumene	98-82-8
	Naphthalene	91-20-3
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.	
NTP	Reasonably anticipated to be a human carcinogen	
	cumene	98-82-8
	Naphthalene	91-20-3

Reproductive toxicity

Product:

Effects on fertility : Remarks: Not expected to impair fertility.
Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Not classified.

STOT - repeated exposure

Product:

Target Organs: Blood, thymus, Liver
Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure.

Aspiration toxicity

Product:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

Further information

Product:

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Information given is based on a knowledge of the components and the ecotoxicology of similar products.
Fuels are typically made from blending several refinery streams. Ecotoxicological studies have been carried out on a variety of hydrocarbon blends and streams but not those containing additives.
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity) :
Remarks: Expected to be toxic:
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to crustacean (Acute toxicity) :
Remarks: Expected to be toxic:
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to algae/aquatic plants (Acute toxicity) :
Remarks: Expected to be toxic:
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to fish (Chronic toxicity) : Remarks: NOEC/NOEL expected to be > 0.01 - <= 0.1 mg/l (based on modeled data)

Toxicity to crustacean (Chronic toxicity) : Remarks: NOEC/NOEL expected to be > 0.1 - <= 1.0 mg/l (based on modeled data)

Toxicity to microorganisms (Acute toxicity) : Remarks: Expected to be practically non toxic:
LL/EL/IL50 > 100 mg/l

Persistence and degradability

Product:

Biodegradability : Remarks: Readily biodegradable.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: ca. 2 - 15

Mobility in soil

Product:

Mobility : Remarks: Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day.
If product enters soil, one or more constituents will be mobile and may contaminate groundwater.
Large volumes may penetrate soil and could contaminate groundwater.
Floats on water.

Other adverse effects

Product:

Additional ecological information : Films formed on water may affect oxygen transfer and damage organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
Send to drum recoverer or metal reclaimer.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.
Drain container thoroughly.Do not dispose into the environment, in drains or in water courses
After draining, vent in a safe place away from sparks and fire.Do not dispose of tank water bottoms by allowing them to drain into the ground.
Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums.This will result in soil and groundwater contamination.
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 should be established beforehand.

Contaminated packaging : Residues may cause an explosion hazard if heated above the flash point. Do not puncture, cut or weld uncleaned drums.
Do not pollute the soil, water or environment with the waste container.
Comply with any local recovery or waste disposal regulations.
Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

Local legislation

Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

TDG

UN number	: 1202
Proper shipping name	: DIESEL FUEL
Class	: 3
Packing group	: III
Labels	: 3
Marine pollutant	: no

International Regulations

IATA-DGR

UN/ID No.	: UN 1202
Proper shipping name	: DIESEL FUEL
Class	: 3
Packing group	: III
Labels	: 3

IMDG-Code

UN number	: UN 1202
Proper shipping name	: DIESEL FUEL
Class	: 3
Packing group	: III
Labels	: 3
Marine pollutant	: yes

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

Pollution category	: Not applicable
Ship type	: Not applicable
Product name	: Not applicable
Special precautions	: Not applicable

Special precautions for user

Remarks : Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Additional Information : MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.
IARC has classified diesel exhaust emissions as a Class 1 carcinogen - carcinogenic to humans.
Steps should be taken to prevent personal exposure to diesel exhaust emissions.
This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

The components of this product are reported in the following inventories:

DSL : All components listed or polymer exempt.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

This product is intended for use in closed systems only.

Version	Revision Date:	SDS Number:	Print Date: 2016-08-27
2.0	2016-08-26	800001031676	Date of last issue: 04.10.2013
			Date of first issue: 26.08.2016

A vertical bar (|) in the left margin indicates an amendment from the previous version.
Due to the conversion of this product to GHS classification and labelling, there has been a significant change to the nature of the information presented in chapter 2.
Revision Date : 2016-08-26

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.

CA / EN

APPENDIX J
SDS FOR DYED DIESEL

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)

SECTION 1: Identification

Product Identifier	**No. 1 Diesel Fuel**
Other means of identification	Diesel Fuel No. 1;No. 1 Diesel, Ultra Low Sulfur, Dyed and Undyed;No. 1 High Sulfur Diesel – Dyed;No. 1 High Sulfur Distillate;No. 1 Low Sulfur Diesel – Dyed; No. 1 Low Sulfur Distillate;#1 DSL ULS 15 NRLM;#1 DSL ULS 15 NRLM D; PCR - HOD – Heating Oil Distillate
SDS Number	**001929**
MARPOL Annex I Category	Kerosenes
Relevant identified uses	Fuel
Uses advised against	All others
24 Hour Emergency Phone Number	CHEMTREC 1-800-424-9300 CANUTEC 613-996-6666 CHEMTREC Mexico 01-800-681-9531

Manufacturer/Supplier	**SDS Information**
Phillips 66 Company	Phone: 800-762-0942
P.O. Box 4428	Email: SDS@P66.com
Houston, Texas 77210	URL: www.Phillips66.com

SECTION 2: Hazard identification

Classified Hazards

H226 - Flammable liquids -- Category 3
H304 -- Aspiration Hazard -- Category 1
H315 -- Skin corrosion/irritation -- Category 2
H336 -- Specific target organ toxicity (single exposure) -- Category 3
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Hazards Not Otherwise Classified (HNOC)

PHNOC: Electrostatic charge may be generated during pumping and other operations

HHNOC: None known

Label Elements

DANGER

Flammable liquid and vapor
May be fatal if swallowed and enters airways
Causes skin irritation
May cause drowsiness or dizziness
Toxic to aquatic life with long lasting effects

Keep away from heat/sparks/open flames/hot surfaces. - No smoking; Ground/bond container and receiving equipment; Use only non-sparking tools; Take precautionary measures against static discharge; Avoid breathing dust/fume/gas/mist/vapours/spray; Wash skin thoroughly after handling; Use only outdoors or in a well-ventilated area; Avoid release to the environment; Wear protective gloves/protective clothing and eye/face protection; IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician; Do NOT induce vomiting; IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower; IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing; Call a POISON CENTER or doctor/physician if you feel unwell; Take off contaminated clothing and wash before reuse; In case of fire: Use CO2, dry chemical, or foam for extinction; Store in a well-ventilated place. Keep container tightly closed; Dispose of contents/container to an approved waste disposal plant

SECTION 3: Composition/information on ingredients

Chemical Name	CASRN	Concentration[1]
Petroleum distillates, hydrotreated light	64742-47-8	0-100
Kerosine, petroleum, hydrodesulfurized	64742-81-0	0-100
Kerosine, petroleum	8008-20-6	0-100
Naphthalene	91-20-3	<3
Ethylbenzene	100-41-4	<1

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4: First aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation: First aid is not normally required. If breathing difficulties develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. Seek immediate medical attention.

Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects, both acute and delayed: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting. Prolonged or repeated contact may dry skin and cause irritation

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to the hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

SECTION 5: Firefighting measures

NFPA 704 Hazard Class

Health: 1 **Flammability:** 2 **Instability:** 0

0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe) Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

Special protective actions for firefighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate the hazard area and deny entry to unnecessary and unprotected personnel Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop and contain spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

SECTION 7: Handling and storage

Precautions for safe handling: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Diesel engine exhaust contains hazardous combustion products and has been identified as a cancer hazard. Exposure should be minimized to reduce potential risk.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

SECTION 8: Exposure controls/personal protection

Chemical Name	ACGIH	OSHA	Other
Petroleum distillates, hydrotreated light	TWA: 200 mg/m^3 Skin	---	200 mg/m^3 TWA8hr 100 mg/m^3 TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)
Kerosine, petroleum, hydrodesulfurized	TWA: 200 mg/m^3 Skin	---	200 mg/m^3 TWA8hr 100 mg/m^3 TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)

Kerosine, petroleum	TWA: 200 mg/m³ Skin	---	200 mg/m³ TWA8hr 100 mg/m³ TWA12hr 28 ppm TWA8hr 14 ppm TWA12hr (Phillips 66 Guidelines)
Naphthalene	TWA: 10 ppm Skin	TWA: 10 ppm : 50 mg/m³	---
Ethylbenzene	TWA: 20 ppm	TWA: 100 ppm TWA: 435 mg/m³	20 ppm TWA8hr 10 ppm TWA12hr 87 mg/m³ TWA8hr 43.5 mg/m³ TWA12hr (Phillips 66 Guidelines)

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION 9: Physical and chemical properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance: Clear, light yellow or light green (may be dyed red)
Physical Form: Liquid
Odor: Kerosene
Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): > 4.5
Upper Explosive Limits (vol % in air): 7.0
Lower Explosive Limits (vol % in air): 0.7
Evaporation Rate (nBuAc=1): <1
Particle Size: Not applicable
Percent Volatile: 98-100% @ 545ºF (285ºC)
Flammability (solid, gas): Not applicable
VOC Content (%): 0.16 lb/1000 gal

Flash Point: 100-150 °F / 38-66 °C
Test Method: Tag Closed Cup (TCC), ASTM D56
Initial Boiling Point/Range: 300 - 572 °F / 149 - 300 °C
Vapor Pressure: 0.40 mmHg
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: < -40 °F / < -40 °C
Auto-ignition Temperature: 410 °F / 210 °C
Decomposition Temperature: No data
Specific Gravity (water=1): 0.775-0.840 @ 68ºF (20ºC)
Bulk Density: 6.73 lbs/gal
Viscosity: 1-2.4 cSt @ 40°C
Solubility in Water: <0.1%

SECTION 10: Stability and reactivity

Reactivity: Not chemically reactive.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Incompatible materials: Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous decomposition products: Not anticipated under normal conditions of use.

SECTION 11: Toxicological information

Information on Toxicological Effects

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Unlikely to be harmful		>5.2 mg/L (mist)
Dermal	Unlikely to be harmful		> 2 g/kg
Oral	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Not expected to cause organ effects from repeated exposure.

Carcinogenicity: Not expected to cause cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Other Comments: Naphthalene has been shown to cause cataracts in humans upon eye contact with vapors or dusts, and upon ingestion or inhalation in laboratory animals.
Diesel engine exhaust has been classified by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a carcinogen.

Information on Toxicological Effects of Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

Ethylbenzene

Carcinogenicity: Rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study demonstrated limited evidence of kidney, liver, and lung cancer. Ethyl benzene has been listed as a possible human carcinogen by IARC.

Target Organ(s): In rats and mice exposed to 0, 75, 250, or 750 ppm ethyl benzene in a two year inhalation study there was mild damage to the kidney (tubular hyperplasia), liver (eosinophilio foci, hypertrophy, necrosis), lung (alveolar epithelium metaplasia), thyroid (hyperplasia), thyroid (hyperplasia) and pituitary (hyperplasia). In animal models (particularly rats), ethyl benzene affects the auditory function mainly in the cochlear mid-frequency range and ototoxicity was observed after combined exposure to noise and ethyl benzene. There is no evidence of either ethyl benzene-induced hearing losses or ototoxicity with combined exposure to ethyl benzene and noise in workers.

SECTION 12: Ecological information

GHS Classification:
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2
Toxic to aquatic life with long lasting effects.

Toxicity: Acute aquatic toxicity studies on samples of jet fuel and kerosine streams show acute toxicity values greater than 1 mg/L and mostly in the range 1-100 mg/L. These tests were carried out on water accommodated fractions, in closed systems to prevent evaporative loss. Results are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon composition. Kerosines should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

Persistence and Degradability: The hydrocarbons in this material are not readily biodegradable but are regarded as inherently biodegradable since their hydrocarbon components can be degraded by microorganisms.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Hydrocarbon constituents of kerosine show measured or predicted Log Kow values ranging from 3 to 6 and above and therefore would be regarded as having the potential to bioaccumulate. In practice, metabolic processes may reduce bioconcentration.

Mobility in Soil: On release to water, hydrocarbons will float on the surface and since they are sparingly soluble, the only significant loss is volatilization to air. It is possible that some of the higher molecular weight hydrocarbons will be adsorbed on sediment. Biodegradation in water is a minor loss process. In air, these hydrocarbons are photodegraded by reaction with hydroxyl radicals with half lives varying from 0.1 to 0.7 days.

Other adverse effects: None anticipated.

SECTION 13: Disposal considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
• D001 - Ignitability characteristic

SECTION 14: Transport information

U.S. Department of Transportation (DOT)
UN Number: UN1202
UN proper shipping name: Diesel fuel
Transport hazard class(es): 3 *or* Combustible liquid
Packing Group: III
Environmental Hazards: Marine pollutant - Environmentally Hazardous

Special precautions for user: *Combustible liquid classification is dependent on a flash point of >60° C (140° F) and <93° C (200° F).*
If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.
Container(s) greater than 5 liters (liquids) or 5 kilograms (solids), shipped by water mode and ALL bulk shipments may require the shipping description to contain the "Marine Pollutant" notation [49 CFR 172.203(l)] and the container(s) to display the [Marine Pollutant Mark] [49 CFR 172.322].
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health Hazard:	Yes
Chronic Health Hazard:	Yes
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration[1]	de minimis
Naphthalene	<3	0.1%
Ethylbenzene	<1	0.1%

[1] All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

EPA (CERCLA) Reportable Quantity (in pounds):
EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Chemical Name	Type of Toxicity
Ethylbenzene	Cancer
Toluene	Developmental Toxicant
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

Diesel engine exhaust is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

Canada:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the Regulations.

International Inventories
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

SECTION 16: Other information

Issue Date:	Previous Issue Date:	SDS Number	Status:
30-Nov-2015	01-Apr-2015	001929	FINAL

Revised Sections or Basis for Revision:
Composition (Section 3); Exposure limits (Section 8); Regulatory information (Section 15)

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
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APPENDIX K
SDS FOR ACETYLENE

Acetylene

Safety Data Sheet E-4559

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-04-2016 Supersedes: 10-15-2013

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Name	:	Acetylene
CAS No	:	74-86-2
Formula	:	C2H2
Other means of identification	:	Acetylene Dissolved,Acetylen, ethine, ethyne, narcylene
Product group	:	Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Industrial use Welding

1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number	:	1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Flam. Gas 1 H220
Dissolved gas H280

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :

GHS02 GHS04

Signal word : DANGER

Hazard statements : **EXTREMELY FLAMMABLE GAS**
MAY REACT EXPLOSIVELY EVEN IN THE ABSENCE OF AIR AT ELEVATED PRESSURE AND/OR TEMPERATURE
CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
MAY FORM EXPLOSIVE MIXTURES WITH AIR

Precautionary statements : 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
Use and store only outdoors or in a well-ventilated area
Leaking gas fire: Do not extinguish, unless leak can be stopped safely
In case of leakage, eliminate all ignition sources

Dispose of contents/container in accordance with container Supplier/owner instructions
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Close valve after each use and when empty
Fusible plugs in the top, bottom, or valve melt at 98°C to 107°C (208°F to 224°F). Do not discharge at pressures above 15 psig (103 kPa)
Use only with equipment rated for cylinder pressure
Never put cylinders into unventilated areas of passenger vehicles

2.3. Other hazards

Other hazards not contributing to the classification : For safety reasons, the acetylene is dissolved in acetone (CAS no. 67-64-1; Flam. Liq. 2, Eye Irrit. 2, STOT SE 3) in the gas container. Vapour of the solvent is carried away as impurity when the acetylene is extracted from the gas container. The concentration of the solvent vapour in the gas is lower than the concentration limits to change the classification of the acetylene.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Acetylene (Main constituent)	(CAS No) 74-86-2	100	Ethyne / Acetylene, dissolved / Acetylene (liquefied) / Ethine

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : See below. See CGA Pamphlet SB-4, *Handling Acetylene Cylinders in Fire Situations*, for further information.

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Fire hazard : If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Reactivity in case of fire	:	No reactivity hazard other than the effects described in sub-sections below.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions	:	Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
Protection during firefighting	:	Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems Stop flow of product if safe to do so Use water spray or fog to knock down fire fumes if possible Continue water spray from protected position until container stays cool.
Other information	:	Acetylene containers are provided with pressure relief devices designed to vent contents when exposed to elevated temperature.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate ventilation. Stop leak if safe to do so.

6.2. Methods and materials for containment and cleaning up

For containment	:	Prevent runoff from contaminating the surrounding environment.

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking" or "Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Storage area : Acetylene trailers are designed and intended for outdoor use. Acetylene storage in excess of 2.500 cu ft (70.79 cubic meters) is prohibited in buildings and other occupancies.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : In case of splash hazard: safety glasses. Face shield. Gloves.

Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Skin and body protection : As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder’s gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information	:	**Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	Colourless gas.
Molecular mass	:	26 g/mol
Colour	:	Colourless.
Odour	:	Garlic like. Poor warning properties at low concentrations.
Odour threshold	:	No data available
pH	:	Not applicable.
pH solution	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-80.8 °C
Freezing point	:	No data available
Boiling point	:	-84 °C
Flash point	:	-17 °C
Critical temperature	:	36 °C
Auto-ignition temperature	:	305 °C
Decomposition temperature	:	635 °C
Vapour pressure	:	4400 kPa
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	6138 kPa
Relative vapour density at 20 °C	:	0.00117 (≥ 21.1)
Relative density	:	Not applicable.
Relative density of saturated gas/air mixture	:	No data available
Density	:	0.0012 g/cm³ (at 0 °C)
Relative gas density	:	0.9
Solubility	:	Water: 1185 mg/l
Log Pow	:	0.37
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	:	No data available
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Flammability (solid, gas)	:	2.5 - 100 vol %

9.2. Other information

Minimum ignition energy	:	≈
Sublimation point	:	-83.3 °C
Gas group	:	Dissolved gas

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.

Chemical stability	:	Dissolved in a solvent supported in a porous mass. Stable under recommended handling and storage conditions (see section 7).
Possibility of hazardous reactions	:	May react explosively even in the absence of air. May decompose violently at high temperature and/or pressure or in the presence of a catalyst. Can form explosive mixture with air. May react violently with oxidants.
Conditions to avoid	:	High temperature. High pressure. Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Incompatible materials	:	Forms explosive acetylides with copper, silver and mercury. Do not use alloys containing more than 65% copper. Air, Oxidiser. Do not use alloys containing more than 43% silver.
Hazardous decomposition products	:	Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate from the volatilization, reaction, or oxidation of the material being worked.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

Acetylene (74-86-2)	
Hydrocarbon	Yes

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No known ecological damage caused by this product.

12.2. Persistence and degradability

Acetylene (74-86-2)	
Persistence and degradability	Will rapidly degrade by indirect photolysis in air. Will not undergo hydrolysis.

12.3. Bioaccumulative potential

Acetylene (74-86-2)	
Log Pow	0.37
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Acetylene (74-86-2)	
Mobility in soil	No data available.
Log Pow	0.37
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on the ozone layer : No known effects from this product

Effect on global warming : No known effects from this product

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1001

TDG Primary Hazard Classes : 2.1 - Class 2.1 - Flammable Gas.

Proper shipping name : ACETYLENE, DISSOLVED

Explosive Limit and Limited Quantity Index : 0

Passenger Carrying Ship Index : 75 kg

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : Forbidden

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1001

Proper Shipping Name (IMDG) : ACETYLENE, DISSOLVED

Class (IMDG) : 2 - Gases

MFAG-No : 116

IATA

UN-No. (IATA) : 1001

Proper Shipping Name (IATA) : Acetylene, dissolved

Class (IATA) : 2

SECTION 15: Regulatory information

15.1. National regulations

Acetylene (74-86-2)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Acetylene (74-86-2)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican national Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

SECTION 16: Other information

Date of issue : 15/10/1979

Revision date : 04/08/2016

Supersedes : 15/10/2013

Indication of changes:

Training advice : Ensure operators understand the flammability hazard.

Other information : When using this product in welding and cutting, read and understand the manufacturer's instructions and the precautionary label on the product. Ask your welding products supplier for a copy of Praxair's free safety booklet, P-2035, Precautions and Safe Practices for Gas Welding, Cutting, and Heating, and for other manufacturers' safety publications. For a detailed treatment, get ANSI Z49.1, Safety in Welding, Cutting, and Allied Processes, published by the American Welding Society (AWS), www.aws.org. Order AWS documents from Global Engineering Documents, global.ihs.com. Arcs and sparks can ignite combustible materials. Prevent fires. Refer to NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hotwork. Do not strike an arc on the container. The defect produced by an arc burn may lead to container rupture

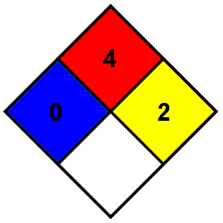
Fumes and gases produced during welding and cutting processes can be dangerous to your health and may cause serious lung disease. KEEP YOUR HEAD OUT OF FUMES. DO NOT BREATHE FUMES AND GASES. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes; or may cause other similar discomfort. Contaminants in the air may add to the hazard of fumes and gases

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

NFPA health hazard	: 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
NFPA fire hazard	: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
NFPA reactivity	: 2 - Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.



HMIS III Rating

Health	: 2 Moderate Hazard - Temporary or minor injury may occur
Flammability	: 4 Severe Hazard - Flammable gases, or very volatile flammable liquids with flash points below 73 F, and boiling points below 100 F. Materials may ignite spontaneously with air. (Class IA)
Physical	: 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

SDS Canada (GHS) - Praxair

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 should not therefore be construed as guaranteeing any specific property of the product.

APPENDIX L
SDS FOR OXYGEN

Oxygen

Safety Data Sheet E-4638

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-03-2016 Supersedes: 10-15-2013

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Name	:	Oxygen
CAS No	:	7782-44-7
Formula	:	O2
Other means of identification	:	Oxygen, Compressed; Medipure® Oxygen; Aviator's Breathing Oxygen; USP Oxygen; Oxygen - Diving Grade; Dioxygen
Product group	:	Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Medical applications Industrial use Diving Gas (Underwater Breathing)

1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number	:	1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Ox. Gas 1	H270
Compressed gas	H280

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :

GHS03 GHS04

Signal word : DANGER

Hazard statements : MAY CAUSE OR INTENSIFY FIRE; OXIDIZER
CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED

Precautionary statements : Do not handle until all safety precautions have been read and understood
Keep away from clothing and other combustible materials
Keep valves and fittings free from oil and grease
In case of fire: Stop leak if safe to do so
Use and store only outdoors or in a well-ventilated area
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Use only with equipment of compatible materials of construction and rated for cylinder pressure

DO NOT change or force fit connections
Avoid spills. Do not walk on or roll equipment over spills
Use only with equipment cleaned for oxygen service
Open valve slowly
Close valve after each use and when empty

2.3. Other hazards

Other hazards not contributing to the classification : Breathing 80 percent or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and central nervous system (CNS) effects, resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness, and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Oxygen (Main constituent)	(CAS No) 7782-44-7	> 99.5	

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Get medical advice/attention. Remove to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : In case of eye irritation: Rinse immediately with plenty of water. Consult an ophthalmologist if irritation persists.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (e.g, safety shower) is the preferred extinguishing media for clothing fires.

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Fire hazard : Oxidizing agent; vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion.

Explosion hazard : CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.

Reactivity : No additional information available.

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions	:	High-pressure, oxidizing gas Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.
Protection during firefighting	:	Self-contained breathing apparatus.
Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems Stop flow of product if safe to do so Use water spray or fog to knock down fire fumes if possible.
Other information	:	Heat of fire can build pressure in container and cause it to rupture. Cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.) No part of the container should be subjected to a temperature higher than 125°F (52°C). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	:	Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Ensure adequate air ventilation. Eliminate ignition sources. Evacuate area. Try to stop release. Monitor concentration of released product. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.2. Methods and materials for containment and cleaning up

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	:	Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.
Safe use of the product	:	**The suitability of this product as a component in underwater breathing gas mixtures** is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking" or "Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Avoid oxygen rich (>23,5%) atmospheres. Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.

Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Environmental exposure controls : **Environmental exposure controls:** Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colourless gas.

Molecular mass : 32 g/mol

Colour	:	Colourless.
Odour	:	No odour warning properties.
Odour threshold	:	No data available
pH	:	Not applicable.
pH solution	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	>= -219 °C (-362°F)
Freezing point	:	No data available
Boiling point	:	-183 °C (-297°F)
Flash point	:	Not applicable.
Critical temperature	:	-118.6 °C (-181.48°F)
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Vapour pressure	:	Not applicable.
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	50.4 bar (731.4 psia)
Relative vapour density at 20 °C	:	0.0827 lb/ft3 (1.325 kg/m3) absolute vapour density at 70°F/21.1°C, 1 atm
Relative density	:	1.1
Relative density of saturated gas/air mixture	:	No data available
Density	:	1.4289 kg/m³ (at 21.1 °C)
Relative gas density	:	1.1
Solubility	:	Water: 39 mg/l
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	:	No data available
Explosive properties	:	Not applicable.
Oxidizing properties	:	Oxidizer.
Flammability (solid, gas)	:	Non flammable Non flammable

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No additional information available.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Violently oxidizes organic material.
Conditions to avoid	:	None under recommended storage and handling conditions (see section 7).
Incompatible materials	:	Keep equipment free from oil and grease. Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion. May react violently with combustible materials. May react violently with reducing agents.
Hazardous decomposition products	:	None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Oxygen (7782-44-7)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Oxygen (7782-44-7)	
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Oxygen (7782-44-7)	
Mobility in soil	No data available.
Log Pow	Not applicable.
Log Kow	Not applicable.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on the ozone layer : None

Effect on global warming : No known effects from this product

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG)	:	UN1072
TDG Primary Hazard Classes	:	2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.
TDG Subsidiary Classes	:	5.1
Proper shipping name	:	OXYGEN, COMPRESSED
ERAP Index	:	3 000
Explosive Limit and Limited Quantity Index	:	0.125 L (0,125 L)
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	75 L

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	:	1072
Proper Shipping Name (IMDG)	:	OXYGEN, COMPRESSED
Class (IMDG)	:	2 - Gases
MFAG-No	:	122

IATA

UN-No. (IATA)	:	1072
Proper Shipping Name (IATA)	:	Oxygen, compressed
Class (IATA)	:	2

SECTION 15: Regulatory information

15.1. National regulations

Oxygen (7782-44-7)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Oxygen (7782-44-7)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on INSQ (Mexican national Inventory of Chemical Substances)

SECTION 16: Other information

Date of issue	:	15/10/1979
Revision date	:	03/08/2016
Supersedes	:	15/10/2013

Indication of changes:

Training advice	:	Ensure operators understand the hazard of oxygen enrichment.

Other information : Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

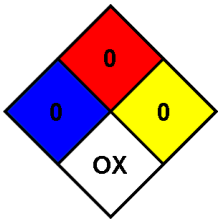
The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).

NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

NFPA specific hazard : OX - This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.



HMIS III Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 3 Serious Hazard - Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion

SDS Canada (GHS) - Praxair

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 should not therefore be construed as guaranteeing any specific property of the product.

APPENDIX M
SDS FOR METHANOL

Methanol

Safety Data Sheet E-4672

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-17-2016 Supersedes: 10-15-2013

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Name	:	Methanol
CAS No	:	67-56-1
Formula	:	CH4O
Other means of identification	:	UCAR HTF, Heat Treating Fluid
Product group	:	Core Products

1.2. Recommended use and restrictions on use

No additional information available

1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

1.4. Emergency telephone number

Emergency number	:	1-800-363-0042 Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Flam. Liq. 2	H225
Acute Tox. 3 (Oral)	H301
Acute Tox. 3 (Dermal)	H311
Acute Tox. 3 (Inhalation)	H331
STOT SE 1	H370

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms :

GHS02 GHS06 GHS08

Signal word : DANGER

Hazard statements : HIGHLY FLAMMABLE LIQUID AND VAPOUR
TOXIC IF SWALLOWED, IN CONTACT WITH SKIN OR IF INHALED
CAUSES DAMAGE TO ORGANS

Precautionary statements : 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
Keep container tightly closed
Ground/bond container and receiving equipment
Use explosion-proof electrical, lighting, ventilating equipment
Use only non-sparking tools

Take precautionary measures against static discharge
Do not breathe gas, vapours
Do not get in eyes, on skin, or on clothing
Do not eat, drink or smoke when using this product
Use and store only outdoors or in a well-ventilated area
Avoid release to the environment
Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection
Store locked up
Dispose of contents/container in accordance with container Supplier/owner instructions
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Use a back flow preventive device in the piping
Close valve after each use and when empty
Do not open valve until connected to equipment prepared for use
Approach suspected leak area with caution
Read and follow the Safety Data Sheet (SDS) before use

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Methanol (Main constituent)	(CAS No) 67-56-1	100	Carbinol / Methyl hydroxide / Wood alcohol / METHYL ALCOHOL

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes. Remove contaminated clothing. Drench affected area with water for at least 15 minutes.

First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Give two glasses of water and induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries : CAUSES DAMAGE TO ORGANS.

Symptoms/injuries after skin contact : Repeated exposure to this material can result in absorption through skin causing significant health hazard. TOXIC IN CONTACT WITH SKIN.

Symptoms/injuries after ingestion : TOXIC IF SWALLOWED. Swallowing a small quantity of this material will result in serious health hazard.

Potential adverse human health effects and symptoms : TOXIC IF SWALLOWED. TOXIC IN CONTACT WITH SKIN.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : NOTES TO PHYSICIAN: The combination of visual disturbances, metabolic acidosis, and formic acid in the urine is evidence of methanol poisoning. Administer ethanol (whiskey, brandy, etc.), 30 ml every 3 hours, until medical assistance is obtained. The therapeutic intravenous administration of ethanol (10 ml per hour) allows it to be preferentially oxidized and reduces production of methanol metabolites. Acidosis must be treated by means of intravenous sodium bicarbonate, and methanol elimination may be increased by hemodialysis as indicated. Treatment should be based on blood methanol levels and acid-base balance. Folates may be administered to enhance the metabolism of formaldehyde. Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog. Use extinguishing media appropriate for surrounding fire.

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Fire hazard : HIGHLY FLAMMABLE LIQUID AND VAPOUR.

Explosion hazard : May form flammable/explosive vapour-air mixture.

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.

Protection during firefighting : **DANGER: FLAMMABLE LIQUID AND VAPOR.** Evacuate all personnel from danger area. Use self-contained breathing apparatus. Immediately cool surrounding containers with water spray from maximum distance, taking care not to extinguish flames. Avoid spreading burning liquid with water. Remove ignition sources if safe to do so. If flames are accidentally extinguished, explosive reignition may occur. Reduce vapors with water spray or fog. Stop flow of liquid if safe to do so, while continuing cooling water spray. Remove all containers from area of fire if safe to do so. Allow fire to burn out. On-site fire brigades must comply with their provincial and local fire code instructions.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Vapor forms explosive mixtures with air and oxidizing agents. If leaking gas catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited by sparks or flames. Vapors are heavier than air and may collect in low spots. Explosive atmospheres may linger. Before entering area, especially confined areas, check with an appropriate device

Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : No additional information available.

6.2. Methods and materials for containment and cleaning up

For containment : On land, sweep or shovel into suitable containers.

Methods for cleaning up : Prevent waste from contaminating the surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

Protective equipment : Avoid breathing gas, vapours.

6.3. Reference to other sections

For further information refer to section 8: Exposure controls/personal protection

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : May irritate skin, eyes, and respiratory tract. Use only with adequate ventilation or respiratory protection. Do not get liquid or vapor in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available. May form explosive mixtures with air. Keep away from heat, sparks, and open flame. Use only spark-proof tools and explosion-proof equipment. Protect containers from damage. Use a suitable hand truck to move containers; do not drag, roll, slide, or drop. For other precautions in using this product, see section 16

Do not breathe vapours

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

Hygiene measures : Do not eat, drink or smoke when using this product. Wash exposed skin thoroughly after handling.

Additional hazards when processed : Handle empty containers with care because residual vapours are flammable.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Conditions to avoid : Sources of ignition. Heat sources.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Methanol (67-56-1)		
USA - ACGIH	ACGIH TLV-TWA (ppm)	200 ppm

Methanol (67-56-1)		
USA - ACGIH	ACGIH TLV-STEL (ppm)	250 ppm
USA - OSHA	OSHA PEL (TWA) (mg/m³)	260 mg/m³
USA - OSHA	OSHA PEL (TWA) (ppm)	200 ppm
Canada (Quebec)	VECD (mg/m³)	328 mg/m³
Canada (Quebec)	VECD (ppm)	250 ppm
Canada (Quebec)	VEMP (mg/m³)	262 mg/m³
Canada (Quebec)	VEMP (ppm)	200 ppm
Alberta	OEL STEL (mg/m³)	328 mg/m³
Alberta	OEL STEL (ppm)	250 ppm
Alberta	OEL TWA (mg/m³)	262 mg/m³
Alberta	OEL TWA (ppm)	200 ppm
British Columbia	OEL STEL (ppm)	250 ppm
British Columbia	OEL TWA (ppm)	200 ppm
Manitoba	OEL STEL (ppm)	250 ppm
Manitoba	OEL TWA (ppm)	200 ppm
New Brunswick	OEL STEL (mg/m³)	328 mg/m³
New Brunswick	OEL STEL (ppm)	250 ppm
New Brunswick	OEL TWA (mg/m³)	262 mg/m³
New Brunswick	OEL TWA (ppm)	200 ppm
New Foundland & Labrador	OEL STEL (ppm)	250 ppm
New Foundland & Labrador	OEL TWA (ppm)	200 ppm
Nova Scotia	OEL STEL (ppm)	250 ppm
Nova Scotia	OEL TWA (ppm)	200 ppm
Nunavut	OEL STEL (mg/m³)	328 mg/m³
Nunavut	OEL STEL (ppm)	250 ppm
Nunavut	OEL TWA (mg/m³)	262 mg/m³
Nunavut	OEL TWA (ppm)	200 ppm
Northwest Territories	OEL STEL (ppm)	250 ppm
Northwest Territories	OEL TWA (ppm)	200 ppm
Ontario	OEL STEL (ppm)	250 ppm
Ontario	OEL TWA (ppm)	200 ppm
Prince Edward Island	OEL STEL (ppm)	250 ppm
Prince Edward Island	OEL TWA (ppm)	200 ppm
Québec	VECD (mg/m³)	328 mg/m³
Québec	VECD (ppm)	250 ppm
Québec	VEMP (mg/m³)	262 mg/m³
Québec	VEMP (ppm)	200 ppm
Saskatchewan	OEL STEL (ppm)	250 ppm
Saskatchewan	OEL TWA (ppm)	200 ppm
Yukon	OEL STEL (mg/m³)	310 mg/m³
Yukon	OEL STEL (ppm)	250 ppm
Yukon	OEL TWA (mg/m³)	260 mg/m³
Yukon	OEL TWA (ppm)	200 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available).

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.

Hand protection : Wear chemically resistant protective gloves. Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

Other information : **Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	Clear, colorless, mobile liquid.
Colour	:	Colourless.
Odour	:	Slight. alcohol-like.
Odour threshold	:	5950 ppm (May) 7800 mg/m³ (May)
pH	:	Not applicable.
pH solution	:	No data available
Relative evaporation rate (butylacetate=1)	:	2.1
Relative evaporation rate (ether=1)	:	Not applicable.
Melting point	:	-98 °C (-144.4°F)
Freezing point	:	-97.7 °C (-143.9°F)
Boiling point	:	64.7 °C (148.5°F)
Flash point	:	11 °C (51.8°F)
Critical temperature	:	239.8 °C (464°F)
Auto-ignition temperature	:	385 °C (725°F)
Decomposition temperature	:	No data available
Vapour pressure	:	0.13 bar (1.86 psia)
Vapour pressure at 50 °C	:	No data available
Relative vapour density at 20 °C	:	1.11
Relative density	:	0.7924
Relative density of saturated gas/air mixture	:	No data available
Density	:	0.791 - 0.792 g/cm³ (at 20 °C)
Relative gas density	:	No data available
Solubility	:	Water: No data available
Log Pow	:	-0.77
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.

Viscosity, dynamic	:	Not applicable.
Viscosity, kinematic (calculated value) (40 °C)	:	No data available
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Flammability (solid, gas)	:	HIGHLY FLAMMABLE LIQUID AND VAPOUR

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	:	HIGHLY FLAMMABLE LIQUID AND VAPOUR. May form flammable/explosive vapour-air mixture.
Possibility of hazardous reactions	:	Not established.
Conditions to avoid	:	Extremely high or low temperatures. Open flame.
Incompatible materials	:	Acids. Alkali metals. Halogens. Halogenated compounds. Oxidizing agents. Lead. Magnesium. Viton® /. Fluoroelastomer (FKM).
Hazardous decomposition products	:	Thermal decomposition may produce : Hydrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Oral: TOXIC IF SWALLOWED.
Acute toxicity (dermal)	:	Dermal: TOXIC IN CONTACT WITH SKIN.
Acute toxicity (inhalation)	:	Inhalation: TOXIC IF INHALED.

Methanol (\f)67-56-1	
LD50 oral rat	5628 mg/kg
LD50 dermal rabbit	17100 mg/kg
LC50 inhalation rat (mg/l)	128.2 mg/l/4h
LC50 inhalation rat (ppm)	64000 ppm/4h
ATE CA (oral)	100.00000000 mg/kg bodyweight
ATE CA (dermal)	300.00000000 mg/kg bodyweight
ATE CA (gases)	700.00000000 ppmv/4h
ATE CA (vapours)	3.00000000 mg/l/4h
ATE CA (dust,mist)	0.50000000 mg/l/4h

Skin corrosion/irritation	:	Not classified pH: Not applicable.
Serious eye damage/irritation	:	Not classified pH: Not applicable.
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	CAUSES DAMAGE TO ORGANS.
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

Potential adverse human health effects and symptoms : TOXIC IF SWALLOWED. TOXIC IN CONTACT WITH SKIN.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water : HARMFUL TO AQUATIC LIFE.

Methanol (67-56-1)	
LC50 fish 1	28200 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
LC50 fish 2	100 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Methanol (67-56-1)	
BCF fish 1	10 mg/l
Log Pow	-0.77
Log Kow	Not applicable.

12.4. Mobility in soil

Methanol (67-56-1)	
Mobility in soil	No data available.
Log Pow	-0.77
Log Kow	Not applicable.

12.5. Other adverse effects

Effect on the ozone layer : None

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste) : Disposal must be done according to official regulations.

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

Ecology - waste materials : Avoid release to the environment. Hazardous waste due to toxicity.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN1230

Packing group : II - Medium Danger

TDG Primary Hazard Classes : 3 - Class 3 - Flammable Liquids

TDG Subsidiary Classes : 6.1

Proper shipping name : METHANOL

Explosive Limit and Limited Quantity Index : 1 L

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 1 L

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 1230

Proper Shipping Name (IMDG) : METHANOL

Class (IMDG)	:	3 - Flammable liquids
Packing group (IMDG)	:	II - substances presenting medium danger

IATA

UN-No. (IATA)	:	1230
Proper Shipping Name (IATA)	:	Methanol
Class (IATA)	:	3 - Flammable Liquids
Packing group (IATA)	:	II - Medium Danger

SECTION 15: Regulatory information

15.1. National regulations

Methanol (67-56-1)

Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Methanol (67-56-1)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Japanese Poisonous and Deleterious Substances Control Law
Listed on INSQ (Mexican national Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

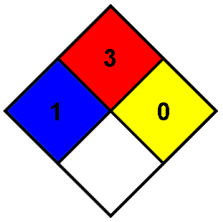
SECTION 16: Other information

Date of issue	:	15/10/1979
Revision date	:	17/08/2016
Supersedes	:	15/10/2013

Indication of changes:

Training advice	:	Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.
Other information	:	When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2). PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.

NFPA health hazard	:	1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.
NFPA fire hazard	:	3 - Liquids and solids that can be ignited under almost all ambient conditions.
NFPA reactivity	:	0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	:	1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	:	3 Serious Hazard - Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 F and boiling points above 100 F. as well as liquids with flash points between 73 F and 100 F. (Classes IB & IC)
Physical	:	0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.

SDS Canada (GHS) - Praxair

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 should not therefore be construed as guaranteeing any specific property of the product.

APPENDIX N
KEROSENE

SAFETY DATA SHEET

KEROSENE

000003000579

Version 2.1 Revision Date 2018/06/07 Print Date 2018/06/07

SECTION 1. IDENTIFICATION

Product name	:	KEROSENE
Synonyms	:	Low Sulphur Kerosene, Kerosine, KEROSENE (TYPE 1-K)
Product code	:	101867, 101866
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	:	Kerosene is a refined petroleum distillate suitable for burning in wick lamps and space heaters designed for kerosene.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Clear liquid.
Colour	Clear and bright
Odour	Hydrocarbon.

GHS Classification

Flammable liquids	:	Category 3
Skin irritation	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3 (Central nervous system)
Aspiration hazard	:	Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause drowsiness or dizziness.

Precautionary statements : **Prevention:**
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting/ equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
Do NOT induce vomiting.
If skin irritation 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. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
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
Skin Absorption

Inhalation : May cause respiratory tract irritation.
Causes headache, drowsiness or other effects to the central nervous system.

Skin : Causes skin irritation.

Prolonged skin contact may cause skin irritation and/or dermatitis.

Eyes : May cause eye irritation.

Ingestion : Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
Aspiration hazard if swallowed - can enter lungs and cause damage.

Aggravated Medical Condition : None known.

Other hazards

None known.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH Confirmed animal carcinogen with unknown relevance to humans

Kerosine (petroleum), hydrodesulfurized 64742-81-0

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
kerosine (petroleum), hydrodesulfurized	64742-81-0	99 - 100 %

** Aromatic content (Edmonton) 7-25% typical (benzene: nil).

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	:	None known.
Protection of first-aiders	:	First Aid responders should pay attention to self-protection and use the recommended protective clothing. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO2) 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), nitrogen oxides (NOx), sulphur oxides (SOx), unidentified organic compounds, 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 for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
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. 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. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Ensure all equipment is electrically grounded before beginning transfer operations. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapours, mist or gas. Keep away from heat and sources of ignition. Keep container closed when not in use. If ingested, seek medical advice immediately and show the container or the label. Never siphon by mouth. Avoid prolonged contact with eyes, skin and clothing.
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.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
kerosine (petroleum), hydrodesulfurized	64742-81-0	TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH

Engineering measures : Use only in well-ventilated areas.

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. 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.

Filter type	:	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.
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.
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	:	Clear liquid.
Colour	:	Clear and bright
Odour	:	Hydrocarbon.
Odour Threshold	:	No data available
pH	:	No data available
Pour point	:	-51 °C (-60 °F)No data available
Boiling point/boiling range	:	150 - 300 °C (302 - 572 °F)

Flash point	:	38 °C (100 °F) Method: Tagliabue.
Auto-Ignition Temperature	:	210 °C (410 °F)
Evaporation rate	:	No data available
Flammability	:	Flammable in presence of open flames, sparks and heat. May accumulate in confined spaces. This product can accumulate static charge and ignite. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back.
Upper explosion limit	:	5 %(V)
Lower explosion limit	:	0.7 %(V)
Vapour pressure	:	10.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	4.5
Relative density	:	0.8 - 0.82
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Viscosity, kinematic	:	1.0 - 2.4 cSt (40 °C / 104 °F)
Explosive properties	:	Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents.
Hazardous decomposition products	:	May release COx, NOx, SOx, unidentified organic compounds, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Product:

Acute oral toxicity	:	Remarks: No data available
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	Remarks: No data available

Components:

kerosine (petroleum), hydrodesulfurized:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): > 5.2 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg,

Skin corrosion/irritation

Product:
Remarks: No data available

Serious eye damage/eye irritation

Product:
Remarks: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - 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

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1223
Proper shipping name	:	Kerosene
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	366

IMDG-Code

UN number	:	UN 1223
Proper shipping name	:	KEROSENE
Class	:	3
Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

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

National Regulations

TDG

UN number	:	UN 1223
Proper shipping name	:	KEROSENE
Class	:	3
Packing group	:	III
Labels	:	3
ERG Code	:	128
Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

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
TSCA	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
EINECS	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	:	2018/06/07

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.

APPENDIX O
FURNACE OIL

SECTION 1. IDENTIFICATION

Product name	:	FURNACE OIL
Synonyms	:	Type 2 Heating Oil, #2 Heating Oil, #2 Furnace Oil, Heating Oil, #2 Fuel Oil, Seasonal Furnace, Seasonal Diesel Fuel, ThermaClean, Farm Diesel, FFO
Product code	:	102900, 102062, 101875, 100484, 100110, 101871, 101870, 101869, 100486, 102061, 101979, 100485, 101868, 101874

Manufacturer or supplier's details

Petro-Canada
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	:	Fuel Oils are distillate fuels suitable for use in liquid fuel burning equipment without preheating.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Bright oily liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Mild petroleum oil like.

GHS Classification

Flammable liquids	:	Category 3
Acute toxicity (Inhalation)	:	Category 4
Skin irritation	:	Category 2
Carcinogenicity	:	Category 2
Specific target organ toxicity - repeated exposure	:	Category 2 (Liver, thymus, Bone)

Aspiration hazard : Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
Harmful if inhaled.
Suspected of causing cancer.
May cause damage to organs (Liver, thymus, Bone) 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.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.
Do NOT induce vomiting.
If skin irritation 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. Keep cool.
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 Skin Absorption
Target Organs	:	Skin Eyes Respiratory Tract
Inhalation	:	May cause respiratory tract irritation. Inhalation may cause central nervous system effects. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.
Skin	:	Causes skin irritation.
Eyes	:	May cause eye irritation.
Ingestion	:	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed - can enter lungs and cause damage.
Aggravated Medical Condition	:	None known.

Other hazards

None known.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
fuels, diesel	68334-30-5	100 %

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	:	First aider needs to protect himself.

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), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), 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 for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec-	:	Use personal protective equipment.

tive equipment and emergency procedures		Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
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. 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. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Avoid contact with skin, eyes and clothing. Do not ingest. Keep away from heat and sources of ignition. Keep container closed when not in use.
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.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	:	Use only in well-ventilated areas. Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. 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.

Filter type	:	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.
Hand protection Material	:	neoprene, nitrile, 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.
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	:	Bright oily liquid.
Colour	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	:	Mild petroleum oil like.
Odour Threshold	:	No data available
pH	:	No data available
Pour point	:	-39 - -1 °C (-38 - 30 °F)
Boiling point/boiling range	:	150 - 371 °C (302 - 700 °F)

Flash point	:	>= 40 °C (104 °F) Method: closed cup
Fire Point	:	No data available
Auto-Ignition Temperature	:	225 °C (437 °F)
Evaporation rate	:	No data available
Flammability	:	Flammable in presence of open flames, sparks and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.
Upper explosion limit	:	6 %(V)
Lower explosion limit	:	0.7 %(V)
Vapour pressure	:	7.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	4.5
Relative density	:	0.8 - 0.88
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Viscosity, kinematic	:	1.3 - 3.6 cSt (40 °C / 104 °F)
Explosive properties	:	Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents and acids.
Hazardous decomposition products	:	May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

Product:

Acute oral toxicity	:	Remarks: No data available
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	Remarks: No data available

Components:

fuels, diesel:

Acute oral toxicity	:	LD50 (Rat): 7,500 mg/kg,
Acute dermal toxicity	:	LD50 (Mouse): 24,500 mg/kg,

Skin corrosion/irritation

Product:

Remarks: No data available

Serious eye damage/eye irritation

Product:

Remarks: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - 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

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 1202
Proper shipping name	:	Heating oil, light
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	366

IMDG-Code

UN number	:	UN 1202
Proper shipping name	:	HEATING OIL LIGHT
Class	:	3
Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

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

National Regulations

TDG

UN number	:	UN 1202
Proper shipping name	:	HEATING OIL LIGHT
Class	:	3
Packing group	:	III
Labels	:	3
ERG Code	:	128
Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

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
TSCA	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
EINECS	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 : 2018/08/20

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