



ATTACHMENT 56

Spill Contingency Plan



City of Iqaluit
Spill Contingency Plan

April 24, 2026

Rev 1



Rev	Date	Comments	Author
0	March 31, 2026	Latest update associated with current licence	
1	April 24, 2026	Revised layout to be consistent with INAC, 2007; updated emergency contact information and spill reporting communication protocol; added spill report form in Appendix D	



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Agency	Telephone No.
24-Hour Spill Line	867-920-8130 spills@gov.nt.ca
City of Iqaluit	
Dispatch	867-979-5650
Chief Administrative Officer (CAO)	867-979-5666 / 867-222-2953
Public Works	
Director of Public Works	867-222-2966
Superintendent of General Operations	867-222-0726
Foreman Roads	867-222-2949
Lead Hand Roads	867-222-2938
Garage Foreman	867-222-2948
Roads On-Call	867-222-6067
Garage On-Call	867-222-1303
Maintenance Manager	867-222-3055
Building Maintenance Maintainer	867-222-8445
Water/Sewage	
Superintendent Water/Sewer utilidor	867-222-2165
Foreman Water/Sewer trucked	867-222-2947
Foreman Utilidor	867-222-3433
Lead Hand Water/ Sewer trucked	867-222-1497
Assistant Utility Technician/meter reads	867-222-1635
Superintendent truck services	867-222-3981
Landfill lead hand	867-222-2335
Waste Water Treatment Plant Operator	867-222-4612
Water treatment Plant Operator	867-222-4468
Water Treatment Plant Operator	867-222-4925
Utilidor On-Call	867-222-3263
Superintendent of Sanitation	867-222-2946
Landfill Foreman	867-222-2972
Fire/Police	
Fire and ambulance emergency line	867-979-4422
Fire Chief	867-222-6270/ 867-979-5653
Deputy Fire Chief	867-222-4787 / 867-979-5690
Deputy Fire Chief	867-222-1080 / 867-979-5689
Chief Municipal	867-979-5674 / 867-222-2959
Enforcement Officer	867-979-5650
RCMP	867-979-1111 / 867-979-0123
Contractor	
Telephone No.	
Baffin Building Systems (BBS)	867-979-6949
Kudlik Construction Ltd	867-979-1166
Nunavut Excavating Ltd	867-975-3320
RL Hanson	867-979-6004
Tower Arctic Ltd	867-979-6465



Qikiqtaaluk Environmental	867-222-8194
Nunatta Environmental	867-979-1488
Government Resources	
Agency	Telephone No.
Environmental Protection, Government of Nunavut	867-975-5900
Indian and Northern Affairs Canada, Nunavut District Manager	867-975-4295
Indian and Northern Affairs Canada, Baffin Sub-District	867-975-4295
Environment and Climate Change Canada, Iqaluit	867-975-4636
Department of Fisheries and Oceans, Iqaluit	867-979-8000
Regional Public Health Officer, Government of Nunavut	867-979-7652



1.0 Introduction

The purpose of this spill contingency plan is to outline a formal practical response system which can be implemented immediately in the event of a deleterious material from being spilled to the natural environment. This includes sewage, fuel and chemicals. This plan covers spills resulting from the City of Iqaluit's activities or from the failure of a system component in the City's municipal infrastructure. This plan is intended to promote the safe handling of potentially hazardous materials to minimize health hazards, environmental damage and clean up costs. The plan is written so it can be easily understood and be reasonably comprehensive in providing access to all information required for handling a spill.

It is the City's policy to:

1. Comply with existing regulations
2. Provide such protection of the environment as is technically and economically feasible
3. Take appropriate action with the necessary resources to remedy a spill situation as soon as it becomes evident
4. Cooperate with other groups to protect the environment
5. Ensure an on-going preventative maintenance program is implemented for all City facilities and to upgrade infrastructure when appropriate
6. Keep employees, government officials and the public informed

In an emergency, prompt action is important and quick access to a response checklist may reduce the seriousness of a spill.

Site plans are presented in Appendix A showing the existing layout of municipal buildings and waste handling/disposal facilities, as well as drainage patterns across the City.



2.0 Response Organization

Key personnel have been identified for emergency spill response. Their key roles are outlined in Table 1. The City phone directory for key personnel is provided in Table 2. The initial spill response and reporting procedures are presented on Figure 1.

Table 1 Response Plan Organization

Position	Role(s)
First responder (City staff or contractor who first identifies the spill)	<ul style="list-style-type: none"> Implement the Procedures for Initial Action (see Figure 1) Report the spill to your supervisor or the City's Dispatch (see Spill Reporting Procedures in Figure 1)
City Dispatch	<ul style="list-style-type: none"> Notifies applicable area superintendent (i.e., water/sewage, water treatment plant, public works garage, etc.) Notify Fire Chief if required.
Foreman	<ul style="list-style-type: none"> Ensure public and worker safety at all times Implements spill response measures under the direction of the area superintendent Determine if the spill is reportable (above reporting thresholds in Appendix B)
Superintendent	<ul style="list-style-type: none"> If the spill is reportable: Contact the 24-Hour Spill Report Line (867-920-8130) Direct staff and equipment to clean up contaminated areas If the spill is major (see Note 1), notifies the Director of Public Works (867-222-2966)
Director of Public Works	<ul style="list-style-type: none"> Authorizes use of non-City resources to respond to the spill (only if required) Liaises with the Fire Chief Notifies city leadership and briefs Chief Administrative Officer (CAO)
Fire Chief	<ul style="list-style-type: none"> Directs fire department resources, if required Provides direction of the spill involves a risk of fire or explosion
Chief Administrative Officer	<ul style="list-style-type: none"> Coordinate the information and messages flow to the media

Note(s):

- Major spill** represents a risk to public safety and requires public notification and other measures (i.e., detours around town). Containment and cleanup require additional resources beyond City staff (i.e., contractors)



Table 2 City of Iqaluit Phone Directory

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Spills that are determined to be the responsibility of the City are reported to the City’s dispatch number.

Appendix B contains a listing of material and the quantities that are reportable in the event of a spill. All spills exceeding these reportable quantities are to be reported immediately to the NWT 24-hour Spill Report Line. Spill Report Line personnel will provide direction and will ensure that an investigation is undertaken by the appropriate government authority. Appendix C contains a fillable PDF Spill Report Form.

Equipment may be dispatched for City spill clean-up by the Director of Public Works only.

The 24-Hour Spill Line is currently being run by the GNWT - Environment and Climate Change division. Callers to the spill line will be provided with expert advice regarding hazardous materials spills. The personnel at the spill line will also ensure that the government agencies with jurisdiction over the spill are contacted.

The flow chart in Figure 1 outlines the communication steps in the event of a spill.

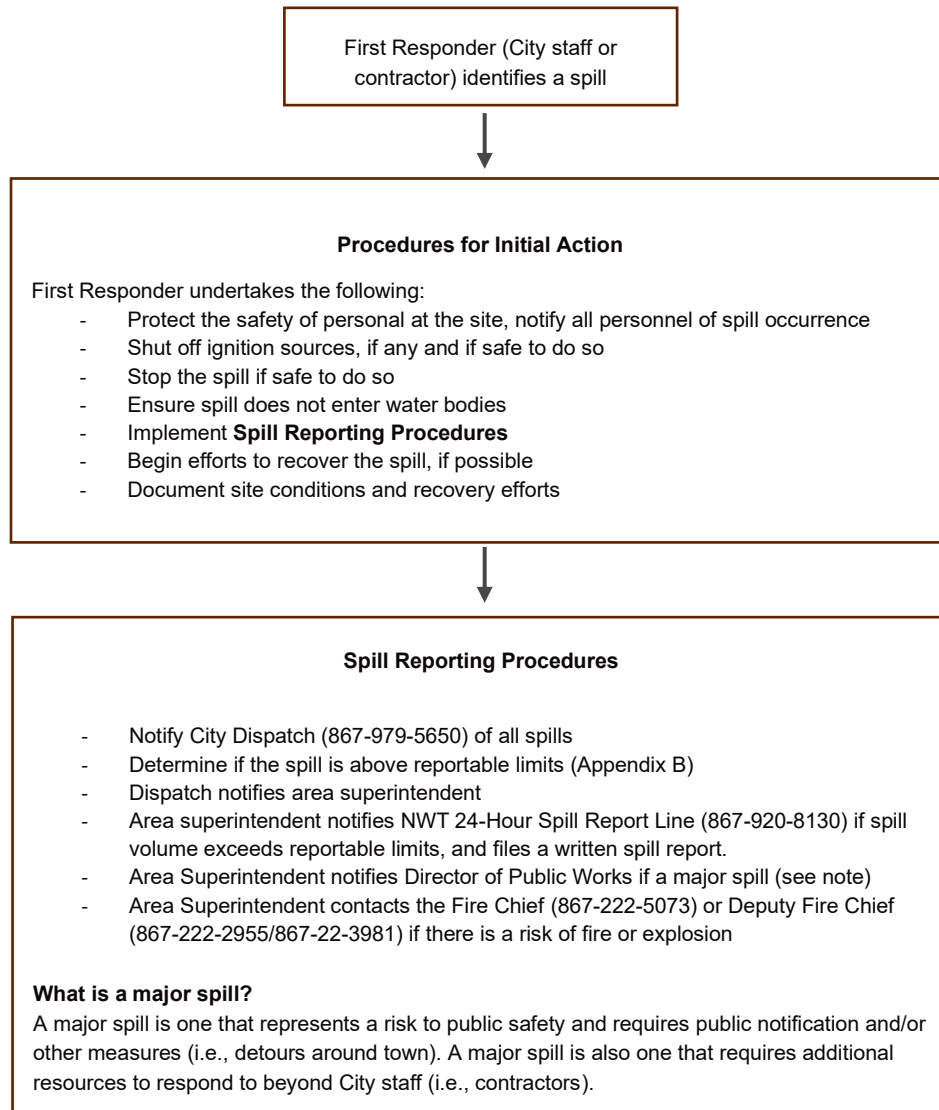


Figure 1 Generic Spill Response and Reporting Procedures



3.0 Sewage Spills

Untreated sewage contains pathogenic organisms and can be toxic to aquatic organisms.

It is the purpose of this section to outline possible failures of the waste handling/treatment system and the control measures in place to prevent such failures. Sewage spills, if they were to occur, are most likely to take place at one or both sewage lift stations, or at the sewage lagoon. These spill scenarios are described further below. The sewage force main is routed entirely beneath the ground surface and is not monitored.

The location of the lift stations and force main are shown in Appendix A. Table 3 contains a list of potential sewage discharge events, with associated discharge volumes and impacts.

Table 3 Potential Sewage Discharge Events

Material	Potential Discharge Event	Discharge Volume (worst case)	Impacts of Discharge
Raw Sewage (Lagoon)	Dyke failure	25,000 m ³ or greater (unlikely)	Overflow into Koojesse Inlet
Raw Sewage (Lift No. 1)	Pump shutdown (equipment failure, electrical failure, etc.)	Pump rate is 44L/s	Overflow into Koojesse Inlet
Raw Sewage (Lift No. 2)		Pump rate is 12.6L/s	Overflow into Koojesse Inlet

Additional information on the City's sewage facilities is provided in Section 3.1. Response procedures for sewage spills are provided in Section 3.2.

3.1 Background on Sewage Facilities

3.1.1 Sewage Lift Stations

There are two lift stations currently servicing the sewage system in Iqaluit. Lift Station No. 1 is located by the break water and Lift Station No. 2 is located by the sealift beach (location of all facilities is shown in Appendix A). In the event of a pump shut down, both sewage lift stations will eventually overflow into Koojesse Inlet. The pumps are electrically powered and will not operate if there is a power failure. The lift stations are physically checked on a daily basis.

In the event of a pump shutdown, there is approximately 20 minutes storage capacity in the wet wells before the sewage will overflow. Each lift station is equipped with fluid high level alarms that trigger auto dialers which contact the 24-Hour Dispatch number. Sewage trucks are dispatched to manually pump out the wet wells. The lift stations are equipped with diesel powered pumps and piping that may be connected for manual operation during power outages.



Upon shut down, all sewage lift stations will eventually overflow to Koojesse Inlet.

Each lift station has the following main components:

- A wet-well that receives the raw sewage.
- Two self-priming centrifugal pumps.
- Float levels in the wet-well that control the pumps · Monitoring for high level of sewage in the wet-wells.
- Building low temperature alarms.
- Motor starters, domestic electrical (lighting) and electric heat.
- Alarms result in activation of the autodialer that will notify Town Dispatch of the alarm at the lift station.

Rating of the lift station pumps are as outlined in Table 4.

Table 4 Sewage Lift Station Pump Details

	Sewage Lift Station 1	Sewage Lift Station 2
Manufacturer	Gorman Rupp	Gorman Rupp
Model	T6A3S – B	T3A3S – B
Size	150 mm	75 mm
Impeller Diameter	314.3 mm	215.9 mm
RPM	1770	1160
Motor	30 HP	5 HP
Design Discharge	44 l/s	12.6 l/s
Head	17.7 m	11.6 m

All lift stations are checked once per day, 7 days per week. Daily records are kept on the status of the lift stations.

3.1.2 Sewage Lagoon

The sewage lagoon is located at the head of Koojesse Inlet on the southwest side of the Municipality.

The Iqaluit sewage lagoon was originally constructed in 1978 by erecting two dykes stretching from the northwestern shoreline to a nearby island in Koojesse Inlet. The lagoon covered an area of approximately 17,000 m², with a retention volume of 32,000 m³. The lagoon was reconstructed in 1991, and the retention volume was reduced to a maximum of 25,000 m³.

The majority of the discharge occurs, as intended, through the west dyke as it is at a lower elevation than the east dyke. Seeps have appeared on the west dyke on two separate occasions, prompting concern regarding the structural integrity of the dyke. The lagoon has an operation detention volume of between 12,000 m³ and 25,000 m³ at operating water levels of 0.7 m to 1.5 m.

In the event of dyke failure, sewage will drain directly into Koojesse Inlet.



Under normal conditions, the lagoon is monitored seven days per week. The lagoon level is checked and the dykes are inspected for leaks. If problems are suspected with the lagoon, the monitoring frequency will increase.

3.2 Response Procedure for Sewage Spill

If there is a sewage spill, it is likely to occur at either the lift station or the lagoon. Some seepage at the lagoon dyke is normal; however, if it is significant, the Spill Response Plan should be activated.

Containment and clean-up are detailed in Sections 5.0 and 6.0, respectively.

Repairs and containment must be dealt with as quickly as possible due to potentially negative effects on the local fish and shellfish populations in the Koojesse inlet. The City has had to respond to lift station sewage overflows in the past. The response team and measures taken to date have proven effective. The City seeks to improve its contingency planning with input from the regulating authorities and other parties



4.0 Spills of Fuels or Other Chemicals

The following section provides general information on the handling of large volume spills to a variety of receptors. In Iqaluit, fuels and chemicals are stored in sufficient quantities that a large volume spill could occur. Table 5 contains a list of materials with the potential to spill, with associated discharge volumes and impacts.

Table 5 Potential Fuel and Chemical Spills

Material	Potential Discharge Event	Discharge Volume (worst case)
Diesel Fuel	<ul style="list-style-type: none"> • Overpumping • Leak in hose • Minor leak in tank • Large leak in tank 	Max 55,000L (unlikely)
Gasoline	<ul style="list-style-type: none"> • Overpumping • Leak in hose • Minor leak in tank • Large leak in tank 	Max 4,500L (unlikely)
Calcium Chloride	<ul style="list-style-type: none"> • Torn bag • Bag is dropped 	2 bags
Chlorine Gas	<ul style="list-style-type: none"> • Leak in container • Equipment malfunction 	Likely 150 lb (max 300lb/2 cylinders)
Lime	<ul style="list-style-type: none"> • Torn bag • Bag is dropped • Spill during transfer 	Likely 25 lb/1 bag (max 3,750 lb/150 bags)
Propane	<ul style="list-style-type: none"> • Overpumping • Leak in hose • Leak in tank 	Likely 40 lb (max 80lb/2 cylinders)



4.1 Spill Scenarios

4.1.1 Diesel Fuel and Gasoline

Heating fuel located southeast of the Waste Transfer Station is stored in a 25,000 L aboveground tank. In addition, the Municipal Garage contains two heating fuel tanks, with capacities of 55,000 L and 6,300 L, respectively, as well as one 4,500 L gasoline tank. A separate 2,000 L aboveground self-contained tank is located adjacent to the Water Treatment Plant and is used to store heating fuel.

Worst-case scenarios:

- Diesel fuel spill: Fuel spill would involve failure of the 55,000 L heating fuel tank at the Municipal Garage, resulting in a full release. The spill could contaminate surrounding soil and migrate to nearby drainage areas, requiring containment, product recovery, and removal of impacted soil
- Gasoline spill: Flammable vapours from the nearby 4,500 L gasoline tank created an explosion hazard requiring evacuation of the facility.

Spill response kits are located adjacent to each of these storage tanks. The City's inventory of spill response kits and their locations are provided in Section 7.

4.1.2 Calcium Chloride

Calcium chloride is a white powder stored in Tyvex bags at the main garage. It is relatively non-toxic and is used as a dust suppressant on gravel roads.

Worst-case scenario: Multiple bags ruptured and the material spilled into a small water body or drainage ditch. The temporary increase in salinity and water hardness could cause short-term stress to aquatic organisms.

4.1.3 Lime

A maximum of 150 - 25 lb bags of lime are stored at the water treatment center for use in controlling the pH of the municipal water supply. It can cause burns to skin and eyes, and can cause rapid pH increases in water bodies, creating harmful conditions for aquatic life.

Worst-case scenario: All 150 bags (approximately 3,750 lb) ruptured and spilled into nearby water or the sanitary sewer. The high pH increase caused mortality to aquatic organisms or disrupted biological treatment processes at the sewage lagoon, requiring pH adjustment and extended system recovery time.

4.1.4 Propane

Two 40 lb propane cylinders, used to fuel the Zamboni, are stored in the Zamboni room at the arena. Propane is highly flammable and heavier than air, accumulating in low-lying areas where it creates explosion and suffocation hazards.



Worst-case scenario: If both 40-lb cylinders in the Zamboni room ruptured, releasing propane into the enclosed space. The gas accumulated, creating an explosion hazard. An ignition source caused an explosion and fire, requiring evacuation of the arena. Personnel were at risk of injuries from explosion, fire, or suffocation.

4.1.5 Chlorine Gas

Chlorine gas is stored at the water treatment plant. A fixed chlorine detector is also mounted in the storage area.

Worst-case scenario: A full chlorine gas cylinder (150 lb) ruptured, releasing toxic gas into the atmosphere. The gas travels downwind, posing severe inhalation hazards requiring immediate evacuation of surrounding areas. Dissolution into nearby water bodies could kill aquatic life. Personnel in the immediate vicinity could suffer severe respiratory injury or death.

Capping tools are available for sealing leaking cylinders. If a cylinder is capped successfully, it may be returned to the supplier for disposal. If the cylinder cannot be capped, remove the cylinder to a safe location downwind of any populated area and allow the gas to escape.



5.0 Containment

Extreme caution should be exercised when containing and cleaning up spilled petroleum products due to high fire and explosion hazards associated with these materials. See section 5.5 for more details.

Depending on the size of the spill and surrounding conditions, personal protective equipment such as rubber gloves (nitrile, neoprene, butyl rubber or PVC), rubber boots (neoprene or butyl rubber), chemical safety goggles and NIOSH/MSHA approved half mask respirators with organic vapor cartridges may be required. In poorly ventilated areas where there is the potential for vapors to concentrate, the use of heavy equipment should be carefully evaluated due to the potential explosion hazard.

5.1 Containment on Land

In all cases of liquid spills, the primary objective is to prevent further dispersion of the material. Containment of large volume spills on land is generally accomplished using minor earthworks such as earth dams or dykes and trenches, constructed with mobile heavy equipment where necessary.

Dykes and dams may be used to contain and direct spilled materials. The dam or dyke may be lined with a synthetic liner to render it impermeable to the spilled product. The location and size of the barrier should allow for the volume of the material to be contained.

When the ground is thawed, trenches may be used to intercept and collect spilled materials. A synthetic liner may be placed on the trench floor and walls to contain the contaminant in the trench. The location and size of the trench should take into account the volume of material to be contained. Trenches placed down slope of the spill may be effective in containing both surface and subsurface movement of spilled material.

Where appropriate, absorbent materials may be applied to capture and immobilize the spill. Alternatively, gelling agents may be used to limit migration and reduce seepage into surrounding areas.

5.2 Containment on Surface Water

5.2.1 Floating Materials

For materials that float, a surface boom should be deployed to contain the spill. In standing water, booms should be deployed to contain the floating material close to the shore, thereby facilitating contaminant recovery. In flowing water, the boom should be positioned across the current downstream from the spill and angled against the current to allow for shore side collection.

If commercial booms are not readily available, improvised booms can be constructed of virtually any material that will float and form a barrier, e.g. logs, inflated fire hoses, etc. These materials may be used alone or, preferably, as supports for absorbent materials.

Where a boom is not available, a dam may be constructed, particularly in shallow areas, to provide effective containment. If the water is flowing through a drainage ditch or smaller stream, an underpass or water bypass



dam should be constructed. An earthen dam is constructed to completely stop the flow of water. Piping is then installed to allow water to flow through below the level of the floating material. Alternately, a channel may be constructed to divert the water flow around the spill area.

Weirs constructed of sheet metal, plywood, etc. may be constructed to prevent material flow through culverts or ditches. The sheet is inserted into the stream to below the level of the floating material. The water flows under the weir and spilled material will collect at the surface for removal.

5.2.2 Sinking Materials

For sinking materials, constructing a dyke, if feasible, will help limit dispersion in standing water. In smaller flowing water bodies, the flow can be diverted around the material through dyking and ditching.

5.3 Containment on or Under Ice

Spills occurring on ice are influenced by both the strength of the ice and whether the spilled material floats or sinks. Before any response actions are taken, the safe bearing capacity of the ice must be carefully assessed.

Table 6 provides general guidelines for good-quality ice.

Table 6 Ice thickness and Load Capacity

Ice Thickness (inches)	Approximate Load Capacity (tons)
3	0.2
6	1.0
9	2.0
15	6.0
20	10.0
30	20.0
40	40.0

Key considerations when working on ice include:

- White ice is only half as strong as blue ice
- Reduce allowable loads by one-half if cracks run parallel to the direction of travel
- Reduce allowable loads by one-quarter if cracks run both parallel and perpendicular to travel
- Exercise extreme caution during periods of fluctuating temperatures (e.g., sudden cold after a warm spell, or sudden warmth after extreme cold)
- Control vehicle speed in shallow water to avoid wave buildup beneath the ice



If the spill remains on the ice surface and it is determined that the ice is safe to work on, containment will be achieved using dykes and dams constructed of earth or snow. The dam or dyke should be lined with plastic to make it impermeable to the fuel. Water may be sprayed on snow dams/dykes to form an impermeable ice layer. Absorbent materials may be used in conjunction with barriers to prevent further spread and seepage.

If the spill penetrates the ice, containment becomes more difficult. If the water beneath the ice is standing, the ice will be broken to install a containment boom. The ice between the spill and the boom should be collected and disposed of along with the contaminated material. Response efforts should focus primarily on recovering the spilled material.

If the water is flowing slowly, ice slotting may be used. A trench is cut into the ice downstream of the spill and at an angle to the current to deflect and concentrate the spill. Spilled material that collects in the ice slot may be pumped out, absorbed or burned in place.

Vertical barriers, e.g. plywood sheets, may be inserted into the ice to deflect the movement of spilled material. Trenches should be cut in the ice at an angle to the direction of flow. The vertical barriers are inserted in the slots and allowed to freeze into place.

The extent of the under-ice spill may be monitored by boring observation holes into the ice with an auger.

5.4 Containment on Snow

Snow is one of the most effective natural absorbents, as spilled materials migrate into it until they become immobilized. When available, snow should be utilized as much as possible during spill response. It also provides additional protection by limiting the spread of fire if the spilled material is flammable and burning is considered a practical response method. Furthermore, snow assists in flotation of spilled substances after melting during controlled burning.

However, caution should be exercised as spilled material can migrate under snow cover for considerable distances and cannot be visible from above. Snow can also increase the migration of contaminants if not properly managed. To prevent a spill on snow from spreading, the following methods are recommended:

- Compact the snow around the perimeter of the spill area, which can be done effectively using a snowmobile.
- Construct snow dams and dykes to contain the spill. These may be lined with an impermeable liner or sprayed with water to form an impermeable ice layer.
- Identify the lowest point of the spill area, then clear channels in the snow to direct unabsorbed material into that low point.

Once collected in the low point, the spilled material can be removed either by shovelling into containers or by using mobile heavy equipment for transport to an approved recovery or disposal site.



5.5 Fire or Explosion Risk

When a hazardous material spill is accompanied by fire or presents an explosion risk, the first step must be to evacuate all personnel from the surrounding area to ensure safety. Extinguishing the fire becomes the priority, as it may otherwise prevent efforts to stop or minimize the spill.

Dykes or trenches should be constructed downslope of the spilled material to minimize spread of unburned liquids and the fire. Once containment measures are in place, appropriate extinguishing agents - such as foam, CO₂, or water - should be applied depending on the nature of the fire. Particular caution must be taken to avoid inhalation of combustion vapours, which may be toxic.

The Iqaluit Fire Department is trained and equipped to manage fires that generate hazardous fumes. Their crews use self-contained breathing apparatus and full protective clothing to safely suppress such incidents.

Once the fire has been fully extinguished and the site is deemed safe, efforts must continue to stop further spillage, contain the released material, and initiate appropriate cleanup and disposal measures.



6.0 Contaminated Material Removal

Sewage spills and affected materials will be collected and disposed of in the sewage lagoon.

Removal of spilled material is accomplished using suction, mechanical removal and absorbent materials.

Suction methods may be used if there is a significant quantity of free product on the ground or water surface. Equipment may include vacuum trucks, portable pumps or shop vacuums. Suction screens may be required to prevent hose plugging and pump damage.

Mechanical recovery using hand tools or heavy equipment should be used to collect contaminated soils or other loose material. Caution should be exercised when using heavy equipment on a spill site as it is possible to cause greater environmental impact from the equipment operation than from the spill itself.

Absorbents may be used for final cleanup, recovery of small amounts of material, or to remove material from inaccessible places. Snow and soil can be used as absorbent material for a variety of products.

Collected material should be transferred into secure containers using equipment appropriate to the scale of the spill. Where feasible, any soil beneath the spill that has been contaminated must also be excavated and disposed of together with the recovered material.

The final method of disposal for all recovered and contaminated materials will be determined in consultation with the appropriate regulatory authorities and in accordance with the guidance provided by the product manufacturer.



7.0 Spill Equipment Inventory

Table 7 lists the equipment owned by the City of Iqaluit that may be used in the event of a spill emergency. The usual location of the equipment is also indicated.

Table 7 Municipal Spill Emergency Equipment

Equipment	Storage Location
2 Cat 950 Loaders	Municipal Garage
4 Cat 938 Loaders	Municipal Garage
1 Rubber Tired Backhoe	Municipal Garage
4 Dump Trucks	Apex Garage
1 Cat 320 Excavator	Municipal Garage
2 Road Graders	Municipal Garage
1 966 Loader	Municipal Garage
5 Sewage Trucks	Apex Garage
5 Water Trucks	Air Base Garage
1 Cat 966 Loader	Municipal Garage
1 Hydro Vac Truck	Municipal Garage
(25kg) "Loose" Absorbent"	
Absorbent Booms	
Absorbent Pads	
Absorbent Socks	
Shovel, Broom, Garbage bags,	

The contents of the universal spill kit owned by the City are provided in Table 8.

Table 8 Universal Spill Kit Standard Contents

Universal Type Spill Kit
10 Absorbent Pads (Oil, Gas & Diesel)
10 Universal Absorbent Pads (Antifreeze & Non Haz)
2 – 3" x 4" Absorbent Socks (Oil, Gas & Diesel)
2 HD Hazmat Disposal Bags
1 Pair of Nitrile Gloves



The spill kits are located at the following locations:

- Water Treatment Plant
- Waste Transfer Station
- Municipal Garage



8.0 Training

Training and communication exercises should be carried on an annual basis to determine the actual readiness and ability of the City to handle a spill emergency. The exercises should be served to train key personnel and determine any weaknesses in the plan prior to the occurrence of an emergency. A variety of scenarios should be tested, e.g., sewage spills from the force main, sewage lagoon dam failures, chlorine gas leaks, fuel spills, etc. to ensure that appropriate action can be taken quickly. The Fire Department and the Emergency Measures Organization (EMO) currently conduct disaster training exercises in the City of Iqaluit. Neither of these groups target hazardous materials scenarios specifically, but a spill situation is often included as part of the larger exercise.

The Worker's Compensation Board will provide funding for employees to participate in hazardous materials courses if contact with hazardous materials is a component of the employee's job description. Courses available include Safety Data Sheets (SDS), Workplace Hazardous Materials Systems (WHMIS), and First Aid.



9.0 References

Guidelines for Spill Contingency Planning. Prepared by Water Resources Division Indian and Northern Affairs
Canada Yellowknife, NT April 2007

Spill Contingency Planning and Reporting Regulations, Environmental Protection Act, Government of the
Northwest Territories, 1993.



APPENDIX A

Site Plans

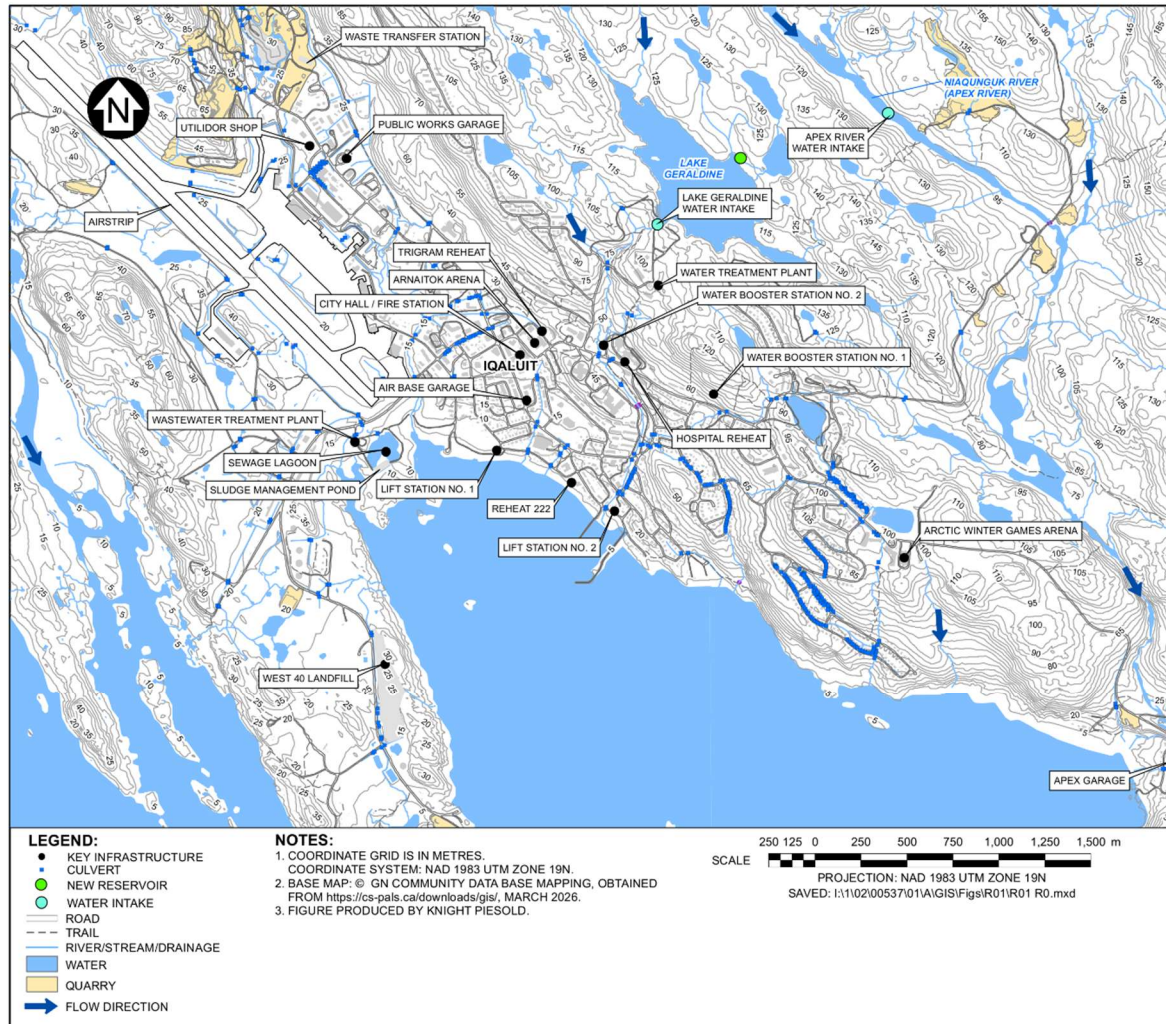


Figure A.1 Location of Municipal Facilities

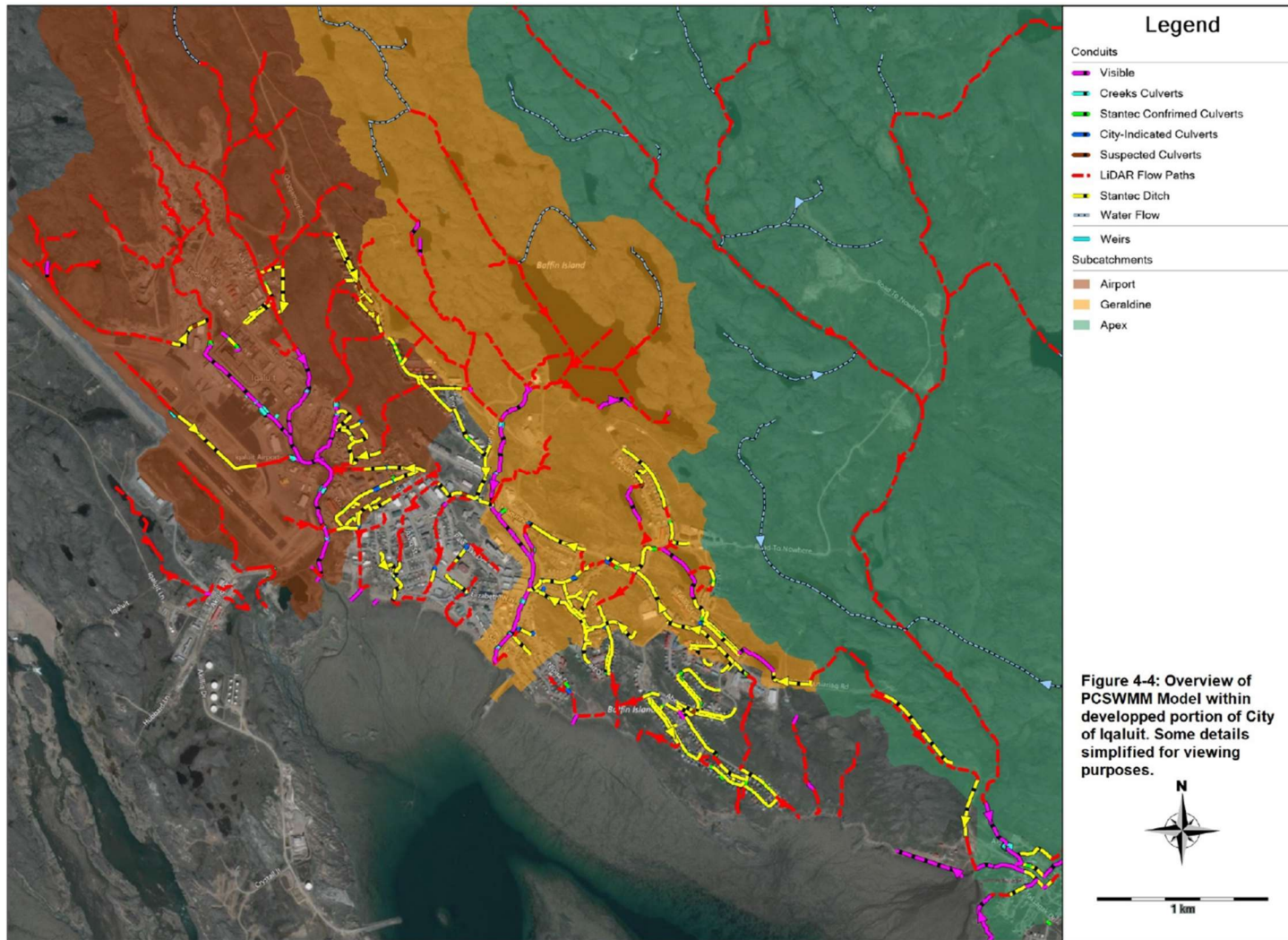


Figure A.2 Drainage Patterns and Ditching



APPENDIX B

Materials and Reportable Quantities List



APPENDIX B

MATERIALS AND REPORTABLE QUANTITIES LIST

Item No.	TDGA Class	Description of Contaminant	Amount Spilled
1	1	Explosives	Any Amount
2	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
3	2.2	Compressed gas (non-corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100 lt.
4	2.3	Compressed gas (toxic)	Any amount
5	2.4	Compressed gas (corrosive)	Any Amount
6	3.1, 3.2, 3.3	Flammable Liquid	100 lt.
7	4.1	Flammable solid	25 kg
8	4.2	Spontaneously combustible solids	25 kg
9	4.3	Water reactant solids	25 kg
10	5.1	Oxidizing substances	50 lt. or 50 kg
11	5.2	Organic Peroxides	1 lt. or 1 kg
12	6.1	Poisonous substances	5 lt. or 5 kg
13	6.2	Infectious substances	Any amount
14	7	Radioactive	Any amount
15	8	Corrosive Substances	5 lt. or 5 kg
16	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 lt. or 50 kg.
17	9.2	Environmentally hazardous	1 lt. or 1 kg
18	9.3	Dangerous wastes	5 lt. or 5 kg
19	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 lt. or 0.5 kg
20	None	Other contaminants	100 lt. or 100 kg



APPENDIX C

Spill Report Form

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS



Canada

**NT-NU 24-HOUR
SPILL REPORT LINE**
Tel: (867) 920-8130
Email: spills@gov.nt.ca



A	Report Date:	MM	DD	YY	Report Time:	<input type="checkbox"/> Original Spill Report OR <input type="checkbox"/> Update # _____ to the Original Spill Report	Report Number:
	B	Occurrence Date:	MM	DD	YY		
C	Land Use Permit Number (if applicable):				Water Licence Number (if applicable):		
D	Geographic Place Name or Distance and Direction from the Named Location:					Region:	
						<input type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Trans-boundary or Ocean	
E	Latitude:			Longitude:			
		_____ Degrees	_____ Minutes	_____ Seconds	_____ Degrees		_____ Minutes _____ Seconds
F	Responsible Party or Vessel Name:			Responsible Party Address or Office Location:			
G	Any Contractor Involved:			Contractor Address or Office Location:			
H	Product Spilled: <input type="checkbox"/> Potential Spill			Quantity in Litres, Kilograms or Cubic Metres:		U.N. Number:	
I	Spill Source:			Spill Cause:		Area of Contamination in Square Metres:	
J	Factors Affecting Spill or Recovery:			Describe Any Assistance Required:		Hazards to Persons, Property or Environment:	
K	Summary of the spill incident and efforts / description of the incident:						
L	Reported to Spill Line by:	Position:		Employer:		Location Calling From:	Telephone:
M	Any Alternate Contact:	Position:		Employer:		Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:		Employer:		Location Called:	Report Line Number:
Lead Agency: <input type="checkbox"/> ECCC <input type="checkbox"/> CCG/TCMSS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA <input type="checkbox"/> CIRNAC <input type="checkbox"/> CER <input type="checkbox"/> Other: _____						File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed	
Agency:		Contact Name:		Contact Time:		Remarks:	
Lead Agency:							
First Support Agency:							
Second Support Agency:							
Third Support Agency:							



APPENDIX D

Safety Data Sheets

SAFETY DATA SHEET



DIESEL FUEL

SDS Number: 000003000395

Version: 8.1

Revision Date: 2025/03/13

Print Date: 2025/03/14

SECTION 1. IDENTIFICATION

- Product name : DIESEL FUEL
- Product code : 12163, 12162, 12161, 12160, 10582, 11803, 11802, 11798, 12016, 11958, 11796, 11771, 11770, 11769, 11768, 11767, 11766, 11612, 11560, 11558, 11555, 11437, 11302, 10979, 10978, 10977, 10976, 10975, 10974, 10973, 10972, 10971, 10970, 10969, 10968, 10966, 10965, 10964, 10786, 10785, 10784, 10783, 10690, 10689, 10687, 10636, 10635, 10626, 10621, 10616, 10610, 10601, 10600, 10598, 10595, 10427, 10041
- Other means of identification : Seasonal Diesel, #2 Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, OSX, D50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend (BX where X is representative of volume %), Renewable Diesel blend (RX where X is represent ative of volume %), Diesel Low Cloud (LC), Marine Gas Oil, Marine Gas Oil Dyed, Type A Diesel, Type B Diesel.

Manufacturer or supplier's details

- Company name of supplier : Petro-Canada
- Address : P.O. Box 2844, 150 - 6th Avenue South-West
Calgary, Alberta T2P 3E3
Canada, Telephone: 1-866-786-2671
- Emergency telephone : CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887;
Suncor Energy: +1 403-296-3000

Recommended use of the chemical and restrictions on use

- Recommended use : Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type.
Mining diesels, marine diesels, marine diesel oil, marine gas oil and naval distillates may have a higher flash point requirement.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

- Flammable liquids : Category 3
- Acute toxicity (Inhalation) : Category 4

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- Skin irritation : Category 2
- Eye irritation : Category 2B
- 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 : H226 Flammable liquid and vapor.
H304 May be fatal if swallowed and enters airways.
H315 + H320 Causes skin and eye irritation.
H332 Harmful if inhaled.
H351 Suspected of causing cancer.
H373 May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air

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and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
Fuels, diesel; Gasoil — unspecified	Fuels, diesel; Gasoil — unspecified	68334-30-5	25 - 100
Alkanes, C10-20-branched and linear	Alkanes, C10-20-branched and linear	928771-01-1	<= 75
Fatty acids, C14-18 and C14-18-unsatd., Me esters	Fatty acids, C14-18 and C14-18-unsatd., Me esters	129756-24-7	<= 20
Fuel oil No. 2	Fuel oil No. 2	68476-30-2	<= 0.2

SECTION 4. FIRST AID MEASURES

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

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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	:	Harmful if inhaled. Respiratory, skin and eye irritation; nausea; cancer.
An indication of immediate medical attention and special treatment needed, if necessary	:	Treat symptomatically. For specialist advice physicians should contact the Poisons Information Service.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO ₂) 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, CO ₂), nitrogen oxides (NO _x), sulphur oxides (SO _x), 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 fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas.
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Material can create slippery conditions.
Mark the contaminated area with signs and prevent access to unauthorized personnel.
Only qualified personnel equipped with suitable protective equipment may intervene.

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 labeled containers.
To maintain product quality, do not store in heat or direct sunlight.
Ensure the storage containers are grounded/bonded.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Fuels, diesel; Gasoil — unspecified	68334-30-5	TWA	100 mg/m ³ (total hydrocarbons)	CA AB OEL
		TWA (inhal-)	100 mg/m ³	CA BC OEL

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		able fraction and vapour)	(total hydrocarbons)	
		TWAEV (inhalable fraction and vapour)	100 mg/m ³ (total hydrocarbons)	CA QC OEL
		TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	ACGIH
Fuel oil No. 2	68476-30-2	TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	CA AB OEL
		TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	CA BC OEL
		TWAEV (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	CA QC OEL
		TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	CA ON OEL
		TWA (Inhalable fraction and vapor)	100 mg/m ³ (total hydrocarbons)	ACGIH

Engineering measures : Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded.
 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 : Concentration in air determines protection needed.
 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

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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 safety glasses with side shields or goggles. Wear face-shield if splashing hazard is likely. Chemical splash goggles and a full-face shield should be worn when handling this material.
- 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

- Physical state : Bright oily liquid.
- Color : Clear to yellow (This product may be dyed red for taxation purposes)
- Odor : Mild petroleum oil like.
- pH : No data available
- Melting point and freezing point : No data available
- Boiling point, or initial boiling point and boiling range : 150 - 371 °C
- Flash point : > 40 °C
Method: closed cup
Marine Gas Oil/Naval Distillate: 60°C min
Mining Diesel: 52°C min
All other Diesel fuels: 40°C min
- Flammability : Flammable liquid
- Upper explosion limit / Upper flammability limit : 6 %(V)

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Lower explosion limit / Lower flammability limit	:	0.7 %(V)
Vapor pressure	:	7.5 mmHg (20 °C)
Relative vapor density	:	4.5
Relative density	:	0.8 - 0.88
Density	:	No data available
Solubility(ies)	:	
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	204 °C
Decomposition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	1.3 - 4.1 cSt (40 °C)
Particle characteristics	:	
Particle size	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Stable at normal ambient temperature and pressure.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerization does not occur.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents and acids.
Hazardous decomposition products	:	May release COx, NOx, SOx, 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

Harmful if inhaled.

Product:

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- Acute oral toxicity : Remarks: Based on available data, the classification criteria are not met.
- Acute inhalation toxicity : Acute toxicity estimate: 11 mg/L
Exposure time: 4 h
Test atmosphere: vapor
Method: Calculation method
- Acute dermal toxicity : Remarks: Based on available data, the classification criteria are not met.

Components:

Fuels, diesel; Gasoil — unspecified:

- Acute oral toxicity : LD50 (Rat): 7,500 mg/kg
- Acute inhalation toxicity : LC50 (Rat): 4.1 mg/l
Exposure time: 4 h
Test atmosphere: vapor
- Acute dermal toxicity : LD50 (Mouse): 24,500 mg/kg

Fuel oil No. 2:

- Acute oral toxicity : LD50 (Rat): 12,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes eye irritation.

Respiratory or skin sensitization

Skin sensitization

Based on available data, the classification criteria are not met.

Respiratory sensitization

Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Based on available data, the classification criteria are not met.

Carcinogenicity

Suspected of causing cancer.

Reproductive toxicity

Based on available data, the classification criteria are not met.

STOT-single exposure

Based on available data, the classification criteria are not met.

STOT-repeated exposure

May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure.

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Aspiration toxicity

May be fatal if swallowed and enters airways.

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/aquatic plants : Remarks: No data available

Toxicity to microorganisms : 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 labeled 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 : Contact local or business unit authorities for guidance on disposal of product.

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SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 1202
Proper shipping name : Diesel fuel
Class : 3
Packing group : III
Labels : Flammable Liquids
Packing instruction (cargo aircraft) : 366

IMDG-Code

UN number : UN 1202
Proper shipping name : DIESEL FUEL
Class : 3
Packing group : III
Labels : 3
EmS Code : F-E, S-E
Marine pollutant : yes

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

Not applicable for product as supplied.

Domestic regulation

TDG

UN number : UN 1202
Proper shipping name : DIESEL FUEL
Class : 3
Packing group : III
Labels : 3
ERG Code : 128
Marine pollutant : yes

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

NPRI Components : Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified
naphthalene
1,2,4-trimethylbenzene
toluene
propan-2-ol
methanol

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

DSL : All components of this product are on the Canadian DSL

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Canadian lists

No substances are subject to a Significant New Activity Notification.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
CA AB OEL	:	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
CA BC OEL	:	Canada. British Columbia OEL
CA ON OEL	:	Ontario Table of Occupational Exposure Limits made under the Occupational Health and Safety Act.
CA QC OEL	:	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
ACGIH / TWA	:	8-hour time weighted average
CA AB OEL / TWA	:	8-hour time weighted average
CA BC OEL / TWA	:	8-hour time weighted average
CA ON OEL / TWA	:	8-hour time weighted average
CA QC OEL / TWA	:	Time-weighted average exposure value

AIIC - Australian Inventory of Industrial Chemicals; 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; 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; TECl - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recom-

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Revision Date: 2025/03/13

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recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Revision Date : 2025/03/13

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.

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SAFETY DATA SHEET

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GASOLINE, UNLEADED

SDS Number: 000003000644

Version: 5.0

Revision Date: 2025/02/05

Print Date: 2025/02/13

SECTION 1. IDENTIFICATION

Product name : GASOLINE, UNLEADED

Product code : 11949, 11000, 10999, 10998, 10995, 10993, 10991, 10990, 10989, 10988, 10987, 10474, 10473, 10461, 10455, 10111, 10108, 10097, 10096, 10040, 10039

Other means of identification : LVB87, Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, Supreme, SuperClean, RegularClean, Plus-Clean, Premium, marked or dyed gasoline, BOB, Blendstock for Oxygenate Blending, Conventional Gasoline, RUL, MUL, SUL, PUL, Additive Denaturant, LVBU (low volatility blend ultra), LVBR (low volatility blend regular).

Manufacturer or supplier's details

Company name of supplier : Petro-Canada
Address : P.O. Box 2844, 150 - 6th Avenue South-West
Calgary, Alberta T2P 3E3
Canada, Telephone: 1-866-786-2671

Emergency telephone : CHEMTREC: 1-800-424-9300 (toll free) or +1 703-527-3887;
^CR^Suncor Energy: +1 403-296-3000

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.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

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 (Inhalation) : Category 1 (hematopoietic system)

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Aspiration hazard : Category 1

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H224 Extremely flammable liquid and vapor.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H340 May cause genetic defects.
H350 May cause cancer.
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs (hematopoietic system) through prolonged or repeated exposure if inhaled.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P331 Do NOT induce vomiting.

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P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
Gasoline; Low boiling point naphtha - unspecified	Gasoline; Low boiling point naphtha - unspecified	86290-81-5	80 - 100
toluene	toluene	108-88-3	<= 40
benzene	benzene	71-43-2	0.006 - 1.5
ethanol	ethanol	64-17-5	<= 0.3
methanol	methanol	67-56-1	<= 0.08

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.

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If swallowed	:	Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.
Most important symptoms and effects, both acute and delayed	:	Respiratory, skin and eye irritation; nausea; cancer. Inhalation may cause central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Chronic exposure to benzene may result in increased risk of leukemia and other blood disorders.
An indication of immediate medical attention and special treatment needed, if necessary	:	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO ₂) 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, CO ₂), nitrogen oxides (NO _x), 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.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus and full protective wear. Wear a positive-pressure supplied-air respirator with full face-piece.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	For personal protection see section 8. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions. Mark the contaminated area with signs and prevent access to unauthorized personnel. Only qualified personnel equipped with suitable protective equipment may intervene.
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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 labeled containers.
To maintain product quality, do not store in heat or direct sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Gasoline; Low boiling point naphtha -unspecified	86290-81-5	TWA	300 ppm	CA AB OEL
		STEL	500 ppm	CA AB OEL
		TWA	300 ppm	CA BC OEL
		STEL	500 ppm	CA BC OEL
		TWA	300 ppm	ACGIH
		STEL	500 ppm	ACGIH
toluene	108-88-3	TWA	20 ppm	CA BC OEL
		TWAEV	20 ppm	CA QC OEL
		TWA	50 ppm	CA AB OEL
		TWA	20 ppm	ACGIH

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benzene	71-43-2	TWA	0.5 ppm	CA BC OEL
		STEL	2.5 ppm	CA BC OEL
		TWA	0.5 ppm	CA ON OEL
		STEL	2.5 ppm	CA ON OEL
		TWAEV	0.5 ppm	CA QC OEL
		STEV	2.5 ppm	CA QC OEL
		TWA	0.5 ppm	CA AB OEL
		STEL	2.5 ppm	CA AB OEL
		TWA	0.02 ppm	ACGIH
		STEL	0.1 ppm	ACGIH
ethanol	64-17-5	STEL	1,000 ppm	CA BC OEL
		STEV	1,000 ppm	CA QC OEL
		TWA	300 ppm	CA AB OEL
		STEL	500 ppm	CA AB OEL
		STEL	1,000 ppm	ACGIH
methanol	67-56-1	TWA	200 ppm	CA BC OEL
		STEL	250 ppm	CA BC OEL
		TWA	200 ppm	CA AB OEL
		STEL	250 ppm	CA AB OEL
		TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH

Engineering measures : Adequate ventilation to ensure that Occupational Exposure Limits are not exceeded.
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 : Concentration in air determines protection needed.
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 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

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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

Physical state	:	Clear liquid.
Color	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odor	:	Gasoline
pH	:	No data available
Melting point and freezing point	:	No data available
Boiling point, or initial boiling point and boiling range	:	25 - 225 °C
Flash point	:	-50 - -38 °C Method: Tagliabue.
Flammability	:	Extremely flammable in presence of open flames and sparks. May accumulate static electrical charge. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back.
Upper explosion limit / Upper flammability limit	:	7.6 %(V)
Lower explosion limit / Lower flammability limit	:	1.3 %(V)
Vapor pressure	:	< 802.5 mmHg (20 °C)
Relative vapor density	:	3

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Relative density	:	0.685 - 0.8
Density	:	No data available
Solubility(ies)	:	
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	257 °C
Decomposition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	No data available
Particle characteristics	:	
Particle size	:	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerization does not occur.
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

Based on available data, the classification criteria are not met.

Product:

Acute oral toxicity	:	Acute toxicity estimate: > 2,000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate: > 20 mg/L Exposure time: 4 h Test atmosphere: vapor Method: Calculation method

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Acute dermal toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:

Gasoline; Low boiling point naphtha -unspecified:

Acute oral toxicity : LD50 (Rat): 13,600 mg/kg

Acute dermal toxicity : LD50 (Rabbit): > 3,750 mg/kg

toluene:

Acute oral toxicity : LD50 (Rat): 5,580 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 20 mg/l
Exposure time: 4 h
Test atmosphere: vapor

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: vapor

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: vapor

methanol:

Acute oral toxicity : LD50 (Rat): 5,600 mg/kg

Acute dermal toxicity : LD50 (Rabbit): 15,800 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

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Respiratory or skin sensitization

Skin sensitization

Based on available data, the classification criteria are not met.

Respiratory sensitization

Based on available data, the classification criteria are not met.

Germ cell mutagenicity

May cause genetic defects.

May cause cancer.

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

STOT-single exposure

May cause drowsiness or dizziness.

STOT-repeated exposure

Causes damage to organs (hematopoietic system) through prolonged or repeated exposure if inhaled.

Aspiration toxicity

May be fatal if swallowed and enters airways.

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/aquatic plants : Remarks: No data available

Toxicity to microorganisms : 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

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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 labeled 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 : Contact local or business unit authorities for guidance on disposal of product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

- UN/ID No. : UN 1203
Proper shipping name : Gasoline
Class : 3
Packing group : II
Labels : Flammable Liquids
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 : yes

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

Not applicable for product as supplied.

Domestic regulation

TDG

- UN number : UN 1203
Proper shipping name : GASOLINE
Class : 3
Packing group : II
Labels : 3
ERG Code : 128
Marine pollutant : yes

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Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

NPRI Components : toluene
benzene
ethanol
methanol
xylene
Naphtha (petroleum), hydrotreated heavy; Low boiling point
hydrogen treated naphtha
ethylbenzene
Solvent naphtha (petroleum), heavy arom.; Kerosine — un-
specified
naphthalene
1,2,4-trimethylbenzene

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

DSL : All components of this product are on the Canadian DSL

Canadian lists

No substances are subject to a Significant New Activity Notification.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
CA AB OEL : Canada. Alberta, Occupational Health and Safety Code (table
2: OEL)
CA BC OEL : Canada. British Columbia OEL
CA ON OEL : Ontario Table of Occupational Exposure Limits made under
the Occupational Health and Safety Act.
CA QC OEL : Québec. Regulation respecting occupational health and safe-
ty, Schedule 1, Part 1: Permissible exposure values for air-
borne contaminants
ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
CA AB OEL / STEL : Short term exposure limit
CA AB OEL / TWA : Time weighted average
CA AB OEL / TWA : 8-hour Occupational exposure limit
CA AB OEL / STEL : 15-minute occupational exposure limit
CA BC OEL / TWA : 8-hour time weighted average
CA BC OEL / STEL : short-term exposure limit
CA ON OEL / TWA : Time-Weighted Average Limit (TWA)
CA ON OEL / STEL : Short-Term Exposure Limit (STEL)
CA QC OEL / TWA EV : Time-weighted average exposure value

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CA QC OEL / STEV : Short-term exposure value

AIIC - Australian Inventory of Industrial Chemicals; 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; 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; TECI - Thailand Existing Chemicals Inventory; 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

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SAFETY DATA SHEET

Chlorine

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier	: Chlorine
Chemical name	: chlorine
Other means of identification	: Molecular chlorine; CHLORINE GAS; active chlorine released from chlorine; Dichlorine; Dichlor; Diatomic chlorine; Chlorine molecule; Chlorine mol.; Chlor mol.; Chlorine, liquefied; Liquid chlorine
Product type	: Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	: Molecular chlorine; CHLORINE GAS; active chlorine released from chlorine; Dichlorine; Dichlor; Diatomic chlorine; Chlorine molecule; Chlorine mol.; Chlor mol.; Chlorine, liquefied; Liquid chlorine
SDS #	: 001015
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253 Inside the US: 1-800-424-9300 (Chemtrec, 24 hours) Outside the US: 1-703-527-3887 (Chemtrec, 24 hours)
24-hour telephone	: Airgas Emergency Response Center 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas ACUTE TOXICITY (inhalation) - Category 2 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 AQUATIC HAZARD (ACUTE) - Category 1

GHS label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: H270 - May cause or intensify fire; oxidizer.
H280 - Contains gas under pressure; may explode if heated.
H314 - Causes severe skin burns and eye damage.
H330 - Fatal if inhaled.
H400 - Very toxic to aquatic life.

Precautionary statements

General

: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service.

Section 2. Hazards identification

- Prevention** : P280 - Wear protective gloves, protective clothing and eye or face protection.
P284 - In case of inadequate ventilation wear respiratory protection.
P220 - Keep away from clothing and other combustible materials.
P244 - Keep reduction valves, valves and fittings free from oil and grease.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P260 - Do not breathe gas.
P264 - Wash thoroughly after handling.
- Response** : P391 - Collect spillage.
P370 + P376 - In case of fire: Stop leak if safe to do so.
P304 + P340, P310 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.
P301 + P310, P330, P331 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353, P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor.
P363 - Wash contaminated clothing before reuse.
P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
- Storage** : P405 - Store locked up.
P410 + P403 - Protect from sunlight. Store in a well-ventilated place.
- Disposal** : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Hazards not otherwise classified** : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Substance
- Chemical name** : chlorine
- Other means of identification** : Molecular chlorine; CHLORINE GAS; active chlorine released from chlorine; Dichlorine; Dichlor; Diatomic chlorine; Chlorine molecule; Chlorine mol.; Chlor mol.; Chlorine, liquefied; Liquid chlorine
- Product code** : 001015

Ingredient name	%	CAS number
Chlorine	100	7782-50-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Section 4. First aid measures

- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : Fatal if inhaled.
- Skin contact** : Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Ingestion** : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

Section 5. Fire-fighting measures

- Specific hazards arising from the chemical** : Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode. This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
halogenated compounds
- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up

- Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
Avoid release to the environment. Empty containers retain product residue and can be hazardous. Keep away from clothing, incompatible materials and combustible materials. Do not breathe gas. Keep reduction valves free from grease and oil.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
chlorine	California PEL for Chemical Contaminants (Table AC-1) (United States) PEL 8 hours: 0.5 ppm. STEL 15 minutes: 1 ppm.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

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.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. 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.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Gas. [GREENISH-YELLOW GAS WITH SUFFOCATING ODOR]
- Color** : Colorless. Green. Yellow.
- Odor** : Pungent.
- Odor threshold** : Not available.
- pH** : Not applicable.
- Melting point/freezing point** : -101°C (-149.8°F)
- Boiling point or initial boiling point and boiling range** : -34°C (-29.2°F)
- Flash point** : [Product does not sustain combustion.]
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials, organic materials and alkalis.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : 85.3 (psig)
- Relative vapor density** : 2.5 [Air = 1]
- Specific Volume (ft³/lb)** : 5.4054
- Gas Density (lb/ft³)** : 0.185
- Relative density** : Not applicable.
- Solubility(ies)** :

Media	Result
cold water	Very slightly soluble

- Solubility in water** : 7.41 g/l
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- Flow time (ISO 2431)** : Not available.
- Molecular weight** : 70.9 g/mole

Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following:
contact with combustible materials
Reactions may include the following:
risk of causing fire
- Conditions to avoid** : No specific data.

Section 10. Stability and reactivity

- Incompatible materials** : Highly reactive or incompatible with the following materials:
combustible materials
reducing materials
grease
oil
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name

chlorine

Result

Rat - Inhalation - LC50 Gas.
293 ppm [1 hours]

Conclusion/Summary [Product] : Not available.

Skin corrosion/irritation

Not available.

Conclusion/Summary [Product] : Not available.

Serious eye damage/eye irritation

Not available.

Conclusion/Summary [Product] : Not available.

Respiratory corrosion/irritation

Not available.

Conclusion/Summary [Product] : Not available.

Respiratory or skin sensitization

Not available.

Skin

Conclusion/Summary [Product] : Not available.

Respiratory

Conclusion/Summary [Product] : Not available.

Germ cell mutagenicity

Not available.

Conclusion/Summary [Product] : Not available.

Section 11. Toxicological information

Carcinogenicity

Not available.

Conclusion/Summary [Product] : Not available.

Reproductive toxicity

Not available.

Conclusion/Summary [Product] : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Not available.

Potential acute health effects

- Eye contact** : Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : Fatal if inhaled.
- Skin contact** : Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Ingestion** : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Section 11. Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary [Product] : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
chlorine	N/A	N/A	146.5	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name

chlorine

Result

Acute - LC50 - Fresh water

Fish - Rainbow trout, donaldson trout - *Oncorhynchus mykiss*

Size: 10.16 to 12.7 cm

14 µg/l [96 hours]

Effect: Mortality

Acute - LC50 - Fresh water

Crustaceans - Aquatic sowbug - *Asellus racovitza*

2.03 µg/l [2 days]

Effect: Mortality

Acute - EC50 - Marine water

Algae - Giant kelp - *Macrocystis pyrifera* - Young

5.1 ppm [4 days]

Effect: Physiology

Conclusion/Summary [Product] : Not available.

Persistence and degradability

Not available.

Conclusion/Summary [Product] : Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Section 12. Ecological information

Soil/Water partition coefficient : Not available.

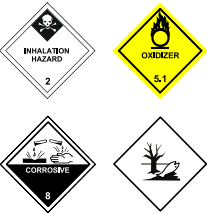

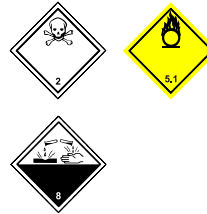
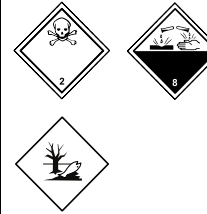
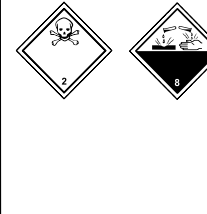
Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1017	UN1017	UN1017	UN1017	UN1017
UN proper shipping name	CHLORINE	CHLORINE	CHLORINE	CHLORINE	CHLORINE
Transport hazard class(es)	2.3 (5.1, 8) 	2.3 (5.1, 8) 	2.3 (5.1, 8) 	2.3 (8) 	2.3 (8) 
Packing group	-	-	-	-	-
Environmental hazards	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Additional information

DOT Classification

: Toxic - Inhalation hazard Zone B
 This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.
Reportable quantity 10 lbs / 4.54 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.
Special provisions 2, B9, B14, T50, TP19

Section 14. Transport information

- TDG Classification** : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5), 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).
The marine pollutant mark is not required when transported by road or rail.
Explosive Limit and Limited Quantity Index 0
ERAP Index 500
Passenger Carrying Vessel Index Forbidden
Passenger Carrying Road or Rail Index Forbidden
- IMDG** : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
- IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden.

Special precautions for user : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

- U.S. Federal regulations** :
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
Clean Water Act (CWA) 311: chlorine

Clean Air Act (CAA) 112 regulated toxic substances: chlorine

TSCA 12(b) - Chemical export notification
Not applicable.

- Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed
- Clean Air Act Section 602 Class I Substances** : Not listed
- Clean Air Act Section 602 Class II Substances** : Not listed
- DEA List I Chemicals (Precursor Chemicals)** : Not listed
- DEA List II Chemicals (Essential Chemicals)** : Not listed

SARA 302/304
Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
chlorine	100	Yes.	100	-	10	-

SARA 304 RQ : 10 lbs / 4.5 kg

- SARA 311/312 Classification** : Refer to Section 2: Hazards Identification of this SDS for classification of substance.
- SARA 313**

Section 15. Regulatory information

	Product name	CAS number	%
Form R - Reporting requirements	chlorine	7782-50-5	100
Supplier notification	chlorine	7782-50-5	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

- Massachusetts** : This material is listed.
- New York** : This material is listed.
- New Jersey** : This material is listed.
- Pennsylvania** : This material is listed.
- California Prop. 65**

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

- Australia** : This material is listed or exempted.
- Canada** : This material is listed or exempted.
- China** : This material is listed or exempted.
- Eurasian Economic Union** : **Russian Federation inventory**: Not determined.
- Japan** : **Japan inventory (CSCL)**: Not determined.
Japan inventory (ISHL): Not determined.
- New Zealand** : This material is listed or exempted.
- Philippines** : This material is listed or exempted.
- Republic of Korea** : This material is listed or exempted.
- Taiwan** : This material is listed or exempted.
- Thailand** : This material is listed or exempted.
- Turkey** : This material is listed or exempted.
- United States** : This material is active or exempted.
- Viet Nam** : This material is listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	/	3
Flammability		0
Physical hazards		3

Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

[National Fire Protection Association \(U.S.A.\)](#)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

[Procedure used to derive the classification](#)

Classification	Justification
OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas ACUTE TOXICITY (inhalation) - Category 2 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 AQUATIC HAZARD (ACUTE) - Category 1	Expert judgment According to package On basis of test data Expert judgment Expert judgment Expert judgment

[History](#)

Date of printing	: 5/7/2025
Date of issue/Date of revision	: 5/7/2025
Date of previous issue	: 2/23/2022
Version	: 2.02

Key to abbreviations	: ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
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References	: Not available.
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[Notice to reader](#)

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET


94-97% Calcium Chloride Powder



Section 1. Identification

GHS product identifier	: 94-97% Calcium Chloride Powder
Other means of identification	: Not available.
Product code	: CC-02
Product use	: Concrete acceleration, Drilling fluid additive, Dust control
Supplier's details	: Cal-Chlor Corporation 3909 Ambassador Caffery Pkwy, Ste H-1 Lafayette, LA 70503 United States Telephone number: 1-800-245-6743 www.Cal-Chlor.com
e-mail address of person responsible for this SDS	: mscelsa@cal-chlor.com
Emergency telephone number (with hours of operation)	: CHEMTREC: 800-424-9300 (United States and Canada)

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: COMBUSTIBLE DUSTS ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A
GHS label elements	
Hazard pictograms	: 
Signal word	: Warning
Hazard statements	: May form combustible dust concentrations in air. Harmful if swallowed. Causes serious eye irritation. Causes skin irritation.
Precautionary statements	
Prevention	: Wear protective gloves. Wear eye or face protection. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
Response	: IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. 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 attention.
Storage	: Not applicable.
Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 2. Hazards identification

- Supplemental label elements** : Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Prevent dust accumulation.
- Hazards not otherwise classified** : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Not available.
- Product code** : CC-02

Ingredient name	%	CAS number
calcium chloride	≥90	10043-52-4
Impurity and Stabilizers:		
potassium chloride	≤5	7447-40-7
sodium chloride	≤3	7647-14-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye irritation. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes.

Section 4. First aid measures

- Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
- Skin contact** : Causes skin irritation. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the skin.
- Ingestion** : Harmful if swallowed.
- Over-exposure signs/symptoms**
- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : Repeated or prolonged exposure to the substance can produce mucous membranes damage.

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : Use dry chemical powder. Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.
- Specific hazards arising from the chemical** : May form explosible dust-air mixture if dispersed.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
halogenated compounds
metal oxide/oxides

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

- Small spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Handling and dilution of concentrates: water temperature <27°C/80°F

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
calcium chloride	None.
potassium chloride	None.
sodium chloride	None.

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. If operating conditions cause high dust concentrations to be produced, use dust goggles.

Skin protection

Hand protection : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Ensure an MSHA/NIOSH-approved respirator or equivalent is used.

Section 9. Physical and chemical properties

Appearance

Physical state	: Solid. [Powder.]
Color	: White.
Odor	: Odorless.
Odor threshold	: Not available.
pH	: Not applicable.
Melting point	: ~772°C (1421.6°F)
Boiling point	: Not applicable.
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: Not available.
Vapor density	: Not applicable.
Relative density	: Not available.
Bulk density	: 65 lb/ft ³
Solubility	: Not available.
Solubility in water	: Soluble.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not applicable.
Decomposition temperature	: Not applicable.
Viscosity	: Not applicable.

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: Stable under recommended storage and handling conditions (see Section 7).
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid	: Keep away from: moisture. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation.
Incompatible materials	: May generate heat on contact with water. Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc. Keep away from: Sulfuric acid and bromide.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
calcium chloride	LD50 Dermal	Rabbit	5000 mg/kg	-
	LD50 Oral	Rat	1 g/kg	-
potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
sodium chloride	LD50 Oral	Rat	3000 mg/kg	-

Conclusion/Summary : Harmful if swallowed.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
calcium chloride	Eyes - Irritant	Rabbit	-	100 milligrams	21 days
potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Conclusion/Summary

Skin : Causes skin irritation.

Eyes : Causes serious eye irritation.

Sensitization

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation, Ocular.

Potential acute health effects

Eye contact : Causes serious eye irritation. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes.

Section 11. Toxicological information

- Inhalation** : Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
- Skin contact** : Causes skin irritation. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the skin.
- Ingestion** : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : Repeated or prolonged exposure to the substance can produce mucous membranes damage.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

Not available.

- Conclusion/Summary** : Not available.
- General** : Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
94-97% Calcium Chloride Powder	1032.2	5257.7	N/A	N/A	N/A
calcium chloride	1000	5000	N/A	N/A	N/A
potassium chloride	2600	N/A	N/A	N/A	N/A
sodium chloride	3000	N/A	N/A	N/A	N/A

Section 11. Toxicological information

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
calcium chloride	LC50 8350 to 10650 mg/l Fresh water	Fish - Lepomis macrochirus	48 hours
	Acute EC50 3130000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 52000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 270 mg/l Marine water	Crustaceans - Americamysis bahia	48 hours
	Acute LC50 759000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 2110 mg/l Fresh water	Fish - Pimephales promelas	96 hours
potassium chloride	Acute EC50 1337000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 590 mg/l Fresh water	Daphnia - Daphnia magna	24 hours
	Acute EC50 83000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 3470 mg/l Fresh water	Crustaceans - Ceriodaphnia dubia	96 hours
	Acute LC50 9.68 mg/l Fresh water	Crustaceans - Pseudosida ramosa - Neonate	48 hours
	Acute LC50 4236 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Acute LC50 880 mg/l Fresh water	Fish - Pimephales promelas	96 hours
sodium chloride	Acute EC50 4.74 g/L Fresh water	Algae - Chlamydomonas reinhardtii	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute EC50 402600 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute EC50 1.7 g/L Fresh water	Fish - Cynopocilus melanotaenia - Fry	96 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks

Conclusion/Summary : Acute toxicity: Practically non-toxic to aquatic organisms.

Persistence and degradability

Conclusion/Summary : Not available.

Section 12. Ecological information

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{oc}) : 0 to 50

Mobility : High mobility in soil, based on experimental data.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	ADR/RID	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-	-
Label						
Packing group	-	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	Marine Pollutant: No	No.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

- U.S. Federal regulations** :
- Clean Air Act Section 112** : Not listed
(b) Hazardous Air Pollutants (HAPs)
- Clean Air Act Section 602** : Not listed
Class I Substances
- Clean Air Act Section 602** : Not listed
Class II Substances
- DEA List I Chemicals** : Not listed
(Precursor Chemicals)
- DEA List II Chemicals** : Not listed
(Essential Chemicals)

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : COMBUSTIBLE DUSTS
ACUTE TOXICITY (oral) - Category 4
SKIN IRRITATION - Category 2
EYE IRRITATION - Category 2A


Composition/information on ingredients

Name	%	Classification
calcium chloride	≥90	ACUTE TOXICITY (oral) - Category 4 EYE IRRITATION - Category 2A
potassium chloride	≤5	EYE IRRITATION - Category 2B
sodium chloride	≤3	EYE IRRITATION - Category 2A

State regulations

- Massachusetts** : None of the components are listed.
- New York** : None of the components are listed.
- New Jersey** : None of the components are listed.
- Pennsylvania** : None of the components are listed.

California Prop. 65

 **WARNING:** This product can expose you to calcium bromate, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
calcium bromate	-	-

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Section 15. Regulatory information

Not listed.

[UNECE Aarhus Protocol on POPs and Heavy Metals](#)

Not listed.

[Inventory list](#)

Australia	: All components are listed or exempted.
Canada	: All components are listed or exempted.
China	: All components are listed or exempted.
Europe	: All components are listed or exempted.
Japan	: Japan inventory (ENCS): All components are listed or exempted.
New Zealand	: All components are listed or exempted.
Philippines	: All components are listed or exempted.
Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Turkey	: All components are listed or exempted.
United States	: All components are listed or exempted.

Section 16. Other information

[National Fire Protection Association \(U.S.A.\)](#)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

[Procedure used to derive the classification](#)

Classification	Justification
COMBUSTIBLE DUSTS ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A	On basis of test data Calculation method Expert judgment Calculation method

[History](#)

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Version	: 2

Section 16. Other information

Key to abbreviations : ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
DOT = Department of Transportation
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
SGG = Segregation Group
TDG = Transportation of Dangerous Goods
UN = United Nations

References : Not available.

✔ Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Material Safety Data Sheet

Propylene Glycol Antifreeze & Engine Coolant

Section 1. Product and company identification

Product name	Propylene Glycol Antifreeze & Engine Coolant	Code	ANT
Material uses	Anti-Freeze and Engine Coolant.	MSDS authored by	AMSOIL INC
Supplier/Manufacturer	AMSOIL INC 925 Tower Avenue Superior, WI 54880	<u>In case of emergency</u>	CHEMTREC, U.S. : 1-800-424-9300 International: +1-703-527-3887

Section 2. Hazards identification

Emergency overview

Color : Yellow.

Physical state : Liquid. [Fluid.]

Odor : Mild to Odorless.

Signal word : CAUTION!

Hazard statements : MAY CAUSE EYE AND SKIN IRRITATION.

Precautions : Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Skin : Slightly irritating to the skin.

Eyes : Slightly irritating to the eyes.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation : No specific data.

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
irritation
watering
redness

Medical conditions aggravated by over-exposure : None known.

See toxicological information (Section 11)

Section 3. Composition/information on ingredients

United States

Name	CAS number	%
1,2-Propanediol	57-55-6	60 - 100

Canada

Name	CAS number	%
1,2-Propanediol	57-55-6	60 - 100

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Section 4. First aid measures

Eye contact : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.

Skin contact : After contact with skin, wash immediately with plenty of soap and water. Get medical attention if symptoms occur.

Inhalation : Move exposed person to fresh air.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Section 5. Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Hazardous decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

- Small spill** : Absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Avoid contact with used product. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
1,2-Propanediol	AIHA WEEL (United States, 5/2010). TWA: 10 mg/m ³ 8 hour(s).

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	
1,2-Propanediol	ON 7/2010	-	10	-	-	-	-	-	-	-	[a]
	US AIHA 5/2010	50	155	-	-	-	-	-	-	-	[b]

Form: [a]Aerosol only. [b]Vapour and aerosol.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures	: Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
Engineering measures	: No special ventilation requirements. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Hygiene measures	: Ensure that eyewash stations and safety showers are close to the workstation location. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Respiratory	: Not required under normal conditions of use. 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. Ensure an MSHA/NIOSH-approved respirator or equivalent is used.
Hands	: Use gloves appropriate for work or task being performed. Recommended: Natural rubber (latex).
Eyes	: Safety eyewear should be used when there is a likelihood of exposure. Recommended: Safety glasses with side shields.
Skin	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. No special protective clothing is required. Recommended: Coveralls.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 9. Physical and chemical properties

Physical state	: Liquid. [Fluid.]	Odor	: Mild to Odorless.
Color	: Yellow.	pH	: Not available.
Flash point	: Closed cup: 99.44°C (211°F) [Pensky-Martens.]	Auto-ignition temperature	: Not available.
Flammable limits	: Not available.	Melting point/ Pour point	: -76°C (-104.8°F)
Boiling point	: >176.67°C (>350°F)	Vapor pressure	: <0.013 kPa (<0.1 mm Hg) [20°C]
Relative density	: 1.02 to 1.03	Vapor density	: 2.6 [Air = 1]
Volatility	: Not available.	Evaporation rate	: Not available.
Viscosity	: Not available.	Solubility	: Easily soluble in the following materials: cold water and hot water.

Section 10. Stability and reactivity

Chemical stability	: The product is stable.
Conditions to avoid	: No specific data.
Materials to avoid	: Reactive or incompatible with the following materials: oxidizing materials and acids.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Hazardous polymerization	: Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
1,2-Propanediol	LD50 Dermal	Rabbit	20800 mg/kg	-
	LD50 Oral	Rat	20.8 g/kg	-

Chronic toxicity : No specific data.

Section 12. Ecological information

Environmental effects : Not established

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
1,2-Propanediol	Acute LC50 >1000 mg/L Marine water	Crustaceans - Chaetogammarus marinus - Young - 5 mm	48 hours
	Acute LC50 1020000 ug/L Fresh water	Daphnia - Ceriodaphnia dubia - <=24 hours	48 hours
	Acute LC50 710000 ug/L Fresh water	Fish - Pimephales promelas - <=7 days	96 hours
	Chronic NOEC 660000 ug/L Fresh water	Daphnia - Ceriodaphnia dubia - <=24 hours	48 hours
	Chronic NOEC 600000 ug/L Fresh water	Fish - Pimephales promelas - <=7 days	96 hours

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. This material and its container must be disposed of in a safe way. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Empty containers or liners may retain some product residues. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT/TDG/IMDG/IATA : Not regulated.

Section 15. Regulatory information

United States

HCS Classification : Not regulated.

U.S. Federal regulations : United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: 1,2-Propanediol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: 1,2-Propanediol: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Air Act (CAA) 112 accidental release prevention: No products were found.

State regulations

Massachusetts : None of the components are listed.
New York : None of the components are listed.
New Jersey : The following components are listed: 1,2-Propanediol
Pennsylvania : The following components are listed: 1,2-Propanediol

California Prop. 65

No products were found.

Canada

WHMIS (Canada) : Not controlled under WHMIS (Canada).
Canadian lists : **CEPA Toxic substances:** None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: None of the components are listed.
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory : All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

Section 16. Other information**United States**

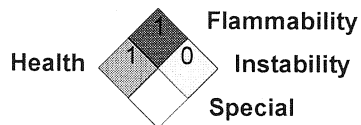
Label requirements : MAY CAUSE EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

Health	1	Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.
Flammability	1	
Physical hazards	0	

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



Date of issue : 08/15/2011

Date of previous issue : 08/15/2010

Version : 2

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Safety Data Sheet (SDS) Hydrofluorosilicic Acid

SECTION 1 – Chemical Identification and Supplier's Information

Product ID: HFS
Use: Industrial Use
Chemical Formula: H₂SiF₆
Chemical Family: N/A
CAS #: 16961-83-4

Supplier's Name & Address:

Pencco, Inc.
P.O. Box 600
San Felipe, TX 77473

Emergency Phone:

Pencco (979) 885-0005
CHEMTREC (800) 424-9300 – 24 hours a day

SECTION 2 – Hazards Identification

GHS Information

Signal Word: **Danger**
Hazard Class: No Physical Hazards
Hazard Category: N/A
Hazard Statement: Harmful if Swallowed (H302)
Causes severe skin burns and eye damage (H314)
Causes serious eye damage (H318)
Harmful if Inhaled (H332)
Harmful to aquatic life (H402)

Appearance and Odor: Fuming colorless liquid with pungent odor.

Emergency Overview: A corrosive chemical. Harmful if swallowed. Harmful if inhaled. Causes severe skin burns and eye damage. Contact with liquid or vapor form of this chemical may cause severe injury. Avoid overexposure.

Pictograms:



Health Hazards

Acute Toxicity, Oral – Category 4. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract. Swallowing a small quantity of this material will result in serious health hazard.

Acute Toxicity, Dermal – Category 3. Prolonged contact may cause irritation and, possibly, burns.

Eye Contact – Irritation and, possibly, burns.

Inhalation – Category 4. May cause irritation of the upper respiratory tract, resulting in difficulty breathing.

Precautionary Statements

Prevention

- Do not breathe fumes, mist, vapors, or sprays. (P260)
- Wash skin thoroughly after handling. (P264)
- Do not eat, drink, or smoke when using this product. (P270)
- Use only outdoors or in a well-ventilated area. (P271)
- Avoid release to the environment. (P273)
- Wear eye protection, face protection, protective gloves, protective clothing. (P280)

Response

- If swallowed: Rinse mouth. (P301+P330)
 - Call a POISON CENTER/doctor/physician. (P312)
- Wash contaminated clothing before reuse. (P363)

Storage Considerations

- Store locked up. (P405)

Disposal Considerations

- Dispose of this material and its container to hazardous or special waste collection point in accordance with local, regional, national, and/or international regulation. (P501)

Carcinogenicity: None of the components of this material are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

Fire and Explosion Hazards: This product will not burn and is not flammable.

	NFPA Rating	HMIS Rating	4 = Extreme / Severe
Health	3	3	3 = High / Serious
Reactivity	0	0	2 = Moderate
Flammability	0	0	1 = Slight

SECTION 3 – Composition/Information on Ingredients

Chemical Identity: Hydrofluorosilicic Acid

Common Name and synonyms: HFSA, Fluorosilicic acid, Hexafluorosilicic acid, hydrosilicofluoric acid

Ingredient	CAS #	Weight Percentage
Hydrofluorosilicic Acid	16961-83-4	25%
Water/Inactive Ingredients	7732-18-5	75%

*All components are NSF compliant

SECTION 4 – First Aid Measures

Eye Contact First Aid: Immediately flush eyes for 15 minutes with large amounts of water while holding eyelids apart. Washing within one minute is essential to achieve maximum effectiveness. Obtain medical attention IMMEDIATELY after flushing.

Skin Contact First Aid: Flush skin with water for at least 15 minutes. Remove contaminated clothing; wash before reuse. If irritation is still present, seek medical attention IMMEDIATELY.

Inhalation First Aid: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical attention IMMEDIATELY.

Ingestion First Aid: DO NOT INDUCE VOMITING. Give 1 or 2 glasses of water or milk. Never give anything by mouth to an unconscious individual. **Obtain medical attention IMMEDIATELY.**

SECTION 5 – Fire Fighting Measures

Flash Point: Not applicable.

Upper/Lower Explosion Limits in Air: Not applicable.

Auto Ignition Temperature: Not applicable.

Extinguishing Media: Will not burn; use materials appropriate for surrounding fire. Do not get water inside containers. Do not apply water stream directly at source of leak. Do not use a heavy water stream. A direct water stream will cause violent splattering and generation of heat.

Fire and Explosion Hazards: Not flammable. Under conditions of fire this material may produce: silicon oxides; hydrogen fluoride; tetrafluorosilane. Decomposes above 108 °C (227 °F)

Fire Fighting Instructions: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face-piece operated in a positive pressure mode. Move exposed containers from fire area if it can be done without risk. Use water to keep fire-exposed containers and tanks cool. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous Product of Decomposition or Combustion: Unknown.

SECTION 6 – Accidental Release Measures

Review safety precautions before proceeding with cleanup. Use appropriate personal protection equipment. Do not touch spilled material. Neutralize spill with limestone (calcium carbonate), or sodium bicarbonate. Restrict access to area until completion of clean up.

Caution: Ventilation should be provided in enclosed areas. Dike area around spill to prevent spreading, and use absorbent material to pick up spill.

Steps to Be Taken in Case Material Is Released or Spilled: Notify the appropriate environmental authorities. Note that spills may need to be reported to the National Response Center ((800) 424-8802)

SECTION 7 – Handling and Storage

Handling: Avoid all eyes and skin contact, and do not create or breathe vapor and mist. Wear recommended personal protective equipment. Ensure there is adequate ventilation. Keep away from heat and open flame. Employ good maintenance practices to prevent leaks. Use good process control measures to prevent releases.

Storage: Reacts with many metals to produce flammable and explosive hydrogen gas. Keep away from strong acids and bases, chlorites, organic peroxides, combustible materials, and metals. Store in dry, cool area. Store in a well-ventilated place away from heat and sources of ignition. Large tanks should be bermed and electrically grounded. Avoid using glass, metal, or stoneware containers.

SECTION 8 – Exposure Controls and Personal Protection

Respiratory Protection: Use a NIOSH-approved respirator or self-contained breathing apparatus whenever exposure may exceed established Occupational Exposure Limits. Use respirator approved for acid fumes and mist.

Eye Protection: Use chemical safety goggles and face shield. Do not wear contact lenses.

Skin Protection: Where there is possibility of skin contact, use the following as appropriate, to avoid skin contact: gloves impervious to material, apron, boots, hood, pants, and jacket. Maintain a safety shower with quick opening valves. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

SECTION 9 – Physical and Chemical Properties

Boiling Point:	136 - 163°C (277 - 326°F)	pH:	1.5 - 2.0
Melting Point:	-18 - -20 °C (-1 - 4 °F)	Solubility in Water:	Complete
Specific Gravity:	1.2 at 24°C	Vapor Pressure:	24 mm Hg at 25°C
% Volatile:	Unknown	Evaporation Rate:	N/A
Vapor Density (Air = 1):	N/A	Molecular Weight:	144 g/mol
Appearance:	Water white to straw yellow	Odor:	Pungent

SECTION 10 – Stability and Reactivity

Reactivity: Reacts with metals to form flammable hydrogen gas.

Stability: Stable at normal conditions.

Decomposition: Thermal decomposition yields hydrogen silica tetrafluoride and hydrogen fluoride gas.

Incompatibility: Metals, glass, stoneware, alkali, strong concentrated acids.

SECTION 11 – Toxicological Information

Chronic Effects: Prolonged absorption of fluorides may result in fluorosis. Symptoms include changes in bone density, ossification of ligaments and mottling of the dental enamel.



Customer Service 800-864-1742
FAX 888-273-6226

Revision Date 2017-11-02

Toxicological Data: LD50 oral rat = 125 mg/kg.

Carcinogenicity: None of the components of this material are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

Reproductive Effects: No reproductive effects are known.

Target Organs: No data available.

SECTION 12 – Ecological Information

Ecotoxicological Information: Acute toxicity to aquatic invertebrates: LD50 = 140 mg/kg.

SECTION 13 – Disposal Considerations

This material is hazardous to the aquatic environment. Keep out of sewers and waterways. Place in an appropriate container. Dispose of contaminated material at a licensed site. Dispose of waste in accordance with applicable federal, state, and local laws.

SECTION 14 – Transportation Information

DOT Shipping Name: Fluorosilicic acid

Hazard Class: 8 – Corrosive Material

UN Number: UN 1778

Packing Group: II

Reportable Quantity: 10000 lbs (4540 kg)

SECTION 15 – Regulatory Information

OSHA: Hazardous Corrosive Liquid – 29 CFR 1920.1200

OSHA Process Safety (29 CFR 1910.119): No

CERCLA: Hazardous Substance – Reportable Quantity (RQ) = 10,000 lbs (4540 kg)

SARA Regulations: 313 and 40 CFR 372: No

SARA Hazard Categories, SARA Sections 311/312 (40 CFR 370.21):

Acute: Yes; Chronic: Yes; Fire: No; Reactive: No; Sudden Release: No

Clean Water Act: Designated as a hazardous substance under Section 311(b)(2)(A) of the Federal Water Pollution Control Act; Ingredients are regulated by the Clean Water Act Amendments of 1977 and 1978. This chemical is subject to regulations regarding its discharge.



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TSCA Inventory Status: Yes

California Proposition 65: No

Right-To-Know Lists: Massachusetts, New Jersey. This substance does not contain nor is manufactured with ozone-depleting substances.

Canadian Regulations: CPR: Very toxic, Class D; Corrosive, Class E; DSL: Listed

SECTION 16 – Other Information

Revision Date: November 2, 2017

Pencco provides the information contained in each SDS, technical data sheet ("TDS"), product information brochure and/or information contained herein (including data and statements) in good faith and makes no representations as to its comprehensiveness or accuracy as of the date of publication. The SDSs, TDSs, and product information brochures are referred to collectively as the "Data Sheets". It is the responsibility of the user to obtain and use the most recent version of the Data Sheets. Each Data Sheet relates only to the specific product designated therein and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use of the product and information are beyond the control of Pencco, Pencco expressly disclaims any and all liability as to any consequential damages or results obtained or arising from any use of the products or the information contained in the Data Sheets. NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE AS CONCERNS THE DATA SHEETS OR THE RELATED PRODUCTS.

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SAFETY DATA SHEET

HYDRATED LIME

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hydrated Lime
Synonym/s: HY, High Calcium Hydrated Lime, Hydrate, Slaked Lime, HL
Chemical Name: Calcium Hydroxide
Chemical Formula: Ca(OH)₂
Product Use/s: Water Treatment, pH Adjustment, FGD, Construction, Pulp/Paper

Manufacturer: Cheney Lime and Cement Company
478 Graystone Road
Allgood, Alabama 35013
205-625-3031

Emergency Phone: 205-625-3031

SECTION 2: HAZARDS IDENTIFICATION

Emergency Overview: Hydrated Lime is an odorless white powder. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract.

Hazard Pictograms:



Signal Word:

Danger

Potential Health Effects:

Eyes: Contact can cause severe irritation or burning of eyes, including permanent damage.

Skin: Contact can cause severe irritation or burning of skin, especially in the presence of moisture.

Ingestion: This product can cause severe irritation or burning of gastrointestinal tract if swallowed.

Inhalation: This product can cause severe irritation of the respiratory system. Long-term exposure may cause permanent damage. Hydrated lime is not listed by MSHA, OSHA, or IARC as a carcinogen. However, this product may contain trace amounts of crystalline silica in the form of quartz or cristobalite, which has been classified by IARC as a Group I carcinogen to humans when inhaled. Inhalation of silica can also cause a chronic lung disorder, silicosis.

Potential Environmental Effects:

This material is alkaline and if released into water or moist soil will cause an increase in pH.

SAFETY DATA SHEET

HYDRATED LIME

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Chemical Formula	Common Name	Conc. (%)
Calcium Hydroxide	Ca(OH) ₂	Hydrated Lime	> 90
Magnesium Oxide	MgO	Periclase	< 2.5
Calcium Carbonate	CaCO ₃	Limestone	< 3.0
Crystalline Silica	SiO ₂	Quartz	< 1.0

SECTION 4: FIRST AID MEASURES

Eyes: Immediately flush eyes with generous amounts of water or eye wash solution if water is unavailable. Pull back eyelid while flushing to ensure that all hydrated lime dust has been washed out. Seek medical attention promptly if the initial flushing of the eyes does not remove the irritant. Do not rub eyes.

Skin: Brush off or remove as much dry lime as possible. Wash exposed area with large amounts of water. If burned seriously or if irritation persists, seek medical attention promptly.

Inhalation: Move victim to fresh air. Seek medical attention. If breathing has stopped, give artificial respiration.

Ingestion: Do not induce vomiting. Seek medical attention immediately. Never give anything by mouth unless instructed to do so by medical personnel.

Medical Conditions Aggravated by Exposure: Hydrated lime is an odorless white powder. Contact can cause irritation to eyes, skin, respiratory system, and gastrointestinal tract.

SECTION 5: FIREFIGHTING MEASURES

Fire Hazards:

Suitable Extinguishing Media: Use dry chemical or CO₂ fire extinguisher to extinguish the surrounding fire.

Fire Fighting Instructions: Keep personnel away from and upwind of fire. Avoid skin contact or inhalation of dust. Wear full fire-fighting turn-out gear (full Bulk gear), and respiratory protection (SCBA)

Hazardous Combustion Products: Not applicable

SAFETY DATA SHEET

HYDRATED LIME

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill / Leak Procedures: Do Not use water on bulk material spills. Use proper personal protective equipment.

Small Spills: Use dry methods to collect spilled materials. Avoid generating dust. Do not clean up with compressed air. Store collected materials in dry, sealed plastic or non-aluminum metal containers. Residue on surfaces may be water washed.

Large Spills: Use dry methods to collect spilled materials. Evacuate area downwind of clean-up operations to minimize dust exposure. Store spilled materials in dry, sealed plastic or non-aluminum metal containers.

Containment: Minimize dust generation and prevent bulk release to sewers or waterways.

Clean-up: Residual amounts of material can be flushed with large amounts of water. Equipment can be washed with either a mild vinegar and water solution, or detergent and water.

SECTION 7: HANDLING AND STORAGE

Handling: Keep in tightly closed plastic or non-aluminum metal containers. Protect containers from physical damage. Avoid direct skin contact with the material. Avoid breathing any dust.

Storage: Store in a cool, dry, well-ventilated location. Do not store near acids or other incompatible materials. Keep away from moisture. Do not store or ship in aluminum containers. Hydrated lime is not combustible or flammable. However, it reacts vigorously with acids, and may release heat sufficient to ignite combustible materials in specific instances. Hydrated lime is not considered to be an explosion hazard, although reaction with acids or other incompatible materials may rupture containers.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Ingredient	OSHA PEL, TWA 8/40h (mg/m3)	ACGIH TLV, TWA 8/40h (mg/m3)	NIOSH REL,TWA 8/40h (mg/m3)	NIOSH IDLH (mg/m3)
Calcium Hydroxide	15 (total dust) 5 (respirable)	5	5	N/A
Magnesium Oxide	10	10	N/A	N/A
Calcium Carbonate	15 (total dust) 5 (respirable)	10	10(total dust) 5 (total dust)	N/A
Crystalline Silica	10/(SiO ₂ % + 2) (respirable)	0.025 (respirable)	0.05 (respirable)	50

SAFETY DATA SHEET

HYDRATED LIME

Engineering Controls: Provide ventilation adequate to maintain PELs.

Respiratory Protection: Use NIOSH/MSHA approved respirators if airborne concentration exceeds PELs.

Skin Protection: Use appropriate gloves and footwear to prevent skin contact and the potential for burns. Clothing should fully cover arms and legs. Should lime get inside clothing or gloves, remove the clothing and the lime promptly.

Eye Protection: Use safety glasses with side shields or safety goggles. Contact lenses should not be worn when working with lime products.

Other: Eye wash fountain/stations and emergency showers should be available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White free flowing powder
Odor:	Odorless
Physical State:	Solid
Melting Point (°C/°F):	decomposes at 580/1076
Boiling Point (°C/°F):	N/A
Bulk Density:	25-35 lbs. /cu. Ft.
Specific Gravity:	2.3 – 2.4
Vapor Pressure (mm Hg):	N/A
Vapor Density:	N/A
Evaporation Rate:	N/A
pH (25°C/77°F):	12.4
Solubility in Water:	0.159 grams per 100 grams sat. sol. at 25°C

SECTION 10: STABILITY AND REACTIVITY

Stability: Chemically stable, but slowly reacts with CO₂ to form calcium carbonate.

(See also Incompatibility below.)

Hazardous Decomposition/Products: Does not occur

Hazardous Polymerization: Does not occur

Incompatibility/Conditions to Avoid:

Hydrated lime should not be mixed or stored with the following materials, due to the potential for vigorous reaction and release of heat:

Acids (unless in a controlled process), Organic Acid Anhydrides, Reactive Fluoridated Compounds, Nitro-Reactive Brominated Compounds, Reactive Phosphorous Compounds, Reactive Powdered Metals, Interhalogenated Compounds

SAFETY DATA SHEET

HYDRATED LIME

SECTION 11: TOXICOLOGICAL INFORMATION

ORL-RAT LD50: 7,340 mg/kg ORL-MUS LD50: 7,300 mg/kg

Hydrated lime is not listed by MSHA, OSHA, or IARC as a carcinogen, but this product may contain trace amounts of crystalline silica, which has been classified by IARC as carcinogenic to humans when inhaled in the form of quartz or cristobalite. Inhalation, skin and eye contact are the most likely routes of exposure. This material is irritating to the skin and severely irritating to the eyes.

SECTION 12: ECOLOGICAL INFORMATION

Eco-toxicity: Because of the high pH of this product, it would be expected to produce significant Eco-toxicity upon exposure to aquatic organisms and aquatic systems in high concentrations (> 1 g/L).

Environmental Fate: This material shows no bioaccumulation effect or food chain concentration toxicity. High pH values will rapidly decrease over time as a result of recarbonation. This material may be used in soil stabilization or remediation and will show very little mobility in soils.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable federal, state, and local environmental regulations. If this product as supplied, and unmixed, becomes a waste, it will not meet the criteria of a hazardous waste as defined under the U.S. Resource Conservation and Recovery Act (RCRA).

SECTION 14: TRANSPORTATION INFORMATION

Hydrated lime is not classified as a hazardous material by US DOT and is not regulated by the Transportation of Dangerous Goods (TDG) when shipped by any mode of transport.

SECTION 15: REGULATORY INFORMATION

U.S. EPA Regulations:

RCRA Hazardous Waste Number (40 CFR 261.33): **not listed**

RCRA Hazardous Waste Classification (40 CFR 261): **not classified**

CERCLA Hazardous Substance (40 CFR 302.4) **unlisted specific per RCRA, Sec. 3001;**

CWA, Sec. 311(b)(4); CWA, Sec. 307(a), CAA, Sec. 112

CERCLA Reportable Quantity (RQ), **not listed**

SARA 311/312 Codes: **not listed**

SARA Toxic Chemical (40 CFR 372.65): **not listed**

SARA EHS (Extremely Hazardous Substance) (40 CFR 355): **not listed**

Threshold Planning Quantity (TPQ): **not listed**

All chemical ingredients are listed on the US EPA TSCA Inventory List.

SAFETY DATA SHEET

HYDRATED LIME

OSHA/MSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): 5mg/M3 TWA-8

MSHA: **not listed**

OSHA Specifically Regulated Substance (29 CFR 1910): **not listed**

State Regulations: Consult state and local authorities for guidance. Components found in this product may contain trace amounts of inherent naturally occurring elements (such as, but not limited to arsenic and cadmium) that may be regulated under California Proposition 65 and other states regulations.

Canada:

WHMIS Classification: "D2A" Materials Causing Other Toxic Effects

WHMIS Classification: "E" Corrosive Materials (listed due to corrosive effect on aluminum)

Canada DSL: **Listed**

SECTION 16: OTHER INFORMATION

Prepared By: Cheney Lime and Cement Company

Date Prepared: June 1, 2015

NFPA Hazard Class: Health: 2 Flammability: 0 Instability: 0

HMIS Hazard Class: Health: 2* Flammability: 0

Physical Hazard: 0

Personal Protection: E

Abbreviations: N/A - Not Applicable, IARC - International Agency for Research on Cancer, IATA - International Air Transport Association, ACGIH - American Conference of Governmental Industrial Hygienists, TWA - Time Weighted Average, PEL - Permissible Exposure Limit, TLV - Threshold Limit Value REL Recommended Exposure Limit.

Cheney lime and Cement Company provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person. Individuals receiving this information must consult their own technical and legal advisors and/ or exercise their own judgment in determining its appropriateness for a particular purpose.

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Revision: 02

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Safety Data Sheet

Section 01 Identification

Product Identifier	Sodium Hypochlorite 12-16% Hypochlor-12, PCP Hypochlor 12, NSF® - 60 Hypochlor 15, NSF® - 60 Hypochlor 16, NSF® - 60 Sodium Hypochlorite 12%, NSF® - 60 Sodium Hypochlorite 12.5% With 1% Alkalinity Sodium Hypochlorite 15%, NSF® - 60 Sodium Hypochlorite 16%, NSF® - 60
Other Means of Identification	Sodium hypochlorite, Bleach, Chlorox, Hypochlorous acid, sodium salt, Javel water, liquid bleach, CAS: 7681-52-9
Product Use and Restrictions on Use	Bleaching agent, source of available chlorine, deodorizer. This product is NSF certified for use in drinking water, see section 15 and the NSF website for further information.
Initial Supplier Identifier	ClearTech Industries Inc. 1500 Quebec Avenue Saskatoon, SK. Canada S7K 1V7 Phone: 800.387.7503 Fax: 888.281.8109 www.cleartech.ca
Prepared By	ClearTech Industries Inc. technical writer
24-Hour Emergency Phone	306.664.2522

Section 02 Hazard Identification

Physical Hazards

Corrosive to metals Category 1

Health Hazards

Skin corrosion / irritation Category 1B

Serious eye damage / eye irritation Category 1

Signal Word

Danger

Hazard Statements

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

Pictograms



Precautionary Statements

Prevention

- P234 Keep only in original packaging.
- P260 Do not breathe vapours, fumes, or mists.
- P264 Wash affected body parts thoroughly after handling.
- P273 Avoid release to the environment.
- P280 Wear protective gloves, protective clothing, eye protection, face protection.

Response

- P301 P330 P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303 P361 P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse.
- P304 P340 P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.
- P305 P351 P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P390 Absorb spillage to prevent material damage.

Storage

- P405 Store locked up.

Disposal

- P501 Dispose of contents / container in accordance with all federal, provincial and / or local regulations including the Canadian Environmental Protection Act.

Hazards Not Otherwise Classified

Contact with acids liberates toxic gas.

Supplemental Information

Not available

Section 03 Composition / Information on Ingredients

Hazardous Ingredients:

Chemical name	Common name(s)	CAS number	Concentration (w/w%)
Hypochlorous acid, sodium salt	Sodium hypochlorite	7681-52-9	10-16%

Section 04 First-Aid Measures

Description of necessary first-aid measures

Inhalation	Remove source of exposure or move person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor. If breathing has stopped, trained personnel should begin rescue breathing or if the heart has stopped, immediately start cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED). Avoid mouth to mouth contact by using a barrier device. May release toxic chlorine gas.
Ingestion	Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. If vomiting occurs naturally, lie on your side, in the recovery position.
Skin contact	Avoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately contaminated clothing, shoes and leather goods. Rinse skin with lukewarm, gently flowing water / shower for 30 minutes. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before re-use, or discard.
Eye contact	Avoid direct contact. Wear chemical protective gloves, if necessary. Remove source of exposure or move person to fresh air. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a POISON CENTER or doctor.

Most important symptoms and effects, both acute and delayed

Inhalation	Causes severe burns to the mouth and throat (mist). May release toxic and irritating chlorine gas.
Ingestion	Causes burns to the mouth and throat.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.
Further information	For further information see Section 11 Toxicological Information.

Section 05 Fire Fighting Measures

Suitable extinguishing media	Extinguish fire using extinguishing agents suitable for the surrounding fire.
Unsuitable extinguishing media	Do NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed. Water jets are not recommended in fires involving chemicals.
Specific hazards arising from the chemical	Explosive decomposition may occur under fire conditions and closed containers may rupture violently due to a rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time.
Special protective equipment for fire-fighters	Wear NIOSH-approved self-contained breathing apparatus and chemical-protective clothing.

Section 06 Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures	Wear appropriate personal protective equipment (See Section 08 Exposure Controls and Personal Protection). Stay upwind, ventilate area. Do not breathe vapours, fumes, or mists. Do not use material handling equipment with exposed metal surfaces. Sodium hypochlorite solutions release chlorine when in contact with acids or oxidizable materials, such as organic material or most metals. Chlorine is a respiratory irritant, so respiratory protection is advised.
Environmental Precautions	Do NOT let this chemical enter the environment. Prevent material from entering waterways, sewers or confined spaces. Notify local health and wildlife officials. Notify operators of nearby water intakes.
Methods and Materials for Containment and Cleaning Up	SMALL SPILLS: Stop or reduce leak if safe to do so. Clean up spill with non-reactive absorbent and place in suitable, covered, labeled containers. Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Use vented containers to avoid pressure buildup. LARGE SPILLS: Contact fire and emergency services and supplier for advice.

Section 07 Handling and Storage

Precautions for Safe Handling	<p>Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure. Prevent the release of vapours, fumes, or mists into the workplace air.</p> <p>Inspect containers for damage or leaks before handling. If the original label is damaged or missing replace with a workplace label. Have suitable emergency equipment for fires, spills and leaks readily available.</p> <p>Never return contaminated material to its original container.</p>
Conditions for Safe Storage	<p>Store in a cool, dry, well-ventilated area, away from heat sources and incompatible materials. Always store in original labeled container. Keep containers tightly closed when not in use and when empty. Empty containers may contain hazardous residues. Protect label and keep it visible. Do not transfer to metal containers. Sodium hypochlorite solutions may slowly give off oxygen during storage. Vent caps are required to prevent a build-up of pressure that could cause containers to burst.</p>
Incompatibilities	<p>Acids, such as sulphuric, nitric, hydrochloric, phosphoric, fluosilicic (HFSA), sulphonic, acetic, citric, oxalic, and formic.</p> <p>Oxidizing agents, such as oxygen, hydrogen peroxide, sulphuric and nitric acids and permanganates.</p> <p>Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid.</p> <p>Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids</p> <p>Metals, such as aluminum, steel, and brass.</p>

Section 08 Exposure Controls and Personal Protection

Exposure limits

Component	Regulation	Type of listing	Value
Sodium Hypochlorite	NIOSH	REL	2 mg/m ³
	OSHA	PEL	2 mg/m ³
Chlorine	ACGIH	TWA	0.1 ppm

Engineering controls

Ventilation Requirements	<p>Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.</p>
Other	<p>An emergency shower and eyewash station should be available, tested, and be in close proximity to the product being handled in accordance with provincial regulations.</p>

Protective equipment

The following are recommendations only. It is the responsibility of the employer / user to conduct a hazard assessment of the process in which this product being used and determine the proper engineering controls and PPE for their process. Additional regulatory and safety information should be sought from local authorities and, if needed, a professional industrial hygienist.

Eye and face protection	<p>Where there is potential eye or face exposure, tightly fitting safety goggles and a face shield or a full face respirator or similar protective equipment which protects the wearer's face and eyes are recommended. Contact lenses are not recommended; they may contribute to severe eye injury.</p>
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Hand and body protection Disposable latex or nitrile gloves are recommended to prevent incidental contact. Butyl rubber, neoprene, or PVC skin protection is recommended for extended contact. Leather gloves are not recommended for chemical protection. Refer to manufacturer's specifications for breakthrough times and permeability information; note that breakthrough times and permeability vary with temperature, application and age of material. Continued use of contaminated safety gear or clothing is not recommended; wash before reuse or discard.

Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.

NIOSH respirator recommendations for: Chlorine

Up to: 5 ppm

(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against Chlorine

(APF = 10) Any supplied-air respirator

Up to: 10 ppm

(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against Chlorine

(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against Chlorine

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Chlorine

(APF = 50) Any self-contained breathing apparatus with a full facepiece.

(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against Chlorine

Any appropriate escape-type, self-contained breathing apparatus

Thermal hazards Not available

Section 09 Physical and Chemical Properties

Appearance

Physical state Liquid
Colour Clear, greenish-yellow solution
Odour Strong chlorine odour
Odour threshold Not available

Property

pH 10.8-11.2
Melting point / freezing point Not available

Initial boiling point and boiling range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability	Not applicable
Upper flammable limit	Not available
Lower flammable limit	Not available
Vapour pressure	Negligible
Vapour density	Not available
Relative density	Not applicable
Solubility	Completely soluble in water
Partition coefficient: n-octanol/water	Log POW = ~ -3.42
Auto-ignition temperature	Not available
Decomposition temperature	Sodium hypochlorite's decomposition rate is an exponential function of temperature. Each increase of 10 °C will increase the degradation rate by a factor of 2 to 4 (there is disagreement in the literature).
Viscosity	Not available
Specific gravity	1.1-1.2 g/mL
Particle characteristics	Not applicable
Formula	NaOCl
Molecular weight	74.44 g/mol

Section 10 Stability and Reactivity

Reactivity	May be corrosive to metals. Reacts violently with acids.
Stability	Sodium hypochlorite solutions are unstable and will decompose over time. Sodium hypochlorite's decomposition rate is an exponential function of temperature. Each increase of 10 °C will increase the degradation rate by a factor of 2 to 4 (there is disagreement in the literature). Exposure to ultraviolet light (sunlight) will accelerate the degradation of sodium hypochlorite.
Possibility of hazardous reactions	Hazardous polymerization is not known to occur. Reacts with acids to form hypochlorous acid, a powerful oxidizing agent, which degrades into toxic chlorine gas.
Conditions to avoid	Do not heat. Do not freeze.
Incompatible materials	Acids, such as sulphuric, nitric, hydrochloric, phosphoric, fluosilicic (HFSA), sulphonic, acetic, citric, oxalic, and formic. Oxidizing agents, such as oxygen, hydrogen peroxide, sulphuric and nitric acids and permanganates. Reducing agents, such as hydrogen, sodium borohydride, sulphur dioxide, thiosulphates, hydrazine, phosphites, carbon, and oxalic, formic and ascorbic acid. Organic material, such as wood, paper, gasoline, diesel, solvents and some glycol based heat transfer fluids Metals, such as aluminum, steel, and brass.
Hazardous decomposition products	Chlorine, sodium chlorate.

Section 11 Toxicological Information

Acute Toxicity (LD50 / LC50 values)

Customer Service: 800.387.7503

www.cleartech.ca

Emergency: 306.664.2522

Revision Date: July 19, 2023

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Safety Data Sheet

Sodium Hypochlorite 12-16%
ClearTech Industries Inc

Component	Route	Species	Value	Exposure time
Sodium Hypochlorite	Oral	Rat	>5000 mg/kg bw	
Chlorine	Inhalation	Mouse	137 ppm	1 hour

Toxic Health Effect Summary

Chemical characteristics	Toxicity caused primarily by high pH and oxidative potential. Hypochlorites may react with organic molecules to form organochlorides which have unknown toxicology.
Skin	Very dilute solutions have caused negligible irritation, while more concentrated solutions have caused acute corrosive injury to skin. Prolonged exposure may lead to permanent scarring of skin.
Ingestion	Acute exposure may lead to burning of the mouth and throat, abdominal cramps, nausea, vomiting, diarrhea, shock. May lead to convulsions, coma, and even death.
Inhalation	Causes severe burns to the mouth and throat (mist). May release toxic and irritating chlorine gas. Chlorine, one of the primary decomposition products of sodium hypochlorite, is an irritant of the nose and throat, causing coughing, difficulty breathing, and pulmonary edema.
Eye contact	Causes irritation, redness, and pain. May cause burns and possible damage to vision.
Sensitization	This product and its components at their listed concentration have no known sensitizing effects.
Mutagenicity	This product and its components at their listed concentration have no known mutagenic effects.
Carcinogenicity	IARC has classified hypochlorite salts as group 3, not classifiable as to its carcinogenicity to humans.
Reproductive toxicity	This product and its components at their listed concentration have no known reproductive effects.
Specific organ toxicity	This product and its components at their listed concentration have no known effects on specific organs.
Aspiration hazard	Prolonged or repeated overexposure may cause lung damage.
Synergistic materials	Not available

Section 12 Ecological Information

Ecotoxicity

Component	Type	Species	Value	Exposure Time
Sodium Hypochlorite 12%	LC50	Marine fish	0.27 mg/L	96 hours
	EC50	Marine invertebrates	0.22 mg/L	48 hours
	EC50	Freshwater algae	0.42 mg/L	72 hours

Biodegradability	The domestic substance list categorizes sodium hypochlorite as non-persistent.
Bioaccumulation	The domestic substance list categorizes sodium hypochlorite as non-bioaccumulative.
Mobility	This product is water soluble, is not predicted to adsorb to soil and may contaminate ground water.
Other adverse effects	The domestic substance list categorizes sodium hypochlorite as inherently toxic to aquatic organisms.

Section 13 Disposal Considerations

Waste From Residues / Unused Products	Dispose in accordance with all federal, provincial, and local regulations including the Canadian Environmental Protection Act.
Contaminated Packaging	Do not remove label, follow label warnings even after the container is empty. Empty containers should be recycled or disposed of at an approved waste handling facility.

Section 14 Transport Information

UN number	UN 1791
UN proper shipping name and description	HYPOCHLORITE SOLUTION with more than 7% available chlorine
Transport hazard class(es)	8
Packing group	III
Excepted quantities	5 L
Environmental hazards	Listed as a marine pollutant under Canadian TDG Regulations, schedule III.
Special precautions	No special precautions
Transport in bulk	ERAP index: not required

MARPOL 73/78 and IBC Code:

Product name: Sodium hypochlorite solution (15% or less)

Pollution category: Y

Hazards: the product is included in the Code because of both its safety and pollution hazards.

Ship type: ship type 2

Tank type: integral gravity tank

Tank vents: controlled venting

Tank environmental control: no special requirements under this Code

	Temperature classes	no requirements
Electrical equipment:	Apparatus group	no requirements
	Flash point	non-flammable product

Gauging: restricted gauging

Vapour detection: no special requirements under this Code

Fire protection: no special requirements under this Code

Emergency equipment: no special requirements under this Code

Specific and operational requirements 15.19.6

Additional information Secure containers (full or empty) during shipment and ensure all caps, valves, or closures are secured in the closed position.

TDG PRODUCT CLASSIFICATION: This product has been classified on the preparation date specified at section 16 of this SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and published test data regarding the classification of this product are listed in the references at section 16 of this SDS.

Section 15 Regulatory Information.

NOTE: THE PRODUCT LISTED ON THIS SAFETY DATA SHEET HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN HAZARDOUS PRODUCTS REGULATIONS. THIS SAFETY DATA SHEET CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

All components of this product appear on the domestic substance list.

NSF Certification: Hypochlor 12 is certified under NSF / ANSI Standard 60 for disinfection & oxidation at a maximum dosage of: 103 mg/L. NSF product use restrictions based on requirements obtained from the NSF website; consult NSF website for current requirements.

Section 16 Other Information

Date of latest revision: July 19, 2023

Note: The responsibility to provide a safe workplace remains with the buyer / user. The buyer / user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the buyer / user to comply with all applicable laws and regulations regarding handling, using, reselling and shipping this product.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the RDC Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

- 1) *NIOSH Pocket Guide to Chemical Hazards*; U.S. Department of Health and Human Services, <https://www.cdc.gov/niosh/npg/default.html>
- 2) *WorkSafe BC E-Limit*; Workers' Compensation Board of British Columbia, <https://elimit.online.worksafebc.com/>
- 3) *ECHA - Registered Substance Dossier*; European Chemicals Agency, <https://echa.europa.eu/registration-dossier/-/registered-dossier/15516>
- 4) *Transportation of Dangerous Goods Regulations*; Transport Canada, <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2001-286/index.html>
- 5) Globally Harmonized System of Classification and Labeling of Chemicals (GHS) *Seventh revised edition*
- 6) International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) 2007 Edition
- 7) The ACS Style Guide

Section 1: IDENTIFICATION

Product Name: Propane

Synonyms: LPG (Liquefied Petroleum Gas); LP-Gas.

Product Use: Propane is commonly used as a fuel for heating, cooking, automobiles, forklift trucks, crop drying and welding and cutting operations. Propane is used in industry as a refrigerant, solvent and as a chemical feedstock.

Restrictions on Use: Not available.

Manufacturer/Supplier: Superior Propane
Suite 400, 6750 Century Avenue
Mississauga, ON L5N 2V8

Phone Number: 1-877-873-7467

Emergency Phone: CANUTEC 1-888-CAN-UTEC (226-8832) or 613-996-6666 or *666 on a cellular phone

Date of Preparation of SDS: September 17, 2021

Section 2: HAZARD(S) IDENTIFICATION**GHS INFORMATION**

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

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, hot surfaces, sparks, open flames and other ignition sources. 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.

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 - 99
Ethane	Not available.	74-84-0	0 - 5
1-Propene	Propylene	115-07-1	0 - 5
Butane	Not available.	106-97-8	0 - 2.5

Section 4: FIRST-AID MEASURES

- Inhalation:** Call a poison center or doctor if you feel unwell.
Acute and delayed symptoms and effects: May displace oxygen and cause rapid suffocation. Central nervous system depression can occur if product is present in concentrations that will reduce the oxygen content of air below 18 % (vol). Symptoms may include headache, lightheadedness, drowsiness, disorientation, vomiting and seizures. Unconsciousness and death may occur with severe oxygen deprivation. May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.
- Eye Contact:** Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if needed. 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.
- 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. Thaw frosted parts with lukewarm water. 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 colour to white or grayish-yellow. The pain after contact with liquid can quickly subside.
- 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 a 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.

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:

Avoid breathing gas. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. 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. 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: Simple asphyxiant; Explosion hazard

OSHA: 1000 ppm (TWA), 1800 mg/m³ (TWA);

Ethane [CAS No. 74-84-0]

ACGIH: Simple asphyxiant; Explosion hazard

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 (STEL); Explosion hazard (2012)

OSHA: 800 ppm (TWA) [Vacated];

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: Wear safety glasses. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

Hand Protection: Wear insulated neoprene 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, 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. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Liquefied gas.
Colour:	Colourless.
Odour:	Odourless, unless odourized with ethyl mercaptan (skunky odour, similar to boiling cabbage).
Odour Threshold:	4800 ppm
Physical State:	Gas.
pH:	Not available.
Melting Point / Freezing Point:	-188 °C (-306.4 °F)
Initial Boiling Point:	-42.2 °C (-44 °F)
Boiling Point:	-42 °C (-43.6 °F)
Flash Point:	-103.4 °C (-154.1 °F) (Closed Cup)
Evaporation Rate:	Rapid.
Flammability (solid, gas):	Extremely flammable gas.

SAFETY DATA SHEET

Lower Flammability Limit:	2.1%
Upper Flammability Limit:	9.5%
Vapor Pressure:	1435 kPa (maximum) at 37.8 °C (100 °F)
Vapor Density:	1.52 (Air = 1)
Relative Density:	0.51 (Water = 1)
Solubilities:	Slight, 6.1% by volume @ 17.8°C (64 °F)
Partition Coefficient: n-Octanol/Water:	Not available.
Auto-ignition Temperature:	432 °C (809.6 °F)
Decomposition Temperature:	Not available.
Viscosity:	Not available.
Percent Volatile, wt. %:	Not available.
VOC content, wt. %:	Not available.
Density:	Not available.
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:	Gas explodes spontaneously when mixed with chloride dioxide.
Conditions to Avoid:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Incompatible Materials:	Oxidizers. Chlorine dioxide.
Hazardous Decomposition Products:	Carbon dioxide. Carbon monoxide.

Section 11: TOXICOLOGICAL INFORMATION**EFFECTS OF ACUTE EXPOSURE****Product Toxicity**

Oral:	Not available.
Dermal:	Not available.
Inhalation:	Not available.

SAFETY DATA SHEET

Date of Preparation: September 17, 2021

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

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

Target Organs: Skin. Eyes. Respiratory system. Central nervous system.

Symptoms (including delayed and immediate effects)

Inhalation:

May displace oxygen and cause rapid suffocation. Central nervous system depression can occur if product is present in concentrations that will reduce the oxygen content of air below 18 % (vol). Symptoms may include headache, lightheadedness, drowsiness, disorientation, vomiting and seizures. Unconsciousness and death may occur with severe oxygen deprivation. 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.

Skin: Contact with rapidly expanding or liquefied gas may cause irritation and/or frostbite. Symptoms of frostbite include change in skin colour to white or grayish-yellow. The pain after contact with liquid can quickly subside.

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. Central 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, LIQUEFIED PETROLEUM GASES, 2.1

Class: 2.1

UN Number: UN1075

Packing Group: Not applicable.

Label Code:

**Canada Transportation of Dangerous Goods (TDG)**

Proper Shipping Name: UN1075, LIQUEFIED PETROLEUM GASES, 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.

SAFETY DATA SHEET

Date of Preparation: September 17, 2021

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

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.

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

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.

Note: E = Environmental Hazard

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: September 17, 2021

Version: 2.0

GHS SDS Prepared by: Deerfoot Consulting Inc.

Phone: (403) 720-3700

Carus Proprietary Zinc Phosphate and Orthophosphate Water Treatment Chemicals

Product Safety Summary

Summary:

Carus Proprietary Zinc Phosphate and Orthophosphate Water Treatment Chemicals are premier corrosion inhibitors for use in potable and industrial water systems. They are mostly liquid concentrates with a few dry blends of exceptional purity, clarity and stability utilizing a blend of zinc-based chemicals and/or phosphoric acid.

Chemical Identity, Chemical Formula and CAS #:

One or more of the following chemicals may be present in each product in this category:

Chemical Identity	Chemical Formula	CAS #
Phosphoric acid	H ₃ PO ₄	7664-38-2
Phosphoric acid sodium salt	Na ₂ HPO ₄	7558-80-7
Polyphosphoric acid, sodium salt	(NaPO ₃) ₆	68915-31-1
Sulfuric acid, zinc salt	ZnSO ₄	7733-02-0
Hydrochloric acid, zinc salt (2:1)	ZnCl ₂	7646-85-7
Phosphoric acid, zinc salt (2:3)	Zn ₂ (PO ₄) ₃	7779-90-0
Sulfuric acid, monosodium salt	NaHSO ₄	7681-38-1
Sulfuric acid	H ₂ SO ₄	7664-93-9
Hydrochloric acid	HCl	7647-01-0

What are Carus Proprietary Zinc Phosphate and Orthophosphate Water Treatment Chemicals and What are They Used for?

The Carus Proprietary Zinc Phosphate Water Treatment Chemicals are liquid or dry products containing one or more of the above mentioned chemicals. The products are prepared by the reaction of raw materials or by blending of two or more chemicals listed above along with water to form a liquid blend product or dry blends of various chemicals available as dry powders. The blended phosphates are a mixture of zinc-based phosphates and are used as an additive to eliminate or prevent corrosion as well as used to isolate and hold unwanted impurities from getting into the water system. They are sold under the trade names of Carus™, QUANTICHEM®, CALCIQUEST® and AQUADENE® Water Treatment Chemicals.

Carus proprietary zinc phosphate water treatment chemicals are primarily used as an integral part of corrosion control processes used by municipal drinking water authorities or other industries to purify and improve the quality of drinking water as it is distributed to the public. Controlling staining (red water caused by iron-based impurities and black water caused by manganese-based impurities), controlling copper, and controlling lead release to the public is the primary application of phosphate based products.

The main benefits by the use of phosphate products are the following:

1. Extends the operating life of the water distribution system by reducing corrosion and scale formation.
2. Eliminates and/or minimizes the presence of lead, copper, iron and manganese impurities in the municipal drinking water.

3. Increases the water quality by preventing rusty and dirty water, discoloration, staining, mineral buildup, or leaching of heavy metals.

In addition to the water treatment application where Carus products are used, some phosphates are also generally consumed by the public in multiple products. It is found in toothpaste, cola based products, cheeses, as well as leavening agents in baking. Phosphoric acid can be found in many popular soft drinks.

Physical-chemical Properties:

Carus' liquid zinc phosphate and orthophosphate products are clear, homogeneous acidic solutions, meaning they have a low pH. They have a markedly corrosive action on all body tissues and should be handled with care. Even dilute solutions may be acidic and may have a destructive effect on tissue after prolonged contact. Inhalation of mists can cause damage to the upper respiratory tract. Ingestion can cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach.

The liquid products have a specific gravity of about 1.2-1.6 g/ml. They are of acidic pH (<1) and are corrosive. The dry product blends are powders of either white or off-white color. The bulk densities of the dry blends are approximately 80 lbs/cubic feet and are soluble in water. Both liquid and dry blends are stable under normal conditions. They are not flammable but are reactive because of their corrosive nature. We recommend storing these products away from incompatibles like caustics in a tightly closed container in a cool, dry area and protecting containers from physical damage. Avoid freezing the liquid product blends.

Since they are corrosive, they are stored in high-medium density polyethylene, cross-linked polyethylene, and fiber enforced plastic. It is not compatible with black iron, mild steel, galvanized metals, aluminum, zinc, stainless steel, copper, lead, brass, bronze, tin and other base metals.

Health and Environmental Effects:

The health effects of Carus' zinc phosphate and orthophosphate products are mainly due to its corrosive properties. They are corrosive to skin, eyes, or respiratory tract. Contact with skin may cause redness, pain, and severe skin burns. Contact with eyes may cause redness, pain, blurred vision, eye burns, and permanent eye damage. In applications where dust, vapors, or mist are created, inhalation may cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath. Ingestion may cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach. Severe exposures can lead to shock, circulatory collapse, and death. Phosphates are slowly and incompletely absorbed when ingested, and seldom result in systemic effects. Such effects, however, have occurred. Symptoms may include vomiting, lethargy, diarrhea, blood chemistry effects, heart disturbances and central nervous system effects. The toxicity of phosphates is because of their ability to sequester calcium.

Carus' zinc phosphate and orthophosphate products are expected to be toxic to aquatic life when present in high concentrations, mainly due to its acidic nature. When released into the soil, this material may leach into groundwater. When released to water, natural water hardness minerals may readily reduce acidity. The phosphate, however, may persist indefinitely. During transport through the soil, phosphoric acid will dissolve some of the soil material, in particular, carbonate-based materials. The acid will be neutralized to some degree. However, significant amounts of acid will remain for transport down toward the groundwater table. Since it is an inorganic compound and contains no degradable functional groups, it exerts no biological oxygen demand.

Exposure Potential:

Carus' zinc phosphate and orthophosphate products are corrosive to all body tissues and they should be handled with care. The most likely ways exposure could occur are:

1. Worker Exposure- Exposure could occur in the manufacturing facility, to transportation personnel, or users in municipal drinking water or waste water treatment facilities and or industrial facilities that use. When exposures occur, they are typically skin, eye or inhalation exposures. Ingestion exposure is not very likely to occur. To minimize the risk of exposure good industrial hygiene practice, engineering controls and the use of personal protective equipment, such as chemical goggles, gloves, and work clothing that covers arms and legs as needed, have been established. Emergency responders such as firefighters could also be exposed to phosphates if they are present during an incident. Normal turnout protective gear for first responders such as positive pressure breathing units, chemical resistant suits, boots and gloves will minimize their risk.
2. Consumer Exposure – Carus Corporation does not sell Carus zinc phosphate nor orthophosphate water treatment chemicals in retail stores, although some components present in our products may also be an ingredient in some consumer products from other manufacturers. Public exposure to phosphates is possible through accidents, spills, and inadvertent misuse of the products or overdosing from the municipal water treatment systems.
3. Releases: Non-routine releases to the environment can occur from accidents, spills and inadvertent misuse of the products. If a spill occurs, emergency personnel should wear protective equipment suitable for the task to minimize exposures. Avoid runoff into storm sewers and ditches that lead to waterways. If releases to environment are in CERCLA reportable quantities, report to the required agencies. Clean up spills immediately. Contain spill by collecting the liquid in a pit or holding behind a dam (clay like material or soil). Absorb with inert media and dispose of properly. Flush area with large amounts of water. Do not flush to sewer. Disposal of all materials shall be in full and strict compliance with all federal, state, and local regulations pertaining to phosphates and corrosive liquids.

Risk Management Measures:

The primary mechanism for providing advice on the handling of phosphates is through the Safety Data Sheet (SDS). Carus provides a SDS to all customers and others directly involved in handling the products, and to other stakeholders upon request through the company website. All of the pertinent handling information is reemphasized in Product Data (specification) Sheets and in Technical Bulletins targeted to specific uses of phosphates.

Carus also provides customers advice and assistance in the design and construction of equipment used to safely handle phosphates. For example, municipal water treatment authorities are offered bulk liquid dosing options.

Carus has prepared a series of Technical Briefs that advise customers how to safely and effectively use phosphates.

In addition Carus provides PowerPoint safety presentations given by the Technical Services Department or trained personnel. In many municipal bids this is written in as a requirement of the vendor.

REGULATORY INFORMATION / CLASSIFICATION AND LABELLING

The classification and labelling according to GHS of the chemical substances in the phosphate products are provided below.

Phosphoric acid sodium salt	Na₂HPO₄	7558-80-7
Polyphosphoric acid, sodium salt	(NaPO₃)₆	68915-31-1

The above two chemical substances that may be present in some of the phosphate product mixture at any concentration are not classified.

Sulfuric acid, zinc salt	ZnSO₄	7733-02-0
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Physical hazards

None

Health hazards

Acute toxicity – oral Acute Toxicity, Category 4

Serious eye damage/eye irritation Eye Damage Category 1

Environmental hazards

Hazardous to the aquatic environment (acute/short-term)	Aquatic Acute, Category 1
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Hazardous to the aquatic environment (long-term)	Aquatic Chronic, Category 1
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Labelling

Signal word	Danger
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Hazard pictogram

GHS05: corrosion

GHS07: exclamation mark

GHS09: environment

Hazard statements

Harmful if swallowed.

Causes serious eye damage.

Very toxic to aquatic life with long lasting effects.

Precautionary statements

Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER/doctor

Avoid release to the environment.

Collect spillage.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hydrochloric acid, zinc salt (2:1)	ZnCl₂	7646-85-7
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Physical hazards

None

Health hazards

Acute toxicity – oral Acute Toxicity, Category 4

Skin corrosion/irritation Skin Corrosion, Category 1B

Environmental hazards

Hazardous to the aquatic environment (acute/short-term)	Aquatic Acute Category 1
Hazardous to the aquatic environment (long-term)	Aquatic Chronic Category 1

Labelling

Signal word Danger

Hazard pictogram

GHS05: corrosion
GHS07: exclamation mark
GHS09: environment

Hazard statements

Harmful if swallowed.
Causes severe skin burns and eye damage.
Very toxic to aquatic life with long lasting effects.

Precautionary statements

Do not breathe dust/fume/gas/mist/vapors/spray.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Avoid release to the environment.
Store locked up.
Collect spillage.
Dispose of contents/container in accordance with local/regional/national/international regulations.

Phosphoric acid

H₃PO₄ 7664-38-2

Physical Hazards

None

Health Hazards

Skin corrosion/irritation Category 1B
Serious eye damage/eye irritation Category 1
Specific concentration limits

Concentration range (%)>= 25.0	Skin Corrosion, Category 1B
Concentration range (%)>= 10.0 < 25.0	Eye Irritation, Category 2A Skin Irritation, Category 2

Environmental hazards

None

Labelling

Signal word Danger

Hazard pictogram

GHS05: corrosion

Hazard statements

May be corrosive to metals.
Causes severe skin burns and eye damage.

Precautionary statements

Do not breathe mist or vapor. Wear protective gloves/protective clothing/eye protection/face protection.
Wash thoroughly after handling. Keep only in original container.

IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 Wash contaminated clothing before reuse.
 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 Immediately call a POISON CENTER/doctor/...
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 Store locked up. Store in corrosive resistant container with a resistant inner liner.
 Dispose of contents/container in accordance with local/regional/national/international regulations.

Phosphoric acid, zinc salt (2:3) $Zn_2(PO_4)_3$ 7779-90-0

Physical hazards

None

Health hazards

None

Environmental hazards

Hazardous to the aquatic environment (acute/short-term)

Aquatic Acute Category 1

Hazardous to the aquatic environment (long-term)

Aquatic Chronic Category 1

Labelling

Signal word Warning

Hazard pictogram

GHS09: environment

Hazard statements

Very toxic to aquatic life with long lasting effects.

Precautionary statements

Avoid release to the environment.

Collect spillage.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Sulfuric acid, monosodium salt $NaHSO_4$ 7681-38-1

Physical hazards

None

Health hazards

Serious eye damage /eye irritation

Eye Damage, Category 1

Environmental hazards

None

Labelling

Signal word Danger

Hazard pictogram

GHS05: corrosion

Hazard statements

Causes serious eye damage.

Precautionary statements

Wear protective gloves/protective clothing/eye protection/face protection.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Immediately call a POISON CENTER/doctor.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hydrochloric acid

HCl

7647-01-0

(Concentration range (%))>= 0.1 < 10.0)

Physical hazards

Corrosive to metals Metal Corrosion, Category 1

Health hazards

None

Environmental hazards

None

Labelling

Signal word Danger

Hazard pictogram

GHS05: corrosion

Hazard statement

May be corrosive to metals

Precautionary statements

Keep only in original container.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Sulfuric acid

H2SO4

7664-93-9

(Concentration range (%))>= 5.0 < 15.0)

Physical hazards

None

Health hazards

(Concentration range (%))>= 5.0 < 15.0)

Skin corrosion / irritation Skin Irritation, Category 2
Eye Irritation, Category 2

Labelling

Signal word Warning

Hazard pictogram

GHS07: Irritant/toxic

Hazard statements

Causes skin and eye irritation

RCRA (Resource Conservation and Recovery Act of USA):

When discarded, the liquid products are considered as a hazardous waste because of its low pH (D002, Compound/characteristic: Corrosivity) as that term is defined by the Resource, Conservation and Recovery Act (RCRA), 40 CFR 261. The empty containers should be rinsed clear of any residues before disposal.

Transport Information:

Almost all of the liquid products are classified as corrosive because of its pH and are regulated by DOT, TDG, IMDG and IATA. Some solid products be classified as corrosive because of its pH and or the presence of CAS# 7320-34-5 and is regulated by DOT, TDG, IMDG and IATA.

CONCLUSION

Carus proprietary zinc phosphate water treatment chemicals are primarily used as an integral part of corrosion control processes to purify and improve the quality of drinking water as it is distributed to the public. Exposure to humans and the environment is minimized by good industrial hygiene practice, engineering controls and the use of personal protective equipment.

CONTACT INFORMATION WITHIN COMPANY

For further information on this substance or product safety summaries in general, please contact:

salesmkt@caruscorporation.com or visit our website at <http://www.caruscorporation.com/page/site/responsible-care>

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