

Teck Metals Ltd. Pine Point Tailings Impoundment Area

Contingency Manual – V5.1

Water Licence: MV2017L2-0007

Land Use Permit: MV2019X0006

Effective Date: June 21, 2019

Revised Date: November 15, 2024

Plain Language Summary

The Teck Metals Ltd. (Teck) Pine Point Tailings Impoundment Area (TIA) is located approximately 50 km southwest of Fort Resolution, NT and approximately 75 km east of Hay River, NT. The TIA is associated with the former Pine Point lead-zinc mine that operated from 1964 to 1988. In 1996, most of the lands leased to Teck's predecessor, Cominco, were released back to the Government of Northwest Territories (GNWT). The remaining lease (#85B/16-9-11) at closure includes the north portion of the TIA and some surrounding area. In 2020, an additional surface lease was acquired (L-2000009T) that incorporates the southern portion of the TIA for purposes of dyke inspection and maintenance, and reclamation research and implementation.

Current activities on site are those associated with the "Closure Active Care Phase" of the TIA, which includes active treatment of water that collects in the TIA according to Water Licence MV2017L2-0007 and Land Use Permit MV2019X0006. Surface water runoff from the tailings area is collected and treated onsite with lime to precipitate zinc before discharge to the environment from June to October (approximately). In addition to water treatment, intermittent research activities are done to inform final reclamation and closure planning.

This contingency plan describes the types of products that might be used on site, spill prevention and how spills would be managed as summarized as follows:

- Response actions for potential spills of any size.
- Key response personnel and their roles and responsibilities in the event of a spill.
- Controls in place to prevent environmental impacts associated with release of products (e.g., spill kits).
- Investigations following a release to prevent future occurrences.

Version History Table

Version No.	Date	Revision(s) Made
1.0	22-Aug-2017	Original submitted with Type B Water Licence renewal
2.0	4-Apr-2019	Submitted with the Land Use Permit application.
2.1	2-Jul-2019	Addressed comments from the MVLWB.
3.0	7-May 2020	Included flocculants as a product used in the water treatment process
4.0	21-Jun-2021	Included the surface lease obtained in 2020, introduction of the mechanical evaporator system, and general updates as per the amended Land Use Permit.
5.0	17-Sep-2021	Updated to address comments from the MVLWB related to describe how untreated water could be released if mechanical evaporator operational criteria are not maintained, prevention and release response.
5.1	15-Nov-2024	General updates including updated role definitions for the Site Manager, Manager, Environmental Performance, and Legacy Dispatch and notification process and updates to improve clarity. Includes SDS for coagulant and flocculant products planned for use in a water treatment trial as required in comments from the MVLWB on the Water Management Plan.

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1.0 Introduction and Site Description

The Teck Metals Ltd. (Teck) Pine Point Tailings Impoundment Area (TIA) is located approximately 50 km southwest of Fort Resolution, NT and approximately 75 km east of Hay River, NT (Figure 1.1). The TIA is associated with the former Pine Point lead-zinc mine that operated from 1964 to 1988. In 1996, most of the lands leased to Teck's predecessor, Cominco, were released back to the Government of Northwest Territories (GNWT). The remaining lease (#85B/16-9-11) at closure includes the north portion of the TIA and some surrounding area. In 2020, an additional surface lease was acquired (L-2000009T) that incorporates the southern portion of the TIA for purposes of dyke inspection and maintenance and reclamation research and implementation (Figure 1.2).

The TIA is the area of approximately 640 ha that is bordered by the perimeter dykes and is located to the north of the former Pine Point mill site on terrain that slopes gently downward towards the northwest (Figure 1.2). The earth-fill perimeter dyke system retains tailings and ponded water. The dyke system extends fully along the north and west sides of the TIA but is required along only a portion of the south and east sides. The TIA is covered with 10 to 20 cm of coarse sandy gravel overlaying the tailings. Typical native soil for the area is gravelly clay. No other historic waste management locations are known.

Current activities at the facility are those associated with the "Closure Active Care Phase" of the TIA, which includes active treatment of water that collects in the TIA according to Water Licence MV2017L2-0007 and Land Use Permit MV2019X0006. Surface water runoff from the tailings area is collected and treated onsite with lime to precipitate zinc before discharge to the environment. As a condition of the 2017 updated water licence, research is currently underway at the facility to develop a final closure plan to transition the site to a Closure Passive Care Phase. In 2021, a Mechanical Evaporation system was proposed to be installed to supplement water treatment with lime in reducing water levels. Subsequently, Teck decided not to deploy the evaporators, but the Contingency Manual includes contingencies associated with their operation in case they are used in the future and in accordance with the Land Use Permit, which was amended to allow for their use. Current activities at the site are active water treatment from June to October (approximately), site maintenance and intermittent research activities.

1.1 Environmental Policy

As part of Teck's Code of Sustainable Conduct, Teck implements "practices to ensure the safe operation and closure of tailings storage facilities" and promotes "the efficient and responsible use of energy, water and other resources throughout our business." This contingency manual was completed according to Teck's Code of Sustainable Conduct in that it outlines the practice for responding to spills and releases during the current phase of the facility.

1.2 Objectives

This contingency manual satisfies the requirements as outlined in the Water Licence MV2017L2-007 Part G and Land Use Permit Part C.62 and describes how Teck will prevent and respond to releases during the current phase of the facility. The document was prepared in accordance with the GNWT Spill Contingency Planning and Reporting Regulations according to the *Environmental Protection Act* and according to the Guidelines for Spill Contingency Planning (INAC 2007).

The objectives of this contingency manual are as follows:

- Identify the responsibilities of on-site and corporate personnel in the event of an emergency or spill
- Identify reporting requirements
- Identify spill prevention practices
- Facilitate the prompt, efficient and safe clean-up of spills
- Provide information on available resources, facilities and trained personnel in the event that a spill or an emergency occurs.

1.3 Company Name and Contact

Teck Metals Ltd.
601 Knighton Road, Bag 2000
Kimberley, BC
V1A 3E1

Contact: Michelle Unger, Manager Environmental Performance
Pine Point Coordinates (associated with decant area at TIA):
60°53'41.3"N 114°25'30.7"W

1.4 Document Review

The Manager, Environmental Performance is responsible for reviewing the manual annually and updating as required. Teck uses an Environmental Management System called SiteLine, which allows tasks, such as annual reviews, to be assigned to task or document owners. If revisions to the document are required, the contingency manual shall be submitted to the MVLWB for approval at least 60 days prior to implementing any proposed changes in accordance with the Water Licence.



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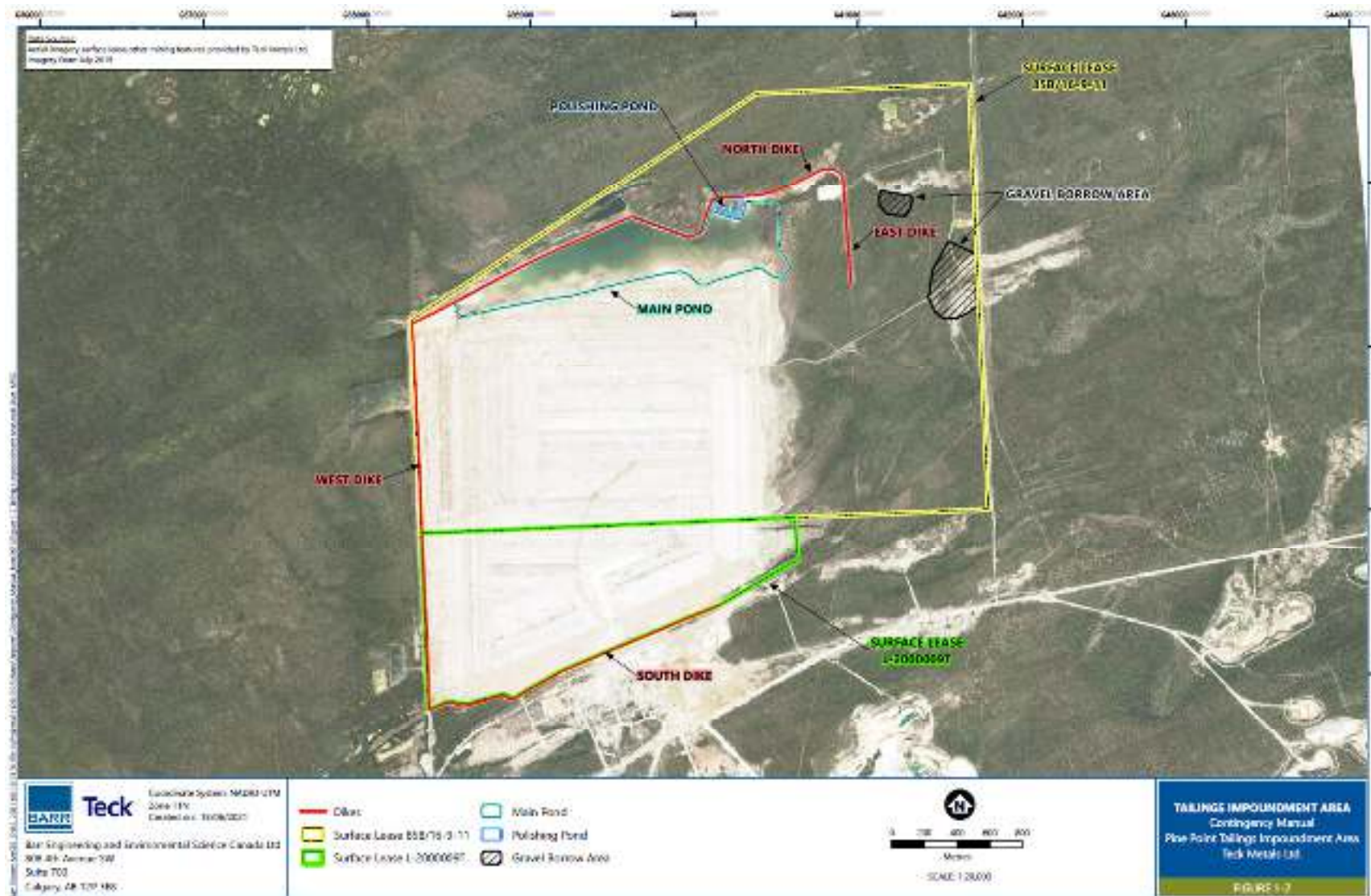


Figure 1.2 Tailings Impoundment Area

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2.0 Potential Release Scenarios

Potential release scenarios include release of hydrocarbons used during water treatment and ancillary work activities, and the impounded (untreated) water and stored tailings.

2.1 Hydrocarbons

The TIA is currently in Closure Active Care Phase. As such, the water treatment equipment and staff are present at the TIA for the limited period when water treatment is occurring. Water treatment currently occurs for 5 to 16 weeks during June to October each year. Each year, prior to water treatment commencing, equipment and supplies used in water treatment such as pumps, generators, lime, and trailers are brought to site. Gasoline and diesel are used to power various on-site equipment. Gasoline is stored in a 450-L Tidy Tank, which is truck-mounted. Diesel and gasoline, in 20 L jerry cans, are stored within a secondary container with capacity that exceeds the full volume (up to 80 L) of the jerry cans.

If the Mechanical Evaporator system is operated in the future, it would potentially use a 680-kW diesel-powered generator or equivalent. Diesel would likely be stored in a 7600-L (2000-gallon) above ground storage tank. Installation and operation of the above ground storage tank would adhere to the Environmental Code of Practice of Aboveground and Underground storage Tank Systems Containing Petroleum and Allied Petroleum Products (PN1326) (CCME 2003) including but not limited to the following:

- Leak detection devices
- Overfill protection devices
- Secondary containment for 110% of the contents (double-walled tank)
- Secondary containment at fuel line connections between fuel tank and generator set
- Visual inspections

The fuel tank and generator set will be located greater than 100 m from the “Ordinary High-Water Mark of any Watercourse” according to conditions of the Land Use Permit. In addition, the fuel tank and generator set will be secured to prevent possible tampering, safety risks, or fuel theft, which could also result in fuel releases.

In addition to water treatment, research activities are conducted on site by a limited number of people. Typically, the research team is composed of two to four people for two-to-three-week periods, approximately three to four periods per year. Research activities may require one or two gasoline and diesel storage tanks that are truck mounted or in jerry cans for fueling equipment.

A limited number of vehicles are present at the TIA at any given period. During the water treatment period, 2 to 4 trucks associated with crew transport and water treatment activities such as water sample and supply delivery and first aid requirements (emergency transport vehicle) are on site. During research activities two light trucks may be present. Occasionally,

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heavier equipment may be needed, such as excavators, rock trucks and drill rigs for short durations to support ad hoc site activities.

Hydrocarbons may be released to the environment during refueling, drips and leaks from equipment, and catastrophic failure of tidy tanks or jerry cans. Release response is included in Section 5.0.

2.2 Untreated Water and Tailings

Tailings are contained in the TIA by a dyke system that partially surrounds the area. Water from snow melt and rain within the TIA collects at the north end of the TIA in the Main Pond. Water within the Main Pond is held until water treatment occurs in the summer months. The TIA is managed according to the Operation, Maintenance and Surveillance (OMS) manual (PP-OMS-001) and the water treatment is managed as outlined in the Water Management Plan (Water Treatment Manual) (PP-EP-001).

Untreated water from the Main Pond could be released to the adjacent environment if water levels are excessively high (as defined in the OMS manual [PP-OMS-001]) due to high snow melt conditions in the spring and/or heavier than normal, recurring rain events. High water levels may mean that adequate freeboard to maintain dyke stability cannot be maintained. In this scenario, untreated water may be released through controlled water level reduction mechanisms such as pumping or siphoning water out of the treatment pond or water may be released uncontrolled through the spillway.

Tailings and water could be released if a dyke breach were to occur as a result of significant erosion or a seismic event. Erosion could occur due to wave action on the face of the dykes or from heavy precipitation. If erosion were to become extreme, the potential to weaken the dyke to the point of failure is possible. Seismic events, such as an earthquake are rare in the NWT. However, seismic events could cause structural damage to the dam.

If mechanical evaporators were in use, untreated water could be released if mechanical evaporators over-spray during a high wind event when winds are from the south. Typical windspeeds for the Pine Point TIA are less than 6 metres per second (m/s) (about 22 km/h). With a tail wind speed of 6 m/s, the evaporator spray will travel a maximum distance of 300 m based on manufacturer specifications. The evaporators will be positioned so that spray is maintained within 300 m and therefore, would not spray beyond the dyke.

2.3 Coagulants and Flocculants

Coagulants and/or flocculants may be used to improve water treatment effectiveness. Selected chemical settling aid products will be deployed within the treatment pond following lime addition in the inlet culvert. Flocculant blocks have been used in the past and may be used again as they have shown some effectiveness in reducing suspended solid concentrations. Similarly, flocculant-embedded curtains may be used to reduce suspended solids prior to discharge.

Additional products, such as an aluminum chlorohydrate coagulant and an anionic flocculant, are being considered for a field trial to specifically test the treatment efficacy during colder water temperatures. During a field trial, the most likely spill scenario would be from human error during product loading, which may cause a spill in the immediate vicinity of the treatment area. Small to moderate quantities ($<5 \text{ m}^3$ of coagulant and $\leq 200 \text{ kg}$ of powder flocculant) will be used during trials and there are no natural waterbodies present in the area of intended use. Chemical totes will be stored in secondary containment to prevent accidental spills. In the event of a spill to the treatment pond, the outlet siphons will be quickly closed preventing the discharge of excessive chemical settling aids. Product will be stored according to manufacturer recommendations.

3.0 Release Prevention

Prevention is the best mitigation for spill events. Teck employs several best practices to prevent the release of contamination to the surrounding environment.

3.1 Hydrocarbon Storage and Fueling

Hydrocarbon spills are prevented by using proper storage and fueling procedures. All fuel storage tanks include secondary containment. All fuel powered generators and hydrocarbon waste containers are equipped with secondary or emergency spill containment (e.g., collapsible containment berm, double-walled tank). Fuel storage and hydrocarbon waste bins are inspected regularly to identify damage to bins (e.g., holes) and to look for possible leaks.

Fueling only occurs if spill containment is in place. Spill containment may include use of a drip pan or similar device to catch potential spills while fueling. In addition, the main gasoline tank used to fuel on-site equipment and generators each have an electric pump that is equipped with an automatic shut off. If a larger generator is used in the future (e.g., 680-kW generator), potential leaks at the fuel line connection will be collected in an impermeable drip pan or similar device.

All equipment (including light trucks) that may be parked for two hours or more, shall have a drip tray under it, in accordance with the Land Use Permit. Leaky equipment shall be repaired immediately.

3.2 Untreated Water and Tailings

To prevent the release of untreated water, water levels in the Main Pond are managed and monitored carefully. Water levels are managed by treating water in the summer months. The objective of the water treatment is to draw the water levels down as much as feasible through active treatment; thereby maximizing the capacity of the pond in the spring when the highest water levels are anticipated. During the late winter months, weather forecasts are closely monitored to estimate freshet conditions and water levels are monitored using remote observations and visual inspections according to the Trigger Action Response Plan (TARP) defined in the OMS manual (PP-OMS-001). The TARP defines actions that are taken to prevent the release of untreated water and to maintain dyke stability (e.g., early water treatment).

The primary mechanism of preventing release of tailings is to maintain the dykes and to avoid high water levels that could cause overtopping and erosion of the dyke. Dykes are inspected three times a year (spring, summer and fall) in compliance with the water licence and maintenance undertaken promptly as required. Geotechnical performance indicators, such as cracks, slough, and erosion, are noted and evaluated for significance. Event-driven inspections also occur in response to an earthquake, high precipitation and other situations defined in the TARP. Inspection results are reported in Routine Inspection Reports, Event-Driven Inspection Reports and in the Annual Performance Facility Report (AFPR). The reports are submitted to

the Site Manager, Responsible Tailings Facility Engineer (RTFE) and EoR for review and actions in accordance with the TARP. Significant erosion observations, and full or partial dyke failures are reported immediately to the Site Manager for prompt repair.

In addition, as described above, water levels are closely monitored and managed according to the TARP. In an extreme weather event that causes water levels to exceed thresholds resulting in increased risk of dyke failure, untreated water may be released to prevent the release of tailings. Untreated water is released through a spillway to prevent pressure against the dyke or may be pumped.

If mechanical evaporators were to be used, the system would include an on-board meteorological station that would measure wind direction, wind speed, temperature and relative humidity and the system would have an angle (trajectory) adjustment feature. The evaporator system would be programmed such that with the current wind direction and speed, the spray will not travel more than 300 m. If the measured wind speed is greater than 6 m/s from the south (behind the evaporator), then the system would be shut down until acceptable wind conditions return. The system would also shut down when temperatures are below freezing and when relative humidity is greater than 80% so that evaporators would not run when conditions are not favourable for optimal evaporation. If the system shuts down because one or more of the above conditions occur, the system would return to operation only when all of the above conditions are present for 30 minutes. If the meteorological station is not functioning, then the evaporators would also not operate.

The Site Manager is notified by the federal government if there is an earthquake within 100 km that is characterized as a magnitude 5.0 or greater on the Richter scale. The Site Manager will immediately contact a geotechnical engineer to undertake a dyke inspection. If a geotechnical engineer is not readily available, then a person with geotechnical experience will conduct a preliminary inspection of the dyke. Recommendations from the geotechnical engineer would be acted upon in a timely manner. Refer to the Pine Point Tailings Impoundment Area OMS Manual (PP-OMS-001) for additional information regarding the safe operation, routine and event driven maintenance, and monitoring programs for the facility.

3.3 Coagulants and Flocculants

Coagulants and flocculants will be stored according to manufacturer recommendations, including use of double-walled containers or secondary containment composed of compatible materials. During field trialing, liquid coagulants and flocculants will be stored in 1-m³ Intermediate Bulk Containers (IBC) as received from the chemical supplier. Powder flocculants will be made-down for use in 1-m³ IBCs. The powder flocculants are received from the chemical supplier in 22.7-kg bags and will be stored indoors when not in use. The products will be stored at least 150 m from any downstream environment. Product will be handled according to manufacturer direction. Off-loading of material will occur only as needed with appropriate precautions by trained individuals.

4.0 Reportable Spills

A release of untreated water, either uncontrolled or controlled, would be considered a reportable spill. The OMS describes a TARP that includes careful monitoring of water levels and precipitation events. If water levels are high and a significant weather event is forecasted such that a risk to the integrity of the dyke is deemed unacceptable, then a request would be submitted to the GNWT Water Resources Officer to allow for an emergency discharge. If authorized, reporting to the MVLWB and affected parties would occur as per Section 5.4.

A reportable spill is defined in Schedule B of the NWT Spill Contingency Planning and Reporting Regulations (NWT Reg. 068-93), pursuant to the *Environment Protection Act*. Schedule B has been reproduced in Table 4.1 below. If an unpredicted extreme weather event were to occur such that water was released uncontrolled through the spillway, reporting would occur as an “other contaminant” as listed in Table 4.1.

Table 4.1 Reportable Quantities of Released Materials (Schedule B from the Spill Contingency Planning and Reporting Regulations)

Transportation of Dangerous Goods Act – Class Designation	Description of Contaminant	Reportable Release Limit
1	Explosives	Any amount
2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 L
2.2	Compressed gas (non-Corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
2.3	Compressed gas (toxic)	Any amount
2.4	Compressed gas (corrosive)	Any amount
3.1, 3.2, 3.3	Flammable liquid	100 L
4.1	Flammable solid	25 kg
4.2	Spontaneously combustible solid	25 kg
4.3	Water reactant solids	25 kg
5.1	Oxidizing substances	50 L or 50 kg
5.2	Organic peroxides	1 L or 1 kg
6.1	Poisonous substances	5 L or 5 kg
6.2	Infectious substances	Any amount

Transportation of Dangerous Goods Act – Class Designation	Description of Contaminant	Reportable Release Limit
7	Radioactive	Any amount
8	Corrosive substances	5 L or 5 kg
9.1 (in part)	Miscellaneous products or substances excluding PCB mixtures	50 L or 50 kg
9.2	Environmentally hazardous	1 L or 1 kg
9.3	Dangerous wastes	5 L or 5 kg
9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 L or 0.5 kg
None	Other contaminants	100 L or 100 kg

5.0 Release Response Action Plan

The Pine Point TIA maintains a site-specific Mine Emergency Response Plan, which includes emergency response procedures and action plans relative to known and potential hazards specific to work at the site including spills. Training is carried out annually, or more frequently, as required. Personnel with a named responsibility, including those nominated as alternates, are required to attend the training events.

5.1 Role Definition

5.1.1 First Responder

The First Responder is the person who has witnessed or who has observed evidence of a spill (e.g., a stain observed on soil). The Pine Point TIA has water treatment staff present for a limited period each year. Depending on the amount of precipitation and therefore the amount of water collected in the Main Pond, water treatment may occur for a duration of 5 to 16 weeks. The water treatment period occurs any time between June and October. At other times, environmental consultants or engineers may be on site conducting inspections, maintenance or other activities to support the operation of the TIA or to collect data for the reclamation closure plan. Therefore, the First Responder could be anyone who first witnesses a release.

5.1.2 Site Manager

The Site Manager has the overall accountability for planning, directing and controlling activities to ensure the safe and effective use of resources and has the authority to make decisions, assign responsibility and delegate responsibility to others as needed.

5.1.3 Manager, Environmental Performance

The Manager, Environmental Performance is responsible for the initial regulatory reporting, regulatory liaison, remediation procedures and regulatory reporting (i.e., completion of follow-up reports as required). The Manager, Environmental Performance will also coordinate an investigation.

5.1.4 Teck Legacy Dispatch (24-hour monitor)

Teck Legacy Properties maintains a 24-hour on-call service that allows First Responders to contact Dispatch as soon as it is safe to do so. All events that are classified as incidents must be reported immediately to Dispatch. Dispatch will contact necessary internal personnel to support the First Responder.

In the event of an emergency, roles and responsibilities are defined in the Mine Emergency Response Plan (PP-ERP-002).

5.2 Identification of a Release

The First Responder is the person to observe the occurrence of a release or evidence of a release after the occurrence (e.g., soil stain). If the situation is unsafe, the First Responder must evacuate the area and block access to the site by all non-emergency personnel and then contact emergency response personnel, recognizing that responders require an hour to access the site. As soon as it is safe to do so, the First Responder shall contact Dispatch to report the release, regardless of the severity. Phone connection supported by Starlink internet is located at the water treatment plant when water treatment operations are underway. If water treatment is not occurring, then contractors must have a means of contacting emergency personnel (e.g., satellite phone or messaging system).

If safe to do so, the First Responder should stop the source and contain the spill to prevent migration of the product, especially to waterways. The First Responder must begin to complete the Teck Initial Event Report Form (TLP-SF-004) and include details such as the type of product released, estimated volume, expected or known cause for the spill, level of containment, and potential for harm to the environment and human health are required. Support for completing the form will be provided during the initial call with dispatch or with a follow-up call from the Site Manager or Manager, Environmental Performance (or designate). The form must be submitted to legacy.safety@teck.com within 2 hours.

5.3 Situation-Specific Response

5.3.1 Hydrocarbon Release

For a hydrocarbon spill (flammable liquid), all ignition sources must be turned off immediately. Once safe to do so, all hydrocarbon releases must be contained. A spill kit containing a 45-gallon kit with absorbent booms and sheets is available at the water treatment plant site during seasonal operations. In addition, any other personnel (e.g., consultants) responsible for refueling equipment must have an appropriately sized spill kit available. Small spill kits contain absorbent pads, granular absorbent material, a trowel, heavy plastic bags or a pail for containment of contaminated materials (e.g., absorbent materials and soil), gloves and safety goggles.

A larger spill kit will be stationed near any above ground storage tanks that support future uses such as a mechanical evaporator system. The spill kit will include absorbent pads, pillows and socks to contain and recover spilled fuel promptly, a shovel to collect contaminated material and a leak proof container appropriate for hydrocarbon contaminated materials.

For hydrocarbon spills to soil, all free product and contaminated soil must be dug up and disposed of in properly labeled containers available on-site and dedicated for hydrocarbon wastes. If the spill is small, the First Responder is expected to do this immediately with the tools available on site. For a large spill, the hydrocarbon spill must be contained to the extent possible using absorbent materials and building a berm around the area. Contractors from Fort

Resolution or Hay River must be contacted promptly for completion of the spill remediation (Table 5.1).

Table 5.1 Service Providers for Spill Response Services

Contractor	Phone Number	Services Provided
Carter Industries	(867) 874-6574	Specialized in earthworks Located in Hay River
Rowe's Construction	(867) 874-3243	Specialized in equipment rentals Located in Hay River
Hay River Disposals	(867) 874-2720	Specialized in vacuum trucks Located in Hay River

If a hydrocarbon spill to the Main Pond or the polishing pond occurs, the syphons would be immediately shut off to prevent discharge to the downstream drainage to allow for clean-up. Any spill into open water would be surrounded with a containment boom and collected using a vacuum truck.

All contaminated material will be disposed of at a licensed facility and according to procedures identified in the Waste Management Plan (PP-EP-003).

5.3.2 Untreated Water and Tailings

In the event of a dyke breach, barriers will be placed (e.g., rock or earthen berm) or constructed to prevent further migration of tailings and dyke material as soon as it is safe to do so using available equipment on site and those procured from Fort Resolution or Hay River (Table 2). Tailings and dyke material will be collected and returned to the TIA.

If over-spray from evaporators was observed (i.e., automated shut-down controls malfunction), the First Responder would contact the Teck dispatcher at the emergency contact number posted at the facility, who will contact the Site Manager. The Site Manager will coordinate a response to the tailings impoundment area to shut down the evaporators. The responder will confirm malfunctioning of the system and shut down mechanical evaporator system. A detailed investigation will be completed to determine why the automated shut-down controls malfunctioned before the system is restarted.

5.3.3 Coagulants and Flocculants

Coagulant and flocculant products may be used at Pine Point and may be in powder, gel or liquid form. It is important that any stored or unused products be properly contained, unexposed to precipitation and away from surface water. Products may be toxic to aquatic life if released in significant amounts and therefore pose a risk if handled in an uncontrolled manner. Coagulant or flocculant products that are spilled must be cleaned up using absorbent materials or by digging up the product if in soil and placing contaminated materials into an appropriate waste

bin (e.g., a labelled 20-L plastic pail with a lid). The waste bin must be removed from site and disposed of appropriately according to the Pine Point Waste Management Plan (PP-EP-003).

5.3.4 Other Products

Contractors are required to identify products they plan to bring to site in the contractors Environment, Health and Safety Work Plan (EHSC Plan), and Safety Data Sheets (SDS) are required to be available for safe handling and confirm that the appropriate spill response equipment is available. All spills will be cleaned up and contaminated materials will be disposed of at a licensed facility.

5.4 Release reporting

Following receipt of a spill report from the Teck Dispatch, the Manager, Environmental Performance (or designate) will review the spill release information and the reportable spill volumes to determine whether the spill is reportable to the NWT 24-Hour Spill Report Line. Releases of a substance into the environment that may cause, is causing or has caused an adverse effect to the environment, human health or safety, or property must be reported immediately regardless of the volume. If deemed reportable, the Manager, Environmental Performance will phone 1-867-920-8130. The GNWT Water Resources Officer, DKFN and FRMG will also be notified.

The Manager, Environmental Performance will complete and submit the NWT Spill Report Form (see Appendix A for the complete form):

- Date and time of spill
- Location of spill
- Contractor involved.
- Type of contaminant spilled and quantity spilled.
- Cause of spill.
- Whether spill is continuing or has stopped.
- Description of existing containment.
- Action taken to contain, recover, clean up and dispose of spilled contaminant.
- Name, address and phone number of person reporting spill.

In addition to the NWT Spill report, a detailed report on the spill, including descriptions of root causes, response actions and any changes to procedures to prevent similar occurrences in the future, will be submitted to the MVLWB within 30 days.

Even if a release of any substance (liquid, solid or gas) does not trigger external spill or non-compliance reporting, the spill is tracked by Teck to determine cause, determine effective corrective actions and improve procedures. The Manager, Environmental Performance will lead an investigation as described in Section 5.5.

5.4.1 Release Response Personnel Contact Information

Contact information for Teck personnel responsible for release reporting, GNWT agencies and Fort Resolution representatives are presented in Table 5.2.

Table 5.2 Contact Details for Site Manager and Alternate

Contact	Phone	Cell Phone
NWT 24-Hour Spill Report Line	(867) 920-8130	NA
Teck		
Teck Legacy Dispatch (24-hour monitor)	(250) 427-6079 or 1-855-899-6857	NA
Ray Proulx, Site Manager	(250) 242-6335	(250)467-3194
Neil MacDonald, Supervisor, Water Treatment & Monitoring and Alternate Site Manager	(250) 427-8415	(250) 910-0522
Michelle Unger, Manager, Environmental Performance	(250) 427-8422	(250) 432-5264
Cindy Robinson, Sr. Supervisor, Environment and Permitting	NA	(587) 215-6937
Silawat Jeeravipoolvarn, Responsible Tailings Facility Engineer (RTFE)	(587) 284-0319	(587) 284-0319
Additional GNWT Contacts		
Manager, Resource Management Officer	(867) 872-2558	NA
Water Resources Officer	(867) 872-6421	NA
Environment and Climate Change Canada		
ECCC Environmental Enforcement	(867) 669-4730	NA
Fort Resolution Contacts		
Deninu K'ue First Nation	(867) 394-4335	NA
Fort Resolution Métis Government	(867) 394-4151	NA

As stated previously, all reportable spills must be reported to the NWT 24-hour Spill Report Line by the Manager, Environmental Performance. Instructions for follow-up reporting will be provided by the Spill Report Line receiver when the spill is initially reported. Follow-up may include involvement from other GNWT agencies as listed in Table 5.2 or others.

The ECCC Environmental Enforcement office can provide information relating to environmental enforcement and reporting requirements under the *Canadian Environmental Protection Act* and the *Fisheries Act* if required. However, in most cases ECCC would be contacted by the lead

agency as required. A lead agency is the government authority that regulates or has authority over the activity from which the emergency originated.

5.4.2 External Technical Advice

The Canadian Transport Emergency Center (CANUTEC), a branch of Transport Canada, can also be contacted for 24-hour technical advice on Dangerous Goods, as needed. The Dangerous Goods Initial Emergency Response Guide (CANUTEC 2016) can also be referenced for response information. The CANUTEC help line for dangerous goods is 1-888-226-8832 or 613-996-6666.

5.5 Spill Incident Investigation

Upon resolution and completion of cleanup of a spill, an incident investigation must be conducted. The objective of the investigation is to prevent a reoccurrence of an event. The investigation will be coordinated by the Manager, Environmental Performance and may involve additional personnel depending on the nature of the incident and the investigator's technical or operational experience. Teck applies the Incident Cause Analysis Method (ICAM) investigation process. ICAM identifies systemic health, safety, or environmental deficiencies by providing a set of tools to examine the contributing factors that lead to incidents.

6.0 Training

All Teck employees and Contractors working at the Pine Point TIA must be familiar with this document. New employees and contractors will be introduced to the plan as part of their annual orientation. The orientation will include an overview of the potentially hazardous situations that spills can create to the health and safety of workers and the environment, and worker responsibilities to prevent, identify, report, and respond to a spill, including training on the use of spill kits. This document will be made available to all workers. Teck will advise workers of revisions or changes to the plan.

All Teck employees and Contractors must provide Safety Data Sheets (SDS) for all products that are used on site or must be aware of where SDS are stored. For products used during water treatment operations, the SDS are included in Appendix B and are stored in a binder in the laboratory trailer. All personnel must be aware of the contents of the SDS prior to working with products. Teck employees and contractors are trained in Workplace Hazardous Materials Information System (WHMIS) and Transportation of Dangerous Goods (TDG) prior to doing work on site.

7.0 Related Procedures

The following Teck related procedures are required for review and acknowledgement by all Teck employees and contractors working at Pine Point.

- Initial Event Response Procedure - TLP-SP-043
- Pine Point Waste Management Plan – PP-EP-003
- Pine Point Operations, Maintenance and Surveillance Manual – PP-OMS-001
- Pine Point Mine Emergency Response Plan - PP-ERP-002
- Pine Point Tailings Impoundment Area Water Treatment Manual - PP-EP-001

8.0 References

Canadian Council of Ministers of the Environment (CCME). 2003. Environmental Code of Practice of Aboveground and Underground storage Tank Systems Containing Petroleum and Allied Petroleum Products (PN1326) CCME: Winnipeg, Canada

Canadian Transport Emergency Center (CANUTEC). 2016. Dangerous Goods Initial Emergency Response Guide 2016. Minister of Supply and Services Canada 2016, Ottawa, Canada.

Government of Northwest Territories. 1998. Spill Contingency Planning and Reporting Regulations N.W.T. Reg. 068-93, *Environmental Protection Act*.

Indigenous and Northern Affairs Canada (INAC). 2007. Guidelines for Spill Contingency Planning.

APPENDIX A NWT SPILL REPORT FORM

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NWT Spill Report available at:

https://www.gov.nt.ca/sites/ecc/files/resources/spill_report_form_e_fillable.pdf

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND
OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE

Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca



Canada



REPORT LINE USE ONLY

A	Report Date: <input type="text"/> <input type="text"/> <input type="text"/>	Report Time: <input type="text"/>	<input type="checkbox"/> Original Spill Report	Report Number: <input type="text"/>
	B Occurrence Date: <input type="text"/> <input type="text"/> <input type="text"/>	Occurrence Time: <input type="text"/>	<input type="checkbox"/> Update # <input type="text"/> to the Original Spill Report	
C	Land Use Permit Number (if applicable): <input type="text"/>	Water Licence Number (if applicable): <input type="text"/>		
D	Geographic Place Name or Distance and Direction from the Named Location: <input type="text"/>		Region: <input type="checkbox"/> NT <input type="checkbox"/> Nunavut <input type="checkbox"/> Adjacent Jurisdiction or Ocean	
E	Latitude: <input type="text"/> Degrees <input type="text"/> Minutes <input type="text"/> Seconds		Longitude: <input type="text"/> Degrees <input type="text"/> Minutes <input type="text"/> Seconds	
F	Responsible Party or Vessel Name: <input type="text"/>		Responsible Party Address or Office Location: <input type="text"/>	
G	Any Contractor Involved: <input type="text"/>		Contractor Address or Office Location: <input type="text"/>	
H	Product Spilled: <input type="checkbox"/> Potential Spill	Quantity in Litres, Kilograms or Cubic Metres: <input type="text"/>	U.N. Number: <input type="text"/>	
I	Spill Source: <input type="text"/>	Spill Cause: <input type="text"/>	Area of Contamination in Square Metres: <input type="text"/>	
J	Factors Affecting Spill or Recovery: <input type="text"/>	Describe Any Assistance Required: <input type="text"/>	Hazards to Persons, Property or Environment: <input type="text"/>	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials: <input type="text"/>			
L	Reported to Spill Line by: <input type="text"/>	Position: <input type="text"/>	Employer: <input type="text"/>	Location Calling From: <input type="text"/>
M	Any Alternate Contact: <input type="text"/>	Position: <input type="text"/>	Employer: <input type="text"/>	Alternate Contact Location: <input type="text"/>


REPORT LINE USE ONLY

N	Received at Spill Line by: <input type="text"/>	Position: <input type="text"/>	Employer: <input type="text"/>	Location Called: <input type="text"/>	Report Line Number: <input type="text"/>
Lead Agency: <input type="checkbox"/> EC <input type="checkbox"/> CCGT/CMS <input type="checkbox"/> GNWT <input type="checkbox"/> GN <input type="checkbox"/> ILA			Significance: <input type="checkbox"/> Minor <input type="checkbox"/> Major <input type="checkbox"/> Unknown		File Status: <input type="checkbox"/> Open <input type="checkbox"/> Closed
Agency: <input type="checkbox"/> AANDC <input type="checkbox"/> NEB <input type="checkbox"/> Other: <input type="text"/>					
Agency: <input type="text"/>		Contact Name: <input type="text"/>	Contact Time: <input type="text"/>	Remarks: <input type="text"/>	
Lead Agency: <input type="text"/>					
First Support Agency: <input type="text"/>					
Second Support Agency: <input type="text"/>					
Third Support Agency: <input type="text"/>					

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APPENDIX B SAFETY DATA SHEETS

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SAFETY DATA SHEET	Revision Date: 06/30/2021
	Print Date: 04/07/2022
	SDS Number: 000000226703
Chargepac™ 7 COAGULANT ™ Trademark, Solenis or its subsidiaries or affiliates, registered in various countries 84276	Version: 1.2

SECTION 1. IDENTIFICATION

Product identifier

Trade name : Chargepac™ 7
COAGULANT
™ Trademark, Solenis or its subsidiaries or affiliates,
registered in various countries

Recommended use of the chemical and restrictions on use

Details of the supplier of the safety data sheet Solenis Canada ULC 942 Brant St. Burlington, ON L7R 3X8 Canada RegulatoryRequestsNA@solenis.com	Emergency telephone number 1-844-SOLENIS (844-765-3647) Product Information Contact your local Solenis representative
--	--

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Corrosive to metals : Category 1

Serious eye damage : Category 1

GHS label elements

Hazard pictograms :




Signal word : Danger

Hazard statements : H290 May be corrosive to metals.
H318 Causes serious eye damage.

Precautionary statements : **Prevention:**
P234 Keep only in original packaging.
P280 Wear eye protection/ face protection.

Response:
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

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CENTER/ doctor.
P390 Absorb spillage to prevent material damage.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture


Components

Chemical name	CAS-No.	Concentration (% w/w)
Polyaluminum Hydroxychloride		≥ 50 - < 60

Actual concentration or concentration range is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.
- If inhaled : If breathed in, move person into fresh air.
If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.
- In case of skin contact : First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water.
- In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
- If swallowed : Obtain medical attention.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
- Most important symptoms and effects, both acute and delayed : Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include:
stomach or intestinal upset (nausea, vomiting, diarrhea)
irritation (nose, throat, airways)

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Cough
discomfort in the chest
Causes serious eye damage.


Notes to physician : No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Water spray
Foam
Carbon dioxide (CO2)
Dry chemical
- Unsuitable extinguishing media : High volume water jet
- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : No hazardous combustion products are known
- Specific extinguishing methods : Product is compatible with standard fire-fighting agents.
- Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Comply with all applicable federal, state, and local regulations.
- Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Keep in suitable, closed containers for disposal.

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SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Advice on safe handling : Do not breathe vapours/dust.
 Container hazardous when empty.
 Avoid contact with skin and eyes.
 Smoking, eating and drinking should be prohibited in the application area.
 For personal protection see section 8.
 Dispose of rinse water in accordance with local and national regulations.
- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Electrical installations / working materials must comply with the technological safety standards.
- Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Polyaluminum Hydroxychloride		TWA	2 mg/m3	CAD ON OEL
		TWA	2 mg/m3 (as Al)	CAD AB OEL
		TWA	2 mg/m3 (as Al)	CAD BC OEL
		TWA	2 mg/m3 (as Al)	OEL (QUE)
		TWA	2 mg/m3 (as Al)	CAD AB OEL
		TWA	2 mg/m3 (as Al)	OEL (QUE)
		TWA (Respirable.)	1 mg/m3	CAD BC OEL
		TWA (Respirable fraction.)	1 mg/m3	CAD MB OEL
		TWA	1 mg/m3	CAD ON

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		(Respirable fraction.)		OEL
--	--	------------------------	--	-----

Engineering measures : Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Wear chemical splash goggles and face shield when there is potential for exposure of the eyes or face to liquid, vapor or mist.
Maintain eye wash station in immediate work area.

Skin and body protection : Wear as appropriate:
Impervious clothing
Safety shoes
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Wear resistant gloves (consult your safety equipment supplier).

Hygiene measures : Wash hands before breaks and at the end of workday.
When using do not eat or drink.
When using do not smoke.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Odour : No data available


Odour Threshold : No data available

pH : 3.8 - 5.0

Melting point/freezing point : No data available

Boiling point/boiling range : 100 °C
(1,013.333333 hPa)
Calculated Phase Transition Liquid/Gas


Flash point : Not applicable

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Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Self-ignition	: No data available
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: 23.3333333 hPa (20 °C) Calculated Vapor Pressure
Relative vapour density	: No data available
Relative density	: No data available
Density	: ca. 1.32 g/cm3
Solubility(ies)	
Water solubility	: No data available
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Oxidizing properties	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No decomposition if stored and applied as directed.
Chemical stability	: Stable under recommended storage conditions.
Possibility of hazardous reactions	: Product will not undergo hazardous polymerization.
Conditions to avoid	: excessive heat
Incompatible materials	: alkalis Metals

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Strong oxidizing agents

Hazardous decomposition : Hydrogen chloride gas products

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Skin corrosion/irritation

Not classified based on available information.

Components:

Polyaluminum Hydroxychloride:

Result : Not irritating to skin

Serious eye damage/eye irritation

Causes serious eye damage.

Product:

Remarks : May cause irreversible eye damage.

Components:

Polyaluminum Hydroxychloride:

Result : Corrosive to eyes

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity


Not classified based on available information.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

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Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks : No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 11.1 mg/l
 Exposure time: 96 h
 Test Type: static test

LC50 (Pimephales promelas (fathead minnow)): 8.8 mg/l
 Exposure time: 96 h
 Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : LC 50 (Water flea (Ceriodaphnia dubia)): 462.5 mg/l
 Exposure time: 48 h
 Test Type: static test

Toxicity to microorganisms : IC50 (Bacteria): 12.1 mg/l
 Exposure time: 15 min
 Method: see user defined free text

Persistence and degradability

Product:

Biochemical Oxygen Demand (BOD) : Biochemical oxygen demand within 5 days
 14,500 mg/l

Chemical Oxygen Demand (COD) : 34,300 mg/l
 Method: Chemical oxygen demand

Bioaccumulative potential

No data available


Mobility in soil

No data available

Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
 Toxic to aquatic life.

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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.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.
- Dispose of in accordance with all applicable local, state and federal regulations.
- Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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

Not applicable for product as supplied.

National Regulations

TDG

Not regulated as a dangerous good


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

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

- TSCA : On TSCA Inventory
- TCSI : Not in compliance with the inventory
- DSL : All components of this product are on the Canadian DSL

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AICS : On the inventory, or in compliance with the inventory
 ENCS : On the inventory, or in compliance with the inventory
 KECI : On the inventory, or in compliance with the inventory
 PICCS : On the inventory, or in compliance with the inventory
 IECSC : On the inventory, or in compliance with the inventory

Canadian lists

No substances are subject to a Significant New Activity Notification.

SECTION 16. OTHER INFORMATION


Further information

Revision Date : 06/30/2021

Full text of other abbreviations

CAD AB OEL : Canada. Alberta OELs. (Occupational Health and Safety Act, Chemical Hazards Regulation, Regulation 393/88, Schedule 1)
 CAD BC OEL : Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical 296/97, as amended)
 CAD MB OEL : Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)
 CAD ON OEL : Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)
 OEL (QUE) : Canada. Quebec OELS. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)
 CAD AB OEL / TWA : Time weighted average
 CAD BC OEL / TWA : Time weighted average
 CAD MB OEL / TWA : Time weighted average
 CAD ON OEL / TWA : Time weighted average
 OEL (QUE) / TWA : Time weighted average

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 -

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International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Sources of key data used to compile the Safety Data Sheet

Key literature references and sources of data

SOLENIS Internal data

SOLENIS internal data including own and sponsored test reports

The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

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. This SDS has been prepared by the Solenis Environmental Health and Safety Department.

CA / EN



by Tyco Fire Suppression & Building Products

MATERIAL SAFETY DATA SHEET

ABC Fire Extinguisher

Issue Date: 04-13-2011

1. Product and Company Identification

Material name	ABC Fire Extinguisher
Version #	02
Revision date	04-13-2011
CAS #	Mixture
Product use	Fire Extinguisher
Manufacturer / Importer / Supplier	
Name	Tyco Fire Protection Products
Address	One Stanton Street Marinette, WI 54143-2542
Phone	715-732-3465
Internet	http://www.pyrochem.com
Emergency Phone Number	CHEMTREC 800-424-9300 or 703-527-3887

2. Hazards Identification

Emergency overview	WARNING
	Irritating to eyes and skin. Prolonged exposure may cause chronic effects.
Potential health effects	
Routes of exposure	Eye contact. Skin contact. Inhalation. Ingestion.
Eyes	Contact with eyes may cause irritation.
Skin	Avoid contact with the skin. May cause skin irritation.
Inhalation	Inhalation of dusts may cause respiratory irritation.
Ingestion	Not a likely route of entry.
Target organs	Eyes. Respiratory system. Skin.
Signs and symptoms	Irritation of eyes and mucous membranes.

3. Composition / Information on Ingredients

Non-hazardous components	CAS #	Percent
AMMONIUM HYDROGEN SULFATE	7783-20-2	10 - 30
Other components below reportable levels		> 60

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.
Skin contact	Wash off with warm water and soap. Get medical attention if irritation develops and persists.
Inhalation	Move to fresh air.
Ingestion	Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
General advice	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Extinguishing media

Suitable extinguishing media This product is not flammable. Use extinguishing agent suitable for type of surrounding fire.

Protection of firefighters

Specific hazards arising from the chemical None known.

Protective equipment for firefighters None known.

Special protective equipment for fire-fighters None known.

Explosion data

Sensitivity to mechanical impact Not available.

Sensitivity to static discharge Not available.

Hazardous combustion products Carbon monoxide and carbon dioxide.

6. Accidental Release Measures

Personal precautions Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits.

Environmental precautions Do not contaminate water.

Methods for containment If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up Should not be released into the environment. Sweep up or vacuum up spillage and collect in suitable container for disposal. Collect dust using a vacuum cleaner equipped with HEPA filter. Avoid the generation of dusts during clean-up. Clean up in accordance with all applicable regulations. Following product recovery, flush area with water.

Other information Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Avoid contact with eyes. Wash thoroughly after handling. Wear personal protective equipment.

Storage Guard against dust accumulation of this material. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Personal protective equipment

Eye / face protection Wear safety glasses with side shields (or goggles).

Skin protection Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection.

Respiratory protection In the case of respirable dust and/or fumes, use self-contained breathing apparatus.

9. Physical & Chemical Properties

Appearance

Form Powder.

Color Yellow.

Odor Odorless.

Physical state Solid.

pH Not available.

Melting point Not available.

Freezing point Not available.

Boiling point Not available.

Flash point Not available.

Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Specific gravity	Not available.
Relative density	Not available.
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions.
Incompatible materials	Strong acids.
Hazardous decomposition products	Carbon oxides.

11. Toxicological Information

Toxicological information	The toxicity of this product has not been tested.
Chronic effects	Prolonged inhalation may be harmful. Not expected to be hazardous by WHMIS criteria.

12. Ecological Information

Ecotoxicological data

Components	Test Results
AMMONIUM HYDROGEN SULFATE (7783-20-2)	EC50 Water flea (Ceriodaphnia dubia): 52 - 67 mg/l 48.00 hours LC50 Pink salmon (Oncorhynchus gorbuscha): 0.068 mg/l 96.00 hours
Ecotoxicity	This material is not expected to be harmful to aquatic life.
Environmental effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability	Not available.
Partition coefficient (n-octanol/water)	Not available

13. Disposal Considerations

Disposal instructions	Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.
Waste from residues / unused products	Dispose of in accordance with local regulations.

14. Transport Information

TDG

Not regulated as dangerous goods.

15. Regulatory Information

Canadian regulations	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
WHMIS status	Controlled
WHMIS classification	A - Compressed Gas

WHMIS labeling**Inventory status**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

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

16. Other Information

Further information	HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings	Health: 1* Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 1 Flammability: 0 Instability: 0
Disclaimer	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.
Issue date	04-13-2011

SAFETY DATA SHEET

Creation Date 28-January-2010

Revision Date 24-December-2021

Revision Number 6

1. Identification**Product Name** Buffer Solution, pH 4.00, Color-Coded Red**Cat No. :** SB101-4, SB101-20, SB101-500**Synonyms** (Certified)**Recommended Use** Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.**Details of the supplier of the safety data sheet****Company****Importer/Distributor**Fisher Scientific
112 Colonnade Road,
Ottawa, ON K2E 7L6,
Canada
Tel: 1-800-234-7437**Manufacturer**Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100**Emergency Telephone Number** CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887**2. Hazard(s) identification****Classification****WHMIS 2015 Classification** Not classified under the Hazardous Products Regulations (SOR/2015-17)

Based on available data, the classification criteria are not met

Label Elements

None required

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Water	7732-18-5	98.91
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	1.0
Formaldehyde	50-00-0	0.05

Methanol	67-56-1	0.02
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	0.02

4. First-aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.
Inhalation	Remove to fresh air. Get medical attention immediately if symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.
Most important symptoms/effects Notes to Physician	None reasonably foreseeable. Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Unsuitable Extinguishing Media	No information available
Flash Point	Not applicable
Method -	No information available
Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. None reasonably foreseeable.

Hazardous Combustion Products

Thermal decomposition can lead to release of irritating gases and vapors.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
1

Flammability
0

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment as required. Ensure adequate ventilation.
Environmental Precautions	Should not be released into the environment.

Methods for Containment and Clean Up Sweep up and shovel into suitable containers for disposal.

7. Handling and storage

Handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation.

Storage.

Keep containers tightly closed in a dry, cool and well-ventilated place. Incompatible Materials. None known.

8. Exposure controls / personal protection

Exposure Guidelines

Component	Alberta	British Columbia	Ontario TWAEV	Quebec	ACGIH TLV	OSHA PEL	NIOSH IDLH
Formaldehyde	Ceiling: 1 ppm Ceiling: 1.3 mg/m ³ TWA: 0.75 ppm TWA: 0.9 mg/m ³	TWA: 0.1 ppm STEL: 0.3 ppm	TWA: 0.1 ppm STEL: 1 ppm	Ceiling: 2 ppm Ceiling: 3 mg/m ³	TWA: 0.1 ppm STEL: 0.3 ppm	(Vacated) TWA: 3 ppm (Vacated) STEL: 10 ppm (Vacated) Ceiling: 5 ppm TWA: 0.75 ppm STEL: 2 ppm	IDLH: 20 ppm TWA: 0.016 ppm Ceiling: 0.1 ppm
Methanol	TWA: 200 ppm TWA: 262 mg/m ³ STEL: 250 ppm STEL: 328 mg/m ³ Skin	TWA: 200 ppm STEL: 250 ppm Skin	TWA: 200 ppm STEL: 250 ppm Skin	TWA: 200 ppm TWA: 262 mg/m ³ STEL: 250 ppm STEL: 328 mg/m ³ Skin	TWA: 200 ppm STEL: 250 ppm Skin	(Vacated) TWA: 200 ppm (Vacated) TWA: 260 mg/m ³ (Vacated) STEL: 250 ppm (Vacated) STEL: 325 mg/m ³ Skin TWA: 200 ppm TWA: 260 mg/m ³	IDLH: 6000 ppm TWA: 200 ppm TWA: 260 mg/m ³ STEL: 250 ppm STEL: 325 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures

None under normal use conditions.

Personal protective equipment**Eye Protection**

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Hand Protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Glove material	Breakthrough time	Glove thickness	Glove comments
Natural rubber Nitrile rubber Neoprene PVC	See manufacturers recommendations	-	Splash protection only

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

No protective equipment is needed under normal use conditions.

Recommended Filter type: Particle filter

Environmental exposure controls

No information available.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Red
Odor	Odorless
Odor Threshold	No information available
pH	4.0
Melting Point/Range	0 °C / 32 °F
Boiling Point/Range	100 °C / 212 °F
Flash Point	Not applicable
Evaporation Rate	1.0 (ether = 1)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	0.7 (Water = 1.0)
Specific Gravity	1.0
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Excess heat.
Incompatible Materials	None known
Hazardous Decomposition Products	Thermal decomposition can lead to release of irritating gases and vapors
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information	No acute toxicity information is available for this product
Oral LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Dermal LD50	Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.
Vapor LC50	Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.
Component Information	

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
1,2-Benzenedicarboxylic acid, monopotassium salt	LD50 > 3200 mg/kg (Rat)	>1000 mg/kg	Not listed
Formaldehyde	500 mg/kg (Rat)	LD50 = 270 mg/kg (Rabbit)	0.578 mg/L (Rat) 4 h
Methanol	LD50 = 1187 – 2769 mg/kg (Rat)	LD50 = 17100 mg/kg (Rabbit)	LC50 = 128.2 mg/L (Rat) 4 h
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	Not listed	LD50 > 2000 mg/kg (Rat)	Not listed

Toxicologically Synergistic No information available

Products

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	Not listed	Not listed	Not listed	Not listed	Not listed
Formaldehyde	50-00-0	Group 1	Known	A1	X	A2
Methanol	67-56-1	Not listed	Not listed	Not listed	Not listed	Not listed
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	Not listed	Not listed	Not listed	Not listed	Not listed

IARC (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

IARC (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

A1 - Confirmed Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Confirmed Animal Carcinogen

A4 - Not Classifiable as a Human Carcinogen

A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Formaldehyde	Not listed	Leuciscus idus: LC50 = 15 mg/L 96h	Not listed	EC50 = 20 mg/L 96h EC50 = 2 mg/L 48h
Methanol	Not listed	Pimephales promelas: LC50 > 10000 mg/L 96h	EC50 = 39000 mg/L 25 min EC50 = 40000 mg/L 15 min EC50 = 43000 mg/L 5 min	EC50 > 10000 mg/L 24h

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility

Component	log Pow
Formaldehyde	-0.35
Methanol	-0.74

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Formaldehyde - 50-00-0	U122	-
Methanol - 67-56-1	U154	-

14. Transport information

DOT Not regulated
TDG Not regulated
IATA Not regulated
IMDG/IMO Not regulated

15. Regulatory information

International Inventories

Component	CAS-No	DSL	NDSL	TSCA	TSCA Inventory notification - Active-Inactive	EINECS	ELINCS	NLP
Water	7732-18-5	X	-	X	ACTIVE	231-791-2	-	-
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	X	-	X	ACTIVE	212-889-4	-	-
Formaldehyde	50-00-0	X	-	X	ACTIVE	200-001-8	-	-
Methanol	67-56-1	X	-	X	ACTIVE	200-659-6	-	-
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	X	-	X	ACTIVE	240-474-8	-	-

Component	CAS-No	IECSC	KECL	ENCS	ISHL	TCSI	AICS	NZIoC	PICCS
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Water	7732-18-5	X	KE-35400	X	-	X	X	X	X
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	X	KE-02310	X	X	X	X	X	X
Formaldehyde	50-00-0	X	KE-17074	X	X	X	X	X	X
Methanol	67-56-1	X	KE-23193	X	X	X	X	X	X
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	X	KE-10872	X	X	X	X	X	X

Legend:

X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

Canada

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

Component	Canada - National Pollutant Release Inventory (NPRI)	Canadian Environmental Protection Agency (CEPA) - List of Toxic Substances	Canada's Chemicals Management Plan (CEPA)
Formaldehyde	Part 1, Group A Substance Part 5, Individual Substances Part 4 Substance	Schedule I	
Methanol	Part 1, Group A Substance Part 5, Individual Substances Part 4 Substance		

Legend

NPRI - National Pollutant Release Inventory

Other International Regulations**Authorisation/Restrictions according to EU REACH**

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Formaldehyde	-	Use restricted. See item 72. (see link for restriction details) Use restricted. See item 28. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	-
Methanol	-	Use restricted. See item 69. (see link for restriction details)	-
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	-	Use restricted. See item 75. (see link for restriction details)	-

<https://echa.europa.eu/substances-restricted-under-reach>

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

Component	CAS-No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous
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					Substances (RoHS)
Water	7732-18-5	Listed	Not applicable	Not applicable	Not applicable
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	Not applicable	Not applicable	Not applicable	Not applicable
Formaldehyde	50-00-0	Listed	Not applicable	Not applicable	Not applicable
Methanol	67-56-1	Listed	Not applicable	Not applicable	Not applicable
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	Not applicable	Not applicable	Not applicable	Not applicable

Component	CAS-No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Water	7732-18-5	Not applicable	Not applicable	Not applicable	Not applicable
1,2-Benzenedicarboxylic acid, monopotassium salt	877-24-7	Not applicable	Not applicable	Not applicable	Not applicable
Formaldehyde	50-00-0	5 tonne	50 tonne	Not applicable	Not applicable
Methanol	67-56-1	500 tonne	5000 tonne	Not applicable	Not applicable
Spiro[isobenzofuran-1(3H),9-[9H]xanthen]-3-one, 3,6-dihydroxy-2,4,5,7-tetraiodo-, sodium salt (1:2)	16423-68-0	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By

Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date

28-January-2010

Revision Date

24-December-2021

Print Date

24-December-2021

Revision Summary

This document has been updated to comply with the requirements of WHMIS 2015 to align with the Globally Harmonised System (GHS) for the Classification and Labelling of Chemicals.

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Creation Date 26-Jun-2014

Revision Date 28-Dec-2021

Revision Number 4

1. Identification

Product Name Buffer Solution, pH 7.00, Color-Coded Yellow, Certified

Cat No. : AC611060000; AC611060040; AC611065000

Synonyms No information available

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Label Elements

None required

Hazards not otherwise classified (HNOC)

None identified

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Water	7732-18-5	99.18
Dihydrogen potassium phosphate	7778-77-0	0.7
Sodium hydroxide	1310-73-2	0.1
FD&C yellow No. 5	1934-21-0	0.0 - 0.02

4. First-aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention if symptoms occur.
Skin Contact	Rinse skin with water. Get medical attention if symptoms occur.
Inhalation	Remove to fresh air. If breathing is difficult, give oxygen. Get medical attention if symptoms occur.
Ingestion	Do NOT induce vomiting. Get medical attention if symptoms occur.
Most important symptoms and effects	No information available.
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Unsuitable Extinguishing Media	No information available
Flash Point	Not applicable
Method -	No information available
Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical
Non-combustible. None reasonably foreseeable.

Hazardous Combustion Products

None under normal use conditions.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
1

Flammability
0

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment as required. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing.
Environmental Precautions	Avoid release to the environment.
Methods for Containment and Clean	Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

Up

7. Handling and storage

Handling Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation.

Storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Incompatible Materials. None known.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Sodium hydroxide	Ceiling: 2 mg/m ³	(Vacated) Ceiling: 2 mg/m ³ TWA: 2 mg/m ³	IDLH: 10 mg/m ³ Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Yellow
Odor	Odorless
Odor Threshold	No information available
pH	7.00 @ 25°C
Melting Point/Range	0 °C / 32 °F
Boiling Point/Range	100 °C / 212 °F
Flash Point	Not applicable
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	760 mmHg @ 20 °C
Vapor Density	No information available
Specific Gravity	1.0
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available

Autoignition Temperature
Decomposition Temperature
Viscosity

No information available
No information available
No information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid None known.

Incompatible Materials None known

Hazardous Decomposition Products None under normal use conditions

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information No acute toxicity information is available for this product
Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Dihydrogen potassium phosphate	LD50 = 3200 mg/kg (Rat)	LD50 > 4640 mg/kg (Rabbit)	LC50 > 0.83 mg/L (Rat) 4 h
Sodium hydroxide	LD50 = 325 mg/kg (Rat)	LD50 = 1350 mg/kg (Rabbit)	Not listed
FD&C yellow No. 5	12750 mg/kg (Mouse)	Not listed	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Dihydrogen potassium phosphate	7778-77-0	Not listed	Not listed	Not listed	Not listed	Not listed
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed
FD&C yellow No. 5	1934-21-0	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hydroxide	-	LC50: = 45.4 mg/L, 96h static (Oncorhynchus mykiss)	-	Not listed
FD&C yellow No. 5	Not listed	LC50: > 1000 ppm/48 h (Oryzias latipes)	Not listed	Not listed

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT Not regulated
TDG Not regulated
IATA Not regulated
IMDG/IMO Not regulated

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Water	7732-18-5	X	ACTIVE	-
Dihydrogen potassium phosphate	7778-77-0	X	ACTIVE	-
Sodium hydroxide	1310-73-2	X	ACTIVE	-
FD&C yellow No. 5	1934-21-0	X	ACTIVE	-

Legend:

TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

- - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
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Water	7732-18-5	X	-	231-791-2	X	X		X	X	KE-35400
Dihydrogen potassium phosphate	7778-77-0	X	-	231-913-4	X	X	X	X	X	KE-28622
Sodium hydroxide	1310-73-2	X	-	215-185-5	X	X	X	X	X	KE-31487
FD&C yellow No. 5	1934-21-0	X	-	217-699-5	X	X	X	X	X	KE-06857

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Sodium hydroxide	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium hydroxide	1000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Water	-	-	X	-	-
Sodium hydroxide	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Sodium hydroxide	-	Use restricted. See item 75. (see link for restriction details)	-
FD&C yellow No. 5	-	Use restricted. See item 75. (see link for restriction details)	-

<https://echa.europa.eu/substances-restricted-under-reach>

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

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Water	7732-18-5	Listed	Not applicable	Not applicable	Not applicable
Dihydrogen potassium phosphate	7778-77-0	Listed	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Listed	Not applicable	Not applicable	Not applicable
FD&C yellow No. 5	1934-21-0	Not applicable	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Water	7732-18-5	Not applicable	Not applicable	Not applicable	Not applicable
Dihydrogen potassium phosphate	7778-77-0	Not applicable	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Not applicable	Not applicable	Not applicable	Annex I - Y35
FD&C yellow No. 5	1934-21-0	Not applicable	Not applicable	Not applicable	Not applicable

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 26-Jun-2014

Revision Date 28-Dec-2021

Print Date 28-Dec-2021

Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Revision Date 25-Dec-2021

Revision Number 3

1. Identification

Product Name Buffer solution pH 10 (borate), nach NIST

Cat No. : AC383880000; AC383880010; AC383885000

Synonyms No information available

Recommended Use Laboratory chemicals.

Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Reproductive Toxicity

Category 1A

Label Elements

Signal Word
Danger

Hazard Statements
May damage fertility or the unborn child

**Precautionary Statements****Prevention**

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Use personal protective equipment as required

Response

IF exposed or concerned: Get medical attention/advice

Storage

Store locked up

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

None identified

3. Composition/Information on Ingredients

Component	CAS No	Weight %
Buffer solution pH 10 (borate), nach NIST	NA	100
Water	7732-18-5	99
Potassium chloride	7447-40-7	0.373
Boric acid (H ₃ BO ₃)	10043-35-3	0.309
Sodium hydroxide	1310-73-2	0.175

4. First-aid measures

Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention.
Inhalation	Remove from exposure, lie down. Remove to fresh air.
Ingestion	Clean mouth with water. Get medical attention.
Most important symptoms and effects	No information available.
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Unsuitable Extinguishing Media	No information available
Flash Point	No information available
Method -	No information available

Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

None reasonably foreseeable.

Hazardous Combustion Products

None known.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
0

Flammability
0

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment as required.

Environmental Precautions See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Avoid contact with skin and eyes. Do not breathe mist/vapors/spray.

Storage. Keep in a dry, cool and well-ventilated place. Keep container tightly closed.

8. Exposure controls / personal protection**Exposure Guidelines**

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Boric acid (H ₃ BO ₃)	TWA: 2 mg/m ³ STEL: 6 mg/m ³			TWA: 2 mg/m ³
Sodium hydroxide	Ceiling: 2 mg/m ³	(Vacated) Ceiling: 2 mg/m ³ TWA: 2 mg/m ³	IDLH: 10 mg/m ³ Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures None under normal use conditions.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection

No protective equipment is needed under normal use conditions.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear
Odor	No information available
Odor Threshold	No information available
pH	10
Melting Point/Range	No data available
Boiling Point/Range	No information available
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	No information available
Specific Gravity	1.000
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable.
Conditions to Avoid	Incompatible products.
Incompatible Materials	Strong oxidizing agents
Hazardous Decomposition Products	None under normal use conditions
Hazardous Polymerization	No information available.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity**Product Information**

No acute toxicity information is available for this product

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Potassium chloride	LD50 = 2600 mg/kg (Rat)	Not listed	Not listed
Boric acid (H3BO3)	2660 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	Not listed
Sodium hydroxide	LD50 = 325 mg/kg (Rat)	LD50 = 1350 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS No	IARC	NTP	ACGIH	OSHA	Mexico
Buffer solution pH 10 (borate), nach NIST	NA	Not listed	Not listed	Not listed	Not listed	Not listed
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Potassium chloride	7447-40-7	Not listed	Not listed	Not listed	Not listed	Not listed
Boric acid (H ₃ BO ₃)	10043-35-3	Not listed	Not listed	Not listed	Not listed	Not listed
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Potassium chloride	EC50: 2500 mg/L/72h	Lepomis macrochirus: LC50: 1060 mg/L /96h Pimephales promelas: LC50: 750 - 1020 mg/L /96h	Not listed	EC50: 825 mg/L/48h
Boric acid (H ₃ BO ₃)	-	Gambusia affinis: LC50: 5600 mg/L/96h	-	EC50: 115 - 153 mg/L, 48h (Daphnia magna)
Sodium hydroxide	-	LC50: = 45.4 mg/L, 96h static (Oncorhynchus mykiss)	-	Not listed

Persistence and Degradability Miscible with water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Boric acid (H ₃ BO ₃)	-0.757

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a

hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

<u>DOT</u>	Not regulated
<u>TDG</u>	Not regulated
<u>IATA</u>	Not regulated
<u>IMDG/IMO</u>	Not regulated

15. Regulatory information

United States of America Inventory

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	TSCA - EPA Regulatory Flags
Buffer solution pH 10 (borate), nach NIST	NA	-	-	-
Water	7732-18-5	X	ACTIVE	-
Potassium chloride	7447-40-7	X	ACTIVE	-
Boric acid (H ₃ BO ₃)	10043-35-3	X	ACTIVE	-
Sodium hydroxide	1310-73-2	X	ACTIVE	-

Legend:

TSCA US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

- - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories

Canada (DSL/NDL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Japan (ISHL), Australia (AICS), China (IECSC), Korea (KECL).

Component	CAS No	DSL	NDL	EINECS	PICCS	ENCS	ISHL	AICS	IECSC	KECL
Buffer solution pH 10 (borate), nach NIST	NA	-	-	-	-	-	-	-	-	-
Water	7732-18-5	X	-	231-791-2	X	X	-	X	X	KE-35400
Potassium chloride	7447-40-7	X	-	231-211-8	X	X	X	X	X	KE-29086
Boric acid (H ₃ BO ₃)	10043-35-3	X	-	233-139-2	X	X	X	X	X	KE-03499
Sodium hydroxide	1310-73-2	X	-	215-185-5	X	X	X	X	X	KE-31487

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

U.S. Federal Regulations

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Sodium hydroxide	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA This material, as supplied, contains one or more substances regulated as a hazardous

substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium hydroxide	1000 lb	-

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Water	-	-	X	-	-
Boric acid (H ₃ BO ₃)	-	X	-	X	-
Sodium hydroxide	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
 DOT Marine Pollutant N
 DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations**Mexico - Grade**

No information available

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Boric acid (H ₃ BO ₃)	-	Use restricted. See item 30. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	SVHC Candidate list - 233-139-2 - Toxic for reproduction, Article 57c
Sodium hydroxide	-	Use restricted. See item 75. (see link for restriction details)	-

After the sunset date the use of this substance requires either an authorization or can only be used for exempted uses, e.g. use in scientific research and development which includes routine analytics or use as intermediate.

<https://echa.europa.eu/authorisation-list>

<https://echa.europa.eu/substances-restricted-under-reach>

<https://echa.europa.eu/candidate-list-table>

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

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Buffer solution pH 10 (borate), nach NIST	NA	Not applicable	Not applicable	Not applicable	Not applicable
Water	7732-18-5	Listed	Not applicable	Not applicable	Not applicable
Potassium chloride	7447-40-7	Listed	Not applicable	Not applicable	Not applicable
Boric acid (H ₃ BO ₃)	10043-35-3	Listed	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Listed	Not applicable	Not applicable	Not applicable

Component	CAS No	Seveso III Directive (2012/18/EC) -	Seveso III Directive (2012/18/EC) -	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
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		Qualifying Quantities for Major Accident Notification	Qualifying Quantities for Safety Report Requirements		
Buffer solution pH 10 (borate), nach NIST	NA	Not applicable	Not applicable	Not applicable	Not applicable
Water	7732-18-5	Not applicable	Not applicable	Not applicable	Not applicable
Potassium chloride	7447-40-7	Not applicable	Not applicable	Not applicable	Not applicable
Boric acid (H3BO3)	10043-35-3	Not applicable	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Not applicable	Not applicable	Not applicable	Annex I - Y35

16. Other information

Prepared By

Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date

25-Dec-2021

Print Date

25-Dec-2021

Revision Summary

This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Creation Date 11-February-2010

Revision Date 24-December-2021

Revision Number 4

1. Identification

Product Name Sodium Hydroxide Solution, 0.5N (Certified)

Cat No. : SS270-1; SS270-4; SS270-20; XXSS270200LI; NC1667433

Synonyms Caustic soda solution; Lye solution (Certified)

Recommended Use Laboratory chemicals.

Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company

Importer/Distributor
Fisher Scientific
112 Colonnade Road,
Ottawa, ON K2E 7L6,
Canada
Tel: 1-800-234-7437

Manufacturer

Fisher Scientific Company
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

WHMIS 2015 Classification Classified as hazardous under the Hazardous Products Regulations (SOR/2015-17)

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2

Label Elements

Signal Word

Warning

Hazard Statements

Causes skin irritation
Causes serious eye irritation

**Precautionary Statements****Prevention**

Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Response

IF ON SKIN: Wash with plenty of soap and water

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

If skin irritation occurs: Get medical advice/attention

If eye irritation persists: Get medical advice/attention

Take off contaminated clothing

Disposal

Dispose of contents/container to an approved waste disposal plant

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Water	7732-18-5	98
Sodium hydroxide	1310-73-2	2

4. First-aid measures

General Advice	If symptoms persist, call a physician.
Eye Contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Skin Contact	Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.
Inhalation	Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.
Ingestion	Clean mouth with water and drink afterwards plenty of water.
Most important symptoms/effects	None reasonably foreseeable. . Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Unsuitable Extinguishing Media	Carbon dioxide (CO ₂)
Flash Point	Not applicable
Method -	No information available

Autoignition Temperature	No information available
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Corrosive material. Thermal decomposition can lead to release of irritating gases and vapors.

Hazardous Combustion Products

Sodium oxides.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
3

Flammability
0

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions	Use personal protective equipment as required. Ensure adequate ventilation.
Environmental Precautions	Should not be released into the environment. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling	Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation.
Storage.	Keep containers tightly closed in a dry, cool and well-ventilated place. Corrosives area. Incompatible Materials. Acids. Metals.

8. Exposure controls / personal protection

Exposure Guidelines

Component	Alberta	British Columbia	Ontario TWA/EV	Quebec	ACGIH TLV	OSHA PEL	NIOSH IDLH
Sodium hydroxide	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	CEV: 2 mg/m ³	Ceiling: 2 mg/m ³	Ceiling: 2 mg/m ³	(Vacated) Ceiling: 2 mg/m ³ TWA: 2 mg/m ³	IDLH: 10 mg/m ³ Ceiling: 2 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection
Hand ProtectionGoggles
Wear appropriate protective gloves and clothing to prevent skin exposure.

Glove material	Breakthrough time	Glove thickness	Glove comments
Natural rubber	See manufacturers	-	Splash protection only
Nitrile rubber	recommendations		
Neoprene			
PVC			

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Recommended Filter type: Particulates filter conforming to EN 143

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls

No information available.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear
Odor	Odorless
Odor Threshold	No information available
pH	12.0 Alkaline
Melting Point/Range	0 °C / 32 °F
Boiling Point/Range	100 °C / 212 °F
Flash Point	Not applicable
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	14 mmHg
Vapor Density	> 1.0
Specific Gravity	1.0
Solubility	Soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	NaOH

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.

Conditions to Avoid	Incompatible products. Excess heat. Exposure to air or moisture over prolonged periods.
Incompatible Materials	Acids, Metals
Hazardous Decomposition Products	Sodium oxides
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50

Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50

Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	-	-	-
Sodium hydroxide	LD50 = 325 mg/kg (Rat)	LD50 = 1350 mg/kg (Rabbit)	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Causes burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed
Sodium hydroxide	1310-73-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects Mutagenic effects have occurred in experimental animals.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. .

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium hydroxide	-	LC50: = 45.4 mg/L, 96h static (Oncorhynchus mykiss)	-	Not listed

Persistence and Degradability Soluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1824
 Proper Shipping Name SODIUM HYDROXIDE SOLUTION
 Hazard Class 8
 Packing Group II

TDG

UN-No UN1824
 Proper Shipping Name SODIUM HYDROXIDE SOLUTION
 Hazard Class 8
 Packing Group II

IATA

UN-No UN1824
 Proper Shipping Name SODIUM HYDROXIDE SOLUTION
 Hazard Class 8
 Packing Group II

IMDG/IMO

UN-No UN1824
 Proper Shipping Name SODIUM HYDROXIDE SOLUTION
 Hazard Class 8
 Packing Group II

15. Regulatory information

International Inventories

Component	CAS-No	DSL	NDSL	TSCA	TSCA Inventory notification - Active-Inactive	EINECS	ELINCS	NLP
Water	7732-18-5	X	-	X	ACTIVE	231-791-2	-	-
Sodium hydroxide	1310-73-2	X	-	X	ACTIVE	215-185-5	-	-

Component	CAS-No	IECSC	KECL	ENCS	ISHL	TCSI	AICS	NZIoC	PICCS
Water	7732-18-5	X	KE-35400	X	-	X	X	X	X
Sodium hydroxide	1310-73-2	X	KE-31487	X	X	X	X	X	X

Legend:

X - Listed '-' - Not Listed

KECL - NIER number or KE number (<http://ncis.nier.go.kr/en/main.do>)

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

ENCS - Japanese Existing and New Chemical Substances
 AICS - Australian Inventory of Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances

Canada

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

Other International Regulations

Authorisation/Restrictions according to EU REACH

Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Sodium hydroxide	-	Use restricted. See item 75. (see link for restriction details)	-

<https://echa.europa.eu/substances-restricted-under-reach>

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

Component	CAS-No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential	Restriction of Hazardous Substances (RoHS)
Water	7732-18-5	Listed	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Listed	Not applicable	Not applicable	Not applicable

Component	CAS-No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Water	7732-18-5	Not applicable	Not applicable	Not applicable	Not applicable
Sodium hydroxide	1310-73-2	Not applicable	Not applicable	Not applicable	Annex I - Y35

16. Other information

Prepared By Regulatory Affairs
 Thermo Fisher Scientific
 Email: EMSDS.RA@thermofisher.com

Creation Date 11-February-2010

Revision Date 24-December-2021

Print Date 24-December-2021

Revision Summary This document has been updated to comply with the requirements of WHMIS 2015 to align with the Globally Harmonised System (GHS) for the Classification and Labelling of Chemicals.

Disclaimer

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

End of SDS

The following list contains the Material Safety Data Sheets you requested. Please scroll down to view the requested MSDS(s).

Product	MSDS	Distributor	Format	Language	Quantity
2429300	1403332	Hach Company	ROWGHS	English	1
2429300	2106669	Hach Company	ROWGHS	English	1

Total Enclosures: 2

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

MSDS No: M00188

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Cyclohexanone

Catalog Number: 1403332

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00188

Chemical Name: Cyclohexanone

CAS Number: 108-94-1

Additional CAS No. (for hydrated forms): Not applicable

Chemical Formula: C₆H₁₀O

Chemical Family: Ketones

Intended Use: Laboratory reagent Solvent

2. HAZARDS IDENTIFICATION

GHS Classification:

Hazard categories: Flammable Liquids: Flam. Liq. 3 Acute Toxicity: Acute Tox. 4-Orl Acute Toxicity: Acute Tox. 3-Derm Acute Toxicity: Acute Tox. 4-Inh Skin Corrosion/Irritation: Skin Irrit. 2 Serious Eye Damage/Eye Irritation: Eye Dam. 1 Specific Target Organ Toxicity - Single Exposure: STOT SE 1

GHS Label Elements:

DANGER



Hazard statements: Flammable liquid and vapour. Harmful if inhaled. Toxic in contact with skin. Causes skin irritation. Causes serious eye damage. Harmful if swallowed. Causes damage to organs.

Precautionary statements: Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Do not breathe dust/fume/gas/mist/vapours/spray. Wear protective gloves / protective clothing / eye protection / face protection. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. 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/physician. IF INHALED: Remove victim/person to fresh air and keep at rest in a position comfortable for breathing. In case of fire: Use dry sand or extinguishing powder for extinction.

HMIS:

Health: 3

Flammability: 2

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3

Flammability: 2

Reactivity: 0

Symbol: Not applicable

WHMIS Hazard Classification: Class B, Division 3 - Combustible liquids Class D, Division 1, Subdivision B - Toxic material (immediate effects)

WHMIS Symbols: Acute Poison Flammable / Combustible

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Components according to GHS:

Cyclohexanone

CAS Number: 108-94-1

Chemical Formula: C₆H₁₀OC₆H₁₀O

GHS Classification: Flam. Liq. 3, H226; Acute Tox. 4-Orl, H302; Acute Tox. 3-Derm, H311; Skin Irrit. 2, H315; Eye Dam. 1, H318; Acute Tox. 4-Inh, H332; STOT Single 1, H370

Percent Range (Trade Secret): 100.0

Percent Range Units: weight / weight

PEL: 50 ppm (200 mg/m³)

TLV: 20 ppm (80 mg/m³)

WHMIS Symbols: Acute Poison Flammable / Combustible

4. FIRST AID MEASURES

General Information: In the event of exposure, show this Material Safety Data Sheet and label (where possible) to a doctor.

Advice to doctor: Treat symptomatically.

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician immediately.

Skin Contact (First Aid): Wash skin with soap and plenty of water. Remove contaminated clothing. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. If you feel unwell, contact a physician

Ingestion (First Aid): Never give anything by mouth to an unconscious person. Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately.

5. FIRE FIGHTING MEASURES

Flammable Properties: Flammable liquid and vapors. Vapors can travel to a source of ignition and flash back.

Fire Fighting Instruction: Containers can build up pressure if exposed to heat. As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance.

Extinguishing Media: Carbon dioxide Dry chemical. Alcohol foam. Water spray to cool containers

Extinguishing Media NOT To Be Used: Not applicable

Fire / Explosion Hazards: Combustible liquid Do not expose to flames. Do not expose to sparks or other ignition sources. May react violently with: aldehydes strong acids strong bases strong oxidizers strong reducers

Hazardous Combustion Products: Toxic fumes of: carbon monoxide, carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Containment Technique: Releases of this material may contaminate the environment. Remove all combustible material from spill area. Remove all ignition and spark-creating sources from the spill area. Cover spilled liquid with a commercially available flammable liquid sorbent such as vapor barrier blanket or activated carbon to avoid evolution of fumes. Vapors may travel to a source of ignition and flash back. May be ignited by: heat, sparks, or flames. Material will float on water creating a fire hazard. Dike the material to create a barrier to combustibles.

Clean-up Technique: Eliminate all sources of ignition. Do not breathe the fumes. If permitted by regulation, Cover with an inert material, such as sand. Use only non-sparking tools. Sweep up material. Incinerate material at a government approved hazardous waste facility. Decontaminate the area of the spill with a soap solution. Otherwise, Pick up spill for disposal and place in a closed container Dispose of in accordance with local, state and federal regulations or laws.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

DOT Emergency Response Guide Number: 127

7. HANDLING AND STORAGE

Handling: Avoid contact with: eyes skin clothing Do not breathe mist or vapors. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Store between 10° and 25°C. Protect from: heat light Keep away from: acids alkalies oxidizers reducers

Flammability Class: Class II

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: lab coat nitrile gloves In the EU, the selected gloves must satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 derived from it.

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Use with adequate ventilation. Protect from: heat light Keep away from: acids/acid fumes alkalies oxidizers reducers

TLV: 20 ppm (80 mg/m³)

PEL: 50 ppm (200 mg/m³)

For Occupational Exposure Limits (OEL) for ingredients, see section 3 - Composition/Information on Ingredients.:

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid

Physical State: Liquid

Molecular Weight: 98.14 g/mol

Odor: Peppermint

Odor Threshold: 0.12 ppm

pH: 7

Metal Corrosivity:

Corrosivity Classification: Not classified as corrosive to metals according to GHS criteria.

Steel: Not determined

Aluminum: Not determined

Specific Gravity/ Relative Density (water = 1; air = 1): 0.948

Viscosity: 2.02 cP @ 25 °C (77 °F)

Solubility:

Water: 25 g/L

Acid: Not determined

Other: Soluble in ethanol and most organic solvents

Partition Coefficient (n-octanol / water): 0.81

Coefficient of Water / Oil: Not determined

Melting Point: -26 °C (-15 °F)

Decomposition Temperature: Not applicable

Boiling Point: 155.6 °C (312.1 °F)

Vapor Pressure: 4.33 mm Hg @ 25 °C (77 °F)

Vapor Density (air = 1): 3.4

Evaporation Rate (water = 1): 0.29

Volatile Organic Compounds Content: 100 %

Flammable Properties: Flammable liquid and vapors. Vapors can travel to a source of ignition and flash back.

Flash Point: 44 °C (111 °F)

Method: Closed cup

Flammability Limits:

Lower Explosion Limits: 1.1 %

Upper Explosion Limits: 8.1 %

Autoignition Temperature: 420 °C (788 °F)

Explosive Properties:

Not classified according to GHS criteria.

Oxidizing Properties:

Not classified according to GHS criteria.

Reactivity Properties:

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

Gas under Pressure:

Not classified according to GHS criteria.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Mechanical Impact: None reported

Static Discharge: None reported.

Reactivity / Incompatibility: Incompatible with: acids alkalies oxidizers reducers

Hazardous Decomposition: Heating to decomposition releases toxic fumes of carbon monoxide and carbon dioxide.

Conditions to Avoid: Contact with heat, sparks, open flames or other ignition sources. Exposure to light.

11. TOXICOLOGICAL INFORMATION

Toxicokinetics, Metabolism and Distribution: Summary of findings reported in the literature follow.

Cyclohexanone is metabolized to cyclohexanol, which is conjugated with glucuronic acid and excreted mainly in urine.

Toxicologically Synergistic Products: None reported

Acute Toxicity: Toxicological Testing Route Data Given Below

Oral Rat LD50 = 1296 - 1600 mg/kg

Dermal Rabbit LD50 = 984 mg/kg

Inhalation Rat LC50 = 6.2 - 32.5 mg/L/4 hr

Specific Target Organ Toxicity - Single Exposure (STOT-SE): Target Organs Liver Kidneys Central nervous system Respiratory Tract

Humans - Acute liver and kidney failure have been reported. May cause respiratory tract irritation, and disrupt the central nervous system causing narcotic effects. Spleen effects in rats has been reported.

Specific Target Organ Toxicity - Repeat Exposure (STOT-RE): Target Organs Liver Kidneys Central nervous system Respiratory Tract

Based on single exposure.

Skin Corrosion/Irritation: Irritating to skin.

Skin - Rabbit - Irritating.

Eye Damage: Corrosive to eyes. Data found is significant but not sufficient for classification.

Eyes - Rabbit - 0.250 mg/24 hr/Severe irritation.

Sensitization: Based on classification principles, the classification criteria are not met.

CMR Effects/Properties (carcinogenic, mutagenic or toxic to reproduction): Data insufficient for classification Based on classification principles, the classification criteria are not met. Summary of findings reported in the literature follow.

Cytogenetic Analysis - Human Leukocyte - 0.1 mmol/L; Cytogenetic Analysis - Human Lymphocyte - 0.05 mmol/L.

Inhalation Rat TCLo = 105 mg/m³/Pre-implantation mortality; Inhalation Mouse TCLo = 1400 ppm/Fetotoxicity, musculoskeletal system

IARC Group 3: Non-classifiable

Cyclohexanone

NTP Listed: No

O.S.H.A. Listed: No

Symptoms/Effects:

Ingestion: Harmful May cause: central nervous system depression diarrhea dizziness drowsiness headache loss of coordination nausea vomiting weakness liver damage spleen damage kidney failure death kidney damage

Inhalation: Harmful May cause: respiratory tract irritation nausea vomiting diarrhea headache dizziness drowsiness incoordination central nervous system depression loss of consciousness kidney damage liver damage lung damage death

Skin Absorption: Toxic Will be absorbed through the skin. Effects similar to those of ingestion

Chronic Effects: Chronic overexposure may cause liver damage kidney damage spleen damage symptoms of neurotoxicity respiratory tract damage narcotic effects lung damage dermatitis brain damage

Medical Conditions Aggravated: Pre-existing: Kidney conditions Liver conditions Chronic disorders of the skin, respiratory tract, eyes, nervous system or cardiovascular system.

12. ECOLOGICAL INFORMATION

Product Ecological Information: 48 hr Golden ides LC50 = 536 mg/L; 96 hr Pimephales promelas LC50 = 576 mg/L; 24 hr Daphnia magna EC50 = 820 mg/L.

Based on classification principles, not classified as hazardous to the environment. No bioaccumulation potential. Rapidly biodegradable. Mobility in soil: Moderate to High

CEPA Categorization: Not Persistent or Bioaccumulative. Not inherently toxic to aquatic organisms.

Biodegradation: BOD - 87% in 14 days. Experimental log K_{ow} = 0.81. KOCWIN Estimation: log K_{oc} = 1.57

Ingredient Ecological Information: --

Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D001

Special Instructions (Disposal): Incinerate material at an E.P.A. approved hazardous waste facility.

Empty Containers: Rinse three times with an appropriate solvent. Collect rinsate and dispose of according to local, state or federal regulations. In the US, rinsate from empty containers is classified as hazardous waste and should be disposed of at an E.P. A. approved facility. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information. In Europe: Chemical and analysis solutions must be disposed of in compliance with the respective national regulations. Product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Cyclohexanone

--

Hazard Class: 3

Subsidiary Risk: NA

ID Number: UN1915

Packing Group: III

T.D.G.:

Proper Shipping Name: Cyclohexanone

--

Hazard Class: 3.3

Subsidiary Risk: NA

UN Number/PIN: 1915

Packing Group: III

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Cyclohexanone

--

Hazard Class: 3

Subsidiary Risk: NA

ID Number: UN1915

Packing Group: III

I.M.O.:

Proper Shipping Name: Cyclohexanone

--

Hazard Class: 3

Subsidiary Risk: NA

ID Number: UN1915

Packing Group: III

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard Delayed (Chronic) Health Hazard Fire Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

--

302 (EHS) TPQ (40 CFR 355): Not applicable

304 CERCLA RQ (40 CFR 302.4): Cyclohexanone 5000 lbs.

304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): Not applicable

California Perchlorate Rule CCR Title 22 Chap 33: Not applicable

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: TSCA Listed: Yes

CAS Number: 108-94-1

Canadian Inventory Status: DSL Listed: Yes

EEC Inventory Status: EINECS Listed: Yes

Australian Inventory (AICS) Status: Listed

New Zealand Inventory (NZIoC) Status: Listed

Korean Inventory (KECI) Status: Listed

Japan (ENCs) Inventory Status: Listed

China (PRC) Inventory (MEP) Status: Listed

16. OTHER INFORMATION

References: CCINFO MSDS/FTSS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86. Cincinnati: U.S. Department of Health and Human Services, April, 1987. Patty, Frank A. Industrial Hygiene and Toxicology, 3rd Revised Edition. Volume 2. New York: A Wiley-Interscience Publication, 1981. Technical Judgment. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. Vendor Information. EU Occupational Exposure Limits On Line.

Complete Text of H phrases referred to in Section 3: H226 Flammable liquid and vapour. H302 Harmful if swallowed. H311 Toxic in contact with skin. H315 Causes skin irritation. H318 Causes serious eye damage. H332 Harmful if inhaled. H370 Causes damage to organs.

Revision Summary: Substantial revision to comply with EU Reg 1272/2008, Reg 1907/2006 and UN GHS (ST/SG/AC.10/36/Add.3).

Date of MSDS Preparation:

Day: 22

Month: July

Year: 2014

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

CCOHS Evaluation Note: It is offered under exemption from WHMIS labeling as specified in the Controlled Products Regulation (CPR) Section 17. It is offered under the interim policy that was established by Health Canada permitting use of GHS-formatted safety data sheets in Canada prior to revision of CPR to GHS. This product has been classified and labeled in accordance with the requirements of GHS (ST/SG/AC.10/36/Add.3).

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE.
HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA
OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

HACH COMPANY ©2015

World Headquarters
Hach Company
P.O.Box 389
Loveland, CO USA 80539(970) 669-3050

MSDS No: M00048

SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: ZincoVer ® 5 Zinc Reagent
Catalog Number: 2106669

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00048
Chemical Name: Not applicable
CAS Number: Not applicable
Additional CAS No. (for hydrated forms): Not applicable
Chemical Formula: Not applicable
Chemical Family: Not applicable
Intended Use: Laboratory Reagent Determination of zinc

2. HAZARDS IDENTIFICATION

GHS Classification:

Hazard categories: Acute Toxicity: Acute Tox. 4-Orl Acute Toxicity: Acute Tox. 3-Derm Acute Toxicity: Acute Tox. 4-Inh Skin Corrosion/Irritation: Skin Irrit. 2 Serious Eye Damage/Eye Irritation:Eye Irrit. 2 Reproductive Toxicity: Repr. 1B Specific Target Organ Toxicity - Single Exposure: STOT SE 3 Hazardous to the Aquatic Environment: Aquatic Acute 1 Hazardous to the Aquatic Environment: Aquatic Chronic 1

GHS Label Elements:

DANGER



Hazard statements: May damage fertility. May damage the unborn child. Harmful if swallowed. Very toxic to aquatic life. Toxic if swallowed. Toxic in contact with skin. Harmful if inhaled. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May damage fertility. Suspected of damaging the unborn child. Causes damage to liver through prolonged or repeated exposure by inhalation. Very toxic to aquatic life with long lasting effects. Toxic to aquatic life with long lasting effects.

Contact with acids liberates very toxic gas.

Precautionary statements: If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Rinse mouth. IF exposed or concerned: Get medical advice/attention. Obtain special instructions before use. Avoid breathing dust/fume/gas/mist/vapours/spray. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Collect spillage. Store in a well-ventilated place. Keep container tightly closed. Do not breathe dust/fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Handle environmental release according to local, state, federal, provincial requirements. Wear eye protection. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. IF ON SKIN: Wash with plenty of soap and water. IF INHALED: Remove victim/person to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor/physician if you feel unwell. Remove/Take off immediately all contaminated clothing. Dispose of contents/container according to state, local, federal or national regulations.

HMIS:

Health: 3
Flammability: 0
Reactivity: 1
Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3
Flammability: 0
Reactivity: 1
Symbol: Not applicable

WHMIS Hazard Classification: Class D, Division 1, Subdivision A - Very toxic materials (immediate effects) Class D, Division 2, Subdivision B - Toxic material (other toxic effects)

WHMIS Symbols: Acute Poison Other Toxic Effects

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Components according to GHS:

Potassium Borate

CAS Number: 1332-77-0

Chemical Formula:

GHS Classification: Acute Tox. 5 -Orl, H303; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT Single 3, H335; Repr. 1B, H360

Percent Range (Trade Secret): 50.0 - 60.0

Percent Range Units: weight / weight

PEL: 15 mg/m³ as inhalable dust; 5 mg/m³ as respirable dust

TLV: 10 mg/m³ as inhalable dust; 3 mg/m³ as respirable dust

WHMIS Symbols: Other Toxic Effects

Boron Oxide

CAS Number: 1303-86-2

Chemical Formula: B₂O₃

GHS Classification: Acute Tox. 5 -Orl, H303; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT Single 3, H335; Repr. 1B, H360

Percent Range (Trade Secret): 15 - 20

Percent Range Units: weight / weight

PEL: 15 mg/m³

TLV: 10 mg/m³

WHMIS Symbols: Other Toxic Effects

Potassium Cyanide

CAS Number: 151-50-8

Chemical Formula: KCN

GHS Classification: Met. Corr. 1, H290; Acute Tox. 2 -Orl, H300; Acute Tox. 1 -Derm, H310; Acute Tox. 2 -Inh, H330; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Aquatic Acute 1, H400; Aquatic Chronic 1, H410;

Percent Range (Trade Secret): 1.0 - 5.0

Percent Range Units: weight / weight

PEL: 5 mg/m³ (skin)

TLV: 5 mg/m³ (skin)

WHMIS Symbols: Acute Poison

Hazardous Components according to GHS: No

Zincon

CAS Number: 62625-22-3

Chemical Formula: C₂₀H₁₅N₄O₆S.Na

GHS Classification: Not hazardous per GHS

Percent Range (Trade Secret): < 0.5

Percent Range Units: weight / weight

PEL: Not established

TLV: Not established

WHMIS Symbols: Not applicable

Sodium Ascorbate

CAS Number: 134-03-2

Chemical Formula: $C_6H_7O_6Na$

GHS Classification: Not applicable

Percent Range (Trade Secret): 20.0 - 25.0

Percent Range Units: weight / weight

PEL: 15 mg/m³ as inhalable dust; 5 mg/m³ as respirable dust

TLV: 10 mg/m³ as inhalable dust; 3 mg/m³ as respirable dust

WHMIS Symbols: Not applicable

4. FIRST AID MEASURES

General Information: In the event of exposure, show this Material Safety Data Sheet and label (where possible) to a doctor.

Advice to doctor: Treat symptomatically. If patient has not responded to amyl nitrite, inject intravenously 10 mL of a 3% solution of sodium nitrite at a rate not greater than 2.5 - 5 mL/min.

Emergency response to cyanide exposure should be planned and practiced prior to work with cyanides. First responders should start treatment and get medical attention immediately. Antidote: break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Repeat 5 times at 15 second intervals. Transport to hospital immediately. Note to Physician: Have a cyanide first aid kit available. If patient has not responded to amyl nitrite, inject intravenously 10 mL of a 3% solution of sodium nitrite at a rate not greater than 2.5 - 5 mL/min. Follow directly with 50 mL of a 25 % solution of sodium thiosulfate at the same rate by the same route. Keep patient under observation. If signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in one-half the original doses.

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician immediately.

Skin Contact (First Aid): Wash skin with soap and plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

Inhalation: Remove to fresh air. Always have on hand a cyanide first aid kit. Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Call physician.

Ingestion (First Aid): Call physician immediately. Never give anything by mouth to an unconscious person. Always have on hand a cyanide first aid kit. Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds.

5. FIRE FIGHTING MEASURES

Flammable Properties: Combustion generates toxic fumes. Dusts at sufficient concentrations can form explosive mixtures with air. Not applicable

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance. Water runoff can cause environmental damage. Dike and collect water used to fight fire.

Extinguishing Media: Alkali dry chemical. Do NOT use carbon dioxide.

Extinguishing Media NOT To Be Used: Not applicable Do NOT use carbon dioxide.

Fire / Explosion Hazards: High concentrations of dust may form an explosive mixture with air.

Hazardous Combustion Products: Toxic fumes of: cyanide compounds nitrogen oxides. potassium oxides boron compounds

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Containment Technique: Releases of this material may contaminate the environment. Stop spilled material from being released to the environment.

Clean-up Technique: If permitted by regulation, Carefully mist spill with bleach until saturated. Scoop up slurry into a large beaker. Oxidize spilled material with a 50% excess of bleach containing at least 5% sodium hypochlorite. Allow to react for 24 hours in a fume hood. Flush reacted material to the drain with a large excess of water. Decontaminate area

with bleach solution. Otherwise, Pick up spill for disposal and place in a closed container. Dispose of in accordance with local, state and federal regulations or laws.

Evacuation Procedure: Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

DOT Emergency Response Guide Number: Not applicable

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes skin clothing. Do not breathe dust. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: moisture. Keep away from: acids.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: safety glasses with top and side shields

Skin Protection: disposable latex gloves lab coat. In the EU, the selected gloves must satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 derived from it.

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing. Do not breathe: dust. Wash thoroughly after handling. Keep away from: acids/acid fumes. Protect from: moisture.

TLV: Not established

PEL: Not established

For Occupational Exposure Limits (OEL) for ingredients, see section 3 - Composition/Information on Ingredients.:

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Purple

Physical State: Solid

Molecular Weight: Not applicable

Odor: Not determined

Odor Threshold: Not available

pH: of 5% solution = 8.7

Metal Corrosivity:

Corrosivity Classification: Not classified as corrosive to metals according to GHS criteria.

Steel: Not determined

Aluminum: Not determined

Specific Gravity/ Relative Density (water = 1; air = 1): 1.83

Viscosity: Not determined

Solubility:

Water: Soluble

Acid: Generates HCN

Other: Not determined

Partition Coefficient (n-octanol / water): Not determined

Coefficient of Water / Oil: Not determined

Melting Point: 155°C 311°F

Decomposition Temperature: Not determined

Boiling Point: Not applicable

Vapor Pressure: Not applicable

Vapor Density (air = 1): Not applicable

Evaporation Rate (water = 1): Not applicable

Volatile Organic Compounds Content: Not determined

Flammable Properties: Not applicable

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Explosive Properties:

Not classified according to GHS criteria.

Oxidizing Properties:

Not classified according to GHS criteria.

Reactivity Properties:

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

Gas under Pressure:

Not classified according to GHS criteria.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Mechanical Impact: None reported

Static Discharge: None reported.

Reactivity / Incompatibility: Incompatible with: acids

Hazardous Decomposition: Toxic fumes of: cyanide boron compounds nitrogen oxides potassium oxide Contact with acids/acid fumes releases toxic cyanide gas.

Conditions to Avoid: Excess moisture Heating to decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicokinetics, Metabolism and Distribution: No information available for mixture.

Toxicologically Synergistic Products: None reported

Acute Toxicity: Toxicological Testing and/or Acute Toxicity Estimate (ATE) - Calculated from Ingredient Toxicity Data

Testing data: oral rat LD50 = 383 mg/Kg

ATE Dermal Rat LD50 = 423 mg/Kg

ATE Inhalation Rat LD50 = 1.9 mg/l

Specific Target Organ Toxicity - Single Exposure (STOT-SE): Based on classification principles, the classification criteria are not met.

Specific Target Organ Toxicity - Repeat Exposure (STOT-RE): Based on classification principles, the classification criteria are not met.

Skin Corrosion/Irritation: Mildly irritating to skin.

Eye Damage: Based on classification principles, the classification criteria are not met.

Sensitization: Based on classification principles, the classification criteria are not met.

CMR Effects/Properties (carcinogenic, mutagenic or toxic to reproduction): Contains a reproductive toxin. Reported impairment of fertility by substance or ingredient of mixture.

This product does NOT contain any IARC listed chemicals.

This product does NOT contain any NTP listed chemicals.

This product does NOT contain any OSHA listed carcinogens.

Symptoms/Effects:

Ingestion: Harmful May cause: confusion gastrointestinal tract irritation irregular heartbeat

Inhalation: Harmful May cause: irritation of nose and throat confusion irregular heartbeat

Skin Absorption: Harmful if absorbed through the skin

Chronic Effects: Chronic overexposure may cause brain damage Reproductive toxicity by absorption via ingestion route inhalation route Reproductive toxicity effects include impaired fertility harm to unborn child

Medical Conditions Aggravated: Pre-existing: Respiratory conditions Skin conditions

12. ECOLOGICAL INFORMATION

Product Ecological Information: --

No ecological data available for this product. Mobility in soil: No data available

Ingredient Ecological Information: Boron oxide: Carassius Auratus LC₅₀ 0.57 g/L 3 day; Daphnia magna LC₅₀ 370-490 mg/L at 48hrs; potassium cyanide: Fish 96hr LC50 = 0.068 mg/l; Crustaceas 48 hr LC50 = 0.25 mg/l

Potassium Borate, Boron Oxide: Persistent, not bioaccumulative or inherently toxic to aquatic organisms; Potassium Cyanide: Persistent, inherently toxic to aquatic organisms, not bioaccumulative.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D003

Special Instructions (Disposal): Dispose of material in an E.P.A. approved hazardous waste facility.

Empty Containers: Rinse three times with an appropriate solvent. Collect rinsate and dispose of according to local, state or federal regulations. In the US, rinsate from empty containers is classified as hazardous waste and should be disposed of at an E.P. A. approved facility. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information. In Europe: Chemical and analysis solutions must be disposed of in compliance with the respective national regulations. Product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Cyanides, inorganic, solid, nos
(Potassium cyanide mixture)

Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1588

Packing Group: III

T.D.G.:

Proper Shipping Name: Cyanides, inorganic, solid, nos

Hazard Class: 6.1

Subsidiary Risk: 6.1

UN Number/PIN: 1588

Packing Group: III

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Cyanides, inorganic, solid, nos
(Potassium cyanide mixture)

Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1588

Packing Group: III

I.M.O.:

Proper Shipping Name: Cyanides, inorganic, solid, nos
(Potassium cyanide mixture)

Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1588

Packing Group: III

Marine Pollutant: Yes

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply. ALSO NOTE: If the National Competent Authority declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard Delayed (Chronic) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Potassium Cyanide

302 (EHS) TPQ (40 CFR 355): Potassium Cyanide - RQ 100 lbs.

304 CERCLA RQ (40 CFR 302.4): Potassium cyanide 10 lbs.

304 EHS RQ (40 CFR 355): Potassium Cyanide 10 lbs
Clean Water Act (40 CFR 116.4): Potassium cyanide - RQ 10 lbs.
RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): Not applicable

California Perchlorate Rule CCR Title 22 Chap 33: Not applicable

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).

CAS Number: Not applicable

Canadian Inventory Status: All ingredients of this product are DSL/NDSL Listed.

EEC Inventory Status: All ingredients used to make this product are listed on EINECS / ELINCS.

Australian Inventory (AICS) Status: All ingredients are listed.

New Zealand Inventory (NZIoC) Status: All components either listed or exempt.

Korean Inventory (KECI) Status: Some ingredients are not listed or exempt.

Japan (ENCs) Inventory Status: All components either listed or exempt.

China (PRC) Inventory (MEP) Status: Some ingredients are not listed or exempt.

16. OTHER INFORMATION

References: 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. In-house information. Technical Judgment. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. IUCLID Dataset Year 2000 for CAS No. Directive 98/8/EC Assessment Report Boric Oxide 20 February 2009 COMMISSION REGULATION (EC) No 790/2009 (ATP 30)

Complete Text of H phrases referred to in Section 3: H290 May be corrosive to metals. H300 Fatal if swallowed. Not applicable H310 Fatal in contact with skin. H315 Causes skin irritation. H319 Causes serious eye irritation. H330 Fatal if inhaled. H335 May cause respiratory irritation. H360FD May damage fertility. May damage the unborn child. H400 Very toxic to aquatic life. H410 Very toxic to aquatic life with long lasting effects.

Revision Summary: Substantial revision to comply with EU Reg 1272/2008, Reg 1907/2006 and UN GHS (ST/SG/AC.10/36/Add.3). 2,

Date of MSDS Preparation:

Day: 02

Month: September

Year: 2014

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

CCOHS Evaluation Note: It is offered under exemption from WHMIS labeling as specified in the Controlled Products Regulation (CPR) Section 17. It is offered under the interim policy that was established by Health Canada permitting use of GHS-formatted safety data sheets in Canada prior to revision of CPR to GHS. This product has been classified and labeled in accordance with the requirements of GHS (ST/SG/AC.10/36/Add.3). This SDS has been prepared in accordance with the requirements of GHS (ST/SG/AC.10/36/Add.3).

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2015

Hydrochloric Acid, 50% v/v

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 07/03/2013

Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name. : Hydrochloric Acid, 50% v/v
Product code : LC15130

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : For laboratory and manufacturing use only.

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
16063 Zelienople, PA - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin Corr. 1B H314
Eye Dam. 1 H318
STOT SE 3 H335

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



GHS05



GHS07

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation

Precautionary statements (GHS-US) :

P260 - Do not breathe mist, vapours, spray
P264 - Wash exposed skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear protective gloves, eye protection, protective clothing, face protection
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/...
P363 - Wash contaminated clothing before reuse
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

Full text of H-phrases: see section 16

3.2. Mixture

Hydrochloric Acid, 50% v/v

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Name	Product identifier	%	GHS-US classification
Water	(CAS No) 7732-18-5	79.92	Not classified
Hydrochloric Acid, 37% w/w	(CAS No) 7647-01-0	20.08	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	: Remove to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
First-aid measures after skin contact	: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a POISON CENTER or doctor/physician.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries	: Causes severe skin burns and eye damage.
Symptoms/injuries after inhalation	: Possible inflammation of the respiratory tract.
Symptoms/injuries after skin contact	: Caustic burns/corrosion of the skin.
Symptoms/injuries after eye contact	: Causes serious eye damage.
Symptoms/injuries after ingestion	: Nausea. Vomiting. Irritation of the gastric/intestinal mucosa. Diarrhoea.
Chronic symptoms	: Affection/discolouration of the teeth.

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Foam. Dry powder. Carbon dioxide. Water spray. Sand.
Unsuitable extinguishing media	: Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Not flammable.
Explosion hazard	: Not applicable.
Reactivity	: Thermal decomposition generates : Corrosive vapours.

5.3. Advice for firefighters

Firefighting instructions	: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Avoid (reject) fire-fighting water to enter environment.
Protection during firefighting	: Do not enter fire area without proper protective equipment, including respiratory protection.
Other information	: Not applicable.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Try to stop release. Dike and contain spill.
------------------	--

6.1.1. For non-emergency personnel

Protective equipment	: Gloves. Safety glasses. Protective clothing. Face-shield.
Emergency procedures	: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	: Equip cleanup crew with proper protection.
Emergency procedures	: Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up	: Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.
-------------------------	--

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

Hydrochloric Acid, 50% v/v

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. Do not breathe mist, vapours, spray.
- Hygiene measures : Wash exposed skin thoroughly after handling. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Comply with applicable regulations.
- Storage conditions : Keep only in the original container in a cool, well ventilated place away from : incompatible materials. Keep container closed when not in use.
- Incompatible products : metals. cyanides. Strong bases. Strong acids.
- Incompatible materials : Direct sunlight.
- Packaging materials : Do not store in corrodable metal.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.2. Exposure controls

- Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
- Personal protective equipment : Avoid all unnecessary exposure.
- Hand protection : Wear protective gloves.
- Eye protection : Chemical goggles or face shield.
- Skin and body protection : Wear suitable protective clothing.
- Respiratory protection : Wear appropriate mask.
- Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Molecular mass : 36.46 g/mol
- Colour : Colourless.
- Odour : Odourless.
- Odour threshold : No data available
- pH : ≤ 0.5
- Relative evaporation rate (butylacetate=1) : No data available
- Melting point : No data available
- Freezing point : No data available
- Boiling point : No data available
- Flash point : No data available
- Self ignition temperature : No data available
- Decomposition temperature : No data available
- Flammability (solid, gas) : No data available
- Vapour pressure : No data available
- Relative vapour density at 20 °C : No data available
- Relative density : No data available
- Density : 1 - 1.1
- Solubility : Soluble in water. Soluble in ethanol. Soluble in methanol.
- Log Pow : No data available
- Log Kow : No data available
- Viscosity, kinematic : No data available
- Viscosity, dynamic : No data available
- Explosive properties : Not applicable.
- Oxidising properties : None.
- Explosive limits : No data available

Hydrochloric Acid, 50% v/v

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Thermal decomposition generates : Corrosive vapours.

10.2. Chemical stability

Stable under normal conditions. Not established.

10.3. Possibility of hazardous reactions

Reacts violently with (some) bases: release of heat.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

metals. cyanides. Strong bases.

10.6. Hazardous decomposition products

Hydrogen chloride. Thermal decomposition generates : Corrosive vapours.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Hydrochloric Acid, 37% w/w (7647-01-0)

LD50 oral rat	700 mg/kg
LD50 dermal rabbit	5010 mg/kg

Water (7732-18-5)

LD50 oral rat	≥ 90000 mg/kg
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Skin corrosion/irritation : Causes severe skin burns and eye damage.

pH: ≤ 0.5

Serious eye damage/irritation : Causes serious eye damage.

pH: ≤ 0.5

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classifiedBased on available data, the classification criteria are not met

Carcinogenicity : Not classified

Hydrochloric Acid, 37% w/w (7647-01-0)

IARC group	3
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Reproductive toxicity : Not classifiedBased on available data, the classification criteria are not met

Specific target organ toxicity (single exposure) : May cause respiratory irritation.

Specific target organ toxicity (repeated exposure) : Not classifiedBased on available data, the classification criteria are not met

Aspiration hazard : Not classifiedBased on available data, the classification criteria are not met

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after inhalation : Possible inflammation of the respiratory tract.

Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.

Symptoms/injuries after eye contact : Causes serious eye damage.

Symptoms/injuries after ingestion : Nausea. Vomiting. Irritation of the gastric/intestinal mucosa. Diarrhoea.

Chronic symptoms : Affection/discolouration of the teeth.

SECTION 12: Ecological information

12.1. Toxicity

Hydrochloric Acid, 37% w/w (7647-01-0)

LC50 fishes 1	282 mg/l (96 h; Gambusia affinis; PURE SUBSTANCE)
EC50 Daphnia 1	< 56 mg/l (72 h; Daphnia magna; PURE SUBSTANCE)
LC50 fish 2	862 mg/l (Leuciscus idus; PURE SUBSTANCE)
TLM fish 1	282 ppm (96 h; Gambusia affinis; PURE SUBSTANCE)

Hydrochloric Acid, 50% v/v

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12.2. Persistence and degradability

Hydrochloric Acid, 50% v/v

Persistence and degradability	Not established.
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Hydrochloric Acid, 37% w/w (7647-01-0)

Persistence and degradability	Biodegradability: not applicable. No (test) data on mobility of the components of the mixture available.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

12.3. Bioaccumulative potential

Hydrochloric Acid, 50% v/v

Bioaccumulative potential	Not established.
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Hydrochloric Acid, 37% w/w (7647-01-0)

Log Pow	0.25 (QSAR)
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

12.4. Mobility in soil

Hydrochloric Acid, 37% w/w (7647-01-0)

Ecology - soil	May be harmful to plant growth, blooming and fruit formation.
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12.5. Other adverse effects

Other information : Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

UN-No.(DOT)	: 1789
DOT NA no.	UN1789

14.2. UN proper shipping name

DOT Proper Shipping Name	: Hydrochloric acid
Department of Transportation (DOT) Hazard Classes	: 8 - Class 8 - Corrosive material 49 CFR 173.136
Hazard labels (DOT)	: 8 - Corrosive substances



Packing group (DOT)	: II - Medium Danger
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Hydrochloric Acid, 50% v/v

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DOT Special Provisions (49 CFR 172.102)	: A3 - For combination packagings, if glass inner packagings (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packagings. A6 - For combination packagings, if plastic inner packagings are used, they must be packed in tightly closed metal receptacles before packing in outer packagings. B3 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks and DOT 57 portable tanks are not authorized. B15 - Packagings must be protected with non-metallic linings impervious to the lading or have a suitable corrosion allowance. IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. N41 - Metal construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material. T8 - 4 178.274(d)(2) Normal..... Prohibited TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively. TP12 - This material is considered highly corrosive to steel.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 154
DOT Packaging Non Bulk (49 CFR 173.xxx)	: 202
DOT Packaging Bulk (49 CFR 173.xxx)	: 242

14.3. Additional information

Other information	: No supplementary information available.
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Overland transport

No additional information available

Transport by sea

DOT Vessel Stowage Location	: C - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel.
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Air transport

DOT Quantity Limitations Passenger aircraft/rail : 1 L
(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 30 L
CFR 175.75)

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydrochloric Acid, 50% v/v	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard
Hydrochloric Acid, 37% w/w (7647-01-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
RQ (Reportable quantity, section 304 of EPA's List of Lists) :	5000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

15.2. International regulations

CANADA

Hydrochloric Acid, 50% v/v	
WHMIS Classification	Class E - Corrosive Material
Hydrochloric Acid, 37% w/w (7647-01-0)	
Listed on the Canadian DSL (Domestic Substances List) inventory.	
WHMIS Classification	Class E - Corrosive Material

EU-Regulations

No additional information available

Hydrochloric Acid, 50% v/v

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Classification according to Regulation (EC) No. 1272/2008 [CLP]

Classification according to Directive 67/548/EEC or 1999/45/EC

Not classified

15.2.2. National regulations

Hydrochloric Acid, 37% w/w (7647-01-0)

Listed on the Canadian Ingredient Disclosure List

15.3. US State regulations

Hydrochloric Acid, 37% w/w (7647-01-0)

U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Massachusetts - Right To Know List

SECTION 16: Other information

Indication of changes : Revision - See : *

Other information : None.

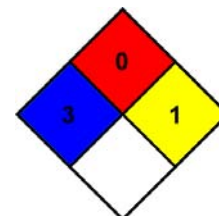
Full text of H-phrases: see section 16:

Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H335	May cause respiratory irritation

NFPA health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

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

NFPA reactivity : 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 0 Minimal Hazard

Physical : 1 Slight Hazard

Personal Protection : H

SDS US (GHS HazCom 2012)

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

SECTION 1: Identification

1.1. Identification

Product form	: Substance
Substance name	: Nitric Acid, 70% w/w
CAS-No.	: 7697-37-2
Product code	: LC17700
Formula	: HNO ₃

1.2. Recommended use and restrictions on use

Use of the substance/mixture	: Chemical raw material Metal surface treatment Printing industry: etch solution Laboratory chemical
Recommended use	: Laboratory chemicals
Restrictions on use	: Not for food, drug or household use

1.3. Supplier

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zellienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number	: CHEMTREC: 1-800-424-9300 or 011-703-527-3887
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

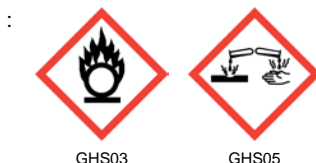
Oxidizing liquids Category 3	H272	May intensify fire; oxidizer
Corrosive to metals Category 1	H290	May be corrosive to metals
Skin corrosion/irritation Category 1A	H314	Causes severe skin burns and eye damage
Serious eye damage/eye irritation Category 1	H318	Causes serious eye damage

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-US labeling

Hazard pictograms (GHS-US)



GHS03

GHS05

Signal word (GHS-US)	: Danger
Hazard statements (GHS-US)	: H272 - May intensify fire; oxidizer H290 - May be corrosive to metals H314 - Causes severe skin burns and eye damage
Precautionary statements (GHS-US)	: P210 - Keep away from heat. - No smoking. P220 - Keep/Store away from clothing, combustible materials P221 - Take any precaution to avoid mixing with combustibles P234 - Keep only in original container. P260 - Do not breathe mist, spray, vapors. P264 - Wash exposed skin thoroughly after handling. P280 - Wear eye protection, face protection, protective clothing, protective gloves. P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated

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clothing. Rinse skin with water/shower.
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a poison center or doctor/physician.
P363 - Wash contaminated clothing before reuse.
P370+P378 - In case of fire: Use carbon dioxide (CO₂), powder, alcohol-resistant foam to extinguish
P390 - Absorb spillage to prevent material-damage.
P405 - Store locked up.
Dispose of contents/container in accordance with local, state and federal regulations.
Store in corrosive resistant/... container with a resistant inner liner
If inhaled: Remove person to fresh air and keep comfortable for breathing

2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Multi-constituent

Name	Product identifier	%	GHS-US classification
Nitric Acid, 70% w/w (Main constituent)	(CAS-No.) 7697-37-2	100	Ox. Liq. 3, H272 Met. Corr. 1, H290 Skin Corr. 1A, H314 Eye Dam. 1, H318

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

First-aid measures after eye contact : Rinse immediately with plenty of water for 15 minutes. Do not apply neutralizing agents. Cover eyes aseptically. Take victim to an ophthalmologist.

First-aid measures after ingestion : Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Give milk to drink. Do not induce vomiting. Do not give activated charcoal. Do not give chemical antidote. Immediately consult a doctor/medical service. Call Poison Information Centre (www.big.be/antigif.htm). Take the container/vomit to the doctor/hospital. Ingestion of large quantities: immediately to hospital.

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

Symptoms/effects after inhalation : Irritation of the respiratory tract. Dry/sore throat. Corrosion of the upper respiratory tract. Coughing. FOLLOWING SYMPTOMS MAY APPEAR LATER: Respiratory difficulties. Possible inflammation of the respiratory tract. Risk of lung edema. Blue/grey discolouration of the skin.

Symptoms/effects after skin contact : Yellow skin. May stain the skin. Caustic burns/corrosion of the skin. Slow-healing wounds.

Symptoms/effects after eye contact : Corrosion of the eye tissue. Permanent eye damage.

Symptoms/effects after ingestion : Nausea. Vomiting. Abdominal pain. Burns to the gastric/intestinal mucosa. Possible esophageal perforation. Shock.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Affection/discolouration of the teeth. Risk of pneumonia.

4.3. Immediate medical attention and special treatment, if necessary

Obtain medical assistance.

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SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media : Adapt extinguishing media to the environment.
- Unsuitable extinguishing media : No unsuitable extinguishing media known.

5.2. Specific hazards arising from the chemical

- Fire hazard : DIRECT FIRE HAZARD. Non combustible. INDIRECT FIRE HAZARD. Promotes combustion. Reactions involving a fire hazard: see "Reactivity Hazard".
- Explosion hazard : INDIRECT EXPLOSION HAZARD. Reactions with explosion hazards: see "Reactivity Hazard".
- Reactivity : Concentrated solution reacts exothermically with water (moisture). Decomposes on exposure to temperature rise: release of toxic and corrosive gases/vapours (nitrous vapours). Violent to explosive reaction with many compounds e.g.: with (strong) reducers, with (some) bases, with organic material and with combustible materials with risk of spontaneous ignition. Reacts violently with (some) metals. Decomposes slowly on exposure to light: release of toxic and corrosive gases/vapours (nitrous vapours). Violent to explosive reaction with (some) metal powders: release of highly flammable gases/vapours (hydrogen).

5.3. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.
- Protection during firefighting : Use self-contained breathing apparatus and chemically protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Dike and contain spill. Absorb spillage to prevent material-damage.

6.1.1. For non-emergency personnel

- Protective equipment : Gas-tight suit. Corrosion-proof suit. See "Material-Handling" to select protective clothing.
- Emergency procedures : Keep upwind. Mark the danger area. Consider evacuation. Seal off low-lying areas. Close doors and windows of adjacent premises. No naked flames. Corrosion-proof appliances. Keep containers closed. Wash contaminated clothes.

6.1.2. For emergency responders

- Protective equipment : Equip cleanup crew with proper protection. Avoid breathing mist, spray.
- Emergency procedures : Stop leak if safe to do so. Ventilate area.

6.2. Environmental precautions

- Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

- For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Dilute toxic gases/vapours with water spray. Take account of toxic/corrosive precipitation water. Hazardous reaction: measure explosive gas-air mixture. Reaction: dilute combustible gas/vapour with water curtain.
- Methods for cleaning up : Take up liquid spill into inert absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Do not take up in combustible material such as: saw dust. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Spill must not return in its original container. Damaged/cooled tanks must be emptied. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

- No additional information available

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Keep the substance free from contamination. Use corrosionproof equipment. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Never dilute by pouring water to the acid. Always add the acid to the water. Keep away from naked flames/heat. Observe very strict hygiene - avoid contact. Keep container tightly closed. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.
- Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

- Incompatible products : combustible materials. metals. Strong bases. Strong reducing agents. wood.
- Incompatible materials : Combustible material. Direct sunlight. Metals.
- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources.
- Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: combustible materials. reducing agents. (strong) bases. cellulosic materials. organic materials. metal powders. water/moisture.
- Storage area : Store in a cool area. Keep out of direct sunlight. Store in a dry area. Store in a dark area. Ventilation at floor level. Fireproof storeroom. Keep locked up. Provide for a tub to collect spills. Aboveground. Keep only in the original container. Store only in a limited quantity. Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: hermetical. dry. clean. opaque. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
- Packaging materials : SUITABLE MATERIAL: stainless steel. aluminium. glass. MATERIAL TO AVOID: synthetic material.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nitric Acid, 70% w/w (7697-37-2)		
ACGIH	ACGIH TWA (ppm)	2 ppm (Nitric acid; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
ACGIH	ACGIH STEL (ppm)	4 ppm (Nitric acid; USA; Short time value; TLV - Adopted Value)
OSHA	OSHA PEL (TWA) (mg/m ³)	5 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	2 ppm
IDLH	US IDLH (ppm)	25 ppm
NIOSH	NIOSH REL (TWA) (mg/m ³)	5 mg/m ³
NIOSH	NIOSH REL (TWA) (ppm)	2 ppm
NIOSH	NIOSH REL (STEL) (mg/m ³)	10 mg/m ³
NIOSH	NIOSH REL (STEL) (ppm)	4 ppm

8.2. Appropriate engineering controls

- Appropriate engineering controls : Emergency eye wash fountains should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Protective goggles. Protective clothing. Face shield. Gloves. Combined gas/dust mask with filter type B/P2.



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Materials for protective clothing:

GIVE LESS RESISTANCE: polyethylene/ethylenevinylalcohol. GIVE POOR RESISTANCE: chloroprene rubber. nitrile rubber. polyethylene. PVA. natural fibres

Hand protection:

Gloves

Eye protection:

Safety glasses

Skin and body protection:

Head/neck protection. Corrosion-proof clothing

Respiratory protection:

Gas mask with filter type B. Gas mask with filter type E. Gas mask with filter type NO. High vapour/gas concentration: self-contained respirator

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Color	: Colourless-yellow On exposure to light: red-brown
Odor	: Irritating/pungent odour Asphyxiating odour
Odor threshold	: 0.29 - 0.98 ppm 0.75 - 2.5 mg/m ³
pH	: 1 (6 %)
pH solution	: 6 %
Melting point	: -42 - -38 °C
Freezing point	: No data available
Boiling point	: 83 - 122 °C
Flash point	: Not applicable
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 7.3 - 58.5 hPa (20 °C)
Relative vapor density at 20 °C	: 2.2
Relative density	: 1.4 - 1.5
Relative density of saturated gas/air mixture	: 1.01
Specific gravity / density	: 1413 - 1513 kg/m ³
Molecular mass	: 63.01 g/mol
Solubility	: Exothermically soluble in water. Soluble in ether. Water: Complete
Log Pow	: -2.3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Auto-ignition temperature	: Not applicable
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: 0.0009 - 0.002 Pa.s (20 °C)
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: May intensify fire; oxidiser.

9.2. Other information

Saturation concentration	: 10 g/m ³
VOC content	: 0 %

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Other properties : Gas/vapour heavier than air at 20°C. Hygroscopic. Producing fumes/mist. Physical properties depending on the concentration. Substance has acid reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity

Concentrated solution reacts exothermically with water (moisture). Decomposes on exposure to temperature rise: release of toxic and corrosive gases/vapours (nitrous vapours). Violent to explosive reaction with many compounds e.g.: with (strong) reducers, with (some) bases, with organic material and with combustible materials with risk of spontaneous ignition. Reacts violently with (some) metals. Decomposes slowly on exposure to light: release of toxic and corrosive gases/vapours (nitrous vapours). Violent to explosive reaction with (some) metal powders: release of highly flammable gases/vapours (hydrogen).

10.2. Chemical stability

Unstable on exposure to light. Hygroscopic.

10.3. Possibility of hazardous reactions

May react violently with reducing agents.

10.4. Conditions to avoid

Direct sunlight. Incompatible materials.

10.5. Incompatible materials

Strong bases. Strong reducing agents. Organic compounds. cyanides. combustible materials. Aldehydes. Ammonia. metals. alcohols.

10.6. Hazardous decomposition products

Nitrogen oxides. oxygen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure	: Inhalation; Skin and eye contact
Acute toxicity	: Not classified
Skin corrosion/irritation	: Causes severe skin burns and eye damage. pH: 1 (6 %)
Serious eye damage/irritation	: Causes serious eye damage. pH: 1 (6 %)
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: Not classified
Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Symptoms/effects after inhalation	: Irritation of the respiratory tract. Dry/sore throat. Corrosion of the upper respiratory tract. Coughing. FOLLOWING SYMPTOMS MAY APPEAR LATER: Respiratory difficulties. Possible inflammation of the respiratory tract. Risk of lung edema. Blue/grey discolouration of the skin.
Symptoms/effects after skin contact	: Yellow skin. May stain the skin. Caustic burns/corrosion of the skin. Slow-healing wounds.
Symptoms/effects after eye contact	: Corrosion of the eye tissue. Permanent eye damage.
Symptoms/effects after ingestion	: Nausea. Vomiting. Abdominal pain. Burns to the gastric/intestinal mucosa. Possible esophageal perforation. Shock.
Chronic symptoms	: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Affection/discolouration of the teeth. Risk of pneumonia.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Classification concerning the environment: not applicable.
Ecology - air	: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009).

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Ecology - water : Maximum concentration in drinking water: 50 mg/l (nitrate) (Directive 98/83/EC). Harmful to fishes. Slightly harmful to invertebrates (Daphnia). May cause eutrophication. pH shift.

Nitric Acid, 70% w/w (7697-37-2)	
EC50 Daphnia 1	180 mg/l (EC50; 48 h)
LC50 fish 2	72 ppm (LC50; 96 h)
Threshold limit algae 1	> 19 mg/l (EC0)

12.2. Persistence and degradability

Nitric Acid, 70% w/w (7697-37-2)	
Persistence and degradability	Biodegradability: not applicable. No test data on mobility of the components available.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

12.3. Bioaccumulative potential

Nitric Acid, 70% w/w (7697-37-2)	
BCF fish 1	<= 1 (BCF)
Log Pow	-2.3 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Bioaccumulation: not applicable.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle/reuse. Remove for physico-chemical/biological treatment. Remove to an authorized dump (Class I). Treat using the best available techniques before discharge into drains or the aquatic environment.

Additional information : LWCA (the Netherlands): KGA category 01. Hazardous waste according to Directive 2008/98/EC.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN2031 Nitric acid (other than red fuming, with at least 65 percent, but not more than 70 percent nitric acid), 8, II

UN-No.(DOT) : UN2031

Proper Shipping Name (DOT) : Nitric acid
other than red fuming, with at least 65 percent, but not more than 70 percent nitric acid

Transport hazard class(es) (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136

Packing group (DOT) : II - Medium Danger

Hazard labels (DOT) : 8 - Corrosive
5.1 - Oxidizer



DOT Packaging Non Bulk (49 CFR 173.xxx) : 158

Nitric Acid, 70% w/w

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DOT Packaging Bulk (49 CFR 173.xxx)	: 242
DOT Special Provisions (49 CFR 172.102)	: A6 - For combination packaging, if plastic inner packaging are used, they must be packed in tightly closed metal receptacles before packing in outer packaging. B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized. B47 - Each tank may have a reclosing pressure relief device having a start-to-discharge pressure setting of 310 kPa (45 psig). IP15 - For UN2031 with more than 55% nitric acid, rigid plastic IBCs and composite IBCs with a rigid plastic inner receptacle are authorized for two years from the date of IBC manufacture. T8 - 4 178.274(d)(2) Normal..... Prohibited TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.
DOT Packaging Exceptions (49 CFR 173.xxx)	: None
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 30 L
DOT Vessel Stowage Location	: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	: 66 - Stow "separated from" flammable solids,74 - Stow "separated from" oxidizers,89 - Segregation same as for oxidizers,90 - Stow "separated from" radioactive materials
Other information	: No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

Nitric Acid, 70% w/w (7697-37-2)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb
SARA Section 311/312 Hazard Classes	Physical hazard - Oxidizer (liquid, solid or gas) Physical hazard - Corrosive to metals Health hazard - Skin corrosion or Irritation Health hazard - Serious eye damage or eye irritation

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Nitric Acid, 70% w/w	CAS-No. 7697-37-2	100%
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15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

Nitric Acid, 70% w/w

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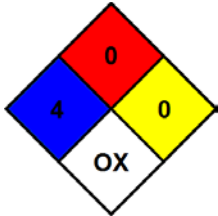
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date : 01/10/2018

Full text of H-phrases: see section 16:

H272	May intensify fire; oxidizer
H290	May be corrosive to metals
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage

NFPA health hazard	: 4 - Materials that, under emergency conditions, can be lethal.	
NFPA fire hazard	: 0 - Materials that will not burn under typical dire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.	
NFPA reactivity	: 0 - Material that in themselves are normally stable, even under fire conditions.	
NFPA specific hazard	: OX - Materials that posses oxidizing properties.	
Hazard Rating		
Health	: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures	
Flammability	: 0 Minimal Hazard - Materials that will not burn	
Physical	: 0 Minimal Hazard - Materials that are normally stable, even under fire conditions, and will NOT react with water, polymerize, decompose, condense, or self-react. Non-Explosives.	
Personal protection	: H H - Splash goggles, Gloves, Synthetic apron, Vapor respirator	

SDS US LabChem

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SECTION 1: Identification

1.1. Identification

Product form : Mixtures
Product name : Sulfuric Acid, 49% w/w
Product code : M10201, FF17001

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : For laboratory and manufacturing use only.
Recommended use : Laboratory chemicals
Restrictions on use : Not for food, drug or household use

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin corrosion/irritation Category 1A H314
Serious eye damage/eye irritation Category 1 H318
Hazardous to the aquatic environment - Acute Hazard Category 3 H402
Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS05

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) : H314 - Causes severe skin burns and eye damage
H402 - Harmful to aquatic life
Precautionary statements (GHS-US) : P260 - Do not breathe mist, spray, vapors
P264 - Wash exposed skin thoroughly after handling
P273 - Avoid release to the environment
P280 - Wear eye protection, face protection, protective clothing, protective gloves
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a poison center or doctor/physician
P363 - Wash contaminated clothing before reuse
P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

Sulfuric Acid, 49% w/w

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2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Water	(CAS No) 7732-18-5	51	Not classified
Sulfuric Acid	(CAS No) 7664-93-9	49	Skin Corr. 1A, H314 Eye Dam. 1, H318

Full text of hazard classes and H-statements : see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
- First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.
- First-aid measures after skin contact : Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor/physician.
- First-aid measures after eye contact : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.
- First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Causes severe skin burns and eye damage.
- Symptoms/injuries after inhalation : Coughing. Irritation of the respiratory tract.
- Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.
- Symptoms/injuries after eye contact : Corrosion of the eye tissue.
- Symptoms/injuries after ingestion : Bleeding of the gastrointestinal tract.
- Symptoms/injuries upon intravenous administration : Not available.
- Chronic symptoms : Respiratory difficulties. Inflammation/damage of the eye tissue. Irritation of the respiratory tract. Skin rash/inflammation.

4.3. Indication of any immediate medical attention and special treatment needed

Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.
- Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Reacts exothermically with water (moisture).
- Explosion hazard : Not applicable.
- Reactivity : Thermal decomposition generates : Corrosive vapors.

5.3. Advice for firefighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.
- Other information : Not applicable.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate area.

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6.1.1. For non-emergency personnel

Protective equipment : Face-shield. Gloves. Protective clothing. Protective goggles.
Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.
Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Do not breathe mist, vapors, spray. Avoid contact during pregnancy/while nursing.
Hygiene measures : Wash exposed skin thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.
Storage conditions : Keep only in the original container in a cool, well ventilated place away from : incompatible materials. Keep container closed when not in use.
Incompatible products : Strong bases. combustible materials. metals.
Incompatible materials : Sources of ignition. Direct sunlight.
Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: (strong) bases. combustible materials. metals. metal powders.
Storage area : Keep container in a well-ventilated place. Keep only in the original container.
Packaging materials : MATERIAL TO AVOID: aluminium, bronze, copper, iron, lead, monel steel, nickel, steel, tin, zinc.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Sulfuric Acid (7664-93-9)		
ACGIH	ACGIH TWA (mg/m ³)	0.2 mg/m ³ (Sulfuric acid; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value; Thoracic fraction)
OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³
IDLH	US IDLH (mg/m ³)	15 mg/m ³
NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³
Water (7732-18-5)		
Not applicable		

8.2. Exposure controls

Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Personal protective equipment : Protective goggles. Gloves. Protective clothing. Face shield. Mist formation: aerosol mask with filter type P1.



Sulfuric Acid, 49% w/w

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Hand protection	: Wear protective gloves.
Eye protection	: Chemical goggles or face shield.
Skin and body protection	: Wear suitable protective clothing.
Respiratory protection	: Wear appropriate mask.
Thermal hazard protection	: None necessary.
Other information	: Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear, colorless liquid.
Color	: Colorless
Odor	: odorless
Odor threshold	: No data available
pH	: ≤ 1
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: Not flammable Non flammable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Specific gravity / density	: 1.386 g/ml
Molecular mass	: 98.08 g/mol
Solubility	: Exothermically soluble in water.
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: 2.6 cSt
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: Not applicable.
Oxidizing properties	: None.

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Thermal decomposition generates : Corrosive vapors.

10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases. Combustible materials.

10.6. Hazardous decomposition products

Sulfur compounds.

Sulfuric Acid, 49% w/w

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure : Skin and eye contact
Acute toxicity : Not classified

Sulfuric Acid (7664-93-9)	
LD50 oral rat	2140 mg/kg body weight (Rat; Experimental value)

Water (7732-18-5)	
LD50 oral rat	≥ 90000 mg/kg
ATE US (oral)	90000.000 mg/kg body weight

Skin corrosion/irritation : Causes severe skin burns and eye damage.
pH: ≤ 1
Serious eye damage/irritation : Causes serious eye damage.
pH: ≤ 1
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified
Based on available data, the classification criteria are not met
Carcinogenicity : Not classified

Sulfuric Acid (7664-93-9)	
Additional information	Strong inorganic acid mists containing sulfuric acid are carcinogenic to humans
IARC group	1 - Carcinogenic to humans
National Toxicology Program (NTP) Status	2 - Known Human Carcinogens

Reproductive toxicity : Not classified
Based on available data, the classification criteria are not met
Specific target organ toxicity – single exposure : Not classified
Specific target organ toxicity – repeated exposure : Not classified
Aspiration hazard : Not classified
Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.
Symptoms/injuries after inhalation : Coughing. Irritation of the respiratory tract.
Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.
Symptoms/injuries after eye contact : Corrosion of the eye tissue.
Symptoms/injuries after ingestion : Bleeding of the gastrointestinal tract.
Symptoms/injuries upon intravenous administration : Not available.
Chronic symptoms : Respiratory difficulties. Inflammation/damage of the eye tissue. Irritation of the respiratory tract.
Skin rash/inflammation.

SECTION 12: Ecological information

12.1. Toxicity

Sulfuric Acid (7664-93-9)	
LC50 fish 1	42 mg/l (LC50; 96 h)
EC50 Daphnia 1	29 mg/l (EC50; 24 h)

12.2. Persistence and degradability

Sulfuric Acid, 49% w/w	
Persistence and degradability	Not established.
Sulfuric Acid (7664-93-9)	
Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable

Sulfuric Acid, 49% w/w

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according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Sulfuric Acid (7664-93-9)

Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable

Water (7732-18-5)

Persistence and degradability	Not established.
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12.3. Bioaccumulative potential

Sulfuric Acid, 49% w/w

Bioaccumulative potential	Not established.
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Sulfuric Acid (7664-93-9)

Log Pow	-2.2 (Estimated value)
Bioaccumulative potential	Bioaccumulation: not applicable.

Water (7732-18-5)

Bioaccumulative potential	Not established.
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12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming	: No known effects from this product.
GWPmix comment	: No known effects from this product.
Other information	: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to comply with local, state and federal regulations.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description	: UN2796 Sulfuric acid (with not more than 51% acid), 8, II
UN-No.(DOT)	: UN2796
Proper Shipping Name (DOT)	: Sulfuric acid with not more than 51% acid
Transport hazard class(es) (DOT)	: 8 - Class 8 - Corrosive material 49 CFR 173.136
Packing group (DOT)	: II - Medium Danger
Hazard labels (DOT)	: 8 - Corrosive



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 202
DOT Packaging Bulk (49 CFR 173.xxx)	: 242

Sulfuric Acid, 49% w/w

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

DOT Special Provisions (49 CFR 172.102)	: A3 - For combination packaging, if glass inner packaging (including ampoules) are used, they must be packed with absorbent material in tightly closed metal receptacles before packing in outer packaging. A7 - Steel packaging must be corrosion-resistant or have protection against corrosion. B2 - MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306 and DOT 406 cargo tanks are not authorized. B15 - Packaging must be protected with non-metallic linings impervious to the lading or have a suitable corrosion allowance. IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized. N6 - Battery fluid packaged with electric storage batteries, wet or dry, must conform to the packaging provisions of 173.159 (g) or (h) of this subchapter. N34 - Aluminum construction materials are not authorized for any part of a packaging which is normally in contact with the hazardous material. T8 - 4 178.274(d)(2) Normal..... Prohibited TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively. TP12 - This material is considered highly corrosive to steel.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 154
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 30 L
DOT Vessel Stowage Location	: B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
Other information	: No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

Sulfuric Acid, 49% w/w	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

Sulfuric Acid, ACS	CAS No 7664-93-9	49%
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Sulfuric Acid (7664-93-9)	
RQ (Reportable quantity, section 304 of EPA's List of Lists)	1000 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	1000 lb
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Sulfuric Acid, 49% w/w

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

15.2. International regulations

CANADA

Sulfuric Acid, 49% w/w	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class E - Corrosive Material
Sulfuric Acid (7664-93-9)	
WHMIS Classification	Class E - Corrosive Material
Water (7732-18-5)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

EU-Regulations

No additional information available

National regulations

Sulfuric Acid, 49% w/w	
Listed on the Canadian IDL (Ingredient Disclosure List)	
Sulfuric Acid (7664-93-9)	
Listed on IARC (International Agency for Research on Cancer)	
Listed as carcinogen on NTP (National Toxicology Program)	

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

Revision date : 02/07/2017

Other information : None.

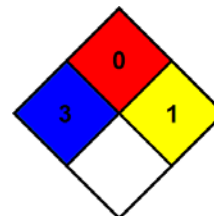
Full text of H-phrases: see section 16:

H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H402	Harmful to aquatic life

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 0 - Materials that will not burn under typical dire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 0 Minimal Hazard - Materials that will not burn

Physical : 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Personal protection : H

H - Splash goggles, Gloves, Synthetic apron, Vapor respirator

SDS US LabChem

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**Product Identifier**

Product Name pH Electrode Storage
Product Number(s) 00653-04, 05942-15
Pure Substance/mixture Mixture

Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Use as laboratory reagent
Uses advised against No information available

Manufacture/Supplier

Cole-Parmer™
North America
625 East Bunker Court
Vernon Hills, IL
60061 USA
Tel: 1-800-323-4340

E-mail address info@coleparmer.com
Made In USA

Emergency Telephone

888-358-4717
8:00 am – 6:00 pm CST

2. HAZARDS IDENTIFICATION**Classification****OSHA Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Classification according to Regulation (EC) No. 1272/2008 [CLP]

This mixture is classified as not hazardous according to regulation (EC) 1272/2008 [GHS]

Label Elements**Emergency Overview**

The product contains no substances which at their given concentration, are considered hazardous to health.

Appearance Clear

Physical State Liquid

Odor None

EUH210 - Safety data sheet available upon request.

Precautionary Statements

P202 - Do not handle until all safety information has been read and understood.

Hazards not otherwise classified (HNOC)

No information available

Other Information

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	EC- No.	CAS-No	Weight %	Trade Secret
Water	231-791-2	7732-18-5	70 - 80 %	*
Potassium Chloride	231-211-8	7447-40-7	20 - 30 %	*
Potassium Dihydrogen Phosphate	231-913-4	7778-77-0	0 – 10%	*
Disodium Hydrogen Phosphate	231-448-7	7558-79-4	0 – 10%	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES**First Aid Measures**

General Advice	Use first aid treatment according to the nature of the injury. Get medical attention immediately if symptoms occur. Show this safety data sheet to the doctor in attendance.
Eye Contact	Rinse thoroughly with plenty of water, also under the eyelids. Obtain medical attention.
Skin Contact	Wash off immediately with soap and plenty of water for at least 15 minutes while removing all contaminated clothing and shoes. If skin reactions occur, contact a physician.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If symptoms persist, obtain medical attention.
Ingestion	Clean mouth with water and drink afterwards plenty of water. Do not include vomiting. Call a physician or Poison Control Center immediately.
Production of First-Aiders	Use personal protective equipment. See Section 8 for more detail. Do not use mouth to mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical devices.

Most important symptoms and effects, both acute and delayed

Most important symptoms/effects No information available

Indication of any immediate medical attention and special treatment needed

Notes to Physician

Treat symptomatically

5. FIRE-FIGHTING MEASURESSuitable Extinguishing Media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media

No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors.

Explosion Data

Sensitivity to Mechanical Impact - None

Sensitivity to Static Discharge – None

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURESPersonal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions

Use personal protective equipment. Refer to Section 8. Evacuate personnel to safe areas.

Environmental Precautions

Beware of vapors accumulating to form explosives concentrations. Vapors can accumulate in low areas.

Method and Material for Containment and Cleaning Up

Methods for Containment

Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up

Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGEPrecautions for Safe Handling

Handling

To avoid risks to human health and the environment, comply with the instructions for use.

Wear personal protective equipment.

Avoid breathing dust/fume/gas/mist/vapors/spray

Ensure adequate ventilation, especially in confined areas.

Conditions for Safe Storage, Including any Incompatibilities

Storage

Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature in the original container.

Keep away from direct sunlight.

Incompatible Products

No information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTIONControl parameters

Exposure Guidelines

Appropriate Engineering Controls

Engineering Measures

Showers

Eyewash stations

Ventilation systems

Individual protection measures, such as personal protective equipment

Eye/face Protection	Wear chemical splash goggles. If splashes are likely to occur, wear: Face-shield.
Skin and Body Protection	Wear protection gloves/clothing
Respiratory Protection	None required under normal usage. In case of inadequate ventilation wear respiratory protection.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIESInformation on basic physical and chemical properties.

Physical State	Liquid
Appearance	Clear
Odor	None
Odor Threshold	No information available
pH Range	6.3 – 6.9

<u>Property</u>	<u>Values</u>	<u>Remarks * Method</u>
Melting point/freezing point	No information available	
Boiling Point/Range	> 100 °C / 212 °F	
Flash Point (High in °C)	N/A	
Evaporation Rate	No information available	
Flammability (solid, gas)	No information available	
Flammability Limit in Air		
Upper flammability limit:	No information available	
Lower flammability limit:	No information available	
Vapor pressure	No information available	
Vapor Density	No information available	
Specific Gravity	No information available	
Water Solubility	soluble	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition Temperature		
Decomposition Temperature	No information available	
Kinematic Viscosity	No information available	
Dynamic Viscosity	No information available	
Explosive Properties	No information available	
Oxidizing Properties	No information available	

Other Information

Softening Point	No information available
Molecular Weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk Density	No information available

10. STABILITY AND REACTIVITYReactivity

No information available

Chemical Stability

Stable under normal conditions

Possibility of Hazardous Reactions

None under normal processing

Conditions to Avoid

Extremes of temperature and direct sunlight

Incompatible Materials

No information available

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating gases and vapors.

11. TOXICOLOGICAL INFORMATION**Information on likely routes of exposure**

Inhalation	No information available
Eye Contact	No information available
Skin Contact	No information available
Ingestion	No information available
Unknown Acute Toxicity	0 % of the mixture consists of ingredient(s) of unknown toxicity
The following values are calculated based on chapter 3/1 of the GHS document	
ATEmix (oral)	11,737 mg/kg

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Water	> 90 ml/kg (Rat)	-	-
Potassium Chloride	= 2600 mg/kg (Rat)	-	-
Potassium Dihydrogen Phosphate	-	4640 mg/kg (Rabbit)	-
Disodium Hydrogen Phosphate	17 g/kg (Rat)	-	-

Information on Toxicological Effects

Symptoms No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No information available
Mutagenic Effects	No information available
Carcinogenicity	No information available
Reproductive Effects	No information available
STOT – single exposure	No information available
STOT – repeated exposure	No information available
Aspiration hazard	No information available

12. ECOLOGICAL INFORMATION**Ecotoxicity**

2% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Component	Freshwater Algae	Freshwater Fish	Water Flea
Potassium Chloride	2500: 72 h Desmodesmus subspicatus mg/L EC50	750 – 1020: 96h Pimephales Promelas mg/L LC50 static 1060: 96 h Lepomis macrochirus mg/L LC50 static	83: 48 h Daphnia magna mg/L EC50 Static 825: 48 h Daphnia

Persistence and Degradability

No information available

Bioaccumulation/Accumulation

No information available

Mobility

No information available

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS**Waste Treatment Methods**

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

Contaminated Packaging Improper disposal or reuse of this container may be dangerous and illegal.

14. TRANSPORT INFORMATION

DOT	Not regulated
ICAO	Not regulated
IATA	Not regulated
IMDG/IMO	Not regulated
RID	Not regulated
ADR	Not regulated
ICAO	Not regulated

15. REGULATORY INFORMATION**International Inventories**

USINV	Complies
CANINV	Complies
EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

USINV/TSCA – United States Toxic Substances Control Act Section 8(b) Inventory

CANINV/DSL/NDL – Canadian Domestic Substances List/Non-Domestic Substance List

EINECS/ELINCS – European Inventory of Existing Commercial Chemical Substance / EU List of Notified Chemical Substances

ENCS – Japanese Existing and New Chemical Substances

IECSC – Chinese Inventory of Existing Chemical Substances

KECL – Korean Existing and Evaluated Chemical Substances

PICCS – Philippines Inventory of Chemicals and Chemical Substances

AICS – Australian Inventory of Chemical Substances

Chemical Safety Assessment

A chemical safety assessment according to regulation (EC) No. 1907/2006 is not required.

U.S. Federal Regulations

This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazardous Communication Standard, 29 CFR 1910.1200.

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain a chemical which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

This material, as supplied, does contain a component regulated as a hazardous substance under the Clean Water Act (Section 112(r) (40 CFR 68.130).

CERCLA

This material, as supplied, does not contain a component regulated as hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302.4) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional or state level pertaining to releases of this material.

U.S. State Regulations**California Proposition 65**

This product is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

State Right-to-Know

Massachusetts Right-to-Know Act – Substance List	Not regulated
New Jersey Worker and Community Right-to-Know Act	Not regulated
Pennsylvania Right-to-Know Act – Hazardous Substance	Not regulated
Rhode Island Right-to-Know Act	Not regulated

U.S. EPA Label Information

No information available

16. OTHER INFORMATION

Revision Date: 23-April -2018

Disclaimer:

IMPORTANT: 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.

Material Safety Data Sheet

Water Lynx 494



1. Identification of the Product and the Company

Product Name: Water Lynx 494

Chemical Family: Coagulant/Flocculant

Material Uses: Water Lynx 494 is used as a coagulation/flocculation agent in municipal and industrial water and wastewater treatment.

Supplier: Clearflow Enviro Systems Group Inc.
#140, 134 Pembina Road
Sherwood Park, AB T8H 0M2
Ph. 780-410-1403
Fx. 780-410-1406
www.clearflowgroup.com

**In Case of
Emergency:** 780-410-1403

Product Type: Solid

2. Composition / Information on Ingredients

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.

3. Hazard Identification

Potential Acute Health Effects

Inhalation: Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.

Ingestion: May cause irritation of the lining of the stomach.

Skin: Mild to Moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.

Eyes: May cause eye irritation. May result in mild to moderate irritation to eyes.

4. First Aid Measures

Inhalation: Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.

Skin contact: In case of contact, rinse with soap and water. Remove contaminated clothing and launder before reuse.

Eye Contact: In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs.

Notes to Physician: Treatment based on sound judgement of physician and individual reactions of patient.

5. Fire-Fighting Measures

Flash Point: Not available.

Flash Point Method: Not applicable.

Autoignition Temperature: Not available.

Flammable Limits in Air (%): Not available.

Extinguishing Media

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

Not Suitable: None known.

Hazardous Thermal

Decomposition Products: Carbon and Nitrogen Oxides.

Special Protective

Equipment for Fire-Fighters: Fire fighters should wear full protective clothing, including self-contained breathing equipment.

NFPA Ratings for this product are: HEALTH 1 FLAMMABILITY 0 INSTABILITY 1

HMIS Ratings for this product are: HEALTH 1 FLAMMABILITY 0 REACTIVITY 1

6. Accidental Release Measures

Personal precautions: Wear appropriate protective equipment. Wet product and aqueous solutions of product are very slippery. Trace amounts of product on smooth surfaces can become extremely slippery when wet.

Environmental Precautions: Prevent entry of concentrated solutions into sewers or streams, dike if needed.

Procedure for Clean-up: Sweep or scoop dry material and place in appropriate container. Absorb aqueous solutions with a dry inert material, such as clay, and place in an appropriate waste disposal container. After most of the material has been cleaned-up clean the area with warm, soapy water.

7. Handling and Storage

Handling: For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment.

Storage: Store in a cool, dry area. Store in accordance with good industrial practices. Keep away from direct sunlight. Protect against physical damage.

8. Exposure Controls / Personal Protection

Personal Protection

Respiratory:	A respirator should not be required when working with Water Lynx 494.
Hands:	Use gloves appropriate for work or task being performed. Recommended: PVC, vinyl, or rubber.
Eyes:	Safety eyewear should be used when there is a likelihood of exposure. Recommended: Chemical goggles; also wear a face shield if splashing hazard exists.
Skin	Skin Contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.
Other Personal Protection Data:	Ensure that eyewash stations and safety showers are proximal to the work-station location.
Engineering Controls:	Local exhaust ventilation as required.

9. Physical and Chemical Properties

Physical State:	Solid
Color:	White or off-white
Odor:	Slight vinegar odor
pH:	4-7 (concentration dependant)
Specific Gravity:	~1.1
Boiling/Condensing Point:	Not available.
Melting/Freezing Point:	Not available.
Vapour Pressure:	Not available.
Vapour Density:	Not available.
% Volatile by Volume:	Not available.
Evaporation Rate:	Not available.
Solubility:	Completely soluble but dissolves very slowly.
VOCs:	Not available.
Viscosity:	Concentration dependant.
Molecular Weight:	Not available.
Other:	None

10. Stability and Reactivity

Chemical Stability:	The product is stable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures.
Materials to Avoid:	Strong bases such as sodium hydroxide may cause the release of ammonia.
Hazardous Decomposition Products:	At high temperatures carbon oxides and nitrogen oxides may be released upon decomposition.
Additional Information:	No additional information.

11. Toxicological Information

Principle Routes of Exposure

Ingestion:	May cause irritation of the lining of the stomach.
Skin contact:	Mild to moderate irritation can occur. Prolonged or repeated contact may cause defatting and drying of the skin. Prolonged or repeated contact may cause discomfort and local redness.
Inhalation:	Inhalation of vapours, mists or dusts of the product may be irritating to the respiratory system. May irritate mouth, nose, and throat.
Eye Contact:	May causes eye irritation. May result in mild to moderate irritation to eyes.
Additional Information:	Prolonged and repeated contact with the skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis.

Acute Toxicity

Acute Oral LD50:	Oral LD50 (Rat) > 5000 mg/kg
Acute Dermal LD50:	Not available.
Acute Inhalation LC50:	Not available.

Carcinogenicity

2-Propenamide is a suspected human carcinogen, but is present at <0.05% (drinking water additive standard).

Carcinogenicity Comment: No additional information available.

Reproductive Toxicity / Teratogenicity / Embryotoxicity / Mutagenicity: Not available.

12. Ecological Information

Aquatic Ecotoxicity

Ingredient	Species	Test	Result
Whole product	Rainbow Trout (<i>Oncorhynchus mykiss</i>)	96hr LC50 Survival (OECD 203)	210.2 mg/L
	<i>Daphnia magna</i>	48hr EC50 Immobilisation (OECD 202)	418.4 mg/L

Other Information:

Bioaccumulation:	The product is not expected to bioaccumulate.
Persistence / Degradability:	Complete mineralization is expected under environmental exposure. Degradation initialization and rate are UV dependent.

13. Disposal Considerations

Disposal of Waste Method:	Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations.
Contaminated Packaging:	Empty containers should be recycled or disposed of through an approved waste management facility.

14. Transport Information

Regulatory Information	UN Number	Proper Shipping Name	Hazard Class	PG*	Label	Additional Information
DOT (U.S.)	-	-	-	-	-	not a regulated product
TDG (Canada)	-	-	-	-	-	not a regulated product

PG* : Packaging Group

15. Regulatory Information

U.S. TSCA Inventory Status: All components of this product are either on the Toxic Substances Control Act (TSCA) Inventory List or exempt.

Canadian DSL Inventory Status: All components of this product are either on the Domestic Substances List (DSL), the Non-Domestic Substances List (NDSL) or exempt.

16. Other Information

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

Prepared By: Clearflow Enviro Systems Group, Inc.

Date of Issue: 05/13/2013

Disclaimer: NOTICE TO READER:
Clearflow, expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from Clearflow Enviro Systems Group.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Clearflow makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Clearflow's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

END OF MSDS

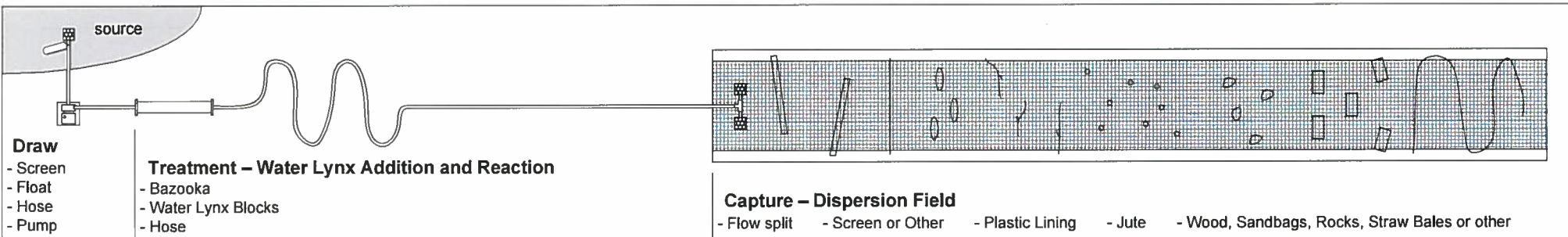
14"
diameter



88" Length



Client:	-	Project/Drawing Title:	Bazooka diagram	Job #:	-
Prepared by:	Jesse Meints, P.Chem.	Original Preparation Date:	-	Revision Date:	-
				Version:	1



Draw Line:
Screen – is attached to the draw line to prevent sucking in debris which can damage the pump and/or plug the bazooka.
Float – is attached to the draw line near the screen preventing suction of mud and debris from the basin floor. Ensure the float is far enough away from the screen to allow complete submersion of the screen.



Treatment:
Bazooka – is attached not far after the pump.
Water Lynx Blocks – are inserted into the bazooka prior to connecting the bazooka to the water lines. It is beneficial to load the Water Lynx blocks into the bazooka add a small amount of Soil Lynx and add several cups of water to activate the blocks prior to leaving for the site.
Hose – after the bazooka the hose should be at least 50 feet long to provide mixing time required for flocculation, causing the hose to have a serpentine or coiled layout will assist in mixing.

Dispersion Field:
Flow Split – adding a “T” or “Y” to the line near the outfall is recommended to reduce the velocity of the flow.
Screens – are added to the hose outlet to further decrease water energy and disperse the flow over a larger area.
Plastic Lining – is laid down first to protect the receiving area from erosion. The liner is to be raised near the edges (using wood, sandbags, straw bales) to contain the flow within the poly lining.
Jute – is to be laid over the plastic lining, jute—when charged with Soil Lynx powder—acts as a strong capture mechanism for flocs as well as unflocculated suspended solids. Tenting of the Jute is required for optimal capture, this is to be achieved by placing material under the jute (see examples pictured above).



Client:	-	Project/Drawing Title:	Bazooka, Dispersion Field Layout	Job #:	-
Prepared by:	Jesse Meints, P.Chem.	Original Preparation Date:	-	Revision Date:	-
				Version:	1



Safety Data Sheet

1 - Identification

Trade Name: WD-40 Aerosol

Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion

Restrictions on Use: None identified

SDS Date Of Preparation: August 2, 2021

Canadian Office:

WD-40 Products [Canada] Ltd.

P.O. Box 220

Toronto, Ontario M9C 4V3

Information Phone #: (416) 622-9881

Emergency Phone # 24 hr: Canutec: (613) 996-6666 -

Designated for use only in the event of chemical emergencies involving a spill, leak, fire exposure or accident involving chemicals

2 – Hazards Identification

WHMIS 2015/GHS Classification:

Flammable Aerosol Category 1

Gas Under Pressure: Compressed Gas

Aspiration Toxicity Category 1

Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)

Note: This product is a consumer product and is labeled in accordance with the Consumer Chemicals and Containers Regulations (CCCR) which take precedence over WHMIS 2015 labeling. The actual container label will not include the label elements below. The labeling below applies to industrial/professional products.

Label Elements:



DANGER!

Extremely flammable aerosol.

Contains gas under pressure; may explode if heated.

May be fatal if swallowed and enters airways.

May cause drowsiness or dizziness.

Prevention

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Do not spray on an open flame or other ignition source.

Do not pierce or burn, even after use.

Avoid breathing mist or vapors.

Use only outdoors or in a well-ventilated area.

Response

IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER or doctor if you feel unwell.

Storage

Store locked up.

Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store in a well-ventilated place.

Disposal

Dispose of contents and container in accordance with local and national regulations.

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	WHMIS 2015/ GHS Classification
Aliphatic Hydrocarbon	64742-47-8	50-70%	Flammable Liquid Category 3 Aspiration Toxicity Category 1 Specific Target Organ Toxicity Single Exposure Category 3 (nervous system effects)
Petroleum Base Oil	Mixture	30-35%	Not Hazardous
Carbon Dioxide	124-38-9	2-3%	Simple Asphyxiant

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.

Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.

Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.

Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

Signs and Symptoms of Exposure: Harmful or fatal if swallowed. If swallowed, may be aspirated and cause lung damage. May cause eye irritation. Inhalation of mists or vapors may cause nasal and respiratory tract irritation and central nervous system effects such as headache, dizziness and nausea. Skin contact may cause drying of the skin.

Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.

Specific Hazards Arising from the Chemical: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.

Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.

Methods and Materials for Containment/Cleanup: Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials. Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure limits
Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m3 TWA (Inhalable) ACGIH TLV (as mineral oil) 5 mg/m3 TWA, 10 mg/m3 STEL Canada- Québec (as oil mist, mineral) 5 mg/m3 TWA, 10 mg/m3 STEL Canada- Ontario (as oil mist, mineral) 1 mg/m3 TWA British Columbia (as Oil mist-mineral, severely refined)
Carbon Dioxide	5000 ppm TWA, 30,000 ppm STEL ACGIH TLV 5000 ppm TWA, 30,000 ppm STEL Canada-Ontario 5000 ppm TWA, 30,000 ppm STEL Canada-Québec 5000 ppm TWA, 15,000 ppm STEL British Columbia

The Following Controls are Recommended for Normal Consumer Use of this Product

Appropriate Engineering Controls: Use in a well-ventilated area.

Personal Protection:

Eye Protection: Avoid eye contact. Always spray away from your face.

Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.

Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended

Appropriate Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.

Personal Protection:

Eye Protection: Safety goggles recommended where eye contact is possible.

Skin Protection: Wear chemical resistant gloves.

Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved organic vapor/particulate or supplied air respirator in accordance with local and national regulations. Respirator selection and use should be based on contaminant type, form and concentration. Follow applicable regulations and good Industrial Hygiene practice.

Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light green to amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8%
Odor:	Mild petroleum odor	Vapor Pressure:	95-115 PSI @ 70°F
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 @ 60°F
Melting/Freezing Point:	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	361 - 369°F (183 - 187°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	122°F (49°C) Tag Open Cup (liquid)	Autoignition Temperature:	Not established
Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas):	Flammable Aerosol	Viscosity:	2.79-2.96 cSt @ 100°F
VOC:	65%	Pour Point:	-63°C (-81.4°F) ASTM D-97

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions

Chemical Stability: Stable

Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.

Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.

Incompatible Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:

Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.

Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.

Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.

Chronic Effects: None expected.

Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.

Reproductive Toxicity: None of the components is considered a reproductive hazard.

Numerical Measures of Toxicity:

Acute Toxicity Estimates: Oral > 5,000 mg/kg; Dermal >2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available; however components of this product are not expected to be harmful to aquatic organisms

Persistence and Degradability: Components are readily biodegradable.

Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.

Mobility in Soil: No data available

Other Adverse Effects: None known

13 - Disposal Considerations

Aerosol containers should not be punctured, compacted in home trash compactors or incinerated. Empty containers may be disposed of through normal waste management options. Dispose of all waste product, absorbents, and other materials in accordance with applicable Federal, state and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: UN1950, Aerosols, 2.1 Ltd. Qty

(Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)

Canadian TDG Classification: Limited Quantity

IMDG Shipping Description: UN1950, Aerosols, 2.1, LTD QTY

ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1

NOTE: WD-40 Company does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

15 – Regulatory Information

National Pollutant Release Inventory (NPRI): This product contains the following chemicals that are listed on the NPRI Substance List: Aliphatic Hydrocarbon (64742-47-8) 50-70%

Canadian Environmental Protection Act: All of the ingredients are listed on the Canadian Domestic Substances List or exempt from notification.

16 – Other Information

HMIS Hazard Rating:

Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Physical Hazard – 0 (minimal hazard)

Revision Date: August 2, 2021


Supersedes: April 29, 2020

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

Reviewed by: I. Kowalski

Regulatory Affairs Dept.

1014100/No.0084106

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SECTION 1. IDENTIFICATION

Product identifier

Trade name : Zalta™ MF1530
FLOCCULANT
™ Trademark, Solenis or its subsidiaries or affiliates,
registered in various countries

Recommended use of the chemical and restrictions on use

Details of the supplier of the safety data sheet Solenis Canada ULC 942 Brant St. Burlington, ON L7R 3X8 Canada RegulatoryRequestsNA@solenis.com	Emergency telephone number 1-844-SOLENIS (844-765-3647) Product Information Contact your local Solenis representative
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SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations

Combustible Dust : Category 1

GHS label elements

Signal word : Warning

Hazard statements : May form combustible dust concentrations in air.

Other hazards

Material can create slippery conditions.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS


Substance / Mixture : Mixture

Components

No hazardous ingredients

SECTION 4. FIRST AID MEASURES


General advice : No hazards which require special first aid measures.

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If inhaled	: If breathed in, move person into fresh air. If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	: First aid is not normally required. However, it is recommended that exposed areas be cleaned by washing with soap and water.
In case of eye contact	: Remove contact lenses. Protect unharmed eye.
If swallowed	: Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	: Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways) Cough Shortness of breath
Notes to physician	: No hazards which require special first aid measures.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray Foam
Specific hazards during firefighting	: Organic dusts at sufficient concentration can form explosive mixtures in air. Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	: Carbon monoxide Carbon dioxide (CO ₂) Nitrogen oxides (NO _x) acid vapors Ammonia sulfur oxides
Specific extinguishing methods	: Product is compatible with standard fire-fighting agents.
Further information	: Material can create slippery conditions. Water may cause extremely slippery conditions.

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Special protective equipment : In the event of fire, wear self-contained breathing apparatus. for firefighters

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Material can create slippery conditions.
Avoid dust formation.
Avoid breathing dust.
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Comply with all applicable federal, state, and local regulations.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
- Methods and materials for containment and cleaning up : Pick up and arrange disposal without creating dust.
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE


- Advice on protection against fire and explosion : Take measures to prevent the build up of electrostatic charge.
Provide appropriate exhaust ventilation at places where dust is formed.
- Advice on safe handling : Avoid spillage on floor as the product can become very slippery.
Avoid dust formation.
Smoking, eating and drinking should be prohibited in the application area.
For personal protection see section 8.
- Conditions for safe storage : No smoking.
Electrical installations / working materials must comply with the technological safety standards.
- Materials to avoid : No materials to be especially mentioned.
- Further information on storage stability : Keep in a dry place.
No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

- Engineering measures** : Provide appropriate exhaust ventilation at places where dust is formed.
General room ventilation should be adequate for normal conditions of use. However, if unusual operating conditions

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exist, provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Personal protective equipment

Respiratory protection	:	No personal respiratory protective equipment normally required.
Eye protection	:	Safety glasses
Skin and body protection	:	Wear as appropriate: Safety shoes Wear resistant gloves (consult your safety equipment supplier).
Hygiene measures	:	Avoid breathing dust.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder
Colour	:	white
Odour	:	odourless
Odour Threshold	:	No data available
pH	:	7.3 (20 °C) Concentration: 5 g/l
Melting point/freezing point	:	Not applicable
Boiling point/boiling range	:	No data available
Flash point	:	Not applicable
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Self-ignition	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available

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Lower explosion limit / Lower flammability limit : No data available

Vapour pressure : No data available

Relative vapour density : No data available

Relative density : No data available

Density : ca. 0.72 g/cm³

Bulk density : 600 - 750 kg/m³

Solubility(ies)

 Water solubility : soluble

 Solubility in other solvents : No data available

Partition coefficient: n-octanol/water : No data available

Decomposition temperature : > 160 °C

Viscosity

 Viscosity, dynamic : > 200 mPa.s (20 °C)

 Viscosity, kinematic : No data available

Oxidizing properties : No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity : No decomposition if stored and applied as directed.


Chemical stability : Stable under recommended storage conditions.

Possibility of hazardous reactions : Product will not undergo hazardous polymerization.

Conditions to avoid : Keep away from heat, flame, sparks and other ignition sources.

Incompatible materials : Acids
chlorates
Chlorine
nitrates
Oxidizing agents
strong bases
Peroxides

Hazardous decomposition products : Carbon monoxide
Carbon dioxide (CO₂)

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Nitrogen oxides (NOx)
acid vapors
Ammonia
Sulphur oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Product:

Acute oral toxicity : LD50 (Mouse): > 5,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

Product:

Result : Not irritating to skin

Serious eye damage/eye irritation

Not classified based on available information.

Product:

Result : Mildly irritating to eyes

Remarks : Unlikely to cause eye irritation or injury.
Product dust may be irritating to eyes, skin and respiratory system.

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Product:

Species : Guinea pig
Method : OECD Test Guideline 406

Germ cell mutagenicity


Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

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STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Product:

No aspiration toxicity classification

Further information

Product:

Remarks : No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): > 150 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to microorganisms : EC50 (Pseudomonas putida): > 2,000 mg/l
Exposure time: 24 h

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects


Product:

Additional ecological information : No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Dispose of in accordance with all applicable local, state and federal regulations.

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Contaminated packaging : Empty remaining contents.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

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

Not applicable for product as supplied.

National Regulations

TDG

Not regulated as a dangerous good

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

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

TCSI	: On the inventory, or in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory
AIIC	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
ENCS	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
NZIOC	: On the inventory, or in compliance with the inventory

Canadian lists

No substances are subject to a Significant New Activity Notification.

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SECTION 16. OTHER INFORMATION

Further information

Revision Date : 10/22/2021

Full text of other abbreviations

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; 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

Sources of key data used to compile the Safety Data Sheet


Key literature references and sources of data

SOLENIS Internal data

SOLENIS internal data including own and sponsored test reports

The UNECE administers regional agreements implementing harmonised classification for labelling (GHS) and transport.

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

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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. This SDS has been prepared by the Solenis Environmental Health and Safety Department.

CA / EN



Be Right™

SAFETY DATA SHEET

Issue Date 06-May-2021

Revision Date 04-Oct-2022

Version 2.5

1. IDENTIFICATION

Product identifier

Product Name ZincoVer® 5 Zinc Reagent

Other means of identification

Product Code(s) 2106669-CA

Safety data sheet number M00048

UN/ID no UN1588

Common name No information available

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory reagent. Determination of zinc

Uses advised against Consumer use

Details of the supplier of the safety data sheet

Initial Supplier Identifier

Hach Sales & Service LP, 3020 Gore Road, London, Ontario N5V 4T7 Canada Tel: 1-800-665-7635

Manufacturer Address

Hach Company, P.O. Box 389, Loveland, CO 80539, USA, +1(970) 669-3050

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300
CANUTEC 613-992-4624

2. HAZARD IDENTIFICATION

Classification

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Reproductive toxicity	Category 1B
Specific target organ toxicity (single exposure)	Category 1
Specific target organ toxicity (single exposure)	Category 3

Specific target organ toxicity (repeated exposure)	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 1

Label elements**Signal word - Danger****Hazard statements**

H302 - Harmful if swallowed
 H311 - Toxic in contact with skin
 H315 - Causes skin irritation
 H319 - Causes serious eye irritation
 H332 - Harmful if inhaled
 H360 - May damage fertility or the unborn child
 H370 - Causes damage to organs
 H372 - Causes damage to organs through prolonged or repeated exposure
 H410 - Very toxic to aquatic life with long lasting effects
 H335 - May cause respiratory irritation

**Precautionary Statements**

P280 - Wear protective gloves, protective clothing, eye protection, and face protection
 P302 + P352 - IF ON SKIN: Wash with plenty of water and soap
 P312 - Call a POISON CENTER or doctor if you feel unwell
 P361 + P364 - Take off immediately all contaminated clothing and wash it before reuse
 P405 - Store locked up
 P501 - Dispose of contents/ container to an approved waste disposal plant
 P271 - Use only outdoors or in a well-ventilated area
 P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
 P332 + P313 - If skin irritation occurs: Get medical attention
 P362 + P364 - Take off contaminated clothing and wash it before reuse
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P337 + P313 - If eye irritation persists: Get medical attention
 P201 - Obtain special instructions before use
 P308 + P313 - IF exposed or concerned: Get medical advice/attention
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray
 P270 - Do not eat, drink or smoke when using this product
 P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor
 P273 - Avoid release to the environment
 P391 - Collect spillage
 P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
 P330 - Rinse mouth

Unknown Acute Toxicity

0 % of the mixture consists of ingredient(s) of unknown toxicity.

0 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

Other Hazards Known

Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS**Substance**

Not applicable

Mixture

Common name No information available.
Chemical Family Mixture.
Chemical nature Mixture of inorganic salts.

Chemical name	Synonyms	CAS No	Percent Range	CBI Protection	Units	HMIRA #
Boron potassium oxide (B4K2O7)	Potassium Borate	1332-77-0	50 - 60%	-	g	-
Boron oxide (B2O3)	No information available	1303-86-2	10 - 20%	-	g	-
Potassium cyanide	No information available	151-50-8	1 - 5%	-	g	-

4. FIRST AID MEASURES**Description of first aid measures**

General advice Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice/attention. Get medical attention immediately if symptoms occur. If breathing has stopped, give artificial respiration. Get medical attention immediately. If symptoms persist, call a physician.

Eye contact Get immediate medical advice/attention. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Remove contact lenses, if present and easy to do. Continue rinsing. Do not rub affected area.

Skin contact Get immediate medical advice/attention. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.

Ingestion Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention.

Self-protection of the first aider Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Avoid contact with skin, eyes or clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Use personal protective equipment as required. See section 8 for more information.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Caution: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	No information available.
Hazardous combustion products	Cyanide compounds. Nitrogen oxides. Potassium oxides. Boron compounds.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures**

WHMIS Notice	Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.
Personal precautions	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Avoid generation of dust. Do not breathe dust.
Other Information	Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions	Prevent further leakage or spillage if safe to do so.
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Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Take up mechanically, placing in appropriate containers for disposal.
Prevention of secondary hazards	Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE**Precautions for safe handling**

Advice on safe handling	Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Take off contaminated clothing and wash before reuse. Do not eat, drink or smoke when using this product. Remove contaminated clothing and shoes. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid generation of dust.
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Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Store locked up.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters**Exposure Limits**

Chemical name	Alberta OEL	British Columbia OEL	Manitoba OEL	New Brunswick OEL	Newfoundland & Labrador OEL
Boron potassium oxide (B4K2O7) 50 - 60%	NDF	TWA: 2 mg/m ³ STEL: 6 mg/m ³	TWA: 2 mg/m ³ STEL: 6 mg/m ³	NDF	TWA: 2 mg/m ³ STEL: 6 mg/m ³
Boron oxide (B2O3) 10 - 20%	TWA: 10 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³
Potassium cyanide 1 - 5%	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*

Chemical name	Northwest Territories OEL	Nova Scotia OEL	Nunavut OEL	Ontario TWA	Prince Edward Island OEL
Boron potassium oxide (B4K2O7) 50 - 60%	NDF	STEL: 6 mg/m ³ TWA: 2 mg/m ³	NDF	NDF	STEL: 6 mg/m ³ TWA: 2 mg/m ³
Boron oxide (B2O3) 10 - 20%	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 10 mg/m ³	TWA: 10 mg/m ³
Potassium cyanide 1 - 5%	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³ SKN*	Ceiling: 5 mg/m ³

Chemical name	Quebec OEL	Saskatchewan OEL	Yukon OEL
Boron oxide (B2O3) 10 - 20%	TWA: 10 mg/m ³	TWA: 10 mg/m ³ STEL: 20 mg/m ³	TWA: 10 mg/m ³
Potassium cyanide 1 - 5%	Ceiling: 10 ppm Ceiling: 11 mg/m ³ SKN*	Ceiling: 5 mg/m ³ Ceiling: 4.7 ppm SKN*	STEL: 5 mg/m ³ TWA: 5 mg/m ³ SKN*

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Boron potassium oxide (B4K2O7) 50 - 60%	STEL: 6 mg/m ³ inhalable particulate matter TWA: 2 mg/m ³ inhalable particulate matter	NDF	NDF
Boron oxide (B2O3) 10 - 20%	TWA: 10 mg/m ³	TWA: 15 mg/m ³ (vacated) TWA: 10 mg/m ³	IDLH: 2000 mg/m ³ TWA: 10 mg/m ³
Potassium cyanide 1 - 5%	S* Ceiling: 5 mg/m ³ CN	TWA: 5 mg/m ³ (vacated) TWA: 5 mg/m ³ *	IDLH: 25 mg/m ³ CN Ceiling: 4.7 ppm CN 10 min Ceiling: 5 mg/m ³ CN 10 min

Legend

See section 16 for terms and abbreviations

Appropriate engineering controls**Engineering Controls**

Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment**Respiratory protection**

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection	Wear suitable gloves. Impervious gloves. Gloves must be inspected prior to use. The selected protective gloves have to satisfy the specifications of EU Directive 2016/425 and the standard EN 374 derived from it. Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374-1:2016.
Eye/face protection	Wear safety glasses with side shields (or goggles). If splashes are likely to occur, wear safety glasses with side-shields.
Skin and body protection	Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.
General Hygiene Considerations	Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid breathing dust/fume/gas/mist/vapors/spray.
Environmental exposure controls	Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.
Thermal hazards	None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Solid
Appearance	powder
Odor	Odorless
Color	purple
Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	Not applicable	
pH	8.7	5% Solution
Melting point / freezing point	155 °C / 311 °F	
Initial boiling point and boiling range	No data available	
Evaporation rate	Not applicable	
Vapor pressure	Not applicable	
Relative vapor density	No data available	
Specific Gravity	1.83	
Partition coefficient	log K _{OW} ~ -1.6	
Soil Organic Carbon-Water Partition Coefficient	log K _{OC} ~ 0.07	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Dynamic viscosity	Not applicable	
Kinematic viscosity	Not applicable	

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

Other information**Metal Corrosivity****Steel Corrosion Rate**

Not applicable

Aluminum Corrosion Rate

Not applicable

Volatile Organic Compounds (VOC) Content

Not applicable

Chemical name	CAS No	Volatile organic compounds (VOC) content	CAA (Clean Air Act)
Boron potassium oxide (B4K2O7)	1332-77-0	No data available	-
Boron oxide (B2O3)	1303-86-2	No data available	-
Potassium cyanide	151-50-8	Not applicable	-

Explosive properties**Upper explosion limit**

No data available

Lower explosion limit

No data available

Flammable properties**Flash point**

Not applicable

Flammability Limit in Air**Upper flammability limit:**

No data available

Lower flammability limit:

No data available

Oxidizing properties

No data available.

Bulk density

Not applicable

10. STABILITY AND REACTIVITY**Reactivity**

Not applicable.

Chemical stability**Stability**

Stable under normal conditions.

Explosion data**Sensitivity to Mechanical Impact** None**Sensitivity to Static Discharge** None.**Possibility of hazardous reactions****Possibility of Hazardous Reactions** None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Excessive heat.

Incompatible materials

Incompatible materials Strong acids. Strong bases. Strong oxidizing agents.

Hazardous decomposition products

Cyanide. Boron compounds. Nitrogen oxides. Potassium oxide. Contact with acids/acid fumes releases toxic cyanide gas.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure**Product Information**

Inhalation	May cause irritation of respiratory tract. Harmful by inhalation.
Eye contact	Irritating to eyes. Causes serious eye irritation.
Skin contact	Causes skin irritation. Toxic in contact with skin.
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Harmful if swallowed.

Symptoms Redness. May cause redness and tearing of the eyes. Coughing and/ or wheezing.

Acute toxicity

Harmful if swallowed
Toxic in contact with skin
Harmful if inhaled

Mixture

Test data reported below.

Oral Exposure Route

<u>Endpoint type</u>	<u>Reported dose</u>	<u>Toxicological effects</u>	<u>Key literature references and sources for data</u>
Rat LD ₅₀	383 mg/kg	Behavioral Loss of righting reflex Sedation Tonic convulsions Eye Ptosis Gastrointestinal Enteritis in the large intestine Enteritis in the small intestine Lungs, Thorax, or Respiration Congestion of the lungs Respiratory depression Infection of the lungs Skin and Appendages Piloerection	Outside testing

Inhalation (Gas) Exposure Route**Ingredient Acute Toxicity Data**

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Boron potassium oxide (B4K2O7) (50 - 60%) CAS#: 1332-77-0	Rat LD ₅₀	3500 mg/kg	None reported	None reported	Vendor SDS
Boron oxide (B2O3) (10 - 20%) CAS#: 1303-86-2	Rat LD ₅₀	3150 mg/kg	None reported	None reported	RTECS
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Rat LD ₅₀	5 mg/kg	None reported	None reported	GESTIS

Dermal Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Boron potassium oxide (B4K2O7) (50 - 60%) CAS#: 1332-77-0	Rat LD ₅₀	> 2000 mg/kg	None reported	None reported	Vendor SDS
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Rabbit LD ₅₀	22.3 mg/kg	None reported	None reported	Vendor SDS

Inhalation (Dust/Mist) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium cyanide	Rat	0.04 mg/L	4 hours	None reported	ERMA

(1 - 5%) CAS#: 151-50-8	LC ₅₀				
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Unknown Acute Toxicity

0 % of the mixture consists of ingredient(s) of unknown toxicity.

0 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	No information available
ATEmix (dermal)	641.80
ATEmix (inhalation-dust/mist)	2.00
ATEmix (inhalation-vapor)	No information available
ATEmix (inhalation-gas)	No information available

Skin corrosion/irritation

Classification based on data available for ingredients. Irritating to skin.

Mixture

No data available.

Ingredient Skin Corrosion/Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Boron potassium oxide (B ₄ K ₂ O ₇) (50 - 60%) CAS#: 1332-77-0	Standard Draize Test	Rabbit	500 mg	4 hours	Skin irritant	ECHA
Boron oxide (B ₂ O ₃) (10 - 20%) CAS#: 1303-86-2	Standard Draize Test	Rabbit	500 mg	24 hours	Mild skin irritant	ECHA

Serious eye damage/eye irritation

Classification based on data available for ingredients. Irritating to eyes.

Mixture

No data available.

Ingredient Eye Damage/Eye Irritation Data

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Boron potassium oxide (B ₄ K ₂ O ₇) (50 - 60%) CAS#: 1332-77-0	OECD Test 405: Acute Eye Corrosion/Irritation	Rabbit	100 mg	24 hours	Eye irritant	ECHA
Boron oxide (B ₂ O ₃) (10 - 20%) CAS#: 1303-86-2	Standard Draize Test	Rabbit	100 mg	24 hours	Mild eye irritant	ECHA

Respiratory or skin sensitization

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

Mixture

No data available.

Ingredient Sensitization Data

No data available.

STOT - single exposure

Based on the classification criteria of the Globally Harmonized System as adopted in the country or region with which this safety data sheet complies, this product has been determined to cause systemic target organ toxicity from acute exposure. (STOT SE). Causes damage to organs if swallowed. Causes damage to organs in contact with skin.

Mixture

No data available.

Ingredient Specific Target Organ Toxicity Single Exposure Data

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Man TD _{Lo}	13.7 mg/kg	None reported	Behavioral Coma Convulsions or effect on seizure threshold Blood Metabolic acidosis	RTECS

STOT - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Mixture

No data available.

Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Rat TD _{Lo}	4.5 mg/kg	15 days	Nutritional and Gross Metabolic Evidence of thyroid hypofunction, Changes in thyroid weight	RTECS

Carcinogenicity

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

Mixture

No data available.

Ingredient Carcinogenicity Data

No data available.

Chemical name	CAS No	ACGIH	IARC	NTP	OSHA
Boron potassium oxide (B4K2O7)	1332-77-0	-	-	-	-
Boron oxide (B2O3)	1303-86-2	-	-	-	-

Potassium cyanide	151-50-8	-	-	-	-
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Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	Does not apply
IARC (International Agency for Research on Cancer)	Does not apply
NTP (National Toxicology Program)	Does not apply
OSHA	Does not apply

Germ cell mutagenicity

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

Mixture invitro Data

No data available.

Substance invitro Data

Test data reported below.

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Boron oxide (B ₂ O ₃) (10 - 20%) CAS#: 1303-86-2	Mutation in microorganisms	Mammalian cells - not specified	None reported	None reported	Negative	RTECS
Potassium cyanide (1 - 5%) CAS#: 151-50-8	DNA inhibition	Mouse lymphocyte	1 mmol/L	None reported	Positive test result for mutagenicity	RTECS

Mixture invivo Data

No data available.

Substance invivo Data

No data available.

Reproductive toxicity

Classification based on data available for ingredients. Contains a known or suspected reproductive toxin. The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Mixture

No data available.

Ingredient Reproductive Toxicity Data

Test data reported below.

Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Domestic mammal - Not specified TD _{Lo}	1767 mg/kg	12 weeks	Effects on Newborn Other neonatal measures or effects Weaning or lactation index (e.g. # alive at weaning per # alive at day 4)	RTECS

Aspiration hazard

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

12. ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects

Unknown Acute Toxicity

0 % of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Mixture**Aquatic Acute Toxicity**

No data available.

Aquatic Chronic Toxicity

No data available.

Substance**Aquatic Acute Toxicity**

Test data reported below.

Fish

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Potassium cyanide (1 - 5%) CAS#: 151-50-8	96 hours	None reported	LC ₅₀	0.068 mg/L	GESTIS

Crustacea

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Boron oxide (B ₂ O ₃) (10 - 20%) CAS#: 1303-86-2	48 Hours	<i>Daphnia magna</i>	LC ₅₀	370 mg/L	IUCLID
Potassium cyanide (1 - 5%) CAS#: 151-50-8	48 Hours	None reported	LC ₅₀	0.25 mg/L	GESTIS

Aquatic Chronic Toxicity

No data available.

**Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL):
Environmentally Hazardous Substances Categorizations**

Chemical name	Category	Persistent	Bioaccumulation	Inherently Toxic to Aquatic Organisms
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Inorganics	Yes	No	Yes

Persistence and degradability**Mixture**

No data available.

Bioaccumulation

MATERIAL DOES NOT BIOACCUMULATE.

Mixture

No data available.

Partition coefficient

log K_{ow} ~ -1.6

Mobility

Soil Organic Carbon-Water Partition Coefficient

log K_{oc} ~ 0.07Other adverse effects

No information available

Chemical name	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disrupters - Evaluated Substances	Endocrine disrupting potential
Potassium cyanide (1 - 5%) CAS#: 151-50-8	Group III Chemical	-	-

13. DISPOSAL CONSIDERATIONSWaste treatment methods**Waste from residues/unused products**

Dispose of waste in accordance with environmental legislation. Dispose of in accordance with local regulations.

Contaminated packaging

Do not reuse empty containers.

14. TRANSPORT INFORMATIONTransport Canada

UN/ID no	UN1588
Proper shipping name	Cyanides, inorganic, solid, n.o.s.
DOT Technical Name	Potassium cyanide
Transport hazard class(es)	6.1
Packing Group	III
Description	UN1588, Cyanides, inorganic, solid, n.o.s., 6.1, III
Emergency Response Guide Number	157

TDG

UN/ID no	UN1588
Proper shipping name	Cyanides, inorganic, solid, n.o.s.
TDG Technical Name	Potassium cyanide
Transport hazard class(es)	6.1
Packing Group	III
Marine pollutant	This product contains a chemical which is listed as a marine pollutant according to TDG.
Description	UN1588, Cyanides, inorganic, solid, n.o.s. (Potassium cyanide), 6.1, III

IATA

UN number or ID number	UN1588
Proper shipping name	Cyanides, inorganic, solid, n.o.s.
IATA Technical Name	Potassium cyanide
Transport hazard class(es)	6.1
Packing group	III
ERG Code	6L
Special precautions for user	A3, A13

IMDG

UN number or ID number	UN1588
Proper shipping name	Cyanides, inorganic, solid, n.o.s.
IMDG Technical Name	Potassium cyanide
Transport hazard class(es)	6.1
Packing Group	III
EmS-No	F-A, S-A
Special precautions for user	47, 223, 274
Marine pollutant	This material meets the definition of a marine pollutant

Note: No special precautions necessary.

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

Regulatory information

National Inventories

DSL/NDSL Complies

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories

TSCA	Complies
EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL - Existing substances	Complies
PICCS	Complies
TCSI	Complies
AICS	Complies
NZIoC	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

Canada - CEPA - Mercury Containing Products

None

International Regulations

The Montreal Protocol on Substances that Deplete the Ozone Layer Not applicable

The Stockholm Convention on Persistent Organic Pollutants Not applicable

The Rotterdam Convention Not applicable

16. OTHER INFORMATION

Special Comments

None

NFPA and HMIS Classifications

	Health hazards - 3	Flammability - 0	Instability - 0	Physical and chemical properties -
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NFPA	Health hazards - * - 3 - 2	Flammability - 0	Physical hazards - 0	Personal protection - X
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Key or legend to abbreviations and acronyms used in the safety data sheet

ACGIH	ACGIH (American Conference of Governmental Industrial Hygienists)
ATSDR	ATSDR (Agency for Toxic Substances and Disease Registry)
CCRIS	CCRIS (Chemical Carcinogenesis Research Information System)
CDC	CDC (Center for Disease Control)
CEPA	CEPA (Canadian Environmental Protection Agency)
CICAD	CICAD (Concise International Chemical Assessment Documents)
ECHA	ECHA (The European Chemicals Agency)
EEA	EEA (European Environment Agency)
EPA	EPA (Environmental Protection Agency)
ERMA	ERMA (New Zealand's Environmental Risk Management Authority)
ECOSARS	Estimation through ECOSARS v1.11 part of the Estimation Programs Interface (EPI) Suite™
FDA	FDA (Food & Drug Administration)
GESTIS	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
HSDB	HSDB (Hazardous Substances Data Bank)
INERIS	INERIS (The National Industrial Environment and Risks Institute)
IPCS INCHEM	IPCS INCHEM (International Programme on Chemical Safety)
IUCLID	IUCLID (The International Uniform Chemical Information Database)
NITE	Japan National Institute of Technology and Evaluation (NITE)
NIH	NIH (National Institutes of Health)
NIOSH	NIOSH (National Institute for Occupational Safety and Health)
LOLI	LOLI (List of Lists - An International Chemical Regulatory Database)
NDF	no data
NICNAS	Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH IDLH	Immediately Dangerous to Life or Health
OSHA	OSHA (Occupational Safety and Health Administration of the US Department of Labor)
PEEN	PEEN (Pan European Ecological Network)
RTECS	RTECS (Registry of Toxic Effects of Chemical Substances)
SIDS	SIDS (Screening Information Dataset) for High Volume Chemicals
SYKE	The Finnish Environment Institute (SYKE)
USDA	USDA (United States Department of Agriculture)
USDC	USDC (United States Department of Commerce)
WHO	WHO (World Health Organization)

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

Prepared By Hach Product Compliance Department

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Revision Note

SDS sections updated

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Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations. THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. HACH COMPANY©2022

End of Safety Data Sheet