

Blina Oilfield Care and Maintenance Environment Plan

Summary Document

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HSE

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1 Introduction

Buru Energy Limited (Company) is an Australian ASX listed company engaged in oil and gas exploration and production in the Kimberley region of Western Australia, in an area known in geological terms as the Canning Basin.

The Company has developed the *Blina Oilfield Care and Maintenance Environment Plan* (HSE-PLN-008) (Environment Plan) for the management of environmental aspects associated with the Company's care and maintenance operations in the Blina Oilfield area (the Activity). This Summary Document summarises the operations and mitigation and management measures in the approved Environment Plan.

1.1 Contact Details

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2 Overview of Activity

Blina Oilfield is located on Petroleum Production Licences L 6, L 8, L 17 and PL 7, and includes wells and facilities at Blina, Sundown, West Terrace, Meda and Erskine, and the PL 7 pipeline. The locations of the well sites are shown in Figure 1, with general characteristics provided in Table 1. Other oilfield areas have been decommissioned.

During care and maintenance, routine inspections and testing will be undertaken by the Company to check the integrity of the suspended or shut-in wells, inspect infrastructure and equipment located on the well sites, and check for potential safety, environmental or security incidents or hazards. As a result of these routine inspections, the Company may implement servicing or maintenance of infrastructure or equipment, and progressive rehabilitation.

2.1 Timing

Well integrity inspections will be undertaken on all suspended or shut-in wells on a six-monthly or annual basis. Inspections of well sites with remaining infrastructure will be undertaken on a monthly basis. Maintenance operations are undertaken on an as needed typically following the outcome of inspections, varying from one day to two weeks in duration.

2.2 Well Integrity Inspections and Testing

Well integrity inspections may include:

- taking photographs of the well;
- checking tubing and annulus pressures;
- pressure test well head seals; and
- inspection then servicing of valves.

2.3 Well Site Infrastructure Inspections

The existing infrastructure on the Company well sites will be routinely inspected to ensure integrity of the infrastructure and also ensure potential health and safety, environmental and security hazards are identified.

Table 1 Details of wells and well sites.

Facility	Location	Well	Location
Blina	-17.6223°, 124.5021°	Blina 1	-17.6226°, 124.5017°
		Blina 2	-17.6179°, 124.4975°
		Blina 3	-17.6216°, 124.4978°
		Blina 4	-17.6203°, 124.5003°
		Blina 5	-17.6249°, 124.5042°
		Blina 6	-17.6232°, 124.5021°
Meda	-17.4834°, 124.2639°	West Terrace 1	-17.5059°, 124.2600°
Erskine	-17.8475°, 124.3698°	N/A (no wells)	
Exploration well sites		Fairwell 1	-17.5441°, 124.3162°
		Miani 1	-18.3641°, 123.4304°

2.4 Service and Maintenance

Service and maintenance operations include infrastructure repair and replacement, civil works and well head maintenance. These operations will be undertaken on as needed basis.

2.4.1 Infrastructure Repair and Replacement

If the routine inspections identify wear, corrosion or damage of well site infrastructure, maintenance operations will be undertaken, including:

- installation or repair of fences, gates, signs or fauna egress paths;
- repair or replacement of liners (e.g. for reinjection infrastructure);
- repair of water bores, environmental monitoring bores;
- removal of vegetation from around the wellhead; and
- servicing and maintenance of generators and other supporting infrastructure.

2.4.2 Civil Works

If required, civil works may also be undertaken. Any clearing will be restricted to the existing cleared areas and will not require removal of vegetation outside of the existing Activity area. The well site, camp site or access track may also be stabilised using gravel, road base, cement blend and/or polymer if required.

2.4.3 Wellhead Maintenance

If integrity issues are detected during well integrity inspections, servicing and maintenance of components of the wellhead and/or Xmas Tree may be undertaken by the Company. No chemicals will be used down hole as part of the wellhead maintenance operations.

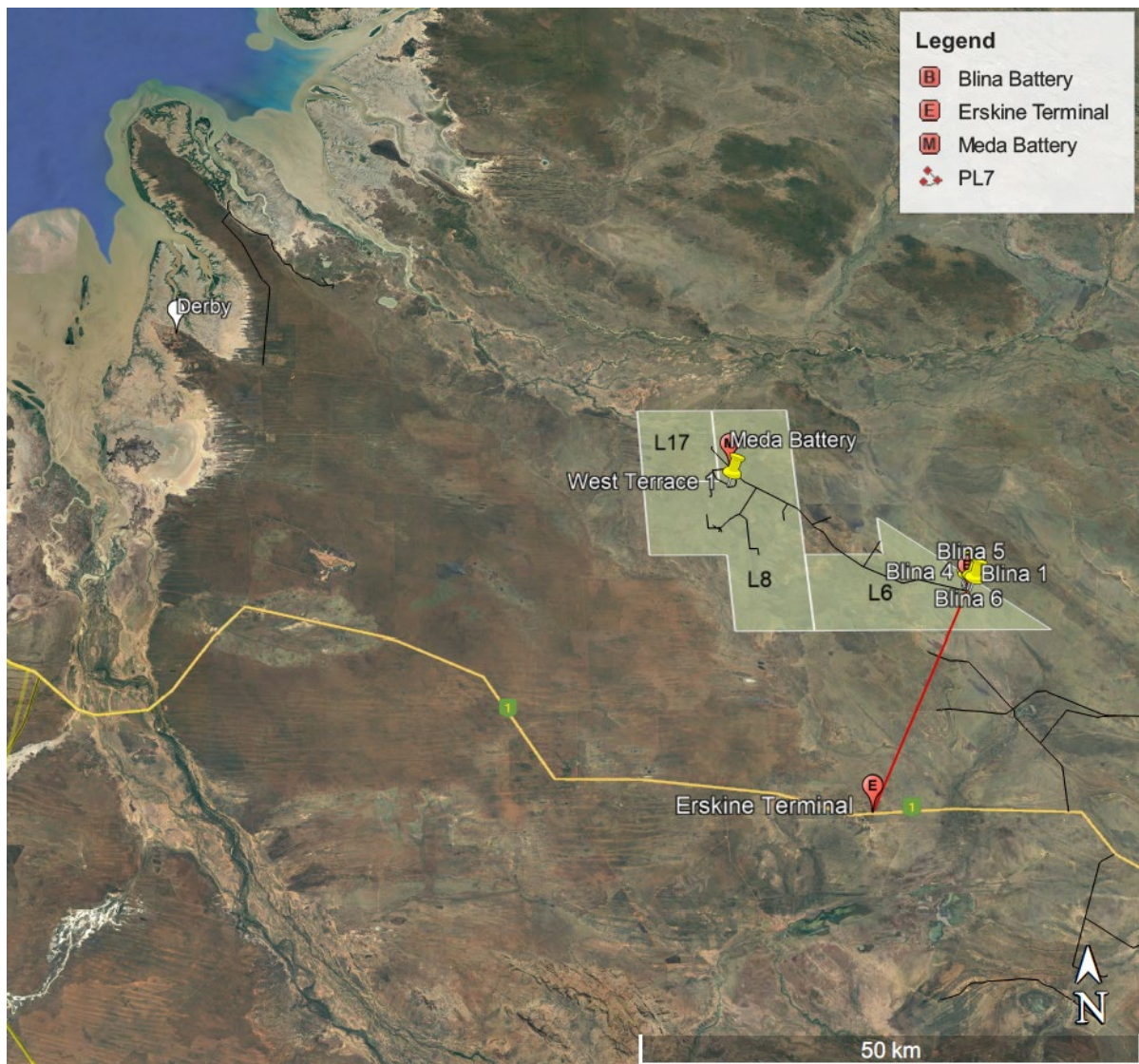


Figure 1 Location of Activity areas.

2.5 Waste and Infrastructure Removal

Any waste oil and sludge currently stored in tanks in the Oilfield tanks will be from storage for reuse/recycling, reinjection, or disposal at a licensed waste disposal facility. Transport of waste oils will be in accordance with the Environmental Protection (Controlled Waste) Regulations 2004, the *Dangerous Goods Safety Act 2004* and Dangerous Goods Safety Regulations 2007.

Beneficial use or recycling options will be sought for infrastructure and materials prior to disposal.

If the surface infrastructure and other scrap materials are determined to be unsuitable for reuse or recycling, they will be transported to a licensed waste disposal facility.

2.6 Decommissioning

The Company will continue further decommissioning and rehabilitation operations in the upcoming years, to proceed to complete decommissioning of the Blina Oilfield.

2.7 Rehabilitation

Following the inspections, the Company will rehabilitate the Activity areas. All rehabilitation will be undertaken in accordance with Company *Rehabilitation Management Procedure* (HSE-PRO-035). Both decommissioning and rehabilitation activities will be undertaken in consultation with the landholders.

2.7.1 Soil and Fluid Management

Soil or fluid requiring testing prior to disposal (e.g. potentially contaminated) will be tested at a NATA accredited laboratory for constituents of potential concern (COPCs) in accordance with the Company *Cuttings, Soil and Fluid Management Procedure* (HSE-PRO-007).

2.8 Environmental Aspects of Care and Maintenance Operations

2.8.1 Personnel, Equipment and Supplies

The Activity will be undertaken by Company personnel and Contractors. The equipment required for the operations will vary but include:

- light vehicles;
- earthmoving equipment (bulldozer, grader, and/or roller);
- mobile fuel storage tank with up to 2,000 L of diesel; and
- camp facilities depending on the operations and well site proximity to other accommodation.

2.8.2 Waste Management

Putrescible waste will be contained to prevent fauna access and litter generation. General and industrial waste will be stored in vehicles or in skips. All waste will be disposed of at licensed waste disposal facility in accordance with Environmental Protection (Controlled Waste) Regulations 2004.

If a mobile camp site is set up for the Activities, sewage will be stored for disposal offsite at a licensed waste disposal facility or treated and discharged onsite. Grey water will be treated and disposed of onsite.

2.9 Demobilisation and Rehabilitation

Demobilisation of the Activity areas will be undertaken following the completion of each operation including removal of all machinery and ancillary equipment. The well head and Xmas tree will be secured to minimise potential for damage to this equipment, and the site left in a stable condition with all waste removed.

3 Environmental Impacts and Management Measures

The Activity will be confined to the existing well sites, camp sites and access tracks. A summary of the existing environmental characteristics of surrounding the Activity area, potential impacts that could result from the Activity and the risk of these potential impacts occurring is provided in Table 2. Included in this Table are also the management and mitigation measures that form part of the implementation strategy to minimise environmental risk.

Table 2 Summary of the existing environment, potential impacts and management approach with the Activity.

Environmental characteristic	Description	Potential Impact	Management / Mitigation Measures	Risk	Implementation Strategy
Groundwater	Results of laboratory analysis of groundwater taken from the environmental monitoring bore at Sundown and the bore at Blina indicate that COPC in the bore water at both locations is below ANZG Stockwater Guideline values with the exception of total dissolved solids (TDS) at the Sundown monitoring bore. Similar results have also been recorded for surface water samples with elevated TDS levels previously recorded for Blina and Sundown produced formation water including within the Interceptor Ponds.	Disturbance of ground water. Contamination of groundwater.	- Routine inspection of Activity areas for erosion and sedimentation will be undertaken. - Erosion and sedimentation observed during inspections will be maintained as required. - Cement, polymer, gravel, road base and/or matting will only be used in parts of the well sites, camp sites, laydown areas and access tracks that require additional compaction and stabilisation, such as sandy areas or drill pad. - In the event of heavy rainfall during civil works, earthmoving operations will cease. Following a high rainfall event, an on-ground assessment will be undertaken prior to recommencing operations to minimise environment and safety risks.	Given the mitigation and management measures that will be implemented contamination is unlikely.	- Continual monitoring during transfer of waste oil. - Company Representative to ensure all environmental incidents are reported. - Company Representative to ensure no clearing or disturbance outside of the Activity area.
Landforms and surface water	The Blina Oilfield is located within the Lennard River catchment with the PL 7 pipeline crossing into the Fitzroy River catchment area. These catchments are characterised by landscapes dominated by pindan soils with occasional rocky outcrops, breakaways and associated local drainages. The geomorphology of the Blina area is characterised by dune and swale systems, which include rain-fed claypans in swales that are truncated drainage lines between dunes and intersected by creek lines and tributaries of the Lennard River system. There are no permanent watercourses in the Blina Oilfield area. There is no direct surface connectivity between the Activity area and surrounding landscape.	Alteration / loss of soil structure or composition. Localised ponding or flow diversion. Soil erosion and sedimentation. Creation of cement dust. Disturbance of fauna habitat. Contamination of surface water. Contamination of soil.	- Vehicles comply with the <i>Travel Management Procedure</i> (HSE-PRO-002). - Refuelling undertaken in accordance with <i>Refuelling Procedure</i> (HSE-PRO-011) (e.g. bunds, drip tray, spill kits). - Oil, lubricants and pesticides will be stored on vehicles. - All operations will be manned and undertaken by suitably qualified personnel. - Wells inspected frequently and maintained as necessary to prevent integrity issues. - Any downhole integrity issues will be rectified in accordance with the activity specific environment plan. - Reinjection Activities will be continually manned. - Reinjection Activities will be undertaken in accordance with approved WMP. - Injection pressures (psi) not to exceed the well design rating, as defined in the relevant approved WMP. - If reinjected fluids contain added chemicals, the relevant chemical disclosure will be revised to reflect the fluid composition and submitted to DEMIRS for approval. - Clean-up materials/spill kits will be available in vehicles for well integrity operations. - Visual inspection of machinery and equipment prior to use. - Vehicles and machinery will be regularly maintained. - Vehicle and personnel access will be limited to the Activity areas. - Potentially contaminated soil and fluid will be managed in accordance with the Company Cuttings, Soil and Fluid Management Procedure (HSE-PRO-007). - Fluids will be pumped across the well site in accordance with the Company Rehabilitation Management Procedure (HSE-PRO-035).	Through the implementation of management measures, it is unlikely that the Activity will have a significant impact on landforms and surface water.	- Contractor to ensure compliance with the Dangerous Goods Safety Regulations 2007 for transport of Controlled Waste and Dangerous Goods, where required. - Visual inspection of Activity areas following clean-up of activity areas. - Internal environmental audits. - DEMIRS Environment Branch notified in writing following completion of remediation operations.
Vegetation and Flora	The Activity area is located in the Dampierland subregion of the Fitzroy Trough Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and within four vegetation units (64, 744, 745, 755) which are widespread across the region. Four species of Threatened flora are known to occur within the Kimberley region. During an on-ground survey undertaken in 2007, no Threatened or Priority Flora species were recorded.	Invasive weed species competing with native flora or altering native fauna habitat. Disturbance of native flora species. Loss of native flora species. Loss of local population of a conservation significant flora species. Loss of environmental values associated with ESA. Loss of native fauna habitat.	- Clearing of vegetation will be limited to the previously cleared areas. - Vegetation, topsoil and any subsoil removed during clearing will be separately stockpiled adjacent to the well site or access track (to be available for rehabilitation). - No cement or polymer will be added, including runoff, outside of the Activity areas or on topsoil/subsoil stockpiles. - Vehicle and personnel access will be limited to the existing Activity areas, including existing tracks. - Inspection and maintenance of firebreaks. - Regular inspection and maintenance of machinery and equipment. - Smoking will be restricted to existing cleared areas and disposal of cigarette butts into bins/skips. - Mobile firefighting equipment available. Firefighting equipment maintained in good working order. - The locations of the closest ESA to each of the Activity areas are described in the Environment Plan. - Any weeds identified during the routine well site infrastructure inspections will be removed by hand or sprayed. - Herbicide will be used in accordance with manufacturer's instructions, including dosage rates. - Herbicide will not be applied when rain is forecast for the area within 24 hours. - Prior to entering the Activity area, earthmoving machinery and equipment will be checked for weeds or weed contaminated materials, and cleaned if necessary, in accordance with the Biosecurity Checklist (HSE-FRM-007). - Gravel or road base from an external source will be weed free.	Through the implementation of management measures, it is unlikely that the Activity will have a significant impact on flora and vegetation.	- Visual inspection of Activity areas following clean-up of activity areas. - Internal environmental audits. - DEMIRS Environment Branch notified in writing following completion of remediation operations. - Company Environmental Representative to ensure corrective actions for weeds are implemented, as required.

		Activity area does not successfully rehabilitate – failure to regenerate vegetation and fauna habitat.	- Prior to excavating gravel from borrow pit, sources of weeds (vegetation and topsoil) will be removed and stockpiled separately. - Progressive rehabilitation, as required. - Ongoing monitoring of areas undergoing progressive rehabilitation in accordance with the <i>Rehabilitation Management Procedure</i> (HSE-PRO-035). - The Company will keep DEMIRS informed of plans for the Activity area, including any plans for rehabilitation. - DEMIRS will be notified in writing of any areas that are to remain at the request of the landholder.		
Fauna	On-ground surveys were undertaken in 2008 and 2015. During the surveys, five species of conservation significance were observed: the Great Egret (<i>Ardea alba</i>), Australian Bustard (<i>Ardeotis australis</i>), Picetorella Mannikin (<i>Heteromunia pectoralis</i>), Rainbow Bee-eater (<i>Merops ornatus</i>) and Fresh Water Crocodile (<i>Crocodylus johnstoni</i>). Habitat is well represented in surrounding region. Four introduced fauna species were identified during the on-ground surveys (cattle, dog, cat and horse).	Increased predation on native fauna. Increased competition for food with native fauna. Disturbance of native fauna. Death or injury of native fauna including conservation significant species.	- Vehicle and personnel access will be limited to the Activity areas. - Vehicles comply with the <i>Travel Management Procedure</i> (HSE-PRO-002). - Cellars will be fenced and covered with grating or similar. Cellars will be inspected. - Demobilisation activities will include removal of all machinery, equipment, waste. Well heads will be secured. - Progressive remediation will be implemented, where operationally practicable, to minimise risks to native fauna.	Given that vegetation associations in the Activity area are locally widespread, it is unlikely that the Activity will significantly impact fauna.	
Cultural Heritage and Community	The Activity area is located on the Blina Pastoral Station. Land use is dominated by open range pasture grazing of beef stock. The closest town is Derby which is located approximately 105 km southeast of the Oilfield. There are no Aboriginal communities within 40 km of the Activity area. No registered Department of Aboriginal Affairs sites are located within the Activity area. The closest registered heritage site is approximately 29 km to the northwest.	Litter generation. Impact on local aesthetics. Damage to cultural heritage site/s or object/s. Disturbance of livestock. Damage to fences and gates. Damage of infrastructure and equipment. Disturbance / disruption of local residents and landholders.	- Vehicles will comply with <i>Travel Management Procedure</i> (HSE-PRO-002). - Vehicle and personnel access limited to the Activity areas. - Civil works to be limited to daylight hours to mitigate any potential impacts on nocturnal species. - Well maintained and muffled equipment and machinery. - Implement dust suppression measures, such as water spraying, as required. - Minimising lighting during activities. - Waste will be managed and monitored in accordance with the Waste Management Procedure (HSE-PRO-005). - Fence, gate and signage kept in place around the boundary of well sites. - Infrastructure left in a stable and secure condition. - Adequate demobilisation with all specific machinery and equipment removed from site at the completion of work programs. - Communication with relevant stakeholders prior to commencement of Activity. - On-going consultation with local landholders, traditional owners and other stakeholders regarding the Activities, including regular notices / updates.	Given limited use of the area by the local community and the implementation of the management measures, impacts to the community are unlikely.	- Contractor to ensure compliance with the Dangerous Goods Safety Regulations 2007 for transport of Controlled Waste and Dangerous Goods, where required. - Visual inspection of Activity areas following clean-up of activity areas. - Internal environmental audits. - DEMIRS Environment Branch notified in writing following completion of remediation operations.

3.1 Communication and Consultation

The Activity will be confined to the existing well sites, camp sites, facility areas and access tracks. A summary of the existing environmental characteristics of surrounding the Activity area, potential impacts that could result from the Activity and the risk of these potential impacts occurring is provided in Table 2. Included in this Table are also the management and mitigation measures that form part of the implementation strategy to minimise environmental risk:

- Department of Water and Environment Regulation;
- Blina Pastoral Station;
- Bunuba Traditional Owners; and
- Warrwa Traditional Owners.

These stakeholders have been consulted via phone, written notices and face-to-face meetings.

No issues have been raised in relation to the Activity through the consultation process. The Company will continue to communicate with stakeholders and consult during all phases of the Activity, on a formal and informal basis, and by email, letter, face-to-face and telephone.

Appendix A Chemical Disclosure and SDSs

CHEMICAL DISCLOSURE FOR BURU ENERGY

A. SYSTEM DETAILS:

OPERATOR:	Buru Energy
PROJECT / WELL:	Blina Oilfield
SYSTEM:	Crude Oil Reinjection
TOTAL VOLUME OF SYSTEM:	450,000 Lt

B. PRODUCT LIST:

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
FORSA™ PAO24033	BHGE	Paraffin Dispersant	This product is organic. AQUATIC TOXICOLOGY COMPONENT 1 (60 – 100% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another solvent of similar mixture and same CAS number.</i> <i>Skeletonema costatum</i> (marine algae) EC50, 72 hours: 67.1 mg/L <i>Acartia tonsa</i> (marine invertebrate) LC50, 48 hours: 161 mg/L <i>Pimephales promelas</i> (freshwater fish) LC50, 96 hours: <10 mg/L COMPONENT 2 (5 – 10% concentration) Static Acute Toxicity <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another linear alkylbenzene sulfonate within the same alkyl chain length.</i> <i>Various marine and freshwater algae</i> EC50, 72 hours: 1 – 10 mg/L <i>Daphnia magna</i> (freshwater invertebrate) LC50, 48 hours: 1 – 5 mg/L <i>Pimephales promelas</i> (freshwater fish) LC50, 96 hours: 1 – 5 mg/L CHEMICAL FATE Octanol/Water Partition Coefficient COMPONENT 1 (60 – 100% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another solvent of similar mixture and same CAS number.</i> OECD 117 (HPLC). Log (Pow): 2.66 to 4.90 COMPONENT 2 (5 – 10% concentration) <i>Not applicable to surfactants.</i> ENVIRONMENTAL FATE	0.444%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Ready Biodegradability COMPONENT 1 (60 – 100% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another solvent of similar mixture and same CAS number.</i> OECD 306. Biodegradability 28 days: 62% COMPONENT 2 (5 – 10% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another linear alkylbenzene sulfonate within the same alkyl chain length.</i> OECD 301D. Biodegradability 28 days: >60% <u>ACUTE MAMMALIAN TOXICITY</u> COMPONENT 1 (60 – 100% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another solvent of similar mixture and same CAS number.</i> Rat. LD50 (oral): 7050 mg/kg COMPONENT 2 (5 – 10% concentration) <i>No scientific data or research is available for this component. Data are presented for a similar ingredient, which is another linear alkylbenzene sulfonate within the same alkyl chain length.</i> Rat. LD50 (oral): >1000 mg/kg <u>CHRONIC TOXICITY</u> This product carries the following classification: H351 - Suspected of causing cancer. This product does not carry any of the following hazard phrases for carcinogenic (H350), chronic (H341, H370, H371, H373), mutagenic (H340) or reproductive (H360, H361, H362) effects for this product.		
Aldacide G Antimicrobial	Halliburton	Biocide	<u>ACUTE TOXICITY</u> Component (10-30% as an ingredient) Algae – EC50 (72h) 0.61 mg/L (Desmodesmus subspicatus), EC50 (72h) 0.5 mg/L (Skeletonema costatum) Fish – LC50 (96h) 10 mg/L (Lepomis macrochirus), NOEC (97d) 1.6 mg/L (Oncorhynchus mykiss), LC50 (96h) 3.5 mg/L (Oncorhynchus mykiss), LC50 (96h) 60 mg/L (Scophthalmus maximus) Microorganisms – EC50 (17h) 6.65 mg/L (Pseudomonas putida)	0.011%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Invertebrates – EC50 (48h) 0.35 mg/L (Daphnia magna), EC50 (48h) 0.7 mg/L (Acartia tonsa), NOEC (21d) 0.13 mg/L (Daphnia magna), EC50 (48h) 0.1 mg/L (Acartia tonsa) <u>CHRONIC TOXICITY</u> Component (10-30% as an ingredient) Can cause skin, eye etc. irritation. <u>BIODEGREDDATION/BIOACCUMULATION</u> Component (10-30% as an ingredient) Ready biodegradable (75% @ 28d) Log Pow -0.36		
Crude oil from storage tanks	Buru Energy (Blina Oilfield Tanks)	Source fluid	<i>No scientific data or research is available for this particular crude oil. Data are presented for similar crude oil from the Company's Ungani Oilfield. The below data are taken from the Ungani Stock Tank Crude Oil SDS.</i> <u>AQUATIC TOXICOLOGY</u> Basis for Assessment: The information given is based on the major component of the product (> 60% petroleum distillate). 96 Hr LC50 Salmo gairdneri: 258 mg/L (static) 24 Hr EC50 Daphnia magna: 36 mg/L 48 Hr EC50 Daphnia magna: <0.26 mg/L (static) <u>ACUTE MAMMALIAN TOXICITY</u> Component 1 (>90% as an ingredient) Rat, mouse LD50 Oral: >4,300 mg/kg Component 2 (<0.03% as an ingredient) Rat LD50 Oral: 636 mg/kg Rabbit LD50 Dermal: >14,100 µL/kg Mouse LC50 Inhalation: 400 ppm/24 hours Component 3 (<0.01% as an ingredient) Rat LD50 Oral: 930 mg/kg Mouse LD50 Dermal: 48 mg/kg Mouse LC50 Inhalation: 9980 ppm <u>CHEMICAL FATE</u> Low Pow >3 – this product is more soluble in octanol. <u>ENVIRONMENTAL FATE</u> Inherently biodegradable. Contains constituents with the potential to bioaccumulate. May accumulate in sediments. <u>CHRONIC TOXICOLOGY</u>	99.556%	N/A

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Potential carcinogen. Component 3 classified as a carcinogenic to humans (IARC Group 1). Exposure may cause drowsiness or dizziness. May cause skin irritation with prolonged or repeated contact.		
TOTAL				100%	
BIOC16733A	ChampionX	Biocide	This product contains organic components. AQUATIC TOXICOLOGY • COMPONENT 1 (1 – 10% concentration) ○ <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 0.26 mg/L ○ <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 0.4 mg/L ○ <i>Cyprinodon variegatus (sheepshead minnow)</i> (Marine fish) LC50 96 hrs: 1.7 mg/L • COMPONENT 2 (60 – 100% concentration) ○ <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 0.16 mg/L ○ <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 0.6 mg/L ○ <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: 72 mg/L • COMPONENT 3 (0 – 1% concentration) ○ <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 4.1 mg/L ○ <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 38 mg/L ○ <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: 611 mg/L • COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines CHEMICAL FATE • COMPONENT 1 (1 – 10% concentration) Log Pow 2.28 (theoretical) • COMPONENT 2 (60 – 100% concentration) Log Pow 0 • COMPONENT 3 (0 – 1% concentration) Log Pow <0 • COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines ENVIRONMENTAL FATE • COMPONENT 1 (1 – 10% concentration) Biodegradability, 28 days: 34% • COMPONENT 2 (60 – 100% concentration)	Contingency, ~0.007%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Biodegradability, 28 days: 61% COMPONENT 3 (0 – 1% concentration) Biodegradability, 28 days: 83% COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines ACUTE MAMMALIAN TOXICITY COMPONENT 1 (1 – 10% concentration) Rat LD50 (oral): 344 mg/kg Rabbit LD50 (dermal): 3340 mg/kg Rat LC50 (inhalation) 4h: >0.054 mg/L COMPONENT 2 (60 – 100% concentration) Rat LD50 (oral): 575 mg/kg (75% active ingredient in water) Rat LD50 (dermal): >2000 mg/kg (75% active ingredient in water) Rat LC50 (inhalation) 4h: 0.591 mg/l (75% active ingredient in water) COMPONENT 3 (0 – 1% concentration) Guinea pig LD50 (oral): 260* mg/kg Rabbit LD50 (dermal): 270* mg/kg Mouse LC50 (inhalation) 4 hr: 497* mg/kg COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines <i>*Literature data from HSNO CCID</i> CHRONIC TOXICITY COMPONENT 1 (1 – 10% concentration) No known carcinogenic, chronic, mutagenic or reproductive effects. COMPONENT 2 (60 – 100% concentration) Skin sensitizer. Reproductive toxicant to rabbits/rats at 50mg/kg/day. COMPONENT 3 (0 – 1% concentration) Skin sensitizer. May cause cancer, IARC Group 1 Carcinogen. COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines		
XC24380	BHGE	Biocide	AQUATIC TOXICOLOGY COMPONENT 1 (60-100% concentration) Static Acute Toxicity <i>Skeletonema costatum</i> (marine algae) EC50, 72 hours.: 0.16 mg/L	Contingency, ~0.05%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			<i>Acartia tonsa</i> (marine invertebrate) LC50, 48 hours: 0.6 mg/L <i>Scophthalmus maximus</i> (marine fish) LC50, 96 hours: 72.5 mg/L COMPONENT 2 (10-30% concentration) Natural product - exempted under the Chemical Disclosure Guidelines CHEMICAL FATE Octanol/Water Partition Coefficient COMPONENT 1 (60-100%concentration) OECD 117 (HPLC). log (Pow): < 0 COMPONENT 2 (10-30% concentration) Natural product - exempted under the Chemical Disclosure Guidelines ENVIRONMENTAL FATE Ready Biodegradability COMPONENT 1 (60-100%concentration) OPPTS 835.4300. Biodegradability 7 days: 60% COMPONENT 2 (10-30% concentration) Natural product - exempted under the Chemical Disclosure Guidelines ACUTE MAMMALIAN TOXICITY COMPONENT 1 (60-100%concentration) Rat. LD50 (oral): 575 mg/kg COMPONENT 2 (10-30% concentration) Natural product - exempted under the Chemical Disclosure Guidelines A component of this product does carry the following Hazard statement: H361 - Suspected of damaging the unborn child CHRONIC TOXICITY No known carcinogenic (H350, H351), chronic (H341, H370, H371, H373), mutagenic (H340) or reproductive (H360, H362) effects for this product.		
Hydrochloric Acid	Coogee Chemicals	pH Control	Constituent 1 as an ingredient 15% Acute Toxicity: EC50 (72 h) 0.73 mg/L (non-neutralized) <i>Chlorella vulgaris</i> (freshwater algae). LC50 (48 h) 0.44 mg/L (non-neutralized) <i>Daphnia magna</i> (freshwater invertebrate). LC50 (96 h) 20.5 mg/L (non-neutralized) <i>Lepomis macrochirus</i> (freshwater fish) LD50 (oral) 238 – 277 mg/kg (Non-neutralized) Rat Chronic Toxicity: No known carcinogenic, chronic, mutagenic or reproductive effects for this product. Biodegradation/bioaccumulation: Not applicable to inorganic compounds Constituent 2 as an ingredient 85% Water	Contingency, ~1.778%	Yes
Acetic acid	Halliburton	Chelating	Acute Toxicity:	Contingency, ~0.001%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
		agent	EC50 (72h) 55.22 mg/L Anabaena (algae) LC50 (96h) 75 mg/L Lepomis macrochirus (fish) LC50 (96h) 251 mg/L Gambusia affinis (fish) EC50 (48h) 65 mg/L Daphnia magna (freshwater invertebrate) Chronic Toxicity: No known carcinogenic, chronic, mutagenic or reproductive effects for this product. Biodegradation/bioaccumulation: Readily biodegradable (99% @ 7d). Log Kow -0.17 The product is not known to be Bioaccumulative.		
Rodine 85	Henkel	Acid inhibitor	Toxicology Data: Chronic Toxicity: Carcinogenicity – Category 2 (Carcinogen), suspected of causing cancer. Toxic to reproduction, category 2. Component 1 (<10%) LC50 (96h) 4.6 mg/L Leuciscus idus (fish) EC50 (24h) 11 mg/L Daphnia magna (freshwater invertebrate) EC50 (8d) >18 mg/L Scenedesmus quadricauda (algae) Component 2 (<5%) EC50 (48h) 56 mg/L Daphnia magna (freshwater invertebrate) Component 3 (<30%) No data available. Data presented for a similar compound LC50 (96h) P. promelas 24 mg/L (fish) LC50 (96h) B. rerio 41 mg/L (fish) EC50 (48h) Daphnia magna ~2 mg/L (freshwater invertebrate) Component 4 (60%) Water Biodegradation/bioaccumulation: Degradability: Component 1 37%, Component 2 3%, Component 3 97% Bioaccumulative potential: Comp. 1 Log Kow -0.35, Comp. 2 LogKow 0.57, Comp. 3 LogPow <1	Contingency, ~0.005%	Yes
Citric Acid	Halliburton	pH control	Acute Fish Toxicity 96h LC50: >440-760 mg/l (Leuciscus idus) Acute Crustacean Toxicity 72h EC50: 120 mg/l (Daphnia magna) Acute Toxicity 7d EC3: 640 mg/l (Scenedesmus quadricauda) Source: IUCLID 2000 Biodegradation/bioaccumulation: Citric Acid is extract of Citrus and rapidly biodegradable. BOD30/COD = 90%. Rapidly biodegradable in water and soil. The product is not known to be Bioaccumulative.	Contingency, ~1.843%	Yes
Soda Ash F.G.	Halliburton	pH control	Toxicology Data LD50 Oral: 4090 mg/kg (Rat); 2800 mg/kg (Rat) LD50 Dermal: 2210 mg/kg (Mouse); >2000 mg/kg (Rabbit) LC50 Inhalation: 2.3 mg/L (Rat) 2h Substance Ecotoxicity Data Toxicity to Algae - EC50 242 mg/L (Nitzschia) Toxicity to Fish – TLM24 385 mg/L (Lepomis macrochirus); LC50 310-1220 mg/L (Pimephales promelas); LC50 (96h) 300 mg/L (Lepomis macrochirus) Toxicity to Microorganisms - No information available Toxicity to Invertebrates – EC50 265 mg/L (Daphnia magna); EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.) Biodegradation/bioaccumulation:	Contingency, ~0.05%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Soda Ash is an inorganic (Sodium Carbonate), naturally occurring salt and partially biodegradable. Soda Ash is fully water soluble and highly mobile in soil. Biodegradability does not pertain to inorganic substances. Does not bioaccumulate. Dissociates into ions.		
Sodium Bicarbonate	Halliburton	pH control	Toxicology Data for Components LD50 Oral: No data available LD50 Dermal: No data available LC50 Inhalation: No data available Substance Ecotoxicity Data Toxicity to Algae - No information available - EC50 (5d): 650 mg/l (Nitzschia linearis) Toxicity to Fish – No information available - LC50 (96h): 7550 mg/l (Gambusia affinis) Toxicity to Microorganisms - No information available Toxicity to Invertebrates – No information available - EC50 (48h): 2350 mg/l (Daphnia magna) Source: IUCLID 2000 Biodegradation/bioaccumulation: Sodium Bicarbonate is an inorganic, naturally occurring salt and partially biodegradable. Sodium Bicarbonate is fully water soluble and highly mobile in soil. The product is not known to be Bioaccumulative.	Contingency, ~0.05%	Yes

** With reference to biodegradation, where a Product is organic then Contractor must state as such in this column

C. CHEMICAL LIST

Chemicals within Products in Part B	CAS Number	Mass Fraction (%)
CRUDE OIL	8002-05-9	99.0723 %
ALKYL (C3-5) BENZENES	64742-94-5	0.69363 %
DODECYLBENZENESULFONIC ACID, MONOETHANOLAMINE SALT	26836-07-7	0.08866 %
NAPHTHALENE	91-20-3	0.07344 %
1,2,4-TRIMETHYLBENZENE	95-63-6	0.04080 %
WATER	7732-18-5	0.01739 %
MESITYLENE	108-67-8	0.00816 %
TOLUENE	108-88-3	0.00318 %
BENZENE	71-43-2	0.00239 %
GLUTARALDEHYDE	111-30-8	0.00005 %
TOTAL	-	100 %
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	Contingency, 0.46 %
BENZYL-(C12-C16 LINEAR ALKYL)-DIMETHYL-AMMONIUM CHLORIDE	68424-85-1	Contingency, 0.044 %
HYDROCHLORIC ACID	7647-01-0	Contingency, <10.467 %

Chemical Disclosure

ACETIC ACID	64-19-7	Contingency, 0.111 %
CITRIC ACID	77-92-9	Contingency, 1.8415 %
PROP-2-YN-1-OL	107-19-7	Contingency, 0.002 %
1,3-DIETHYL-2-THIOUREA	105-55-5	Contingency, 0.001 %
FORMALDEHYDE REACTION PRODUCTS WITH O-TOLUIDINE	68424-85-1	Contingency, 0.001 %
SODIUM CARBONATE	497-19-8	Contingency, 0.05 %
SODIUM BICARBONATE	144-55-8	Contingency, 0.05 %

CHEMICAL DISCLOSURE FOR BURU ENERGY

A. SYSTEM DETAILS:

OPERATOR:	Buru Energy
PROJECT / WELL:	Blina Oilfield
SYSTEM:	Water Reinjection – Inhibited bore water from PL7 pipeline
TOTAL VOLUME OF SYSTEM:	300,000 Lt

B. PRODUCT LIST:

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
HSUR43670A / Hydrosure O-3670R	ChampionX	Hydrotest Chemical	This product contains organic components. AQUATIC TOXICOLOGY COMPONENT 1 (10 – 30% concentration) ○ <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 0.26 mg/L ○ <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 0.4 mg/L ○ <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: 1.7 mg/L COMPONENT 2 (10 – 30% concentration) ○ PLONOR COMPONENT 3 (5 – 10% concentration) ○ <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: >2000 mg/L ○ <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: >2000 mg/L ○ <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: >1800 mg/L COMPONENT 4 (5 – 10% concentration) ○ PLONOR CHEMICAL FATE COMPONENT 1 (10 – 30% concentration) Log Pow 2.28 (theoretical) COMPONENT 2 (10 – 30% concentration) PLONOR COMPONENT 3 (5 – 10% concentration) Log Pow 1.05 COMPONENT 4 (5 – 10% concentration) PLONOR ENVIRONMENTAL FATE COMPONENT 1 (10 – 30% concentration) Biodegradability, 28 days: 34% COMPONENT 2 (10 – 30% concentration) PLONOR COMPONENT 3 (5 – 10% concentration) Biodegradability, 28 days: 76% COMPONENT 4 (5 – 10% concentration) PLONOR ACUTE MAMMALIAN TOXICITY COMPONENT 1 (10 – 30% concentration) Rat LD50 (oral): 344 mg/kg	0.137%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Rabbit LD50 (dermal): 3340 mg/kg Rat LC50 (inhalation) 4h: >0.054 mg/L COMPONENT 2 (10 – 30% concentration) Rat LD50 (oral): >2000 mg/kg (25% active ingredient in water) Rat LD50 (dermal): >2000 mg/kg (20% active ingredient in water) Rat LC50 (inhalation) 4h: >5.5 mg/L COMPONENT 3 (5 – 10% concentration) Guinea pig LD50 (oral): >5000 mg/kg (50% active ingredient in vehicle)* Rabbit LD50 (dermal): 9510 mg/kg* <i>*Literature data from ECHA</i> COMPONENT 4 (5 – 10% concentration) Rat LD50 (oral): 7712 mg/kg* Rabbit LD50 (dermal): 10600 mg/kg <i>*Literature data from ECHA</i> CHRONIC TOXICITY COMPONENT 1 (10 – 30% concentration) No known carcinogenic, chronic, mutagenic or reproductive effects. COMPONENT 2 (10 – 30% concentration) No known carcinogenic, chronic, mutagenic or reproductive effects. COMPONENT 3 (5 – 10% concentration) No known carcinogenic, mutagenic or reproductive effects. May cause damage to organs for repeated dose (oral route). COMPONENT 4 (5 – 10% concentration) No known carcinogenic, chronic, mutagenic or reproductive effects.		
Bore Water	N/A	Water	Natural product – exempt under the Chemical Disclosure Guidelines	99.863%	N/A
TOTAL				100%	
BIOC16733A	Champion X	Biocide	This product contains organic components. AQUATIC TOXICOLOGY COMPONENT 1 (1 – 10% concentration) <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 0.26 mg/L <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 0.4 mg/L <i>Cyprinodon variegatus (sheepshead minnow)</i> (Marine fish) LC50 96 hrs: 1.7 mg/L COMPONENT 2 (60 – 100% concentration) <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 0.16 mg/L <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 0.6 mg/L <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: 72 mg/L COMPONENT 3 (0 – 1% concentration) <i>Skeletonema costatum</i> (Marine algae) EC50 72 hrs: 4.1 mg/L <i>Acartia tonsa</i> (Marine invertebrate) LC50 48 hrs: 38 mg/L <i>Scophthalmus maximus</i> (Marine fish) LC50 96 hrs: 611 mg/L	0.007%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines CHEMICAL FATE COMPONENT 1 (1 – 10% concentration) Log Pow 2.28 (theoretical) COMPONENT 2 (60 – 100% concentration) Log Pow 0 COMPONENT 3 (0 – 1% concentration) Log Pow <0 COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines ENVIRONMENTAL FATE COMPONENT 1 (1 – 10% concentration) Biodegradability, 28 days: 34% COMPONENT 2 (60 – 100% concentration) Biodegradability, 28 days: 61% COMPONENT 3 (0 – 1% concentration) Biodegradability, 28 days: 83% COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines ACUTE MAMMALIAN TOXICITY COMPONENT 1 (1 – 10% concentration) Rat LD50 (oral): 344 mg/kg Rabbit LD50 (dermal): 3340 mg/kg Rat LC50 (inhalation) 4h: >0.054 mg/L COMPONENT 2 (60 – 100% concentration) Rat LD50 (oral): 575 mg/kg (75% active ingredient in water) Rat LD50 (dermal): >2000 mg/kg (75% active ingredient in water) Rat LC50 (inhalation) 4h: 0.591 mg/l (75% active ingredient in water) COMPONENT 3 (0 – 1% concentration) Guinea pig LD50 (oral): 260* mg/kg Rabbit LD50 (dermal): 270* mg/kg Mouse LC50 (inhalation) 4 hr: 497* mg/kg COMPONENT 4 (10 – 30% concentration)		

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			Natural product – exempt under the Chemical Disclosure Guidelines <i>*Literature data from HSNO CCID</i> CHRONIC TOXICITY COMPONENT 1 (1 – 10% concentration) No known carcinogenic, chronic, mutagenic or reproductive effects. COMPONENT 2 (60 – 100% concentration) Skin sensitizer. Reproductive toxicant to rabbits/rats at 50mg/kg/day. COMPONENT 3 (0 – 1% concentration) Skin sensitizer. May cause cancer, IARC Group 1 Carcinogen. COMPONENT 4 (10 – 30% concentration) Natural product – exempt under the Chemical Disclosure Guidelines		
Hydrochloric Acid	Coogee Chemicals	pH Control	Constituent 1 as an ingredient 15% Acute Toxicity: EC50 (72 h) 0.73 mg/L (non-neutralized) Chlorella vulgaris (freshwater algae). LC50 (48 h) 0.44 mg/L (non-neutralized) Daphnia magna (freshwater invertebrate). LC50 (96 h) 20.5 mg/L (non-neutralized) Lepomis macrochirus (freshwater fish) LD50 (oral) 238 – 277 mg/kg (Non-neutralized) Rat Chronic Toxicity: No known carcinogenic, chronic, mutagenic or reproductive effects for this product. Biodegradation/bioaccumulation: Not applicable to inorganic compounds Constituent 2 as an ingredient 85% Water	Contingency, ~0.667%	Yes
Acetic acid	Halliburton	Chelating agent	Acute Toxicity: EC50 (72h) 55.22 mg/L Anabaena (algae) LC50 (96h) 75 mg/L Lepomis macrochirus (fish) LC50 (96h) 251 mg/L Gambusia affinis (fish) EC50 (48h) 65 mg/L Daphnia magna (freshwater invertebrate) Chronic Toxicity: No known carcinogenic, chronic, mutagenic or reproductive effects for this product. Biodegradation/bioaccumulation: Readily biodegradable (99% @ 7d). Log Kow -0.17 The product is not known to be Bioaccumulative.	Contingency, ~0.001%	Yes
Rodine 85	Henkel	Acid inhibitor	Toxicology Data: Chronic Toxicity: Carcinogenicity – Category 2 (Carcinogen), suspected of causing cancer. Toxic to reproduction, category 2. Component 1 (<10%) LC50 (96h) 4.6 mg/L Leuciscus idus (fish) EC50 (24h) 11 mg/L Daphnia magna (freshwater invertebrate) EC50 (8d) >18 mg/L Scenedesmus quadricauda (algae) Component 2 (<5%)	Contingency, ~0.01843%	Yes

Chemical Disclosure

Product Name	Supplier	Purpose	Toxicity, Ecotoxicity & Biodegradability data**	% Product in system fluid	SDS Attached
			EC50 (48h) 56 mg/L Daphnia magna (freshwater invertebrate) Component 3 (<30%) No data available. Data presented for a similar compound LC50 (96h) P. promelas 24 mg/L (fish) LC50 (96h) B. rerio 41 mg/L (fish) EC50 (48h) Daphnia magna ~2 mg/L (freshwater invertebrate) Component 4 (60%) Water Biodegradation/bioaccumulation: Degradability: Component 1 37%, Component 2 3%, Component 3 97% Bioaccumulative potential: Comp. 1 Log Kow -0.35, Comp. 2 LogKow 0.57, Comp. 3 LogPow <1		
Citric Acid	Halliburton	pH control	Acute Fish Toxicity 96h LC50: >440-760 mg/l (Leuciscus idus) Acute Crustacean Toxicity 72h EC50: 120 mg/l (Daphnia magna) Acute Toxicity 7d EC3: 640 mg/l (Scenedesmus quadricauda) Source: IUCLID 2000 Biodegradation/bioaccumulation: Citric Acid is extract of Citrus and rapidly biodegradable. BOD30/COD = 90%. Rapidly biodegradable in water and soil. The product is not known to be Bioaccumulative.	Contingency, ~1.843 %	Yes
Soda Ash F.G.	Halliburton	pH control	Toxicology Data LD50 Oral: 4090 mg/kg (Rat); 2800 mg/kg (Rat) LD50 Dermal: 2210 mg/kg (Mouse); >2000 mg/kg (Rabbit) LC50 Inhalation: 2.3 mg/L (Rat) 2h Substance Ecotoxicity Data Toxicity to Algae - EC50 242 mg/L (Nitzschia) Toxicity to Fish – TLM24 385 mg/L (Lepomis macrochirus); LC50 310-1220 mg/L (Pimephales promelas); LC50 (96h) 300 mg/L (Lepomis macrochirus) Toxicity to Microorganisms - No information available Toxicity to Invertebrates – EC50 265 mg/L (Daphnia magna); EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.) Biodegradation/bioaccumulation: Soda Ash is an inorganic (Sodium Carbonate), naturally occurring salt and partially biodegradable. Soda Ash is fully water soluble and highly mobile in soil. Biodegradability does not pertain to inorganic substances. Does not bioaccumulate. Dissociates into ions.	Contingency, ~0.05%	Yes
Sodium Bicarbonate	Halliburton	pH control	Toxicology Data for Components LD50 Oral: No data available LD50 Dermal: No data available LC50 Inhalation: No data available Substance Ecotoxicity Data Toxicity to Algae - No information available - EC50 (5d): 650 mg/l (Nitzschia linearis) Toxicity to Fish – No information available - LC50 (96h): 7550 mg/l (Gambusia affinis) Toxicity to Microorganisms - No information available Toxicity to Invertebrates – No information available - EC50 (48h): 2350 mg/l (Daphnia magna) Source: IUCLID 2000 Biodegradation/bioaccumulation: Sodium Bicarbonate is an inorganic, naturally occurring salt and partially biodegradable. Sodium Bicarbonate is fully water soluble and highly mobile in soil. The product is not known to be Bioaccumulative.	Contingency, ~0.05%	Yes

** With reference to biodegradation, where a Product is organic then Contractor must state as such in this column

C. CHEMICAL LIST

Chemicals within Products in Part B	CAS Number	Mass Fraction (%)
BORE WATER	7732-18-5	99.39533 %
BENZYL-(C12-C16 LINEAR ALKYL)-DIMETHYL-AMMONIUM CHLORIDE	68424-85-1	0.08681 %
AMMONIUM BISULFITE	10192-30-0	0.02893 %
ETHYLENE GLYCOL	107-21-1	0.00723 %
TETRAKIS(HYDROXYMETHYL) PHOSPHONIUM SULFATE	55566-30-8	0.46 %
DIPROPYLENE GLYCOL MONOMETHYL ETHER	34590-94-8	0.02170 %
TOTAL	-	100 %
WATER	7732-18-5	Contingency, 0.5616 %
HYDROCHLORIC ACID	7647-01-0	Contingency, <10.467 %
ACETIC ACID	64-19-7	Contingency, 0.111 %
CITRIC ACID	77-92-9	Contingency, 1.8415 %
PROP-2-YN-1-OL	107-19-7	Contingency, 0.002 %
1,3-DIETHYL-2-THIOUREA	105-55-5	Contingency, 0.001 %
FORMALDEHYDE REACTION PRODUCTS WITH O-TOLUIDINE	68424-85-1	Contingency, 0.001 %
SODIUM CARBONATE	497-19-8	Contingency, 0.05 %
SODIUM BICARBONATE	144-55-8	Contingency, 0.05 %
BENZYL-(C12-C16 LINEAR ALKYL)-DIMETHYL-AMMONIUM CHLORIDE	68424-85-1	Contingency, 2.89 %
NICKEL SULPHATE	7786-81-4	Contingency, <0.0001 %

PRODUCT NAME UNGANI STOCK TANK CRUDE OIL**1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

Supplier name BURU ENERGY
Address Level 2, 88 William St, Perth, WA, 6000, AUSTRALIA
Telephone (08) 9215 1800
Fax (08) 9215 1899
Emergency 1800 219 070
Email info@buruenergy.com
Synonym(s) PETROLEUM HYDROCARBON • UNGANI CRUDE OIL (FORMERLY)
Use(s) CRUDE OIL • REFINERY FEEDSTOCK
SDS date 13 January 2016

2. HAZARDS IDENTIFICATION**CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA****Risk Phrases**

R11 Highly flammable.
R45 May cause cancer.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R67 Vapours may cause drowsiness and dizziness.

Safety Phrases

S16 Keep away from sources of ignition - No smoking.
S29 Do not empty into drains.
S33 Take precautionary measures against static discharges.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).
S53 Avoid exposure - obtain special instructions before use.

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN Number 1267 **Transport Hazard Class** 3
Packing Group II **Hazchem Code** 3WE

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	CAS Number	EC Number	Content
PETROLEUM (CRUDE OIL)	8002-05-9	232-298-5	>90%
TOLUENE	108-88-3	203-625-9	<0.03%
BENZENE	71-43-2	200-753-7	<0.01%

Ingredient notes Crude oil contains complex hydrocarbon mixtures of paraffinic, olefinic, naphthenic and aromatic compounds.

4. FIRST AID MEASURES

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

PRODUCT NAME UNGANI STOCK TANK CRUDE OIL

Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use a Type AB (Organic vapour, Inorganic and acid gas) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.
Ingestion	For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once). If swallowed, do not induce vomiting.
Advice to doctor	Treat symptomatically.
First aid facilities	Eye wash facilities and safety shower should be available.

5. FIRE FIGHTING MEASURES

Flammability	Highly flammable. May evolve toxic gases (carbon/sulphur oxides, sulphides, hydrocarbons) when heated to decomposition. Vapour may form explosive mixtures with air. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, etc when handling. Earth containers when dispensing fluids.
Fire and explosion	Evacuate area and contact emergency services. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.
Extinguishing	Dry agent, carbon dioxide or foam. Prevent contamination of drains and waterways.
Hazchem code	3WE 3 Normal Foam (protein based foam that is not alcohol resistant). W Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Contain spill and run-off. E Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Ventilate area where possible.
Environmental precautions	Prevent product from entering drains and waterways.
Methods of cleaning up	Contain spillage, then cover / absorb spill with non-combustible absorbent material (vermiculite, sand, or similar), collect and place in suitable containers for disposal.
References	See Sections 8 and 13 for exposure controls and disposal.

7. STORAGE AND HANDLING

Storage	Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Large storage areas should have appropriate fire protection systems.
Handling	Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m ³	ppm	mg/m ³
Benzene	SWA (AUS)	1	3.2	--	--
Toluene	SWA (AUS)	50	191	150	574

Biological limits

Ingredient	Determinant	Sampling Time	BEI
BENZENE	S-Phenylmercapturic acid in urine	End of shift	25 ug/g creatinine
	t,t-Muconic acid in urine	End of shift	500 ug/g creatine
TOLUENE	o-Cresol in urine	End of shift	0.02 mg/L
	Toluene in urine	End of shift	0.03 mg/L
	Toluene in blood	Prior to last shift of workweek	0.02 mg/L

Reference: ACGIH Biological Exposure Indices

Engineering controls

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Flammable/explosive vapours may accumulate in poorly ventilated areas. Vapours are heavier than air and may travel some distance to an ignition source and flash back. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face	Wear splash-proof goggles.
Hands	Wear PVC or rubber gloves. With prolonged use, wear viton (R) or nitrile gloves.
Body	With prolonged use, wear coveralls.
Respiratory	Where an inhalation risk exists, wear a Type AB (Organic and Inorganic gases/vapours) respirator. Where the boiling point is < 65°, use an AX filter type.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	VISCOUS BROWN TO BLACK LIQUID
Odour	CHARACTERISTIC HYDROCARBON ODOUR
Flammability	HIGHLY FLAMMABLE
Flash point	< 15°C
Boiling point	> 35°C
Melting point	21°C
Evaporation rate	CURRENTLY NOT AVAILABLE
pH	NOT PERTINENT
Vapour density	CURRENTLY NOT AVAILABLE
Specific gravity	0.8413
Solubility (water)	INSOLUBLE
Vapour pressure	14.8 kPa
Upper explosion limit	6.0 vol% in air (as per Table K1 in AS1940-2004)
Lower explosion limit	1.1 vol% in air (as per Table K1 in AS1940-2004)
Partition coefficient	CURRENTLY NOT AVAILABLE
Autoignition temperature	310°C (Estimated)
Decomposition temperature	CURRENTLY NOT AVAILABLE
Viscosity	7.4 cSt @ 30°C
Explosive properties	VAPOUR MAY FORM EXPLOSIVE MIXTURES WITH AIR
Oxidising properties	CURRENTLY NOT AVAILABLE
Odour threshold	CURRENTLY NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical stability	Stable under recommended conditions of storage.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources.
Material to avoid	Incompatible with oxidising agents (e.g. hypochlorites), acids (e.g. nitric acid), alkalis (e.g. sodium hydroxide), heat and ignition sources.
Hazardous Decomposition	May evolve toxic gases (carbon/sulphur oxides, sulphides, hydrocarbons) when heated to

PRODUCT NAME UNGANI STOCK TANK CRUDE OIL

Products	decomposition.
Hazardous Reactions	Polymerization is not expected to occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary	Irritant - toxic. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure to crude petroleum products has been associated with higher rates of cancer as they contain polycyclic aromatic hydrocarbons. May contain trace amounts of highly toxic hydrogen sulphide gas and benzene. Benzene is classified as carcinogenic to humans (IARC Group 1). Chronic exposure to hydrogen sulphide may result in nerve paralysis/damage, heart damage and neurological effects.														
Eye	Irritant. Contact may result in irritation, lacrimation, pain and redness.														
Inhalation	Irritant - toxic. Over exposure may result in irritation of the nose and throat, coughing, loss of appetite, nausea and vomiting. May contain irritating/toxic hydrogen sulphide gas which can cause pulmonary oedema, unconsciousness and death.														
Skin	Irritant - toxic. Contact may result in drying and defatting of the skin, rash and dermatitis. May contain polycyclic aromatic hydrocarbons which can cause skin cancer.														
Ingestion	Harmful. Ingestion may result in nausea, vomiting, abdominal pain, laxative effect, diarrhoea, and drowsiness with large quantities. Aspiration or inhalation may cause chemical pneumonitis and pulmonary oedema.														
Toxicity data	PETROLEUM (CRUDE OIL) (8002-05-9) <table><tr><td>LD50 (oral)</td><td>> 4300 mg/kg (rat, mouse)</td></tr></table> TOLUENE (108-88-3) <table><tr><td>LD50 (oral)</td><td>636 mg/kg (rat)</td></tr><tr><td>LD50 (dermal)</td><td>14100 µL/kg (rabbit)</td></tr><tr><td>LC50 (inhalation)</td><td>400 ppm/24 hours (mouse)</td></tr></table> BENZENE (71-43-2) <table><tr><td>LD50 (oral)</td><td>930 mg/kg (rat)</td></tr><tr><td>LD50 (dermal)</td><td>48 mg/kg (mouse)</td></tr><tr><td>LC50 (inhalation)</td><td>9980 ppm (mouse)</td></tr></table>	LD50 (oral)	> 4300 mg/kg (rat, mouse)	LD50 (oral)	636 mg/kg (rat)	LD50 (dermal)	14100 µL/kg (rabbit)	LC50 (inhalation)	400 ppm/24 hours (mouse)	LD50 (oral)	930 mg/kg (rat)	LD50 (dermal)	48 mg/kg (mouse)	LC50 (inhalation)	9980 ppm (mouse)
LD50 (oral)	> 4300 mg/kg (rat, mouse)														
LD50 (oral)	636 mg/kg (rat)														
LD50 (dermal)	14100 µL/kg (rabbit)														
LC50 (inhalation)	400 ppm/24 hours (mouse)														
LD50 (oral)	930 mg/kg (rat)														
LD50 (dermal)	48 mg/kg (mouse)														
LC50 (inhalation)	9980 ppm (mouse)														

12. ECOLOGICAL INFORMATION

Toxicity	Basis for Assessment: The information given is based on the major component of the product (> 60% petroleum distillate). Expected to be harmful: LL/EL/IL50 1-10 mg/L (to aquatic organism) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract). 96 Hr LC50 <i>Salmo gairdneri</i>: 258 mg/L (static). 24 Hr EC50 <i>Daphnia magna</i>: 36 mg/L. 48 Hr EC50 <i>Daphnia magna</i>: <0.26 mg/L (static).
Persistence and degradability	Major constituents are inherently biodegradable, but may contain components that may persist in the environment.
Bioaccumulative potential	Contains constituents with the potential to bioaccumulate.
Mobility in soil	Contains volatile constituents. Partly evaporates from water or soil surfaces, but a significant proportion will remain after one day. If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.
Other adverse effects	Films formed on water may affect oxygen transfer and damage organisms.

13. DISPOSAL CONSIDERATIONS

Waste disposal	For small amounts, absorb with sand, vermiculite or similar and dispose of to an approved waste contractor. Contact the manufacturer/supplier for additional information if disposing of large quantities (if required). Prevent contamination of drains and waterways as aquatic life may be threatened and environmental damage may result.
Legislation	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	1267	1267	1267
Proper Shipping Name	PETROLEUM CRUDE OIL	PETROLEUM CRUDE OIL	PETROLEUM CRUDE OIL
Transport Hazard Class	3	3	3
Packing Group	II	II	II

Environmental hazards No information provided

Special precautions for user

Hazchem code 3WE
 GTEPG 3A1
 EMS F-E, S-E

15. REGULATORY INFORMATION

Poison schedule Classified as a Schedule 5 (S5) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Inventory Listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
 All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information MINERAL OILS - NON REFINED: Animal experiments and human experience have shown cancer risks when handling mineral oils. Such cases are reported to have occurred in conditions where poor occupational hygiene practices resulted in prolonged skin contact. CLEANING MINERAL OIL CONTAMINATED CLOTHING: Cleaners are advised that when cleaning oil contaminated clothing it is essential that freshly distilled solvent is used for each batch, including final rinse, as even filtered solvent will leave oil residues.

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGES: Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: Strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
CAS #	Chemical Abstract Service number - used to uniquely identify chemical compounds
CNS	Central Nervous System
EC No.	EC No - European Community Number
EMS	Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
GHS	Globally Harmonized System
GTEPG	Group Text Emergency Procedure Guide
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m ³	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
STEL	Short-Term Exposure Limit
STOT-RE	Specific target organ toxicity (repeated exposure)
STOT-SE	Specific target organ toxicity (single exposure)
SUSMP	Standard for the Uniform Scheduling of Medicines and Poisons
SWA	Safe Work Australia
TLV	Threshold Limit Value
TWA	Time Weighted Average

Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

Prepared by

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[End of SDS]

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : BIOC16733A
Other means of identification : Not applicable.
Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company : ChampionX Australia Pty Ltd
Suite 1/5 Brodie-Hall Drive, Technology Park
Bentley WA 6102
Australia
TEL: +61 8 9473 9000

Emergency telephone number : CHEMCALL 1800 127 406, International: +64 4 917 8888

Issuing date : 23.04.2023

Section: 2. HAZARDS IDENTIFICATION**GHS Classification**

Flammable liquids : Category 4
Acute toxicity (Oral) : Category 4
Acute toxicity (Inhalation) : Category 3
Skin corrosion/irritation : Sub-category 1B
Serious eye damage/eye irritation : Category 1
Skin sensitization : Category 1
Reproductive toxicity : Category 2

GHS Label element

Hazard pictograms :



Signal Word : Danger

Hazard Statements : Combustible liquid
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
Toxic if inhaled.
Suspected of damaging fertility or the unborn child.

Precautionary Statements : **Prevention:**
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid breathing mist or vapours. Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
Response:
IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse

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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.

Disposal:

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

Other hazards : None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

<u>Chemical Name</u>	<u>CAS-No.</u>	<u>Concentration: (%)</u>
Tetrakis(hydroxymethyl) phosphonium sulfate	55566-30-8	60 - 100
benzalkonium chloride	68424-85-1	5 - 10

Section: 4. FIRST AID MEASURES

- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
- In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- If swallowed : Contact the Poison's Information Centre (eg Australia 13 1126; New Zealand 0800 764 766).

Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention immediately.
- Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.
- Notes to physician : Treat symptomatically.
- Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Foam
Carbon dioxide
Dry powder
Other extinguishing agent suitable for Class B fires
For large fires, use water spray or fog, thoroughly drenching the burning material.
- Unsuitable extinguishing media : None known.
- Specific hazards during firefighting : Fire Hazard
Keep away from heat and sources of ignition.

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Flash back possible over considerable distance.

Hazardous combustion products : Decomposition products may include the following materials: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus Hydrogen chloride

Special protective equipment for firefighters : Use personal protective equipment.

Specific extinguishing methods : Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Hazchem Code : 2X

Section: 6. ACCIDENTAL RELEASE MEASURES

Initial Emergency Response Guide No : 36

Personal precautions, protective equipment and emergency procedures : Ensure adequate ventilation. Remove all sources of ignition. Keep people away from and upwind of spill/leak. Avoid inhalation, ingestion and contact with skin and eyes. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.

Methods and materials for containment and cleaning up : Eliminate all ignition sources if safe to do so. Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Do not ingest. Keep away from fire, sparks and heated surfaces. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only with adequate ventilation.

Conditions for safe storage : Keep away from heat and sources of ignition. Keep away from oxidizing agents. Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material : Keep in properly labelled containers.
Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Tetrakis(hydroxymethyl) phosphonium sulfate	55566-30-8	TWA	2 mg/m3	ACGIH

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below

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occupational exposure standards.

Personal protective equipment

Eye protection	:	Safety goggles Face-shield
Hand protection	:	Wear impervious chemical-resistant gloves when handling this product. The following glove types are recommended based on our review of glove manufacturer information and/or other available sources. Butyl rubber Nitrile rubber Other glove types may be used for short term, incidental contact if determined by testing to provide adequate worker protection. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Skin protection	:	Wear protective overalls, chemical splash goggles and impervious gloves. A full slicker suit is recommended if gross exposure is possible. Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing
Respiratory protection	:	Refer to AS/NZS 1715 and AS/NZS 1716 for selection, use and maintenance of respiratory protective equipment as applicable. Use local exhaust ventilation or other engineering controls as necessary to control airborne vapour and mist. Where concentrations in air may exceed the limits given in this section or when significant vapours are generated, use an approved air purifying respirator fitted with a gas and vapour cartridge. Use a particulate pre-filter where operations generate significant mists or aerosols. Recommended gas and vapour cartridge: Multi-purpose combination filter In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA or supplied-air respirator should be used.
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid
Colour	:	clear
Odour	:	Pungent
Flash point	:	74 °C
pH	:	4.0 - 4.5,(100 %)
Odour Threshold	:	no data available
Melting point/freezing point	:	no data available
Initial boiling point and boiling range	:	105 °C
Evaporation rate	:	no data available
Flammability (solid, gas)	:	Not applicable.

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Upper explosion limit	: no data available
Lower explosion limit	: no data available
Vapour pressure	: 17 kPa, (37.8 °C),
Relative vapour density	: no data available
Relative density	: 1.32, (19 °C),
Density	: 10.3 lb/gal
Water solubility	: completely soluble
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: 33 mPa.s (19 °C)
Viscosity, kinematic	: no data available
Molecular weight	: no data available
VOC	: no data available

Note: properties listed in this section may be typical, calculated, or estimated values and should not be used as product specifications or for system design. For product specifications see the COA or Technical Data sheet.

Section: 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No dangerous reaction known under conditions of normal use.
Conditions to avoid	: Heat, flames and sparks.
Incompatible materials	: Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Strong acids Strong Bases Reducing agents Strong oxidizing agents
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon oxides nitrogen oxides (NOx) Sulphur oxides Oxides of phosphorus Hydrogen chloride

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

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Potential Health Effects

Eyes	: Causes serious eye damage.
Skin	: Causes severe skin burns. May cause allergic skin reaction. May be harmful in contact with skin.
Ingestion	: Harmful if swallowed. Causes digestive tract burns.
Inhalation	: Toxic if inhaled. May cause nose, throat, and lung irritation.
Chronic Exposure	: Suspected of damaging fertility or the unborn child.

Experience with human exposure

Eye contact	: Redness, Pain, Corrosion
Skin contact	: Redness, Pain, Irritation, Corrosion, Allergic reactions
Ingestion	: Corrosion, Abdominal pain
Inhalation	: Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity	: LD50 rat: 575 mg/kg Test substance: 75% Active Ingredient
Acute inhalation toxicity	: LC50 rat: 0.591 mg/l Exposure time: 4 hrs Test atmosphere: dust/mist Test substance: 75% Active Ingredient
Acute dermal toxicity	: LD50 rat: > 2,000 mg/kg Test substance: 75% Active Ingredient
Skin corrosion/irritation	: no data available
Serious eye damage/eye irritation	: no data available
Respiratory or skin sensitization	: no data available
Carcinogenicity	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Reproductive effects	: Suspected of damaging fertility or the unborn child.
Germ cell mutagenicity	: Contains no ingredient listed as a mutagen
Teratogenicity	: no data available
STOT - single exposure	: no data available
STOT - repeated exposure	: no data available
Aspiration toxicity	: No aspiration toxicity classification

Human Hazard Characterization

Based on our hazard characterization, the potential human hazard is: High

Section: 12. ECOLOGICAL INFORMATION

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Toxicity

Environmental Effects : Toxic to aquatic life with long lasting effects.
Harmful to aquatic life.

Product

Toxicity to fish : LC50 *Lepomis macrochirus* (Bluegill sunfish): 93 mg/l
Exposure time: 96 hrs
Test substance: 75% Active Ingredient

LC50 *Oncorhynchus mykiss* (rainbow trout): 119 mg/l
Exposure time: 96 hrs
Test substance: 75% Active Ingredient

Toxicity to daphnia and other aquatic invertebrates : EC50 *Daphnia magna* (Water flea): 19.4 mg/l
Exposure time: 48 hrs
Test substance: 75% Active Ingredient

Toxicity to algae : LC50 Green Algae (*Pseudokirchneriella subcapitata*, previously *Selenastrum capricornutum*): 0.20 mg/l
Exposure time: 96 hrs
Test substance: 75% Active Ingredient

Toxicity to bacteria : EC50 Bacteria: 24 mg/l
Exposure time: 3 hrs
Test substance: 75% Active Ingredient

Persistence and degradability

The organic portion of this preparation is expected to be readily biodegradable.

Mobility

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air : <5%
Water : 30 - 50%
Soil : 50 - 70%

The portion in water is expected to be soluble or dispersible.

Bioaccumulative potential

This preparation or material is not expected to bioaccumulate.

Other information

no data available

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Moderate

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Section: 13. DISPOSAL CONSIDERATIONS

- Disposal methods : The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.
- Disposal considerations : 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

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport

- Proper shipping name : TOXIC LIQUID, ORGANIC, N.O.S.
Technical name(s): : Tetrakis(hydroxymethyl) phosphonium sulfate
UN/ID No. : UN 2810
Transport hazard class(es) : 6.1
Packing group : III
IERG No : 36
Hazchem Code : 2X

Air transport (IATA)

- UN/ID No. : UN 2810
Proper shipping name : TOXIC LIQUID, ORGANIC, N.O.S.
Technical name(s) : Tetrakis(hydroxymethyl) phosphonium sulfate
Transport hazard class(es) : 6.1
Packing group : III

Sea transport (IMDG/IMO)

- UN/ID No. : UN 2810
Proper shipping name : TOXIC LIQUID, ORGANIC, N.O.S.
Technical name(s) : Tetrakis(hydroxymethyl) phosphonium sulfate
Transport hazard class(es) : 6.1
Packing group : III
Marine pollutant : benzalkonium chloride

Section: 15. REGULATORY INFORMATION

- Standard for the Uniform : Schedule 6
Scheduling of Medicines and Poisons

INTERNATIONAL CHEMICAL CONTROL LAWS :

United States TSCA Inventory

This product has not been evaluated for Chemical Inventory regulations and may contain substances not found on Inventory Lists such as TSCA, EINECS, DSL, etc.. This product should be used under the applicable Research and Development provisions of local notification regulations.

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)

All substances in this product comply with the Australian Industrial Chemicals Introduction Scheme (AICIS)

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Canadian Domestic Substances List (DSL)

This product contains substance(s) which are found on the Non-Domestic Substances List (NDSL), or are not in compliance with other Canadian Acts.

Japan. ENCS - Existing and New Chemical Substances Inventory

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

Korea. Korean Existing Chemicals Inventory (KECI)

All substances in this product comply with the Chemical Control Act (CCA) and are listed on the Existing Chemicals List (ECL)

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

Section: 16. OTHER INFORMATION

REFERENCES

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Revision Date : 23.04.2023
Version Number : 1.1
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

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.

Section 1. Identification

Product identifier : FORSA™ PAO24033
Product code : PAO24033
ADG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aromatic naphtha)
Product type : Liquid.
Identified uses : Paraffin dispersant

Supplier's details : Baker Hughes, Australia
 631 Karel Avenue,
 Jandakot,
 Western Australia 6164,
 Australia

Tel: 1800 199 059
 Fax: 1800 020 115

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Asia Pacific Region):
 - Australia: (02) 9037 2994
 - Brunei: +(65)-31581349 (Mandarin/English)
 - China: 4001-204937 (Mandarin) *
 - Hong Kong: 800-968-793 (Cantonese) *
 - Indonesia: 001-803-017-9114 (Bahasa Indonesian) *
 - Japan: +(81)-345209637 (Japanese)
 - Malaysia: 1-800-815-308 (Bahasa Malay) *
 - New Zealand: 9801 0034
 - Philippines: 1-800-1-116-1020 (Tagalog) *
 - PNG: +(61) 2 9037 2994
 - Singapore: 800-101-2201 (Mandarin) *
 - South Korea: 00-308-13-2549 (Korean) *
 - Taiwan: 00801-14-8954 (Mandarin) *
 - Thailand: 001-800-13-203-9987 (Thai) *
 - Vietnam: +(84)-838012436 (Vietnamese)

 - UK: +(44) 870-820-0418
 - USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)
 * Number can only be dialled in-country

Section 2. Hazard(s) identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 4
 SKIN CORROSION/IRRITATION - Category 2
 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
 CARCINOGENICITY - Category 2
 ASPIRATION HAZARD - Category 1
 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 2
 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2

GHS label elements

Hazard pictograms



GHS05

GHS08

GHS09

Signal word

: DANGER

Section 2. Hazard(s) identification

- Hazard statements** : H227 - Combustible liquid.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H351 - Suspected of causing cancer.
H304 - May be fatal if swallowed and enters airways.
H411 - Toxic to aquatic life with long lasting effects.
- 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. Wear protective gloves: > 8 hours (breakthrough time): Nitrile gloves.. Wear eye or face protection. Keep away from flames and hot surfaces. - No smoking. Avoid release to the environment. Wash hands thoroughly after handling.
- Response** : Collect spillage. IF exposed or concerned: Get medical attention. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
- Storage** : Store locked up. Store in a well-ventilated place. Keep cool.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Precautionary statements (Code)** : P201, P280, P210, P273, P301 + P310 + P331, P305 + P310, P235, P501
- Supplemental label elements** : Not applicable.
- Other hazards which do not result in classification** : None known.

Section 3. Composition and ingredient information

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
Solvent naphtha (petroleum), heavy arom.	60 - 100	64742-94-5
dodecylbenzenesulphonic acid, compound with 2-aminoethanol (1:1)	5 - 10	26836-07-7
naphthalene	5 - 10	91-20-3
1,2,4-trimethylbenzene	1 - 5	95-63-6

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

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

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 4. First aid measures

- Skin contact** : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation.
- Ingestion** : May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

- Eye contact** : pain, watering, redness
- Inhalation** : No specific data.
- Skin contact** : pain or irritation, redness, blistering may occur
- Ingestion** : stomach pains, nausea or vomiting

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

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

- Suitable extinguishing media** : Use dry chemical, CO₂, alcohol-resistant foam or water spray (fog).
- Unsuitable extinguishing media** : Do not use water jet.

- Specific hazards arising from the chemical** : Combustible liquid. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

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

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

- Hazardous thermal decomposition products** : carbon dioxide, carbon monoxide, nitrogen oxides, sulfur oxides

- Hazchem code** : •3Z

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not swallow. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

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

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

Section 8. Exposure controls and personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Solvent naphtha (petroleum), heavy arom. naphthalene 1,2,4-trimethylbenzene	EH40/2005 WELs (United Kingdom (UK)). TWA: 500 mg/m³, (Total hydrocarbon vapour) 8 hours. Form: Vapour Safe Work Australia (Australia, 4/2018). STEL: 79 mg/m³, 0 times per shift, 15 minutes. STEL: 15 ppm, 0 times per shift, 15 minutes. TWA: 52 mg/m³, 0 times per shift, 8 hours. TWA: 10 ppm, 0 times per shift, 8 hours. Safe Work Australia (Australia, 4/2018). TWA: 123 mg/m³, 0 times per shift, 8 hours. TWA: 25 ppm, 0 times per shift, 8 hours.

Appropriate engineering controls

- : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls

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

Individual protection measures

Hygiene measures

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

Eye/face protection

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

Skin protection

Hand protection

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. Recommended: > 8 hours (breakthrough time): Nitrile gloves.

Body protection

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

Other skin protection

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

Respiratory protection

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

Section 9. Physical and chemical properties

Appearance

Physical state	: Liquid.
Colour	: Straw. to Yellow. [Light]
Odour	: Aromatic.
Odour threshold	: Not available.
pH	: 7 to 9
Melting point	: -2°C (28.4°F)
Boiling point	: Not available.
Flash point	: Closed cup: 70°C (158°F) [Pensky-Martens.]
Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapour pressure	: Not available.
Vapour density	: Not available.
Relative density	: 0.894 to 0.918 (20°C)
Solubility	: Not available.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Kinematic (40°C): 1 to 10 cSt

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Solvent naphtha (petroleum), heavy arom.	LD50 Oral	Rat	3200 mg/kg	-
naphthalene	LD50 Oral	Rat	>2000 mg/kg	-
1,2,4-trimethylbenzene	LD50 Oral	Rat	490 mg/kg	-
	LC50 Inhalation Vapour	Rat	18000 mg/m ³	4 hours
	LD50 Oral	Rat	5 g/kg	-

Conclusion/Summary : No known significant effects or critical hazards.

Irritation/Corrosion

Skin	: May cause skin irritation.
Eyes	: Risk of serious damage to eyes. May cause eye burns and permanent eye injury.
Respiratory	: No known significant effects or critical hazards.

Sensitisation

Skin	: No known significant effects or critical hazards.
Respiratory	: No known significant effects or critical hazards.

Mutagenicity

Section 11. Toxicological information

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : Suspected of causing cancer.

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
naphthalene	Category 3	Not applicable.	Respiratory tract irritation
1,2,4-trimethylbenzene	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Solvent naphtha (petroleum), heavy arom.	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.
Inhalation : No known significant effects or critical hazards.
Skin contact : Causes skin irritation.
Ingestion : May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain, watering, redness
 No specific data.
Skin contact : pain or irritation, redness, blistering may occur
Ingestion : stomach pains, nausea or vomiting

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

Short term exposure

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

Long term exposure

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

Potential chronic health effects

General : No known significant effects or critical hazards.
Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Fertility effects : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product/ingredient name	Result	Species	Exposure
Solvent naphtha (petroleum), heavy arom.	Acute LC50 2 to 5 mg/l	Fish	96 hours
naphthalene	Acute EC50 1.96 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
1,2,4-trimethylbenzene	Acute LC50 4910 µg/l Marine water	Crustaceans - Elasmopus pecteniscus	48 hours
	Acute LC50 22.4 mg/l Fresh water	Fish - Tilapia zillii	96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Solvent naphtha (petroleum), heavy arom.	-	-	Not readily
naphthalene	-	-	Not readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Solvent naphtha (petroleum), heavy arom.	2.8 to 6.5	99 to 5780	high
naphthalene	3.4	36.5 to 168	low
1,2,4-trimethylbenzene	3.63	243	low

Section 13. Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aromatic naphtha)	9	III	 
ADG	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aromatic naphtha)	9	III	 
IMDG	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aromatic naphtha)	9	III	 

Section 14. Transport information

IATA	UN3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aromatic naphtha)	9	III	 
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PG* : Packing group

Regulatory information	Environmental hazards	Additional information
ADR/RID Class	Yes.	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. Hazchem code 3Z
ADG Class	Yes.	The product is not regulated as a dangerous good when transported by road or rail in either an IBC, or in other container types if ≤500 kg. This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. Hazchem code •3Z
IMDG Class	Yes.	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
IATA Class	Yes.	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

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

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

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

5

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances.**

National Code of Practice for the Labelling of Workplace Substances.
National Code of Practice for the Preparation of Material Safety Data Sheets.
Approved Criteria for Classifying Hazardous Substances.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Section 15. Regulatory information

Not listed.

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

Ingredient name	List name	Status
PAHs	POPs - Annex 3	Listed

Section 16. Any other relevant information

[History](#)

Date of printing : 28 July 2020.

Date of issue/Date of revision : 28 July 2020

Date of previous issue : 12 May 2020

Version : 8

Key to abbreviations :

- ADG = Australian Dangerous Goods
- ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- NOHSC = National Occupational Health and Safety Commission
- SUSMP = Standard Uniform Schedule of Medicine and Poisons
- UN = United Nations

[Procedure used to derive the classification](#)

Classification	Justification
Flam. Liq. 4, H227	On basis of test data
Skin Irrit. 2, H315	Calculation method
Eye Dam. 1, H318	Calculation method
Carc. 2, H351	Calculation method
Asp. Tox. 1, H304	Calculation method
Aquatic Acute 2, H401	Calculation method
Aquatic Chronic 2, H411	Calculation method

References : Not available.

Indicates information that has changed from previously issued version.

[Disclaimer](#)

This 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. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

XC24380

1. Identification of the material and supplier

Product identifier : XC24380
Product code : XC24380
ADG : TOXIC LIQUID, ORGANIC, N.O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)
Product type : Liquid.
Identified uses : Biocide.

Supplier's details : Baker Hughes, Australia
 5 Walker Street,
 Braeside,
 Victoria 3195,
 Australia

Tel: +613 9580 9004
 Fax: +613 9580 6004

Emergency telephone number : CHEMTREC Emergency Telephone Numbers (Australasia Geomarket):
 - Australia: (02) 9037 2994
 - New Zealand: 9801 0034
 - PNG: +(61) 2 9037 2994

 - UK: +(44) 870-820-0418
 - USA: +(1) 703-527-3887 (CHEMTREC International 24 hour)

2. Hazards identification

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
 ACUTE TOXICITY (inhalation) - Category 3
 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
 SKIN SENSITIZATION - Category 1
 TOXIC TO REPRODUCTION (Unborn child) - Category 2
 ACUTE AQUATIC HAZARD - Category 1
 LONG-TERM AQUATIC HAZARD - Category 2

GHS label elements

Hazard pictograms :



Signal word : DANGER

Hazard statements : H331 - Toxic if inhaled.
 H302 - Harmful if swallowed.
 H318 - Causes serious eye damage.
 H317 - May cause an allergic skin reaction.
 H361 - Suspected of damaging the unborn child.
 H400 - Very toxic to aquatic life.
 H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention : Obtain special instructions before use. Wear protective gloves: > 8 hours (breakthrough time): Butyl rubber gloves. Neoprene gloves. Nitrile gloves. Avoid gloves made of PVA.. Wear eye or face protection. Avoid release to the environment.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. IF IN EYES: Immediately call a POISON CENTER or physician.

Storage : Store locked up.

2. Hazards identification

- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Precautionary statements (Code)** : P201, P280, P273, P304 + P340, P305 + P310, P405, P501
- Supplemental label elements** : Not applicable.

Other hazards which do not result in classification : None known.

3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	% (w/w)	CAS number
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	60 - 100	55566-30-8

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

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

4. First aid measures

Description of necessary first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.
- Skin contact** : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 15 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : Toxic if inhaled.
- Skin contact** : May cause an allergic skin reaction.
- Ingestion** : Harmful if swallowed.

Over-exposure signs/symptoms

- Eye contact** : pain, watering, redness
- Inhalation** : reduced foetal weight, increase in foetal deaths, skeletal malformations
- Skin contact** : pain or irritation, redness, blistering may occur, reduced foetal weight, increase in foetal deaths, skeletal malformations

4 . First aid measures

Ingestion : stomach pains, reduced foetal weight, increase in foetal deaths, skeletal malformations

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

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

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

5 . Firefighting measures

Extinguishing media

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

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

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

Hazardous thermal decomposition products : carbon dioxide, carbon monoxide, sulfur oxides, phosphorus oxides

Hazchem code : 2X

6 . Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and material for containment and cleaning up

6 . Accidental release measures

- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7 . Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

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

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

8 . Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
tetrakis(hydroxymethyl)phosphonium sulphate(2:1)	ACGIH TLV (United States, 3/2016). Skin sensitizer. TWA: 2 mg/m ³ 8 hours.

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

8 . Exposure controls/personal protection

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

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

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

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. Recommended: > 8 hours (breakthrough time): Butyl rubber gloves. Neoprene gloves. Nitrile gloves. Avoid gloves made of PVA.

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

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

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

9 . Physical and chemical properties

Appearance

Physical state : Liquid.

Colour : Colourless.

Odour : Pungent.

Odour threshold : Not available.

pH : 3 to 6

Melting point : -43°C (-45.4°F)

Boiling point : Not available.

Flash point : Closed cup: Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapour pressure : Not available.

9 . Physical and chemical properties

Vapour density	: Not available.
Relative density	: 1.39 (20°C)
Solubility	: Soluble in the following materials: cold water.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Kinematic (25°C): 30 cSt

10 . Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: No specific data.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
tetrakis(hydroxymethyl) phosphonium sulphate(2:1)	LC50 Inhalation Dusts and mists	Rat	0.591 mg/l @ 75% THPS (Aqueous solution)	4 hours
	LD50 Dermal	Rat	>2000 mg/kg (75% solution)	-
	LD50 Oral	Rat	575 mg/kg (75% solution)	-

Conclusion/Summary : May be toxic if inhaled. May be harmful if ingested. Can cause target organ damage. Adverse health effects could include the following: breathing difficulty or shortness of breath

Irritation/Corrosion

Conclusion/Summary

- Skin** : No known significant effects or critical hazards.
- Eyes** : Risk of serious damage to eyes. May cause eye burns and permanent eye injury.
- Respiratory** : No known significant effects or critical hazards.

Sensitisation

Conclusion/Summary

- Skin** : May cause sensitisation by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Respiratory** : No known significant effects or critical hazards.

Mutagenicity

- Conclusion/Summary** : No known significant effects or critical hazards.

Carcinogenicity

- Conclusion/Summary** : No known significant effects or critical hazards.

Reproductive toxicity

- Conclusion/Summary** : Suspected of damaging the unborn child.

Teratogenicity

11 . Toxicological information

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Not available.			

Aspiration hazard

Name	Result
Not available.	

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.
Inhalation : Toxic if inhaled.
Skin contact : May cause an allergic skin reaction.
Ingestion : Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : pain, watering, redness
Inhalation : reduced foetal weight, increase in foetal deaths, skeletal malformations
Skin contact : pain or irritation, redness, blistering may occur, reduced foetal weight, increase in foetal deaths, skeletal malformations
Ingestion : stomach pains, reduced foetal weight, increase in foetal deaths, skeletal malformations

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : Suspected of damaging the unborn child.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Toxicity : Very toxic to aquatic organisms. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Product/ingredient name	Result	Species	Exposure
tetrakis(hydroxymethyl) phosphonium sulphate(2:1)	Acute EC50 0.66 mg/l	Algae	96 hours
	Acute EC50 15.1 mg/l	Daphnia	48 hours
	Acute LC50 95 mg/l	Fish	96 hours
	Chronic NOEC 0.064 mg/l	Algae	96 hours
	Chronic NOEC 0.032 mg/l	Daphnia	21 days
	Chronic NOEC 1.1 mg/l	Fish	32 days

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
tetrakis(hydroxymethyl) phosphonium sulphate(2:1)	-	70 % - Readily - 21 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
tetrakis(hydroxymethyl) phosphonium sulphate(2:1)	-	-	Readily

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

13 . Disposal considerations

Disposal methods : Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

14 . Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Transport hazard class(es)	PG*	Label
ADR/RID	UN2810	TOXIC LIQUID, ORGANIC, N. O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)	6.1	III	 
ADG	UN2810	TOXIC LIQUID, ORGANIC, N. O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)	6.1	III	 
IMDG	UN2810	TOXIC LIQUID, ORGANIC, N. O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)	6.1	III	 
IATA	UN2810	TOXIC LIQUID, ORGANIC, N. O.S. (tetrakis(hydroxymethyl)phosphonium sulphate)	6.1	III	

PG* : Packing group

14 . Transport information

Regulatory information	Environmental hazards	Additional information**
ADR/RID Class	Yes.	The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. <u>Tunnel code</u> (E) <u>Hazchem code</u> 2X
ADG Class	No.	<u>Hazchem code</u> 2X
IMDG Class	Yes.	-
IATA Class	No.	-

Additional information**: A • in the Hazchem code indicates that Alcohol Resistant Foam is the preferred extinguishing medium. If not available, use the extinguishing medium indicated by the number in the Hazchem code.

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

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

15 . Regulatory information

Standard Uniform Schedule of Medicine and Poisons

Not regulated.

Model Work Health and Safety Regulations - Scheduled Substances

Australia inventory (AICS) : All components are listed or exempted.

References : **National Code of Practice for the Control of Workplace Hazardous Substances. National Code of Practice for the Labelling of Workplace Substances. National Code of Practice for the Preparation of Material Safety Data Sheets. Approved Criteria for Classifying Hazardous Substances.**

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

16 . Other information

History

Date of printing	: 13 November 2017.
Date of issue/Date of revision	: 13 November 2017
Date of previous issue	: 20 January 2017
Version	: 5
Key to abbreviations	: ADG = Australian Dangerous Goods ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) NOHSC = National Occupational Health and Safety Commission SUSMP = Standard Uniform Schedule of Medicine and Poisons UN = United Nations

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Calculation method
Acute Tox. 3, H331	Calculation method
Eye Dam. 1, H318	Calculation method
Skin Sens. 1, H317	Calculation method
Repr. 2, H361 (Unborn child)	Calculation method
Aquatic Acute 1, H400	Calculation method
Aquatic Chronic 2, H411	Calculation method

References : Not available.

▣ Indicates information that has changed from previously issued version.

Disclaimer

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

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

HYDROCHLORIC ACID 32%

Coogee Chemicals Pty Ltd

Chemwatch: 48-4484

Version No: 7.1

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Chemwatch Hazard Alert Code: 3

Issue Date: 03/09/2020

Print Date: 17/03/2022

L.GHS.AUS.EN.E

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

Product Identifier

Product name	HYDROCHLORIC ACID 32%
Chemical Name	Not Applicable
Synonyms	COOGEE HYDROCHLORIC ACID 32%, MURIATIC ACID, SPIRITS OF SALTS; Product code: 9178
Proper shipping name	HYDROCHLORIC ACID
Chemical formula	Not Applicable
Other means of identification	Not Available

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

Relevant identified uses	Acidifier, Chemical intermediate, Laboratory reagent, Pickling and anodising metals, scale remover.
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Details of the supplier of the safety data sheet

Registered company name	Coogee Chemicals Pty Ltd
Address	Cnr of Patterson and Kwinana Beach Roads Kwinana WA Australia
Telephone	+61 8 9439 8200
Fax	+61 8 9439 8300
Website	www.coogee.com.au
Email	enquiry@coogee.com.au

Emergency telephone number

Association / Organisation	Coogee Chemicals
Emergency telephone numbers	1800 800 655
Other emergency telephone numbers	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Poisons Schedule	S6
Classification [1]	Serious Eye Damage/Eye Irritation Category 1, Hazardous to the Aquatic Environment Long-Term Hazard Category 4, Skin Corrosion/Irritation Category 1B
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Label elements

Hazard pictogram(s)	
Signal word	Danger

Hazard statement(s)

H413	May cause long lasting harmful effects to aquatic life.
H314	Causes severe skin burns and eye damage.

Supplementary statement(s)

Not Applicable

Precautionary statement(s) Prevention

P260	Do not breathe mist/vapours/spray.
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HYDROCHLORIC ACID 32%

P264	Wash all exposed external body areas thoroughly after handling.
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Precautionary statement(s) Response

P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

Precautionary statement(s) Storage

P405	Store locked up.
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Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7647-01-0	32	<u>hydrochloric acid</u>
7732-18-5	balance	<u>water</u>
Legend: 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available		

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: - Immediately hold eyelids apart and flush the eye continuously with running water. - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. - Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. - Transport to hospital or doctor without delay. - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: - Immediately flush body and clothes with large amounts of water, using safety shower if available. - Quickly remove all contaminated clothing, including footwear. - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre. - Transport to hospital, or doctor.
Inhalation	- If fumes or combustion products are inhaled remove from contaminated area. - Lay patient down. Keep warm and rested. - Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. - Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. - Transport to hospital, or doctor, without delay.
Ingestion	- For advice, contact a Poisons Information Centre or a doctor at once. - Urgent hospital treatment is likely to be needed. If swallowed do NOT induce vomiting. - If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. - Observe the patient carefully. - Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. - Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. - Transport to hospital or doctor without delay.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

For acute or short term repeated exposures to strong acids:

- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.**
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. **DO NOT use neutralising agents or any other additives.** Several litres of saline are required.
- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

Continued...

[Ellenhorn and Barceloux: Medical Toxicology]

SECTION 5 Firefighting measures**Extinguishing media**

- ▶ Water spray or fog.
- ▶ Foam.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.
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Advice for firefighters

Fire Fighting	HCl can liberate highly flammable hydrogen gas when in contact with certain metals. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear full body protective clothing with breathing apparatus.
Fire/Explosion Hazard	▶ Non combustible. ▶ Not considered to be a significant fire risk. Decomposition may produce toxic fumes of: hydrogen chloride
HAZCHEM	2R

SECTION 6 Accidental release measures**Personal precautions, protective equipment and emergency procedures**

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▶ Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material. ▶ Check regularly for spills and leaks. ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes.				
Major Spills	Chemical Class:acidic compounds, inorganic				
	For release onto land: recommended sorbents listed in order of priority.				
	SORBENT TYPE	RANK	APPLICATION	COLLECTION	LIMITATIONS
	LAND SPILL - SMALL				
	foamed glass - pillows	1	throw	pitchfork	R, P, DGC, RT
	expanded mineral - particulate	2	shovel	shovel	R, I, W, P, DGC
	foamed glass - particulate	2	shovel	shovel	R, W, P, DGC
	LAND SPILL - MEDIUM				
	expanded mineral -particulate	1	blower	skiploader	R, I, W, P, DGC
	foamed glass- particulate	2	blower	skiploader	R, W, P, DGC
	foamed glass - particulate	3	throw	skiploader	R, W, P, DGC
	Legend				
DGC: Not effective where ground cover is dense					
R; Not reusable					
I: Not incinerable					
P: Effectiveness reduced when rainy					
RT:Not effective where terrain is rugged					
SS: Not for use within environmentally sensitive sites					
W: Effectiveness reduced when windy					
Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;					
R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988					
▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard.					

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage**Precautions for safe handling**

Safe handling	▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs.
Other information	▶ Store in original containers. ▶ Keep containers securely sealed.

Conditions for safe storage, including any incompatibilities

Continued...

HYDROCHLORIC ACID 32%

Suitable container	▶ DO NOT use aluminium or galvanised containers ▶ Lined metal can, lined metal pail/ can. ▶ Plastic pail. For low viscosity materials ▶ Drums and jerricans must be of the non-removable head type. ▶ Where a can is to be used as an inner package, the can must have a screwed enclosure.
Storage incompatibility	Incompatible with oxidizing agents eg. hypochlorites, alkalis, most metals etc, alcohols and amines. ▶ Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0. ▶ Reacts vigorously with alkalis ▶ Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	hydrochloric acid	Hydrogen chloride	Not Available	Not Available	5 ppm / 7.5 mg/m3	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
hydrochloric acid	Not Available	Not Available	Not Available
hydrochloric acid	1.8 ppm	22 ppm	100 ppm

Ingredient	Original IDLH	Revised IDLH
hydrochloric acid	50 ppm	Not Available
water	Not Available	Not Available

MATERIAL DATA

Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
Personal protection	
Eye and face protection	▶ Chemical goggles. ▶ Full face shield may be required for supplementary but never for primary protection of eyes.
Skin protection	See Hand protection below
Hands/feet protection	▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber ▶ When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
Body protection	See Other protection below
Other protection	▶ Overalls. ▶ PVC Apron.

Respiratory protection

Type B-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Colourless to slightly yellow corrosive liquid with pungent acidic odour; miscible with water.		
Physical state	Liquid	Relative density (Water = 1)	1.161
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Available
pH (as supplied)	<1	Decomposition temperature	Not Available
Melting point / freezing point (°C)	<-20	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	109	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	as for water	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Available

Continued...

HYDROCHLORIC ACID 32%

Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	100
Vapour pressure (kPa)	2	Gas group	Not Available
Solubility in water	Miscible	pH as a solution (Not Available%)	Not Available
Vapour density (Air = 1)	1.3	VOC g/L	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	► Contact with alkaline material liberates heat
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

Information on toxicological effects

Inhaled	Acidic corrosives produce respiratory tract irritation with coughing, choking and mucous membrane damage. Symptoms of exposure may include dizziness, headache, nausea and weakness. Hydrogen chloride (HCl) vapour or fumes present a hazard from a single acute exposure. Exposures of 1300 to 2000 ppm have been lethal to humans in a few minutes. Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects; these may be fatal. Inhalation of the vapour is hazardous and may even be fatal
Ingestion	Ingestion of acidic corrosives may produce circumoral burns with a distinct discolouration of the mucous membranes of the mouth, throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.
Skin Contact	The material can produce chemical burns following direct contact with the skin. Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.
Chronic	Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Repeated or prolonged exposure to acids may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Chronic minor exposure to hydrogen chloride (HCl) vapour or fume may cause discolouration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the nasal mucous membranes. Repeated exposures of animals to concentrations of about 34 ppm HCl produced no immediate toxic effects.

HYDROCHLORIC ACID 32%	TOXICITY	IRRITATION
	Not Available	Not Available
hydrochloric acid	TOXICITY	IRRITATION
	dermal (mouse) LD50: 1449 mg/kg ^[2]	Eye (rabbit): 5mg/30s - mild
	Oral (Rat) LD50: 900 mg/kg ^[2]	Eye: adverse effect observed (irritating) ^[1]
		Skin: adverse effect observed (corrosive) ^[1]
water	TOXICITY	IRRITATION
	Oral (Rat) LD50: >90000 mg/kg ^[2]	Not Available
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

HYDROCHLORIC ACID 32%	Inhalation (Rat) LC50: 4.2-4.7 mg/l/1h
HYDROCHLORIC ACID	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. for acid mists, aerosols, vapours Data from assays for genotoxic activity in vitro suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

	The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.		
HYDROCHLORIC ACID & WATER	No significant acute toxicological data identified in literature search.		
Acute Toxicity	✗	Carcinogenicity	✗
Skin Irritation/Corrosion	✓	Reproductivity	✗
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	✗
Respiratory or Skin sensitisation	✗	STOT - Repeated Exposure	✗
Mutagenicity	✗	Aspiration Hazard	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

HYDROCHLORIC ACID 32%	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available
hydrochloric acid	Endpoint	Test Duration (hr)	Species	Value	Source
	EC50(ECx)	9.33h	Fish	0.51mg/L	4
	LC50	96h	Fish	334.734mg/L	4
water	Endpoint	Test Duration (hr)	Species	Value	Source
	Not Available	Not Available	Not Available	Not Available	Not Available

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

Prevent, by any means available, spillage from entering drains or water courses.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
hydrochloric acid	LOW	LOW
water	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
hydrochloric acid	LOW (LogKOW = 0.5392)

Mobility in soil

Ingredient	Mobility
hydrochloric acid	LOW (KOC = 14.3)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal	- Containers may still present a chemical hazard/ danger when empty. - Return to supplier for reuse/ recycling if possible. - Recycle wherever possible. - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
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SECTION 14 Transport information

Labels Required

	
Marine Pollutant	NO

HAZCHEM	2R
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Land transport (ADG)

UN number	1789		
UN proper shipping name	HYDROCHLORIC ACID		
Transport hazard class(es)	Class	8	
	Subrisk	Not Applicable	
Packing group	II		
Environmental hazard	Not Applicable		
Special precautions for user	Special provisions	Not Applicable	
	Limited quantity	1 L	

Air transport (ICAO-IATA / DGR)

UN number	1789		
UN proper shipping name	Hydrochloric acid		
Transport hazard class(es)	ICAO/IATA Class	8	
	ICAO / IATA Subrisk	Not Applicable	
	ERG Code	8L	
Packing group	II		
Environmental hazard	Not Applicable		
Special precautions for user	Special provisions	A3 A803	
	Cargo Only Packing Instructions	855	
	Cargo Only Maximum Qty / Pack	30 L	
	Passenger and Cargo Packing Instructions	851	
	Passenger and Cargo Maximum Qty / Pack	1 L	
	Passenger and Cargo Limited Quantity Packing Instructions	Y840	
	Passenger and Cargo Limited Maximum Qty / Pack	0.5 L	

Sea transport (IMDG-Code / GGVSee)

UN number	1789		
UN proper shipping name	HYDROCHLORIC ACID		
Transport hazard class(es)	IMDG Class	8	
	IMDG Subrisk	Not Applicable	
Packing group	II		
Environmental hazard	Not Applicable		
Special precautions for user	EMS Number	F-A, S-B	
	Special provisions	Not Applicable	
	Limited Quantities	1 L	

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
hydrochloric acid	Not Available
water	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
hydrochloric acid	Not Available
water	Not Available

SECTION 15 Regulatory information

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

hydrochloric acid is found on the following regulatory lists

HYDROCHLORIC ACID 32%

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
 Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5
 Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australian Inventory of Industrial Chemicals (AIIC)
 International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

water is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (hydrochloric acid; water)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	03/09/2020
Initial Date	31/03/2015

SDS Version Summary

Version	Date of Update	Sections Updated
6.1	01/11/2019	One-off system update. NOTE: This may or may not change the GHS classification
7.1	03/09/2020	Classification change due to full database hazard calculation/update.

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
 PC—STEL: Permissible Concentration-Short Term Exposure Limit
 IARC: International Agency for Research on Cancer
 ACGIH: American Conference of Governmental Industrial Hygienists
 STEL: Short Term Exposure Limit
 TEEL: Temporary Emergency Exposure Limit.
 IDLH: Immediately Dangerous to Life or Health Concentrations
 ES: Exposure Standard
 OSF: Odour Safety Factor
 NOAEL :No Observed Adverse Effect Level
 LOAEL: Lowest Observed Adverse Effect Level
 TLV: Threshold Limit Value
 LOD: Limit Of Detection
 OTV: Odour Threshold Value
 BCF: BioConcentration Factors
 BEI: Biological Exposure Index
 AIIC: Australian Inventory of Industrial Chemicals
 DSL: Domestic Substances List
 NDSL: Non-Domestic Substances List
 IECSC: Inventory of Existing Chemical Substance in China
 EINECS: European Inventory of Existing Commercial chemical Substances
 ELINCS: European List of Notified Chemical Substances
 NLP: No-Longer Polymers
 ENCS: Existing and New Chemical Substances Inventory
 KECI: Korea Existing Chemicals Inventory
 NZIoC: New Zealand Inventory of Chemicals
 PICCS: Philippine Inventory of Chemicals and Chemical Substances

HYDROCHLORIC ACID 32%

TSCA: Toxic Substances Control Act

TCSI: Taiwan Chemical Substance Inventory

INSQ: Inventario Nacional de Sustancias Químicas

NCI: National Chemical Inventory

FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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Safety Data Sheet

BONDERITE S-AD 85 ACID INHIBITOR ACHESON known as
RODINE 85

Page 1 of 9

SDS No. : 169742
V001.1
Date of issue: 15.04.2022

Section 1. Identification of the substance/preparation and of the company/undertaking

Product name: BONDERITE S-AD 85 ACID INHIBITOR ACHESON known as RODINE 85

Intended use: Etch Inhibitors

Supplier:

Henkel Australia Pty Ltd
135-141 Canterbury Road
Kilsyth, Victoria, 3137
Australia

Phone: +61 (3) 9724 6444

Emergency information: 24 HOUR EMERGENCY CONTACT NUMBER: 1800 032 379

Section 2. Hazards identification

Classification of the substance or mixture

Hazardous according to the criteria of Safe Work Australia.

GHS Classification:

<u>Hazard Class</u>	<u>Hazard Category</u>	<u>Route of Exposure</u>
Acute toxicity	Category 4	Oral
Skin irritation	Category 2	
Serious eye damage/eye irritation	Category 1	
Skin sensitizer	Category 1	
Carcinogenicity	Category 2	
Target Organ Systemic Toxicant - Repeated exposure	Category 2	

Hazard pictogram:



Signal word: Danger

Hazard statement(s):	H302 Harmful if swallowed. H315 Causes skin irritation. H317 May cause an allergic skin reaction. H318 Causes serious eye damage. H351 Suspected of causing cancer. H373 May cause damage to organs through prolonged or repeated exposure.
Precautionary Statement(s):	
Prevention:	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P260 Do not breathe mist/vapours. P264 Wash hands thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P272 Contaminated work clothing should not be allowed out of the workplace. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response:	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/... if you feel unwell. P302+P352 IF ON SKIN: Wash with plenty of water. P305+P351+P338+P315 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to remove. Continue rinsing. Get immediate medical advice/attention. P308+P313 IF exposed or concerned: Get medical advice/attention. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P362+P364 Take off contaminated clothing and wash it before reuse.
Storage:	P405 Store locked up.
Disposal:	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations.

Dangerous Goods information:

Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

Section 3. Composition / information on ingredients

General chemical description: Mixture
polymers

Identity of ingredients:

Chemical ingredients	CAS-No.	Proportion
Formaldehyde polymer with o-toluidinium chloride	68492-82-0	10- < 30 %
prop-2-yn-1-ol	107-19-7	3- < 5 %
1,3-Diethyl-2-thiourea	105-55-5	3- < 10 %
methanol	67-56-1	< 1 %
non hazardous ingredients~		60- <= 100 %

Section 4. First aid measures

Ingestion:	Do not induce vomiting. Have victim rinse mouth thoroughly with water. Never give anything by mouth if the victim is rapidly losing consciousness, or is unconscious or convulsing. Seek medical advice.
Skin:	Rinse with running water and soap. Apply replenishing cream. Change all contaminated clothing. If necessary, see a dermatologist.

Eyes:	Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. Get immediate medical attention.
Inhalation:	Move to fresh air, consult doctor if complaint persists.
First Aid facilities:	Eye wash Normal washroom facilities
Medical attention and special treatment:	Treat symptomatically and supportively.

Section 5. Fire fighting measures

Suitable extinguishing media:	Foam, extinguishing powder, carbon dioxide. Water spray or fog.
Decomposition products in case of fire:	Thermal decomposition can lead to release of irritating gases and vapors. carbon monoxide Carbon dioxide.
Special protective equipment for fire-fighters:	Wear full protective clothing. Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA).
Additional fire fighting advice:	In case of fire, keep containers cool with water spray. Collect contaminated fire fighting water separately. It must not enter drains.

Section 6. Accidental release measures

Personal precautions:	Avoid skin and eye contact. Danger of slipping on spilled product.
Environmental precautions:	Do not empty into drains / surface water / ground water.
Clean-up methods:	Remove with liquid-absorbing material (sand, peat, sawdust). Wash away residue with plenty of water. Dispose of contaminated material as waste according to Section 13.

Section 7. Handling and storage

Precautions for safe handling:	Avoid skin and eye contact. Ensure that workrooms are adequately ventilated. Wear suitable protective clothing, safety glasses and gloves.
Conditions for safe storage:	Ensure good ventilation/extraction. Store only in the original container. Temperatures between + 5 °C and + 30 °C

Section 8. Exposure controls / personal protection

National exposure standards:

Ingredient [Regulated substance]	form of exposure	TWA (ppm)	TWA (mg/m ³)	Peak Limit. (ppm)	Peak Limit. (mg/m ³)	STEL (ppm)	STEL (mg/m ³)
PROPARGYL ALCOHOL 107-19-7		1	2.3				

METHYL ALCOHOL 67-56-1		200	262				
METHYL ALCOHOL 67-56-1						250	328

Engineering controls:	Ensure good ventilation/extraction.
Eye protection:	Wear chemical goggles and face shield.
Skin protection:	Suitable protective clothing Suitable protective gloves. Please note that in practice the working life of chemical resistant gloves may be considerably reduced as a result of many influencing factors (e.g. temperature). Suitable risk assessment should be carried out by the end user. If signs of wear and tear are noticed then the gloves should be replaced.
Respiratory protection:	If inhalation risk exists, wear a respirator or air supplied mask complying with the requirements of AS/NZS 1715 and AS/NZS 1716.

Section 9. Physical and chemical properties

Appearance:	red Liquid
Odor:	Aromatic
pH:	< 2.0
Melting point / freezing point:	25 °F (-3.9 °C)
Specific gravity:	1.06 - 1.09
Solubility in water:	fully miscible
VOC content (2004/42/EC)	0.2 % (2010/75/EU)

Section 10. Stability and reactivity

Stability:	Stable under normal conditions of temperature and pressure.
Conditions to avoid:	Extremes of temperature.
Incompatible materials:	Reaction with strong oxidants.
Hazardous decomposition products:	Thermal decomposition can lead to release of irritating gases and vapors. carbon monoxide Carbon dioxide.
Hazardous polymerization:	Will not occur.

Section 11. Toxicological information

Health Effects:**Ingestion:****Skin:**

May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

Causes skin irritation.

Symptoms may include redness, edema, drying, defatting and cracking of the skin.

May cause skin sensitization.

Eyes:

Causes serious eye damage.

Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in corneal injury. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva.

Inhalation:

May cause respiratory tract irritation.

Inhalation of product mist may cause irritation of the nose, throat, and respiratory tract.

Chronic effects:**methanol****67-56-1:**

Neurological symptoms; irritation to the nasal mucous membranes through exposure to higher vapor concentrations; headaches, blurred vision and nausea; damage to the skin due to repeated contact; prenatal toxic effects were seen in rats and mice.

Carcinogenicity:

Category 2 (Carcinogen), Suspected of causing cancer.

Toxicity for reproduction:

Toxic to reproduction, category 2, Suspected of damaging fertility or the unborn child.

Acute toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
prop-2-yn-1-ol 107-19-7	LD50	56.4 mg/kg	oral		rat	OECD Guideline 401 (Acute Oral Toxicity)
1,3-Diethyl-2-thiourea 105-55-5	LD50 LD50 Acute toxicity estimate (ATE)	930 mg/kg > 1,000 - < 2,000 mg/kg 1,001 mg/kg	oral dermal dermal		mouse rat	not specified OECD Guideline 402 (Acute Dermal Toxicity) Expert judgement
methanol 67-56-1	Acute toxicity estimate (ATE)	300 mg/kg	oral			Expert judgement

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
1,3-Diethyl-2-thiourea 105-55-5	not irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
methanol 67-56-1	not irritating	20 h	rabbit	BASF Test

Serious eye damage/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
1,3-Diethyl-2-thiourea 105-55-5	Category 1 (irreversible effects on the eye)		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
methanol 67-56-1	not irritating		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

Hazardous components CAS-No.	Result	Test type	Species	Method
1,3-Diethyl-2-thiourea 105-55-5	Sensitizing	Guinea pig maximisation test	guinea pig	Magnusson and Kligman Method
methanol 67-56-1	not sensitising	Guinea pig maximisation test	guinea pig	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)

Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study/ Route of administration	Metabolic activation / Exposure time	Species	Method
1,3-Diethyl-2-thiourea 105-55-5	negative positive positive	bacterial reverse mutation assay (e.g Ames test) single cell gel/comet assay in mammalian cells mammalian cell gene mutation assay	with and without without without		not specified not specified Mammalian Cell Gene Mutation Assay
1,3-Diethyl-2-thiourea 105-55-5	negative	oral: gavage		rat	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
methanol 67-56-1	negative negative negative	bacterial reverse mutation assay (e.g Ames test) in vitro mammalian cell micronucleus test mammalian cell gene mutation assay	with and without without with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay) not specified equivalent or similar to OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
methanol 67-56-1	negative	intraperitoneal		mouse	equivalent or similar to OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)

Repeated dose toxicity:

Hazardous components CAS-No.	Result	Route of application	Exposure time / Frequency of treatment	Species	Method
1,3-Diethyl-2-thiourea 105-55-5	NOAEL=7.35 mg/kg	oral: feed	7 wdaily	rat	not specified
1,3-Diethyl-2-thiourea 105-55-5	LOAEL=10 mg/kg	oral: feed	52 wdaily	rat	not specified
methanol 67-56-1	NOAEL=6.63 mg/l	inhalation: vapour	4 weeks 6 h/d, 5 d/w	rat	equivalent or similar to OECD Guideline 412 (Repeated Dose Inhalation Toxicity: 28/14- Day)
methanol 67-56-1	NOAEL=0.13 mg/l	inhalation: vapour	12 m 20 h/d	rat	equivalent or similar to OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)

Section 12. Ecological information

General ecological information: Do not empty into drains / surface water / ground water.

Ecotoxicity: Harmful to aquatic life with long lasting effects.

Toxicity:

Hazardous components CAS-No.	Value type	Value	Acute Toxicity Study	Exposure time	Species	Method
prop-2-yn-1-ol 107-19-7	LC50	4.6 mg/l	Fish	96 h	Leuciscus idus	DIN 38412-15
prop-2-yn-1-ol 107-19-7	EC50	11 mg/l	Daphnia	24 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
prop-2-yn-1-ol 107-19-7	EC50	> 18 mg/l	Algae	8 d	Scenedesmus quadricauda	OECD Guideline 201 (Alga, Growth Inhibition Test)
prop-2-yn-1-ol 107-19-7	EC0	< 18 mg/l	Algae	8 d	Scenedesmus quadricauda	OECD Guideline 201 (Alga, Growth Inhibition Test)
1,3-Diethyl-2-thiourea 105-55-5	LC50	910 mg/l	Fish	96 h	Danio rerio	OECD Guideline 203 (Fish, Acute Toxicity Test)
1,3-Diethyl-2-thiourea 105-55-5	EC50	56 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
1,3-Diethyl-2-thiourea 105-55-5	EC50	310 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
1,3-Diethyl-2-thiourea 105-55-5	NOEC	73 mg/l	Algae	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
methanol 67-56-1	LC50	15,400 mg/l	Fish	96 h	Lepomis macrochirus	EPA-660 (Methods for Acute Toxicity Tests with Fish, Macroinvertebrates and Amphibians)
methanol 67-56-1	NOEC	7,900 mg/l	Fish	200 h	Oryzias latipes	OECD Guideline 210 (fish early life stage toxicity test)
methanol 67-56-1	EC50	18,260 mg/l	Daphnia	96 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
methanol 67-56-1	EC50	22,000 mg/l	Algae	96 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
methanol 67-56-1	IC50	> 1,000 mg/l	Bacteria	3 h	activated sludge of a predominantly domestic sewage	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

Persistence and degradability:

Hazardous components CAS-No.	Result	Route of application	Degradability	Method
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prop-2-yn-1-ol 107-19-7		aerobic	37 %	EU Method C.4-E (Determination of the "Ready" Biodegradability Closed Bottle Test)
1,3-Diethyl-2-thiourea 105-55-5	not readily biodegradable.	aerobic	3 %	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
methanol 67-56-1	readily biodegradable	aerobic	82 - 92 %	EU Method C.4-E (Determination of the "Ready" Biodegradability Closed Bottle Test)

Bioaccumulative potential / Mobility in soil:

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
prop-2-yn-1-ol 107-19-7	-0.35				25 °C	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
1,3-Diethyl-2-thiourea 105-55-5	0.57					OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
methanol 67-56-1		< 10	72 h	Leuciscus idus melanotus		not specified
methanol 67-56-1	-0.77					other guideline:

Section 13. Disposal considerations

Waste disposal of product:	Dispose of according to Federal, State and local governmental regulations.
Recommended cleanser:	Water, if necessary with added cleaning agent.
Disposal for uncleaned package:	Packaging that cannot be cleaned are to be disposed of in the same manner as the product.

Section 14. Transport information**Road and Rail Transport:**

Dangerous Goods information:	Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).
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Marine transport IMDG:

UN no.:	3265
Proper shipping name:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (o-Toluidine hydrochloride copolymer)
Class or division:	8
Packing group:	III
EmS:	F-A ,S-B
Seawater pollutant:	-

Air transport IATA:

UN no.:	3265
Proper shipping name:	Corrosive liquid, acidic, organic, n.o.s. (o-Toluidine hydrochloride copolymer)
Class or division:	8
Packing group:	III
Packing instructions (passenger)	852
Packing instructions (cargo)	856

Section 15. Regulatory information

SUSMP Poisons Schedule None

Section 16. Other information

Abbreviations/acronyms:

- ADGC - Australian Dangerous Goods Code
- IMDG: International Maritime Dangerous Goods code
- IATA-DGR: International Air Transport Association – Dangerous Goods Regulations
- STEL - Short term exposure limit
- TWA - Time weighted average
- AIIC - Australian Inventory of Industrial Chemicals (AIIC)
- AICIS - Australian Industrial Chemicals Introduction Scheme

Reason for issue: Reviewed SDS. Reissued with new date. involved chapters: 1 - 16

Date of previous issue: 24.01.2017

Disclaimer:

The percentage weight (% w/w) of ingredients is not to be taken as a specification guaranteed by Henkel Australia Pty. Limited, but only as an approximate guide to the content of hazardous ingredients in the material. The information contained herein does not constitute a guarantee by Henkel Australia Pty. Limited concerning the properties of the material.

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This information is not to be construed as a representation that the material is suitable for any particular purpose or use except those conditions and warranties implied by either Commonwealth or State statutes. Customers are encouraged to make their own enquiries as to the material's characteristics and, where appropriate, to conduct their own tests in the specific context of the material's intended use.

No warranty or representation of any kind is given with respect to the substantive or export laws of any other jurisdiction or country. Please confirm that the information provided herein conforms to the substantive export or other law of any other jurisdiction prior to export. Please contact Henkel Product Safety and Regulatory Affairs for additional assistance.

SAFETY DATA SHEET**SODIUM BICARBONATE**

Revision Date: 30-Apr-2020

Revision Number: 38

1. Product Identifier & Identity for the Chemical

Statement of Hazardous Nature Non-Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

1.1. Product Identifier

Product Name SODIUM BICARBONATE

Other means of Identification

Synonyms None

Hazardous Material Number: HM001824

Recommended use of the chemical and restrictions on use

Recommended Use Buffer

Uses advised against No information available

Supplier's name, address and phone number

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300
E-mail Address fdunexchem@halliburton.com

Emergency phone number

+ 61 1 800 686 951

Global Incident Response Access Code: 334305

Contract Number: 14012

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

2. Hazard Identification

Statement of Hazardous Nature Non-Hazardous according to the criteria of the 3rd Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

Classification of the hazardous chemical

Not classified

Label elements, including precautionary statements**Hazard Pictograms**

Signal Word Not Hazardous

Hazard Statements: Not Classified

Precautionary Statements

Prevention None
Response None
Storage None
Disposal None

Contains

Substances

Contains no hazardous substances in concentrations above cut-off values according to the competent authority

CAS Number

NA

Other hazards which do not result in classification

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

For the full text of the H-phrases mentioned in this Section, see Section 16

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Australia
Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	60 - 100%	Not classified

4. First aid measures

Description of necessary first aid measures

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin Wash with soap and water. Get medical attention if irritation persists.

Ingestion Under normal conditions, first aid procedures are not required.

Symptoms caused by exposure

No significant hazards expected.

Medical Attention and Special Treatment

Notes to Physician Treat symptomatically

5. Fire Fighting Measures

Suitable extinguishing equipment

Suitable Extinguishing Media

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

Specific hazards arising from the chemical

Special exposure hazards in a fire

Not applicable

Special protective equipment and precautions for fire fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

Avoid creating or inhaling dust. Avoid contact with eyes, skin, or clothing. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Store away from acids. Store in a dry location.

Other Guidelines

No information available

8. Exposure Controls/Personal Protection

Control parameters - exposure standards, biological monitoring

Exposure Limits

Substances	CAS Number	Australia NOHSC	ACGIH TLV-TWA
Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	Not applicable	Not applicable

Appropriate engineering controls

Engineering Controls

A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment (PPE)

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Not normally needed. But if significant exposures are possible then the following respirator is recommended:

Dust/mist respirator. (N95, P2/P3)

Hand Protection

Normal work gloves.

Skin Protection

Normal work coveralls.

Eye Protection

Wear safety glasses or goggles to protect against exposure.

Other Precautions

None known.

Environmental Exposure Controls

Do not allow material to contaminate ground water system.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Solid
Odor: Odorless

Color White
Odor Threshold: No information available

PropertyValuesRemarks/ - Method**pH:**

8

Freezing Point / Range

No data available

Melting Point / Range

No data available

Pour Point / Range

No data available

Boiling Point / Range

No data available

Flash Point

No data available

Evaporation rate

No data available

Vapor Pressure

No data available

Vapor Density

No data available

Specific Gravity

2.16

Water Solubility

Soluble in water

Solubility in other solvents

No data available

Partition coefficient: n-octanol/water

No data available

Autoignition Temperature

No data available

Decomposition Temperature

No data available

Viscosity

No data available

Explosive Properties

No information available

Oxidizing Properties

No information available

9.2. Other information**VOC Content (%)**

No data available

10. Stability and Reactivity**10.1. Reactivity**

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Strong acids.

10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

11. Toxicological Information**Information on routes of exposure****Principle Route of Exposure** Eye or skin contact, inhalation.**Symptoms related to exposure****Most Important Symptoms/Effects**

No significant hazards expected.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Contains no hazardous substances in concentrations above cut-off values according to the competent	NA	No data available	No data available	No data available

authority				
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Immediate, delayed and chronic health effects from exposure

Inhalation	None known.
Eye Contact	May cause mechanical irritation to eye.
Skin Contact	Not irritating to skin in rabbits.
Ingestion	None known.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Exposure Levels

No data available

Interactive effects

None known.

Data limitations

No data available

12. Ecological Information

Ecotoxicity**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	No information available	No information available	No information available	No information available

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	No information available

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
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Contains no hazardous substances in concentrations above cut-off values according to the competent authority	NA	No information available
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12.6. Other adverse effects**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

13. Disposal Considerations

Safe handling and disposal methods

Bury in a licensed landfill according to federal, state, and local regulations.

Disposal of any contaminated packaging

Follow all applicable national or local regulations.

Environmental regulations

Not applicable

14. Transport Information

Transportation Information**Australia ADG**

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IMDG/IMO

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IATA/ICAO

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

Special precautions during transport

None

HazChem Code

None Allocated

15. Regulatory Information

Safety, health and environmental regulations specific for the product**International Inventories**

Australian AICS Inventory	All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate.
New Zealand Inventory of Chemicals	All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate.
US TSCA Inventory	All components listed on inventory or are exempt.
Canadian Domestic Substances List (DSL)	All components listed on inventory or are exempt.

Poisons Schedule number

None Allocated

International Agreements**Montreal Protocol - Ozone Depleting Substances:**

Does not apply.

Stockholm Convention - Persistent Organic Pollutants:

Does not apply

Rotterdam Convention - Prior Informed Consent:

Does not apply.

Basel Convention - Hazardous Waste:

Does not apply.

16. Other information**Date of preparation or review****Revision Date:**

30-Apr-2020

Revision Note

SDS sections updated:

2

Full text of H-Statements referred to under sections 2 and 3

None

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key abbreviations or acronyms used

bw – body weight

CAS – Chemical Abstracts Service

EC50 – Effective Concentration 50%

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

NOEC – No Observed Effect Concentration

OEL – Occupational Exposure Limit

PBT – Persistent Bioaccumulative and Toxic

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

vPvB – very Persistent and very Bioaccumulative

h - hour

mg/m³ - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

w/w - weight/weight

d - day

Key literature references and sources for datawww.ChemADVISOR.com/

NZ CCID

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material is the sole responsibility of the user.

End of Safety Data Sheet

SAFETY DATA SHEET**CITRIC ACID**

Revision Date: 09-Mar-2023

Revision Number: 54

1. Product Identifier & Identity for the Chemical

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

1.1. Product Identifier

Product Name CITRIC ACID

Other means of Identification

Synonyms None

Hazardous Material Number: HM004421

Recommended use of the chemical and restrictions on use

Recommended Use Scale Remover pH Control

Uses advised against No information available

Supplier's name, address and phone number

Manufacturer/Supplier Halliburton/Baroid Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300
E-mail Address fdunexchem@halliburton.com

Emergency phone number

+ 61 1 800 686 951

Global Incident Response Access Code: 334305

Contract Number: 14012

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

2. Hazard Identification

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

Classification of the hazardous chemical

Serious Eye Damage/Irritation

Category 2 - H319

Label elements, including precautionary statements

Hazard Pictograms

**Signal Word**

WARNING

Hazard Statements:

H319 - Causes serious eye irritation

Precautionary Statements**Prevention**P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear eye protection/face protection**Response**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 advice/attention**Storage**

None

Disposal

None

**Contains
Substances**

Citric acid

CAS Number

77-92-9

Other hazards which do not result in classification

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

*For the full text of the H-phrases mentioned in this Section, see Section 16***3. Composition/information on Ingredients**

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Australia
Citric acid	77-92-9	60 - 100%	Eye Irrit. 2A (H319)

4. First aid measures**Description of necessary first aid measures****Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

Skin

For skin contact, wipe away excess material with dry towel. Then wash affected areas with plenty of water, and soap if available, for several minutes. Get medical attention if irritation occurs.

Ingestion

Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Symptoms caused by exposure

Causes serious eye irritation.

Medical Attention and Special Treatment**Notes to Physician**

Treat symptomatically

5. Fire Fighting Measures

Suitable extinguishing equipment

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Specific hazards arising from the chemical

Special exposure hazards in a fire

Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

Special protective equipment and precautions for fire fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Store in a cool, dry location. Product has a shelf life of 60 months.

Other Guidelines

No information available

8. Exposure Controls/Personal Protection

Control parameters - exposure standards, biological monitoring

Exposure Limits

Substances	CAS Number	Australia NOHSC	ACGIH TLV-TWA
Citric acid	77-92-9	Not applicable	Not applicable

Appropriate engineering controls

Engineering Controls

Use in a well ventilated area.

Personal protective equipment (PPE)

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection	If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Dust/mist respirator. (N95, P2/P3)
Hand Protection	Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Nitrile gloves. (>= 8 mm thickness) This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.
Skin Protection	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing. Normal work coveralls.
Eye Protection	Chemical goggles; also wear a face shield if splashing hazard exists. (EN-166)
Other Precautions	Eyewash fountains and safety showers must be easily accessible.
Environmental Exposure Controls	No information available

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State:	Solid	Color	White
Odor:	Odorless	Odor Threshold:	No information available

<u>Property</u>	<u>Values</u>
Remarks/ - Method	
pH:	1.8
Freezing Point / Range	No data available
Melting Point / Range	153 °C / 307.4 °F
Pour Point / Range	No data available
Boiling Point / Range	Decomposes
Flash Point	345 °C / 653 °F
Upper flammability limit	65
Lower flammability limit	%
Evaporation rate	No data available
Vapor Pressure	0.0000221 Pa
Vapor Density	No data available
Specific Gravity	1.66
Water Solubility	Soluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	-1.61 to -1.80
Autoignition Temperature	1010 °C / 1832 °F
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

Molecular Weight	192.12
VOC Content (%)	No data available

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Strong oxidizers. Strong alkalis. Sulfuric acid. Nitric acid.

10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

11. Toxicological Information

Information on routes of exposure**Principle Route of Exposure** Eye or skin contact, inhalation.**Symptoms related to exposure****Most Important Symptoms/Effects**

Causes serious eye irritation.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Citric acid	77-92-9	5400 mg/kg (Rat) 5790 mg/kg (Mouse) 11,700 mg/kg (Rat)	> 2000 mg/kg	No data available

Immediate, delayed and chronic health effects from exposure

Inhalation	May cause mild respiratory irritation.
Eye Contact	Causes serious eye irritation.
Skin Contact	Not irritating to skin in rabbits.
Ingestion	May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Exposure Levels

No data available

Interactive effects

None known.

Data limitations

No data available

Substances	CAS Number	Skin corrosion/irritation
Citric acid	77-92-9	Not irritating to skin in rabbits.

Substances	CAS Number	Serious eye damage/irritation
Citric acid	77-92-9	Causes moderate eye irritation

Substances	CAS Number	Skin Sensitization
Citric acid	77-92-9	Patch test on human volunteers did not demonstrate sensitization properties

Substances	CAS Number	Respiratory Sensitization
Citric acid	77-92-9	No information available

Substances	CAS Number	Mutagenic Effects
Citric acid	77-92-9	Did not show mutagenic effects in animal experiments

Substances	CAS Number	Carcinogenic Effects
Citric acid	77-92-9	Did not show carcinogenic effects in animal experiments

Substances	CAS Number	Reproductive toxicity
Citric acid	77-92-9	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Substances	CAS Number	STOT - single exposure
Citric acid	77-92-9	No data of sufficient quality are available.
Substances	CAS Number	STOT - repeated exposure
Citric acid	77-92-9	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	Aspiration hazard
Citric acid	77-92-9	No adverse health effects are expected from swallowing.

12. Ecological Information

Ecotoxicity

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Citric acid	77-92-9	EC50 (72h) 18000 mg/L (Chlorella vulgaris) NOEC (8d) 425 mg/L (cell density) (Scenedesmus quadricauda) LOEC (8d) >80 mg/L (Microcystis aeruginosa)	LC50 (96h) 1516 mg/L (Lepomis macrochirus) LC50 (48h) 440 mg/L (Leuciscus idus melanotus) LC50 (96h) >100 mg/L (Pimephales promelas)	TT (72h) 485 mg/L (Entosiphon sulcatum)	TLM96 100-330 ppm (Crangon crangon) EC50 (24h) 1535 mg/L (Daphnia magna) LC50 (48h) 160 mg/L (Daphnia magna) EC50 (48h) >50 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Citric acid	77-92-9	Readily biodegradable (97% @ 28d)

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Citric acid	77-92-9	-1.61 to -1.80

12.4. Mobility in soil

Substances	CAS Number	Mobility
Citric acid	77-92-9	No information available

Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

13. Disposal Considerations

Safe handling and disposal methods

Bury in a licensed landfill according to federal, state, and local regulations.

Disposal of any contaminated packaging

Follow all applicable national or local regulations.

Environmental regulations

Not applicable

14. Transport Information

Transportation Information

Australia ADG

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IMDG/IMO

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IATA/ICAO

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

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

Not applicable

Special precautions during transport

None

HazChem Code

None Allocated

15. Regulatory Information

Safety, health and environmental regulations specific for the product

International Inventories

Australian AICS Inventory	All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate.
New Zealand Inventory of Chemicals	All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate.
US TSCA Inventory	All components listed on inventory or are exempt.
Canadian Domestic Substances List (DSL)	All components listed on inventory or are exempt.

Poisons Schedule number

None Allocated

International Agreements

Montreal Protocol - Ozone Depleting Substances:	Does not apply.
Stockholm Convention - Persistent Organic Pollutants:	Does not apply
Rotterdam Convention - Prior Informed Consent:	Does not apply.
Basel Convention - Hazardous Waste:	Does not apply.

16. Other information

Date of preparation or review

Revision Date: 09-Mar-2023

Revision Note

Update to Format

Full text of H-Statements referred to under sections 2 and 3

H319 - Causes serious eye irritation

Additional information:

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key abbreviations or acronyms used

bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NOEC – No Observed Effect Concentration
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
vPvB – very Persistent and very Bioaccumulative
h - hour
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data

www.ChemADVISOR.com/
OSHA
ECHA C&L
NZ CCID

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End of Safety Data Sheet

SAFETY DATA SHEET**SODA ASH F.G.**

Revision Date: 15-Mar-2022

Revision Number: 39

1. Product Identifier & Identity for the Chemical

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

1.1. Product Identifier

Product Name SODA ASH F.G.

Other means of Identification

Synonyms None

Hazardous Material Number: HM003760

Recommended use of the chemical and restrictions on use

Recommended Use pH Control

Uses advised against No information available

Supplier's name, address and phone number

Manufacturer/Supplier Halliburton/Baroid Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300
E-mail Address fdunexchem@halliburton.com

Emergency phone number

+ 61 1 800 686 951

Global Incident Response Access Code: 334305

Contract Number: 14012

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

2. Hazard Identification

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Non-Dangerous Goods according to the criteria of ADG.

Classification of the hazardous chemical

Serious Eye Damage/Irritation

Category 2 - H319

Label elements, including precautionary statements**Hazard Pictograms**

**Signal Word**

WARNING

Hazard Statements:

H319 - Causes serious eye irritation

Precautionary Statements**Prevention**

P264 - Wash face, hands and any exposed skin thoroughly after handling
 P280 - Wear eye protection/face protection

Response

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 advice/attention

Storage

None

Disposal

None

Contains**Substances**

Sodium carbonate

CAS Number

497-19-8

Other hazards which do not result in classification

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

For the full text of the H-phrases mentioned in this Section, see Section 16

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Australia
Sodium carbonate	497-19-8	60 - 100%	Eye Irrit. 2 (H319)

4. First aid measures

Description of necessary first aid measures**Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.

Skin

Wash with soap and water. Get medical attention if irritation persists.

Ingestion

Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Symptoms caused by exposure

Causes eye irritation. May be harmful if swallowed.

Medical Attention and Special Treatment**Notes to Physician**

Treat symptomatically

5. Fire Fighting Measures

Suitable extinguishing equipment**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Specific hazards arising from the chemical**Special exposure hazards in a fire**

Decomposition in fire may produce harmful gases.

Special protective equipment and precautions for fire fighters**Special protective equipment for firefighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling**Handling Precautions**

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities**Storage Information**

Store away from acids. Store in a cool, dry location. Product has a shelf life of 60 months.

Other Guidelines

No information available

8. Exposure Controls/Personal Protection

Control parameters - exposure standards, biological monitoring**Exposure Limits**

Substances	CAS Number	Australia NOHSC	ACGIH TLV-TWA
Sodium carbonate	497-19-8	Not applicable	Not applicable

Appropriate engineering controls**Engineering Controls**

Use in a well ventilated area. Localized ventilation should be used to control dust levels.

Personal protective equipment (PPE)**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and

	instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Dust/mist respirator. (N95, P2/P3)
Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Dust proof goggles.
Other Precautions	None known.
Environmental Exposure Controls	Do not allow material to contaminate ground water system.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State:	Powder	Color	White to off white
Odor:	Odorless	Odor Threshold:	No information available

<u>Property</u>	<u>Values</u>
Remarks/ - Method	
pH:	11.5
Freezing Point / Range	No data available
Melting Point / Range	No data available
Pour Point / Range	No data available
Boiling Point / Range	No data available
Flash Point	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	2.5
Water Solubility	Partly soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

Molecular Weight	105.99 g/mol
VOC Content (%)	No data available

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Strong acids.

10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

11. Toxicological Information

Information on routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure**Most Important Symptoms/Effects**

Causes eye irritation. May be harmful if swallowed.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium carbonate	497-19-8	2800 mg/kg (Rat)	>2000 mg/kg (Rabbit)	1.15 mg/L (Rat, 4 hr, aerosol)

Immediate, delayed and chronic health effects from exposure

Inhalation	None known.
Eye Contact	Causes eye irritation.
Skin Contact	None known.
Ingestion	Irritation of the mouth, throat, and stomach. May be harmful if swallowed.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Exposure Levels

No data available

Interactive effects

None known.

Data limitations

No data available

Substances	CAS Number	Skin corrosion/irritation
Sodium carbonate	497-19-8	Non-irritating to the skin

Substances	CAS Number	Serious eye damage/irritation
Sodium carbonate	497-19-8	Irritating to eyes

Substances	CAS Number	Skin Sensitization
Sodium carbonate	497-19-8	Not classified

Substances	CAS Number	Respiratory Sensitization
Sodium carbonate	497-19-8	No information available

Substances	CAS Number	Mutagenic Effects
Sodium carbonate	497-19-8	In vivo tests did not show mutagenic effects.

Substances	CAS Number	Carcinogenic Effects
Sodium carbonate	497-19-8	No information available

Substances	CAS Number	Reproductive toxicity
Sodium carbonate	497-19-8	Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	STOT - repeated exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Sodium carbonate	497-19-8	Not applicable

12. Ecological Information

Ecotoxicity**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Sodium carbonate	497-19-8	EC50 242 mg/L (Nitzschia)	LC50(96h) 300 mg/L (Lepomis macrochirus) LC50 310-1220 mg/L (Pimephales promelas)	No information available	EC50 265 mg/L (Daphnia magna) EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Sodium carbonate	497-19-8	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Sodium carbonate	497-19-8	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Sodium carbonate	497-19-8	No information available

12.6. Other adverse effects**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

13. Disposal Considerations

Safe handling and disposal methods

Bury in a licensed landfill according to federal, state, and local regulations.

Disposal of any contaminated packaging

Follow all applicable national or local regulations.

Environmental regulations

Not applicable

14. Transport Information

Transportation Information**Australia ADG**

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IMDG/IMO

UN Number	Not restricted
UN proper shipping name:	Not restricted
Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

IATA/ICAO

UN Number	Not restricted
UN proper shipping name:	Not restricted

Transport Hazard Class(es):	Not applicable
Packing Group:	Not applicable
Environmental Hazards:	Not applicable

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

Not applicable

Special precautions during transport

None

HazChem Code

None Allocated

15. Regulatory Information

Safety, health and environmental regulations specific for the product**International Inventories****Australian AICS Inventory**

All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate.

New Zealand Inventory of Chemicals

All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate.

US TSCA Inventory

All components listed on inventory or are exempt.

Canadian Domestic Substances List (DSL)

All components listed on inventory or are exempt.

Poisons Schedule number

None Allocated

International Agreements**Montreal Protocol - Ozone Depleting Substances:**

Does not apply.

Stockholm Convention - Persistent Organic Pollutants:

Does not apply

Rotterdam Convention - Prior Informed Consent:

Does not apply.

Basel Convention - Hazardous Waste:

Does not apply.

16. Other information

Date of preparation or review**Revision Date:**

15-Mar-2022

Revision Note

SDS sections updated:

2

Full text of H-Statements referred to under sections 2 and 3

H319 - Causes serious eye irritation

Additional information:

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key abbreviations or acronyms used

bw – body weight

CAS – Chemical Abstracts Service

EC50 – Effective Concentration 50%

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NOEC – No Observed Effect Concentration
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
vPvB – very Persistent and very Bioaccumulative
h - hour
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data

www.ChemADVISOR.com/
NZ CCID

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End of Safety Data Sheet

SAFETY DATA SHEET**ACETIC ACID (10 -50%)**

Revision Date: 22-Jul-2021

Revision Number: 36

1. Product Identifier & Identity for the Chemical

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Dangerous Goods according to the criteria of ADG.

1.1. Product Identifier

Product Name ACETIC ACID (10 -50%)

Other means of Identification

Synonyms None

Hazardous Material Number: HM001728

Recommended use of the chemical and restrictions on use

Recommended Use Acid

Uses advised against No information available

Supplier's name, address and phone number

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300
E-mail Address fdunexchem@halliburton.com

Emergency phone number

+ 61 1 800 686 951

Global Incident Response Access Code: 334305

Contract Number: 14012

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

2. Hazard Identification

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Dangerous Goods according to the criteria of ADG.

Classification of the hazardous chemical

Skin Corrosion/Irritation	Category 1 - H314
Serious Eye Damage/Irritation	Category 1 - H318
Flammable liquids.	

Label elements, including precautionary statements**Hazard Pictograms**

**Signal Word**

DANGER

Hazard Statements:

H314 - Causes severe skin burns and eye damage

H318 - Causes serious eye damage

Precautionary Statements**Prevention**

P260 - Do not breathe dust/fume/gas/mist/vapors/spray

P264 - Wash face, hands and any exposed skin thoroughly after handling

P280 - Wear protective gloves/protective clothing/eye protection/face protection

Response

P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water [or shower].

P363 - Wash contaminated clothing before reuse

P310 - Immediately call a POISON CENTER or doctor/physician

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses, if present and easy to do. Continue rinsing

P370 + P378 - In case of fire: Use water spray for extinction

Storage

None

Disposal

None

Contains**Substances**

Acetic acid

CAS Number

64-19-7

Other hazards which do not result in classification

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

For the full text of the H-phrases mentioned in this Section, see Section 16

3. Composition/information on Ingredients
--

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Australia
Acetic acid	64-19-7	30 - 60%	Skin Corr. 1A (H314) Eye Corr. 1 (H318) Flam. Liq. 3 (H226)

4. First aid measures

Description of necessary first aid measures**Inhalation**

If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes

In case of contact, immediately flush eyes with plenty of water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Seek immediate medical attention/advice. Suitable emergency eye wash facility should be immediately available

Skin

In case of contact, immediately flush skin with plenty of soap and water for at least 30 minutes and remove contaminated clothing, shoes and leather goods

Ingestion

immediately. Get medical attention immediately. Remove contaminated clothing and launder before reuse.

Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Symptoms caused by exposure

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction.

Medical Attention and Special Treatment**Notes to Physician**

Treat symptomatically

5. Fire Fighting Measures

Suitable extinguishing equipment**Suitable Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Specific hazards arising from the chemical**Special exposure hazards in a fire**

Use water spray to cool fire exposed surfaces. Decomposition in fire may produce harmful gases. Do not allow runoff to enter waterways.

Special protective equipment and precautions for fire fighters**Special protective equipment for firefighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Ensure adequate ventilation. Evacuate all persons from the area.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas. Consult local authorities.

6.3. Methods and material for containment and cleaning up

Dike far ahead of liquid spill for later disposal. Neutralize with lime slurry, limestone, or soda ash. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. Handling and storage

7.1. Precautions for safe handling**Handling Precautions**

Ensure adequate ventilation. Use appropriate protective equipment. Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities**Storage Information**

Store away from alkalis. Store away from oxidizers. Store in a cool well ventilated area. Keep container closed when not in use.

Other Guidelines

No information available

8. Exposure Controls/Personal Protection

Control parameters - exposure standards, biological monitoring**Exposure Limits**

Substances	CAS Number	Australia NOHSC	ACGIH TLV-TWA
Acetic acid	64-19-7	TWA: 10 ppm TWA: 25 mg/m ³ STEL: 15 ppm STEL: 37 mg/m ³	TWA: 10 ppm STEL: 15 ppm

Appropriate engineering controls**Engineering Controls**

Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment (PPE)**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Organic vapor/acid gas respirator.

Hand Protection

Chemical-resistant protective gloves (EN 374) Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374): Nitrile gloves. (>= 8 mm thickness)

This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced. Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection

Full protective chemical resistant clothing.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls

Do not allow material to contaminate ground water system.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid

Color: Clear

Odor: Acrid

Odor Threshold: No information available

PropertyValues

Remarks/ - Method

pH:

2.9

Freezing Point / Range

16 °C

Melting Point / Range

No data available

Pour Point / Range

No data available

Boiling Point / Range

117 °C / 244 °F

Flash Point

> 93.3 °C / > 200 °F (PMCC)

Evaporation rate

No data available

Vapor Pressure

11.7 mmHg @ 20 C

Vapor Density

No data available

Specific Gravity

1.01 - 1.055

Water Solubility

Soluble in water

Solubility in other solvents

No data available

Partition coefficient: n-octanol/water

No data available

Autoignition Temperature

No data available

Decomposition Temperature

No data available

Viscosity

No data available

Explosive Properties

No information available

Oxidizing Properties

No information available

9.2. Other information**Molecular Weight**

60.6 (g/mole)

VOC Content (%)

No data available

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

Keep away from heat, sparks and flame.

10.5. Incompatible materials

Strong alkalis. Strong oxidizers.

10.6. Hazardous decomposition products

Toxic fumes. Carbon monoxide and carbon dioxide.

11. Toxicological Information

Information on routes of exposure**Principle Route of Exposure** Eye or skin contact, inhalation.**Symptoms related to exposure****Most Important Symptoms/Effects**

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Acetic acid	64-19-7	No data available	1060 mg/kg-bw (rabbit)	11.4 mg/L (rat, 4 h, vapor)

Immediate, delayed and chronic health effects from exposure**Inhalation**

Causes severe respiratory irritation.

Eye Contact

Causes severe eye burns.

Skin Contact

Causes severe burns.

Ingestion

Causes burns of the mouth, throat and stomach.

Chronic Effects/Carcinogenicity

Prolonged, excessive exposure may cause erosion of the teeth.

Exposure Levels

No data available

Interactive effects

Skin disorders.

Data limitations

No data available

Substances	CAS Number	Skin corrosion/irritation
Acetic acid	64-19-7	Extremely corrosive and destructive to tissue Skin, rabbit:

Substances	CAS Number	Serious eye damage/irritation
Acetic acid	64-19-7	Eye, rabbit: Causes serious eye damage

Substances	CAS Number	Skin Sensitization
Acetic acid	64-19-7	Not regarded as a sensitizer.
Substances	CAS Number	Respiratory Sensitization
Acetic acid	64-19-7	No information available
Substances	CAS Number	Mutagenic Effects
Acetic acid	64-19-7	In vivo tests did not show mutagenic effects. In vitro tests did not show mutagenic effects.
Substances	CAS Number	Carcinogenic Effects
Acetic acid	64-19-7	Did not show carcinogenic effects in animal experiments
Substances	CAS Number	Reproductive toxicity
Acetic acid	64-19-7	Did not show teratogenic effects in animal experiments. Animal testing did not show any effects on fertility.
Substances	CAS Number	STOT - single exposure
Acetic acid	64-19-7	May cause respiratory irritation. No information available
Substances	CAS Number	STOT - repeated exposure
Acetic acid	64-19-7	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	Aspiration hazard
Acetic acid	64-19-7	Not applicable

12. Ecological Information

Ecotoxicity

Product Ecotoxicity Data

Product is not classified as hazardous to the environment.

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Acetic acid	64-19-7	EC50(72 h)=55.22 mg/L (Anabaena flos-aquae)	LC50(96 h)=251 mg/L (Gambusia affinis) LC50(96 h)=75 mg/L (Lepomis macrochirus)	NOAEC (16 h) =1150 mg/L (Pseudomonas putida)	EC50(48 h)=65 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Acetic acid	64-19-7	Readily biodegradable (99% @ 7d)

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Acetic acid	64-19-7	LogPow-0.17

12.4. Mobility in soil

Substances	CAS Number	Mobility
Acetic acid	64-19-7	No information available

12.6. Other adverse effects

Endocrine Disruptor Information

This product does not contain any known or suspected endocrine disruptors

13. Disposal Considerations

Safe handling and disposal methods

Disposal should be made in accordance with federal, state, and local regulations.

Disposal of any contaminated packaging

Follow all applicable national or local regulations.

Environmental regulations

Not applicable

14. Transport Information

Transportation Information**Australia ADG**

UN Number	UN2790
UN proper shipping name:	Acetic Acid Solution
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Not applicable

IMDG/IMO

UN Number	UN2790
UN proper shipping name:	Acetic Acid Solution
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Not applicable
EMS:	EmS F-A, S-B

IATA/ICAO

UN Number	UN2790
UN proper shipping name:	Acetic Acid Solution
Transport Hazard Class(es):	8
Packing Group:	III
Environmental Hazards:	Not applicable

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

Not applicable

Special precautions during transport

None

HazChem Code

2P

15. Regulatory Information

Safety, health and environmental regulations specific for the product**International Inventories****Australian AICS Inventory**

All components are listed on the AIIIC or are subject to a relevant exemption, permit, or assessment certificate.

New Zealand Inventory of Chemicals

All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate.

US TSCA Inventory

All components listed on inventory or are exempt.

Canadian Domestic Substances List (DSL)

All components listed on inventory or are exempt.

Poisons Schedule number

S6

International Agreements

Montreal Protocol - Ozone Depleting Substances:

Does not apply.

Stockholm Convention - Persistent Organic Pollutants:
Rotterdam Convention - Prior Informed Consent:
Basel Convention - Hazardous Waste:

Does not apply
Does not apply.
Does not apply.

16. Other information

Date of preparation or review

Revision Date: 22-Jul-2021

Revision Note

SDS sections updated:
2

Full text of H-Statements referred to under sections 2 and 3

H226 - Flammable liquid and vapor

H314 - Causes severe skin burns and eye damage

H318 - Causes serious eye damage

Additional information:

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key abbreviations or acronyms used

bw – body weight

CAS – Chemical Abstracts Service

EC50 – Effective Concentration 50%

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

NOEC – No Observed Effect Concentration

OEL – Occupational Exposure Limit

PBT – Persistent Bioaccumulative and Toxic

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

vPvB – very Persistent and very Bioaccumulative

h - hour

mg/m³ - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

w/w - weight/weight

d - day

Key literature references and sources for data

www.ChemADVISOR.com/

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This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet

Section: 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : HSUR43670A
Other means of identification : Not applicable.
Recommended use : OXYGEN SCAVENGER, CORROSION INHIBITOR, HYDROTEST CHEMICAL
Restrictions on use : Refer to available product literature or ask your local Sales Representative for restrictions on use and dose limits.
Company : ChampionX Australia Pty Ltd
Suite 1/5 Brodie-Hall Drive, Technology Park
Bentley WA 6102
Australia
TEL: +61 8 9473 9000

Emergency telephone : CHEMCALL 1800 127 406, International: +64 4 917 8888
number

Issuing date : 17.01.2023

Section: 2. HAZARDS IDENTIFICATION**GHS Classification**

Corrosive to metals : Category 1
Acute toxicity (Oral) : Category 4
Acute toxicity (Inhalation) : Category 2
Skin corrosion/irritation : Sub-category 1B
Serious eye damage/eye irritation : Category 1

GHS Label element

Hazard pictograms : 

Signal Word : Danger

Hazard Statements : May be corrosive to metals.
Harmful if swallowed.
Causes severe skin burns and eye damage.
Fatal if inhaled.

Precautionary Statements : **Prevention:**
Do not breathe mist or vapours. Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection. Wear respiratory protection.
Response:
IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
Storage:

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

Disposal:

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

Other hazards : Contact with acids liberates toxic gas.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

<u>Chemical Name</u>	<u>CAS-No.</u>	<u>Concentration: (%)</u>
Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides	68424-85-1	10 - 30
Ammonium Bisulfite	10192-30-0	10 - 30
Ethylene Glycol	107-21-1	5 - 10
Dipropylene Glycol Monomethyl Ether	34590-94-8	5 - 10

Section: 4. FIRST AID MEASURES

In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

In case of skin contact : Wash off immediately with plenty of water for at least 15 minutes. Use a mild soap if available. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

If swallowed : Rinse mouth with water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Contact the Poison's Information Centre (eg Australia 13 1126; New Zealand 0800 764 766).

If inhaled : Remove to fresh air. Treat symptomatically. Get medical attention if symptoms occur.

Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as required.

Notes to physician : Treat symptomatically.

Most important symptoms and effects, both acute and delayed : See Section 11 for more detailed information on health effects and symptoms.

Section: 5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media : None known.

Specific hazards during firefighting : Not flammable or combustible.

Hazardous combustion : Decomposition products may include the following materials: Carbon oxides

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products nitrogen oxides (NOx) Sulphur oxides Hydrogen chloride

Special protective equipment : Use personal protective equipment.
for firefighters

Specific extinguishing : Collect contaminated fire extinguishing water separately. This must not be
methods discharged into drains. Fire residues and contaminated fire extinguishing water
must be disposed of in accordance with local regulations.

Hazchem Code : 2X

Section: 6. ACCIDENTAL RELEASE MEASURES

Initial Emergency Response : 37
Guide No

Personal precautions, : Ensure adequate ventilation. Keep people away from and upwind of spill/leak.
protective equipment and : Avoid inhalation, ingestion and contact with skin and eyes. When workers are
emergency procedures : facing concentrations above the exposure limit they must use appropriate
certified respirators. Ensure clean-up is conducted by trained personnel only.
Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not allow contact with soil, surface or ground water.

Methods and materials for : Stop leak if safe to do so. Contain spillage, and then collect with non-
containment and cleaning up : combustible absorbent material, (e.g. sand, earth, diatomaceous earth,
vermiculite) and place in container for disposal according to local / national
regulations (see section 13). Flush away traces with water. For large spills, dike
spilled material or otherwise contain material to ensure runoff does not reach a
waterway.

Section: 7. HANDLING AND STORAGE

Advice on safe handling : Do not ingest. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in
eyes, on skin, or on clothing. Wash hands thoroughly after handling. Use only
with adequate ventilation.

Conditions for safe storage : Keep out of reach of children. Keep container tightly closed. Store in suitable
labelled containers.

Suitable material : Keep in properly labelled containers.

Unsuitable material : not determined

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Form of exposure	Permissible concentration	Basis
Ethylene Glycol	107-21-1	TWA (Vapour.)	20 ppm 52 mg/m3	AU OEL
		VLE (Vapour.)	40 ppm 104 mg/m3	AU OEL
		TWA (Particulate.)	10 mg/m3	AU OEL
Ethylene Glycol	107-21-1	WES-Ceiling (Vapour and mist)	50 ppm 127 mg/m3	NZ OEL
Ethylene Glycol	107-21-1	TWA (Vapour.)	25 ppm	ACGIH
		STEL (Vapour.)	50 ppm	ACGIH
		STEL (Inhalable	10 mg/m3	ACGIH

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		fraction, Aerosol only)		
Dipropylene Glycol Monomethyl Ether	34590-94-8	TWA	50 ppm 308 mg/m3	AU OEL
Dipropylene Glycol Monomethyl Ether	34590-94-8	WES-STEL	150 ppm 909 mg/m3	NZ OEL
		WES-TWA	100 ppm 606 mg/m3	NZ OEL
Dipropylene Glycol Monomethyl Ether	34590-94-8	STEL	150 ppm 900 mg/m3	NIOSH REL
		TWA	100 ppm 600 mg/m3	NIOSH REL
		TWA	100 ppm 600 mg/m3	OSHA Z1

Engineering measures : Effective exhaust ventilation system. Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Eye protection : Safety goggles
Face-shield

Hand protection : Wear impervious chemical-resistant gloves when handling this product. The following glove types are recommended based on our review of glove manufacturer information and/or other available sources.
butyl-rubber
Nitrile rubber
Other glove types may be used for short term, incidental contact if determined by testing to provide adequate worker protection.
Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin protection : Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Respiratory protection : Use local exhaust ventilation or other engineering controls as necessary to control airborne vapour and mist.
Where concentrations in air may exceed the limits given in this section or when significant vapours are generated, use an approved air purifying respirator fitted with a gas and vapour cartridge.
Use a particulate pre-filter where operations generate significant mists or aerosols.
Recommended gas and vapour cartridge:
Multi-purpose combination filter
In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA or supplied-air respirator should be used.
Refer to AS/NZS 1715 and AS/NZS 1716 for selection, use and maintenance of respiratory protective equipment as applicable.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling. Provide suitable facilities for quick drenching or flushing of the eyes and body in case of contact or splash hazard.

The Personal Protective Equipment (PPE) recommendations provided above have been made in good faith based on typical expected conditions of use. PPE selection should always be completed in conjunction with a proper risk assessment and in accordance with a PPE management program.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

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Colour	: colourless
Odour	: Pungent
Flash point	: Not applicable.
pH	: 4 - 6
Odour Threshold	: no data available
Melting point/freezing point	: no data available
Initial boiling point and boiling range	: Not applicable.
Evaporation rate	: no data available
Flammability (solid, gas)	: Not applicable.
Upper explosion limit	: no data available
Lower explosion limit	: no data available
Vapour pressure	: not determined
Relative vapour density	: no data available
Relative density	: 1.045 - 1.075, (20 °C),
Density	: no data available
Water solubility	: completely miscible
Solubility in other solvents	: no data available
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, dynamic	: < 20 mPa.s (20 °C)
Viscosity, kinematic	: 10 mm ² /s (40 °C)
Molecular weight	: no data available
VOC	: no data available

Note: properties listed in this section may be typical, calculated, or estimated values and should not be used as product specifications or for system design. For product specifications see the COA or Technical Data sheet.

Section: 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No dangerous reaction known under conditions of normal use.
Conditions to avoid	: None known.
Incompatible materials	: Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition products	: Decomposition products may include the following materials: Carbon oxides

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nitrogen oxides (NOx)
Sulphur oxides
Hydrogen chloride

Section: 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Inhalation, Eye contact, Skin contact

Potential Health Effects

Eyes : Causes serious eye damage.
Skin : Causes severe skin burns.
Ingestion : Harmful if swallowed. Causes digestive tract burns.
Inhalation : May cause nose, throat, and lung irritation.
Chronic Exposure : Health injuries are not known or expected under normal use.

Experience with human exposure

Eye contact : Redness, Pain, Corrosion
Skin contact : Redness, Pain, Corrosion
Ingestion : Corrosion, Abdominal pain, Vomiting
Inhalation : Respiratory irritation, Cough

Toxicity

Product

Acute oral toxicity : Acute toxicity estimate: 1,441 mg/kg
Acute inhalation toxicity : Acute toxicity estimate: 0.2651 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Acute dermal toxicity : no data available
Skin corrosion/irritation : no data available
Serious eye damage/eye irritation : no data available
Respiratory or skin sensitization : Result: Contains an ingredient that can cause asthmatic-like reactions in sulfite-sensitive individuals.
Carcinogenicity : No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
Reproductive effects : No reproductive toxic effects expected.
Germ cell mutagenicity : Contains no ingredient listed as a mutagen
Teratogenicity : no data available
STOT - single exposure : no data available
STOT - repeated exposure : no data available

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Aspiration toxicity : No aspiration toxicity classification

Components

Acute dermal toxicity : Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides
LD50 rabbit: 3,340 mg/kg

Ethylene Glycol
LD50 rabbit: 10,600 mg/kg

Dipropylene Glycol Monomethyl Ether
LD50 rabbit: 9,510 mg/kg

Human Hazard Characterization

Based on our hazard characterization, the potential human hazard is: High

Section: 12. ECOLOGICAL INFORMATION

Toxicity

Environmental Effects : Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Product

Toxicity to fish : no data available

Toxicity to daphnia and other aquatic invertebrates : no data available

Toxicity to algae : no data available

Components

Toxicity to fish : Ethylene Glycol
LC50 : 72,860 mg/l
Exposure time: 96 h

Dipropylene Glycol Monomethyl Ether
LC50 Fish: > 1,000 mg/l
Exposure time: 96 h

Components

Toxicity to daphnia and other aquatic invertebrates : Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides
EC50 Daphnia magna (Water flea): 0.016 mg/l
Exposure time: 48 h

Ammonium Bisulfite
EC50 : 89 mg/l
Exposure time: 48 h

Ethylene Glycol
EC50 : > 100 mg/l
Exposure time: 48 h

Components

Toxicity to algae : Ethylene Glycol
EC50 : 6,500 mg/l
Exposure time: 96 h

Components

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Toxicity to bacteria : Ethylene Glycol
> 1,995 mg/l

Components

Toxicity to fish (Chronic toxicity) : Ethylene Glycol
NOEC: 15,380 mg/l
Exposure time: 7 d

Components

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Ethylene Glycol
NOEC: 8,590 mg/l
Exposure time: 7 d

Persistence and degradability

no data available

Mobility

no data available

Bioaccumulative potential

no data available

Other information

no data available

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: High

Section: 13. DISPOSAL CONSIDERATIONS

Disposal methods : The product should not be allowed to enter drains, water courses or the soil. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations. Dispose of wastes in an approved waste disposal facility.

Disposal considerations : 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

The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

Land transport

Proper shipping name : CORROSIVE LIQUID, N.O.S.
Technical name(s): : Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides
UN/ID No. : UN 1760
Transport hazard class(es) : 8
Packing group : II
IERG No : 37

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Hazchem Code : 2X

Air transport (IATA)

UN/ID No. : UN 1760
Proper shipping name : CORROSIVE LIQUID, N.O.S.
Technical name(s) : Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides
Transport hazard class(es) : 8
Packing group : II

Sea transport (IMDG/IMO)

UN/ID No. : UN 1760
Proper shipping name : CORROSIVE LIQUID, N.O.S.
Technical name(s) : Quaternary Ammonium Compounds, Benzyl-C12-16-Alkyldimethyl, Chlorides
Transport hazard class(es) : 8
Packing group : II
Marine pollutant : Quaternary ammonium compound

Section: 15. REGULATORY INFORMATION

Standard for the Uniform : Schedule 6
Scheduling of Medicines and Poisons

INTERNATIONAL CHEMICAL CONTROL LAWS :

Canadian Domestic Substances List (DSL)

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

United States TSCA Inventory

On or in compliance with the active portion of the TSCA inventory.

Australia. Australian Industrial Chemicals Introduction Scheme (AICIS)

All substances in this product comply with the Australian Industrial Chemicals Introduction Scheme (AICIS)

Japan. ENCS - Existing and New Chemical Substances Inventory

On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996, and are listed on or are exempt from the New Zealand Inventory of Chemicals.

Korea. Korean Existing Chemicals Inventory (KECI)

On the inventory, or in compliance with the inventory

Philippines Inventory of Chemicals and Chemical Substances (PICCS)

On the inventory, or in compliance with the inventory

China Inventory of Existing Chemical Substances

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on or exempt from the Inventory of Existing Chemical Substances China (IECSC).

Taiwan Chemical Substance Inventory

On the inventory, or in compliance with the inventory

Section: 16. OTHER INFORMATION

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REFERENCES

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Revision Date : 17.01.2023
Version Number : 1.8
Prepared By : Regulatory Affairs

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

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.

SAFETY DATA SHEET**ALDACIDE® G ANTIMICROBIAL**

Revision Date: 06-Apr-2021

Revision Number: 11

1. Product Identifier & Identity for the Chemical

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Dangerous Goods according to the criteria of ADG.

1.1. Product Identifier

Product Name ALDACIDE® G ANTIMICROBIAL

Other means of Identification

Synonyms None

Hazardous Material Number: HB003462

Recommended use of the chemical and restrictions on use

Recommended Use Biocide

Uses advised against No information available

Supplier's name, address and phone number

Manufacturer/Supplier Halliburton Australia Pty. Ltd.
15 Marriott Road, Jandakot, WA 6164
Australia
ACN Number: 009 000 775
Telephone Number: + 61 1 800 686 951
Fax Number: 61 (08) 9455 5300
E-mail Address fdunexchem@halliburton.com

Emergency phone number

+ 61 1 800 686 951

Global Incident Response Access Code: 334305

Contract Number: 14012

Australian Poisons Information Centre

24 Hour Service: - 13 11 26

Police or Fire Brigade: - 000 (exchange): - 1100

2. Hazard Identification

Statement of Hazardous Nature Hazardous according to the criteria of the 7th Revised Edition of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS), Dangerous Goods according to the criteria of ADG.

Classification of the hazardous chemical

Acute Oral Toxicity	Category 4 - H302
Acute inhalation toxicity - vapor	Category 3 - H331
Skin Corrosion/Irritation	Category 1 - H314
Serious Eye Damage/Irritation	Category 1 - H318
Respiratory Sensitization	Category 1 - H334
Skin Sensitization	Category 1 - H317
Specific Target Organ Toxicity - (Single Exposure)	Category 3 - H335
Acute Aquatic Toxicity	Category 1 - H400

Chronic Aquatic Toxicity

Category 3 - H412

Label elements, including precautionary statements**Hazard Pictograms****Signal Word**

DANGER

Hazard Statements:

H302 - Harmful if swallowed
 H314 - Causes severe skin burns and eye damage
 H317 - May cause an allergic skin reaction
 H318 - Causes serious eye damage
 H331 - Toxic if inhaled
 H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
 H335 - May cause respiratory irritation
 H400 - Very toxic to aquatic life
 H412 - Harmful to aquatic life with long lasting effects

Precautionary Statements**Prevention**

P201 - Obtain special instructions before use
 P202 - Do not handle until all safety precautions have been read and understood
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray
 P264 - Wash face, hands and any exposed skin thoroughly after handling
 P270 - Do not eat, drink or smoke when using this product
 P271 - Use only outdoors or in a well-ventilated area
 P272 - Contaminated work clothing should not be allowed out of the workplace
 P273 - Avoid release to the environment
 P280 - Wear protective gloves/protective clothing/eye protection/face protection
 P281 - Use personal protective equipment as required
 P285 - In case of inadequate ventilation wear respiratory protection
 P301+ P330 + P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
 P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
 P363 - Wash contaminated clothing before reuse
 P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
 P310 - Immediately call a POISON CENTER or doctor/physician
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P391 - Collect spillage

Response**Storage**

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
 P405 - Store locked up

Disposal

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

Contains Substances
 Glutaraldehyde

CAS Number
 111-30-8

Other hazards which do not result in classification

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
 This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

For the full text of the H-phrases mentioned in this Section, see Section 16

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - Australia
Glutaraldehyde	111-30-8	10 - 30%	Acute Tox. 3 (H301) Acute Tox. 2 (H330) Skin Corr. 1B (H314) Eye Corr. 1 (H318) Resp. Sens. 1 (H334) Skin Sens. 1 (H317) STOT SE 3 (H335) Aquatic Acute 1 (H400) Aquatic Chronic 2 (H411)

4. First aid measures

Description of necessary first aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes	Immediately flush eyes with large amounts of water for at least 30 minutes. Seek prompt medical attention.
Skin	In case of contact, immediately flush skin with plenty of soap and water for at least 30 minutes and remove contaminated clothing, shoes and leather goods immediately. Get medical attention immediately.
Ingestion	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

Symptoms caused by exposure

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause allergic skin reaction. May cause allergic respiratory reaction. May cause respiratory irritation. Harmful if swallowed. Toxic if inhaled.

Medical Attention and Special Treatment

Notes to Physician Treat symptomatically

5. Fire Fighting Measures

Suitable extinguishing equipment

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

Specific hazards arising from the chemical

Special exposure hazards in a fire

Decomposition in fire may produce harmful gases.

Special protective equipment and precautions for fire fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Ensure adequate ventilation. Avoid breathing vapors. Avoid contact with skin, eyes and clothing. Evacuate all persons from the area. Use only competent persons for cleanup.

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Dike far ahead of liquid spill for later disposal. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. Handling and storage

7.1. Precautions for safe handling**Handling Precautions**

Use appropriate protective equipment. Ensure adequate ventilation. Avoid breathing vapors. Avoid breathing mist. Avoid contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities**Storage Information**

Store away from acids. Store away from alkalis. Store in a well ventilated area. Keep container closed when not in use. Store locked up. Product has a shelf life of 36 months.

Other Guidelines

No information available

8. Exposure Controls/Personal Protection

Control parameters - exposure standards, biological monitoring**Exposure Limits**

Substances	CAS Number	Australia NOHSC	ACGIH TLV-TWA
Glutaraldehyde	111-30-8	Not applicable	Ceiling: 0.05 ppm

Appropriate engineering controls**Engineering Controls**

Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation. If vapors are strong enough to be irritating to the nose or eyes, the TLV is probably being exceeded and special ventilation or respiratory protection maybe required.

Personal protective equipment (PPE)**Personal Protective Equipment**

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional. Organic vapor respirator.

Hand Protection

Impervious gloves Manufacturer's directions for use should be observed because of great diversity of types.

Skin Protection

Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coverall, as appropriate, to prevent skin contact.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls

Do not allow material to contaminate ground water system.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid
Odor: Sharp

Color Clear light yellow
Odor Threshold: No information available

PropertyValuesRemarks/ - Method**pH:**

3.1-4.5

Freezing Point / Range

(-5) - (-10) °C

Melting Point / Range

No data available

Pour Point / Range

No data available

Boiling Point / Range

100.5 °C / 213 °F

Flash Point

No data available

Evaporation rate

0.9

Vapor Pressure

0.2 mmHg

Vapor Density

0.8

Specific Gravity

1.064

Water Solubility

Soluble in water

Solubility in other solvents

No data available

Partition coefficient: n-octanol/water

-0.333

Autoignition Temperature

> 275 °C / > 527 °F

Decomposition Temperature

No data available

Viscosity

No data available

Explosive Properties

No information available

Oxidizing Properties

No information available

9.2. Other information**VOC Content (%)**

No data available

10. Stability and Reactivity**10.1. Reactivity**

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

Keep away from heat, sparks and flame.

10.5. Incompatible materials

Strong acids. Strong alkalis.

10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

11. Toxicological Information**Information on routes of exposure****Principle Route of Exposure** Eye or skin contact, inhalation; Ingestion.**Symptoms related to exposure****Most Important Symptoms/Effects**

Causes severe eye irritation which may damage tissue. Causes severe skin irritation with tissue destruction. May cause allergic skin reaction. May cause allergic respiratory reaction. May cause respiratory irritation. Harmful if swallowed. Toxic if inhaled.

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Glutaraldehyde	111-30-8	50 mg/kg (Guinea Pig)	560 µL/kg (Rabbit)	0.28-0.5 mg/L (Rat) 4h

Immediate, delayed and chronic health effects from exposure

Inhalation	Toxic if inhaled. Causes severe respiratory irritation. May cause allergic respiratory reaction. Inhalation of vapors may result in skin sensitization.
Eye Contact	Causes severe eye irritation which may damage tissue.
Skin Contact	Causes severe burns. May cause an allergic skin reaction.
Ingestion	Harmful if swallowed. Causes burns of the mouth, throat and stomach.
Chronic Effects/Carcinogenicity	No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Exposure Levels

No data available

Interactive effects

Skin disorders. Lung disorders. Liver disorders.

Data limitations

No data available

Substances	CAS Number	Skin corrosion/irritation
Glutaraldehyde	111-30-8	Causes severe skin irritation with tissue destruction. (Rabbit)
Substances	CAS Number	Serious eye damage/irritation
Glutaraldehyde	111-30-8	Causes severe eye irritation which may damage tissue. (Rabbit)
Substances	CAS Number	Skin Sensitization
Glutaraldehyde	111-30-8	Skin sensitizer in guinea pig.
Substances	CAS Number	Respiratory Sensitization
Glutaraldehyde	111-30-8	May cause sensitization by inhalation
Substances	CAS Number	Mutagenic Effects
Glutaraldehyde	111-30-8	In vivo tests did not show mutagenic effects.
Substances	CAS Number	Carcinogenic Effects
Glutaraldehyde	111-30-8	Did not show carcinogenic effects in animal experiments
Substances	CAS Number	Reproductive toxicity
Glutaraldehyde	111-30-8	Not a confirmed teratogen or embryotoxin.
Substances	CAS Number	STOT - single exposure
Glutaraldehyde	111-30-8	No information available
Substances	CAS Number	STOT - repeated exposure
Glutaraldehyde	111-30-8	May cause disorder and damage to the Kidney
Substances	CAS Number	Aspiration hazard
Glutaraldehyde	111-30-8	Not applicable

12. Ecological Information

Ecotoxicity**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Glutaraldehyde	111-30-8	EC50(72h): 0.61 mg/L (Desmodesmus subspicatus) EC50(72h): 0.5 mg/L (Skeletonema costatum)	LC50(96h): 10 mg/L (Lepomis macrochirus) NOEC(97d): 1.6 mg/L (Oncorhynchus mykiss) LC50(96h): 3.5 mg/L (Oncorhynchus mykiss)	EC50 (17h) 6.65 mg/L (Pseudomonas putida)	EC50(48h): 0.35 mg/L (Daphnia magna) EC50(48h): 0.7 mg/L (Acartia tonsa) NOEC(21d): 0.13 mg/L (Daphnia magna)

		LC50(96h): 60 mg/L (Scophthalmus maximus)		EC50(48h): 0.1 mg/L (Acartia tonsa)
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12.2. Persistence and degradability

Readily biodegradable

Substances	CAS Number	Persistence and Degradability
Glutaraldehyde	111-30-8	Readily biodegradable (75% @ 28d)

12.3. Bioaccumulative potential

Does not bioaccumulate.

Substances	CAS Number	Bioaccumulation
Glutaraldehyde	111-30-8	-0.36

12.4. Mobility in soil

Substances	CAS Number	Mobility
Glutaraldehyde	111-30-8	Potential for mobility in soil is high (Koc between 50 and 150). Given its very low Henry's constant (3.3E-08 atm*m3/mole; 25 °C Measured), volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

12.6. Other adverse effects**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

13. Disposal Considerations

Safe handling and disposal methods

Disposal should be made in accordance with federal, state, and local regulations.

Disposal of any contaminated packaging

Follow all applicable national or local regulations.

Environmental regulations

Not applicable

14. Transport Information

Transportation Information**Australia ADG**

UN Number	UN3265
UN proper shipping name:	Corrosive Liquid, Acidic, Organic, N.O.S. (Contains Glutaraldehyde)
Transport Hazard Class(es):	8
Packing Group:	II
Environmental Hazards:	Marine Pollutant

IMDG/IMO

UN Number	UN3265
UN proper shipping name:	Corrosive Liquid, Acidic, Organic, N.O.S. (Contains Glutaraldehyde)
Transport Hazard Class(es):	8
Packing Group:	II
Environmental Hazards:	Marine Pollutant
EMS:	EmS F-A, S-B

IATA/ICAO

UN Number	UN3265
UN proper shipping name:	Corrosive Liquid, Acidic, Organic, N.O.S. (Contains Glutaraldehyde)
Transport Hazard Class(es):	8
Packing Group:	II
Environmental Hazards:	Marine Pollutant

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

Not applicable

Special precautions during transport

None

HazChem Code

2X

15. Regulatory Information**Safety, health and environmental regulations specific for the product****International Inventories****Australian AICS Inventory**

All components are listed on the AICS or are subject to a relevant exemption, permit, or assessment certificate.

New Zealand Inventory of Chemicals

All components are listed on the NZIoC or are subject to a relevant exemption, permit, or assessment certificate.

US TSCA Inventory

All components listed on inventory or are exempt.

Canadian Domestic Substances List (DSL)

All components listed on inventory or are exempt.

Poisons Schedule number

S6

International Agreements**Montreal Protocol - Ozone Depleting Substances:**

Does not apply.

Stockholm Convention - Persistent Organic Pollutants:

Does not apply.

Rotterdam Convention - Prior Informed Consent:

Does not apply.

Basel Convention - Hazardous Waste:

Does not apply.

16. Other information**Date of preparation or review****Revision Date:**

06-Apr-2021

Revision Note

SDS sections updated:

2
3
4
11
14**Full text of H-Statements referred to under sections 2 and 3**

H301 - Toxic if swallowed

H302 - Harmful if swallowed

H314 - Causes severe skin burns and eye damage

H317 - May cause an allergic skin reaction

H318 - Causes serious eye damage

H330 - Fatal if inhaled

H331 - Toxic if inhaled

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

H335 - May cause respiratory irritation

H400 - Very toxic to aquatic life

H411 - Toxic to aquatic life with long lasting effects

H412 - Harmful to aquatic life with long lasting effects

Additional information

For additional information on the use of this product, contact your local Halliburton

representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key abbreviations or acronyms used

bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NOEC – No Observed Effect Concentration
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
vPvB – very Persistent and very Bioaccumulative
h - hour
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data

www.ChemADVISOR.com/
NZ CCID

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End of Safety Data Sheet