



# SAFETY DATA SHEET BUTANOL REVISION 6, DATE 08 JUL 21

## 1. IDENTIFICATION

<b>Product Name</b>	<b>Butanol</b>
<b>Other Names</b>	1-Butanol; Butan-1-ol; Butyl alcohol; n-Butyl alcohol; Propyl carbinol
<b>Uses</b>	Industrial solvent for chemical and textile processes; Organic synthesis; Chemical intermediate.
<b>Chemical Family</b>	No Data Available
<b>Chemical Formula</b>	C <sub>4</sub> H <sub>10</sub> O
<b>Chemical Name</b>	n-Butanol
<b>Product Description</b>	No Data Available

### Contact Details of the Supplier of this Safety Data Sheet

<b>Organisation</b>	<b>Location</b>	<b>Telephone</b>
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

### Emergency Contact Details

*For emergencies only; DO NOT contact these companies for general product advice.*

<b>Organisation</b>	<b>Location</b>	<b>Telephone</b>
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887




## 2. HAZARD IDENTIFICATION

**Poisons Schedule (Aust)**

Not Scheduled



## Globally Harmonised System

<b>Hazard Classification</b>		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
<b>Hazard Categories</b>		Flammable Liquids - Category 3 Acute Toxicity (Oral) - Category 4 Skin Corrosion/Irritation - Category 2 Serious Eye Damage/Irritation - Category 1 Specific Target Organ Toxicity (Single Exposure) - Category 3
<b>Pictograms</b>		  
<b>Signal Word</b>		Danger
<b>Hazard Statements</b>		<b>H226</b> Flammable liquid and vapour. <b>H302</b> Harmful if swallowed. <b>H315</b> Causes skin irritation. <b>H318</b> Causes serious eye damage. <b>H335</b> May cause respiratory irritation. <b>H336</b> May cause drowsiness or dizziness.
<b>Precautionary Statements</b>	Prevention	<b>P210</b> Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. <b>P280</b> Wear protective gloves/protective clothing/eye protection/face protection. <b>P261</b> Avoid breathing mist/vapours/spray. <b>P233</b> Keep container tightly closed. <b>P240</b> Ground and bond container and receiving equipment. <b>P241</b> Use explosion-proof electrical/ventilating/lighting and all other equipment. <b>P242</b> Use non-sparking tools. <b>P243</b> Take action to prevent static discharges. <b>P235</b> Keep cool. <b>P270</b> Do not eat, drink or smoke when using this product. <b>P271</b> Use only outdoors or in a well-ventilated area.
	Response	<b>P370 + P378</b> In case of fire: Use carbon dioxide (CO2), dry chemical or foam for extinction. <b>P305 + P351 + P338 + P310</b> 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 CENTRE/doctor. <b>P312</b> Call a POISON CENTER or doctor if you feel unwell. <b>P303 + P361 + P353</b> IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. <b>P330</b> Rinse mouth. <b>P332 + P313</b> If skin irritation occurs: Get medical attention. <b>P304 + P340</b> IF INHALED: Remove victim to fresh air and keep comfortable for breathing. <b>P363</b> Wash contaminated clothing before reuse.
	Storage	<b>P403 + P233</b> Store in a well-ventilated place. Keep container tightly closed. <b>P405</b> Store locked up.
	Disposal	<b>P501</b> Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)  
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)  
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Physical Hazards	3.1C	Flammable liquid - medium hazard
	Health Hazards	6.1D	Substances that are acutely toxic - Harmful
		6.1E	Substances that are acutely toxic –May be harmful, Aspiration hazard
		6.3A	Substances that are irritating to the skin
		8.3A	Substances that are corrosive to ocular tissue

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
n-Butanol	C4H10O	71-36-3	>=99 - <=100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth, then drink 1 or 2 glasses of water. Keep respiratory tract clear. Do not induce vomiting. Do NOT give milk or alcoholic beverages. Immediately call a Poison Centre or doctor/physician for advice. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Never give anything by mouth to an unconscious person.
Eye	IF IN EYES: Protect unharmed eye! Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advice. Immediate medical attention is required! Continue rinsing eyes during transport to hospital.
Skin	IF ON SKIN: Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse. *In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician for advice. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Advice to Doctor	No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Keep victim calm and warm. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Ensure that attending medical personnel are aware of identity and nature of product(s) involved, and take precautions to protect themselves. *Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. The decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or

oesophageal control.

**Medical Conditions Aggravated by Exposure** Repeated excessive exposure may aggravate pre-existing liver and kidney disease. Skin contact may aggravate pre-existing dermatitis.

## 5. FIRE FIGHTING MEASURES

<b>General Measures</b>	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out. Avoid getting water inside containers.
<b>Flammability Conditions</b>	FLAMMABLE LIQUID & VAPOUR: Low flashpoint - Will be easily ignited by heat, sparks or flame.
<b>Extinguishing Media</b>	Use dry chemical, Carbon dioxide (CO <sub>2</sub> ), foam or water spray for extinction - Do not use water jets. Alcohol resistant foam is the preferred firefighting medium but, if it is not available, fine water spray can be used. *Caution: Use of water spray when fighting fire may be inefficient.
<b>Fire and Explosion Hazard</b>	Risk of violent reaction or explosion! Vapours will form explosive mixtures with air. Vapours may travel to source of ignition and flash back. Most vapours are heavier than air and will collect in low or confined areas. Many liquids are lighter than water. Containers may explode when heated. Vapours from runoff may create an explosion hazard.
<b>Hazardous Products of Combustion</b>	Fire may produce irritating and/or toxic gases, including Carbon monoxide, Carbon dioxide, fumes, smoke.
<b>Special Fire Fighting Instructions</b>	Collect contaminated fire extinguishing water separately; This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed off in accordance with local regulations.
<b>Personal Protective Equipment</b>	Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.
<b>Flash Point</b>	35 °C [Closed cup]
<b>Lower Explosion Limit</b>	1.4 %
<b>Upper Explosion Limit</b>	11.2 %
<b>Auto Ignition Temperature</b>	345 °C
<b>Hazchem Code</b>	•2Y

## 6. ACCIDENTAL RELEASE MEASURES

<b>General Response Procedure</b>	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources - All equipment used when handling the product must be earthed. Do not touch or walk through spilled material. Avoid breathing vapours and contact with eyes, skin and clothing.
<b>Clean Up Procedures</b>	Absorb with earth, sand or other non-combustible material. Use clean, non-sparking tools to collect material and place it in suitable, properly labelled containers for later disposal (see SECTION 13). *large amounts, pump off product.
<b>Containment</b>	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. *Vapour-suppressing foam may be used to control vapours. Water spray may be used to knock down or divert vapour clouds.
<b>Decontamination</b>	Wash-waters must be contained and prevented from entering into soil, waterways and ground water.
<b>Environmental Precautionary Measures</b>	Spillages and decontamination runoff should be prevented from entering drains and watercourses - Vapours from runoff may create an explosion hazard!
<b>Evacuation Criteria</b>	Spill or leak area should be isolated immediately. Evacuate personnel to safe areas. Keep upwind and to higher ground. Keep unauthorised personnel away. *Large spill: Immediately contact Police or Fire Brigade; Consider initial downwind evacuation of areas within at least 300 m.
<b>Personal Precautionary Measures</b>	Use personal protective equipment as required (see SECTION 8).

**7. HANDLING AND STORAGE**

<b>Handling</b>	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation - Use only outdoors or in a well-ventilated area. Handle in accordance with good industrial hygiene and safety practice. Open drums carefully as contents may be under pressure. Avoid formation of aerosols. Avoid breathing mist/vapours/aerosols and contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). <b>FLAMMABLE LIQUID &amp; VAPOUR:</b> Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Do not spray on a naked flame or any incandescent material. Ground and bond container and receiving equipment. Use explosion-proof equipment and non-sparking tools. Take action to prevent static discharges (which might cause ignition of organic vapours).
<b>Storage</b>	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up. Electrical installations/working materials must comply with the technological safety standards.
<b>Container</b>	Store in original container. Containers, even those that have been emptied, can contain vapours. Do not cut, drill, grind, weld or perform similar operations on or near empty containers.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

<b>General</b>	For n-Butyl alcohol (CAS No. 71-36-3): - Safe Work Australia Exposure Standard: TWA = 50 ppm (152 mg/m3) Peak limitation; Absorption through the skin may be a significant source of exposure (Sk). - New Zealand Workplace Exposure Standard [Next review: 2023]: Ceiling = 50 ppm (152 mg/m3); Skin absorption (skin). - NIOSH REL: Ceiling = 50 ppm (150 mg/m3) [skin]. - OSHA PEL: TWA = 100 ppm (300 mg/m3). - Immediately dangerous to life or health (IDLH) concentration: 1,400 ppm.
<b>Exposure Limits</b>	No Data Available
<b>Biological Limits</b>	No information available.
<b>Engineering Measures</b>	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. *Use explosion-proof electrical/ventilating/lighting equipment.
<b>Personal Protection Equipment</b>	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Organic vapour respirator. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator. - Hand protection: Wear protective gloves. Recommended: Use chemical resistant gloves, e.g. Natural rubber (latex), Neoprene, Polyethylene, Ethyl vinyl alcohol laminate (EVAL), Polyvinyl alcohol (PVA), Polyvinyl chloride (PVC or vinyl). - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Use protective clothing chemically resistant to this material. Selection of specific items such as boots, apron or full body-suit will depend on operation. Choose body protection according to the amount and concentration of the hazardous substance(s) at the work place.
<b>Special Hazards Precautions</b>	Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
<b>Work Hygienic Practices</b>	Do not eat, drink or smoke when using this product. Remove contaminated clothing immediately, wash skin areas with soap and water and launder clothing before reuse or dispose of properly.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Physical State</b>	Liquid
<b>Appearance</b>	Liquid

<b>Odour</b>	Alcohol-like
<b>Colour</b>	Colourless
<b>pH</b>	No Data Available
<b>Vapour Pressure</b>	5.6 hPa (@ 20 °C)
<b>Relative Vapour Density</b>	2.6 Air = 1
<b>Boiling Point</b>	118 °C
<b>Melting Point</b>	No Data Available
<b>Freezing Point</b>	-89 °C
<b>Solubility</b>	7.45 g/l in water 25°C
<b>Specific Gravity</b>	0.81 (Water = 1)
<b>Flash Point</b>	35 °C [Closed cup]
<b>Auto Ignition Temp</b>	345 °C
<b>Evaporation Rate</b>	0.4
<b>Bulk Density</b>	No Data Available
<b>Corrosion Rate</b>	No Data Available
<b>Decomposition Temperature</b>	No Data Available
<b>Density</b>	No Data Available
<b>Specific Heat</b>	No Data Available
<b>Molecular Weight</b>	74.12 g/mol
<b>Net Propellant Weight</b>	No Data Available
<b>Octanol Water Coefficient</b>	log Pow: 1
<b>Particle Size</b>	No Data Available
<b>Partition Coefficient</b>	No Data Available
<b>Saturated Vapour Concentration</b>	No Data Available
<b>Vapour Temperature</b>	No Data Available
<b>Viscosity</b>	No Data Available
<b>Volatile Percent</b>	No Data Available
<b>VOC Volume</b>	No Data Available
<b>Additional Characteristics</b>	No information available.
<b>Potential for Dust Explosion</b>	Not applicable.
<b>Fast or Intensely Burning Characteristics</b>	Risk of violent reaction or explosion!
<b>Flame Propagation or Burning Rate of Solid Materials</b>	No information available.
<b>Non-Flammables That Could Contribute Unusual Hazards to a Fire</b>	No information available.
<b>Properties That May Initiate or Contribute to Fire Intensity</b>	FLAMMABLE LIQUID & VAPOUR: Low flashpoint - Will be easily ignited by heat, sparks or flame.
<b>Reactions That Release Gases or Vapours</b>	Fire/decomposition may produce irritating and/or toxic gases, including Carbon monoxide, Carbon dioxide, fumes, smoke.
<b>Release of Invisible Flammable Vapours and Gases</b>	Vapours will form explosive mixtures with air.

## 10. STABILITY AND REACTIVITY

<b>General Information</b>	No dangerous reaction known under conditions of normal use.
<b>Chemical Stability</b>	Stable under normal conditions.

<b>Conditions to Avoid</b>	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Take action to prevent static discharges.
<b>Materials to Avoid</b>	Incompatible/reactive with strong oxidisers, strong mineral acids, nitric acid, sodium hydroxide, alkali metals, halogens.
<b>Hazardous Decomposition Products</b>	Fire/decomposition may produce irritating and/or toxic gases, including Carbon monoxide, Carbon dioxide, fumes, smoke.
<b>Hazardous Polymerisation</b>	Hazardous polymerisation does not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>General Information</b>	<ul style="list-style-type: none"> <li>- Acute toxicity: Harmful if swallowed. Swallowing can result in nausea, vomiting and central nervous system depression. Absorption through the skin may be a significant source of exposure.</li> <li>- Skin corrosion/irritation: Causes skin irritation. Skin irritation (Rabbit, 2 h). The substance defats the skin, which may cause dryness or cracking. Skin contact may aggravate pre-existing dermatitis.</li> <li>- Eye damage/irritation: Causes serious eye damage. Irreversible effects on the eye (Rabbit).</li> <li>- Respiratory/skin sensitisation: No information available.</li> <li>- Germ cell mutagenicity: Not mutagenic in studies with mammals.</li> <li>- Carcinogenicity: Not listed as carcinogenic according to the International Agency for Research on Cancer (IARC).</li> <li>- Reproductive toxicity: No evidence of impaired fertility was found in animal studies. No reproductive or developmental effects.</li> <li>- STOT (single exposure): May cause respiratory irritation (respiratory system). May cause drowsiness or dizziness (Central nervous system). Can cause narcotic effects. Breathing in vapour can result in headaches, dizziness, drowsiness and nausea. Breathing in high concentrations can produce central nervous system depression, which can lead to loss of coordination, impaired judgement and if exposure is prolonged, unconsciousness.</li> <li>- STOT (repeated exposure): Repeated excessive exposure may aggravate pre-existing liver and kidney disease. Evidence from animal tests indicate that repeated or prolonged exposure at concentrations of 200 ppm and above produces corneal inflammation, blurring of vision, watering of the eyes and photophobia (intolerance to light).</li> <li>- Aspiration toxicity: If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.</li> </ul>
<b>Acute</b>	
<b>Ingestion</b>	Acute toxicity (Oral): - LD50, Rat: 790 - 4,360 mg/kg
<b>Other</b>	Acute toxicity (Dermal): - LD50, Rabbit: 3,400 mg/kg
<b>Inhalation</b>	Acute toxicity (Inhalation): - LC50, Rat: 24.3 mg/l (4 h)
<b>Carcinogen Category</b>	None

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	Aquatic toxicity: - LC50, Fish (Pimephales promelas): 1,376 mg/l (96 h). - EC50, Crustacea (Daphnia magna): 1,328 mg/l (48 h). - EC50, Algae (Pseudokirchneriella subcapitata): 225 mg/ l (96 h).
<b>Persistence/Degradability</b>	Readily biodegradable.
<b>Mobility</b>	High mobility in soil and may volatilise from dry soil surface.
<b>Environmental Fate</b>	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
<b>Bioaccumulation Potential</b>	- Bioconcentration factor (BCF): 3.16 - log Pow: 1
<b>Environmental Impact</b>	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations. All efforts to recycle material should be made. Incineration under approved, controlled conditions using incinerators suitable or designed for the disposal of hazardous chemical wastes, is the preferred method for disposal.
Special Precautions for Land Fill	Contaminated packaging: Empty remaining contents. Do not re-use empty containers. Do not burn or use a cutting torch on the empty drum.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
EPG	16 Liquids - Highly Flammable, Toxic
UN Number	1120
Hazchem	+2Y
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
EPG	16 Liquids - Highly Flammable, Toxic
UN Number	1120
Hazchem	+2Y
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
EPG	16 Liquids - Highly Flammable, Toxic
UN Number	1120
Hazchem	+2Y
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)

US DOT



Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
ERG	129 Flammable Liquids (Polar / Water-Miscible / Noxious)
UN Number	1120
Hazchem	•2Y
Pack Group	III
Special Provision	No Data Available

Sea Transport

IMDG Code

Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
UN Number	1120
Hazchem	•2Y
Pack Group	III
Special Provision	No Data Available
EMS	F-E, S-D
Marine Pollutant	No

Air Transport

IATA DGR

Proper Shipping Name	BUTANOLS
Class	3 Flammable Liquids
Subsidiary Risk(s)	No Data Available
UN Number	1120
Hazchem	•2Y
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001096 (Reissued)
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## National/Regional Inventories

Australia (AIIIC)	Listed
Canada (DSL)	Listed
Canada (NDSL)	Not Determined
China (IECSC)	Listed
Europe (EINECS)	200-751-6
Europe (REACH)	Not Determined
Japan (ENCS/METI)	Listed
Korea (KECI)	Listed
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Listed

## 16. OTHER INFORMATION

Related Product Codes	BUTANO1000, BUTANO1001, BUTANO1002, BUTANO1003, BUTANO1004, BUTANO1005, BUTANO1006, BUTANO1007, BUTANO1008, BUTANO1009, BUTANO1010, BUTANO1011, BUTANO1012, BUTANO1013, BUTANO1014, BUTANO1015, BUTANO1016, BUTANO1017, BUTANO1018, BUTANO1019, BUTANO1020, BUTANO1021, BUTANO1050, BUTANO1100, BUTANO1200, BUTANO1500, BUTANO1800, BUTANO1801, BUTANO1802, BUTANO2000, BUTANO2001, BUTANO2002, BUTANO2003, BUTANO2004, BUTANO2005, BUTANO2100, BUTANO2101, BUTANO2200, BUTANO2500, BUTANO2501, BUTANO3000, BUTANO3001, BUTANO3010, BUTANO3020, BUTANO3021, BUTANO3030, BUTANO3040, BUTANO3041, BUTANO3100, BUTANO3200, BUTANO3201, BUTANO3210, BUTANO3220, BUTANO3221, BUTANO3400, BUTANO3500, BUTANO3600, BUTANO3800, BUTANO4000, BUTANO4500, BUTANO4600, BUTANO5000, BUTANO5500, BUTANO6000, BUTANO6200, BUTANO6500, BUTANO6600, BUTANO6700, BUTANO6800, BUTANO7000, BUTANO7010, BUTANO7050, BUTANO7100, BUTANO7101, BUTANO7102, BUTANO7150, BUTANO7500, BUTANO7600, BUTANO7700, BUTANO8000, BUTANO8500, BUTANO9000, BUTANO9900, BUTANO9901, BUTANO9902
Revision	6
Revision Date	08 Jul 2021
Key/Legend	<p>&lt; Less Than</p> <p>&gt; Greater Than</p> <p><b>AICS</b> Australian Inventory of Chemical Substances</p> <p><b>atm</b> Atmosphere</p> <p><b>CAS</b> Chemical Abstracts Service (Registry Number)</p> <p><b>cm<sup>2</sup></b> Square Centimetres</p> <p><b>CO<sub>2</sub></b> Carbon Dioxide</p> <p><b>COD</b> Chemical Oxygen Demand</p> <p><b>deg C (°C)</b> Degrees Celcius</p> <p><b>EPA (New Zealand)</b> Environmental Protection Authority of New Zealand</p>

**deg F (°F)** Degrees Fahrenheit

**g** Grams

**g/cm<sup>3</sup>** Grams per Cubic Centimetre

**g/l** Grams per Litre

**HSNO** Hazardous Substance and New Organism

**IDLH** Immediately Dangerous to Life and Health

**immiscible** Liquids are insoluble in each other.

**inHg** Inch of Mercury

**inH<sub>2</sub>O** Inch of Water

**K** Kelvin

**kg** Kilogram

**kg/m<sup>3</sup>** Kilograms per Cubic Metre

**lb** Pound

**LC<sub>50</sub>** LC stands for lethal concentration. LC<sub>50</sub> is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.

**LD<sub>50</sub>** LD stands for Lethal Dose. LD<sub>50</sub> is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.

**ltr or L** Litre

**m<sup>3</sup>** Cubic Metre

**mbar** Millibar

**mg** Milligram

**mg/24H** Milligrams per 24 Hours

**mg/kg** Milligrams per Kilogram

**mg/m<sup>3</sup>** Milligrams per Cubic Metre

**Misc** or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.

**mm** Millimetre

**mmH<sub>2</sub>O** Millimetres of Water

**mPa.s** Millipascals per Second

**N/A** Not Applicable

**NIOSH** National Institute for Occupational Safety and Health

**NOHSC** National Occupational Health and Safety Commission

**OECD** Organisation for Economic Co-operation and Development

**Oz** Ounce

**PEL** Permissible Exposure Limit

**Pa** Pascal

**ppb** Parts per Billion

**ppm** Parts per Million

**ppm/2h** Parts per Million per 2 Hours

**ppm/6h** Parts per Million per 6 Hours

**psi** Pounds per Square Inch

**R** Rankine

**RCP** Reciprocal Calculation Procedure

**STEL** Short Term Exposure Limit

**TLV** Threshold Limit Value

**tne** Tonne

**TWA** Time Weighted Average

**ug/24H** Micrograms per 24 Hours

**UN** United Nations

**wt** Weight