Infosafe No™ 1CHAR Issue Date :June 2022 RE-ISSUED by CHEMSUPP

Product Name **CYCLOHEXANONE LR**

Classified as hazardous

Section 1 - Identification

Product Identifier	CYCLOHEXANONE LR
Company Product Codes / Numbers / Unique Identifiers	CL020
Company Name	CHEMSUPPLY AUSTRALIA PTY LTD (ABN 19 008 264 211)
Address	38 - 50 Bedford Street GILLMAN SA 5013 Australia
Telephone/Fax Number	Tel: (08) 8440-2000
Emergency Phone Number	CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)
E-mail Address	www.chemsupply.com.au
Recommended use of the chemical and restrictions on use	Organic sythesis, particularly of adipic acid and caprolactam, production of polymers and resins, wood stains, paint and varnish removers, spot removers, metal and leather degreasers, polishes, leveling agent, lubricating oil additive, solvent for cellulosics, natural and synthetic resins, waxes, crude rubber, fats, shellac, polymers and insecticides, dyeing and delustering silk, elemental analysis and manufacture of magnetic and video tapes and laboratory reagent.

Other Names

Name	Product Code
CYCLOHEXANONE	
Pimelic ketone	
Ketohexamethylene	

Other Information

ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Section 2 - Hazard(s) Identification

GHS Classification of the Substance/Mixture	Flammable Liquids: Category 3 Acute Toxicity - Inhalation: Category 4 Acute Toxicity - Dermal: Category 4 Acute Toxicity - Oral: Category 4 Eye Damage/Irritation: Category 1 Skin Corrosion/Irritation: Category 2
Signal Word	DANGER
Hazard Statement (s)	H226 Flammable liquid and vapour. H302 Harmful if swallowed. H312 Harmful in contact with skin. H315 Causes skin irritation. H318 Causes serious eye damage. H332 Harmful if inhaled.
Pictogram (s)	Flame, Corrosion, Exclamation mark

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Precautionary Statement – Prevention	P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P233 Keep container tightly closed. P240 Ground/bond container and receiving equipment. P241 Use explosion-proof equipment. P242 Use only non-sparking tools. P243 Take precautionary measures against static discharge. P261 Avoid breathing fumes or vapours. P264 Wash thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Precautionary Statement – Response	P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of soap and water. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P362 Take off contaminated clothing and wash before reuse. P363 Wash contaminated clothing before reuse. P303+P361+P353 IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower. P332+P313 If skin irritation occurs: Get medical advice/attention. P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P312 Call a POISON CENTER or doctor/physician if you feel unwell. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313 If eye irritation persists: Get medical advice/attention. P370+P378 In case of fire: Use alcohol-resistant foam, dry chemical, CO2 or water spray for extinction.
Precautionary Statement – Storage	P403+P235 Store in a well-ventilated place. Keep cool.
Precautionary Statement – Disposal	P501 Dispose of contents/container according to local, state and federal regulations.

Section 3 - Composition and Information on Ingredients

Ingredients	Name	CAS	Proportion
	Cyclohexanone	108-94-1	100 %

Section 4 - First Aid Measures

Inhalation	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Immediately obtain medical aid if cough or other symptoms appear.
Ingestion	Rinse mouth thoroughly with water immediately. Give water to drink. DO NOT induce vomiting. Seek immediate medical assistance. Never give anything by mouth to an unconscious person. Caution if victim vomits. Risk of aspiration.
Skin	Wash affected areas with copious quantities of water immediately. Remove contaminated clothing and wash before re-use. If persistent irritation occurs, obtain medical attention.
Eye	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. Seek medical attention. Risk of corneal clouding.
First Aid Facilities	Maintain eyewash fountain and drench facilities in work area.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of the patient.

	In small ingestions the major concern is aspiration and gastrointestinal decontamination is not recommended. With larger ingestions there is potential for systemic toxicity from gastrointestinal absorption and decontamination is suggested, keeping in mind that aspiration is still a concern. Cyclohexanol in urine can be useful in diagnosis.
Most important symptoms/effects, acute, delayed and aggravated medical conditions	Irritant effects, dizziness, narcosis, nausea, vomiting, stomach/intestinal disorders, headache, salivation, coma.

Section 5 - Firefighting Measures

Hazards from Combustion Products	Acrid smoke, toxic and/or irritating fumes and gases including carbon monoxide and carbon dioxide.
Specific Methods	Small fire: Use alcohol-resistant foam, dry chemical, CO2 or water spray. Large fire: Use foam, fog or water spray. Do not use water jets. If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until well after fire is out. Avoid getting water inside containers.
Specific Hazards Arising from the Chemical	May be ignited by heat, sparks or flames. Vapours may form explosive mixtures with air. Vapours may travel to source of ignition and flash back. Vapours are heavier than air and will spread along ground and collect in low or confined areas (drains, basements, tanks). The liquid is lighter than water. Containers may explode when heated. Fire may produce irritating, poisonous and/or corrosive gases. Vapours from runoff may create explosion hazard.
Hazchem Code	3[Y]
Precautions in connection with Fire	SCBA and structural firefighter's uniform may provide limited protection.

Section 6 - Accidental Release Measures

Spills & Disposal	ELIMINATE all ignition sources (no smoking, flares, sparks or flames) within at least 25m - All equipment used when handling the product must be earthed. Do not touch or walk through spilled material. Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Risk of explosion. Vapour-suppressing foam may be used to control vapours - Water spray may be used to knock down or divert vapour clouds. Absorb with earth, sand or other non-combustible material. Use clean, non-sparking tools to collect absorbed material and place it into loosely-covered metal or plastic containers for later disposal. SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.
Personal Precautions	Avoid inhalation, contact with skin, eyes and clothing.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)
Clean-up Methods - Small Spillages	Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum.

Section 7 - Handling and Storage

Precautions for Safe Handling	Avoid ingestion and inhalation of gas/fumes/vapour/spray mist. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Minimise generation or accumulation of mists or vapours in the atmosphere. Keep container tightly closed. Open containers cautiously as contents may be under pressure. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing. It is essential that all who come into contact with this material maintain high standards of personal hygiene ie. Washing hands prior to eating, drinking, smoking or using toilet facilities. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Keep away from heat and ignition sources - No Smoking. Keep away from incompatibles such as

	oxidizing agents, acids, alkalis. Take precautions against static discharge. Ground and bond containers when transferring material. All electrical equipment must be flameproofed. Use non-sparking type tools and equipment, including explosion proof electrical (ventilating, lighting and material handling) equipment. Empty containers retain product residue, (liquid and/or vapour), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.
Conditions for safe storage, including any incompatibilities	Flammables-area. Fireproof. Store in a segregated and approved area. Store in tightly closed containers, in a cool, dark, dry, well-ventilated area away from incompatible substances. Protect against physical damage. Store away from sources of ignition, oxidising agents, foodstuffs, and clothing and out of direct sunlight and moisture. Inspect regularly for deficiencies such as damage or leaks. Always keep in containers made of the same material as the supply container. Do not stack more than 3 pallets high. Store away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Storage and use areas should be No Smoking areas. Have appropriate fire extinguishers available in and near the storage area. Take precautions against static electricity discharges. Containers should be bonded and grounded for transfers to avoid static sparks. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapours, liquid); observe all warnings and precautions listed for the product.
Corrosiveness	May corrode steel drums. Not corrosive to common metals such as aluminium, stainless steel, cast iron, copper, brass, bronze, nickel and its alloys. Attacks most paints, plastics, rubber and coatings.
Storage Regulations	Refer Australian Standard AS 1940-2004 'The storage and handling of flammable and combustible liquids'.

Section 8 - Exposure Controls and Personal Protection

Occupational Exposure Limit (OEL) Values

Name	STEL		TWA		
	mg/m3	ppm	mg/m3	ppm	Footnote
Cyclohexanone			100	25	

Other Exposure Information	A time weighted average (TWA) has been established for Cyclohexanone (Safe Work Australia) of 100 mg/m³, (25 ppm). The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. Note: Absorption through skin may be a significant source of exposure.
Engineering Controls	In industrial situations maintain the concentrations values below the TWA. This may be achieved by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods.
Respiratory Protection	Where ventilation is not adequate, respiratory protection may be required. Avoid breathing vapours or mists. Select and use respirators in accordance with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust/mist filters. Filter capacity and respirator type depends on exposure levels.
Eye and Face Protection	The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.
Hand Protection	Hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance. Recommendation: Excellent: Supported Polyvinyl Alcohol (PVA) gloves. Unsupported Butyl. Fair: Supported Nitrile. Poor: NR latex, vinyl, nitrile, neoprene gloves.
Personal Protective Equipment	Final choice of personal protective equipment will depend on individual circumstances and/or according to risk assessments undertaken.
Footwear	Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection	Flame retardant antistatic protective clothing. Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.
Hygiene Measures	Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Section 9 - Physical and Chemical Properties

Form	Liquid
Appearance	Clear, colourless to pale yellow oily liquid.
Odour	Sweet, sharp, pungent, mildly pleasant odour, characteristic, reminiscent of peppermint and acetone.
Melting Point	Reported values vary widely; at or below -26 °C; - 47 °C.
Boiling Point	153.0 - 157 °C.
Solubility in Water	Soluble (150 g/l at 10 °C; 80 - 95 g/l at 20 °C; 50 g/l at 30 °C).
Solubility in Organic Solvents	Cyclohexanone forms azeotrope mixtures with water and numerous organic solvents. Soluble in all proportions in ethanol, acetone, diethyl ether, benzene, methanol, n-hexane, benzol, nitrobenzol, naphtha, xylol, ethylene, glycol, isoamylacetate, diethylamine, chloroform, cellulose-nitrate, acetate and ether, vinyl resins, india rubber, waxes, fats, shellac, colouring materials, bitumen, tree resins and most other common organic solvents.
Specific Gravity	0.946 - 0.948
pH	Practically neutral (7 at 70 g/l and 20 °C).
Vapour Pressure	2 - 5 mm Hg (at 20 °C).
Relative Vapour Density (Air=1)	3.4
Evaporation Rate	0.29 (butyl acetate = 1); 40.6 (ether = 1).
Coefficient Water/Oil Distr.	Log P(oct) = 0.81.
Odour Threshold	0.12 ppm - 100 ppm (detection) (geometric mean odour threshold: 3.5 ppm); 0.12 ppm (recognition).
Viscosity	0.898 cP at 25 °C
Volatile Component	100 %vol @ 21 °C
Partition Coefficient: n-octanol/water (log value)	Log Pow: 0.81; 0.86 at 25 °C (experimental); 0.947 (calculated).
Surface Tension	35.05 mN/m (dynes/cm) 20 °C
Flash Point	44 °C (Closed cup)
Flammability	Flammable liquid. FLAMMABLE. This product should be stored and used in a well ventilated area away from naked flames, heat, sparks and other sources of ignition. Electrically link and ground metal containers for transfers of the product to prevent accumulation of static electricity. Keep the container tightly closed.
Auto-ignition Temperature	420 °C
Flammable Limits - Lower	1.1 vol%
Flammable Limits - Upper	9.4 vol%
Explosion Properties	Product is not explosive. However, formation of flammable/explosive air/vapour mixtures is possible. Explosive under influence of a flame.
Molecular Weight	98.15

Dynamic Viscosity	2.2 mPa.s (2.2 cP) at 25 °C.
Saturated Vapour Concentration	5264 ppm (0.53%) at 20 °C; 6840 ppm (0.68%) at 25 °C (calculated).
Other Information	Critical Temperature: 356 °C. Critical Pressure: 560 psia= 38 atm= 3850 kPa =3.8 MN/m² C/4 °C. Heat of Combustion: -15,430 btu/lb= -8570 cal/g= -358.8x10+5 J/kg. Heat of Vaporization: 45.06 kJ/mol @ 25 °C. Refractive Index: 1.4507 @ 20 °C. Conversion Factor: 1 ppm = 4.0 mg/m³; 1 mg/m³ = 0.25 ppm (calculated).

Section 10 - Stability and Reactivity

Chemical Stability	Stable under normal temperatures, pressures and conditions of use and storage. Over time, the colour of the liquid changes to yellow. May form unstable peroxides.
Possibility of Hazardous Reactions	Cyclohexanone can react vigorously with strong oxidizing agents (e.g. nitric acid, peroxides, perchlorates) - violent reaction, increased risk of fire and explosion), nitric acid and hydrogen peroxide (form oily, explosive peroxides), acids, alkalis. May attack plastics, resins, and rubber.
Conditions to Avoid	Heat, excess heat, confined spaces, direct sunlight, open flames, sparks, static discharge, flow, agitation, etc (may lead to a build up of electrostatic charge), other ignition sources and incompatible materials.
Incompatible Materials	Oxidizing agents, amines, nitric acid and other strong acids, strong alkalies (bases) such as sodium hydroxide or potassium hydroxide, strong oxidizing agents (perchlorates, peroxides, permanganates, chlorates, nitrates, chlorine, bromine, fluorine), chromium trioxide. Plastics.
Hazardous Decomposition Products	Toxic gases/noxious fumes containing carbon monoxide, carbon dioxide (CO, CO2).
Hazardous Polymerization	Will not occur.

Section 11 - Toxicological Information

Acute Toxicity - Oral	LD50 (rat): 1620 mg/kg.
Acute Toxicity - Dermal	LD50 (rabbit): 1100 mg/kg.
Acute Toxicity - Inhalation	LC50 (rat): 2639 ppm/4 hr.
Ingestion	Harmful if swallowed. Causes gastrointestional tract irritation and complaints with burning sensation, abdominal pain, nausea, vomiting, and diarrhoea. Absorption of large quantities may cause headache, salivation, nausea, vomiting, dizziness, narcosis, coma and may affect behaviour/central nervous system and cause central nervous system depression characterized by excitement followed by headache, dizziness, drowsiness, nausea and other symptoms similar to inhalation. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause liver and kidney damage. Aspiration of even a small amount of liquid could result in a life threatening accumulation of fluid in the lungs. Severe lung damage (oedema), respiratory failure, cardiac arrest and death may result.
Inhalation	Harmful by inhalation. Inhalation of product vapours will cause irritation to mucous membranes of the nose, throat and upper respiratory tract at airborne concentrations of 50 ppm; and 75 ppm causes marked irritation; and 125 ppm causes significant irritation. Symptoms of exposure may include burning sensation, sore throat, coughing, wheezing, laryngitis, shortness of breath, behaviour/central nervous system effects, central nervous system depression with nausea, headache, lightheadedness, ataxia, somnolence, weakness, dizziness, confusion, loss of coordination and loss of consciousness. May cause kidney and liver damage. Extreme exposures may cause other CNS effects including death. High concentrations have a narcotic effect. Irritation effects normally prevent exposures high enough to cause systemic effects.
Skin	Probably a moderate to severe skin irritant, depending upon the concentration of the solution. Dilute solutions and occasional skin contact with the liquid

	are not expected to be irritating. Symptoms include redness, itching, dry skin, and pain. Danger of ready absorption through the skin with possible systemic effects. Symptoms of CNS depressions, as described for 'Inhalation' above, may occur if significant skin contact occurs. Not expected to cause an allergic skin reaction. Prolonged or frequently repeated skin contact may cause irritation or dermatitis, due to degreasing/defatting effects.
Eye	Solutions greater than 15% can cause severe to corrosive eye injury, based on animal information. Risk of corneal clouding and transient corneal injury. Permanent eye injury or blindness could result. May cause tearing, stinging, burning pain, blurred vision, and redness. The vapours are also irritating to the eyes, at exposures of greater than 50 to 75 ppm for 3 to 5 minutes. Vapours may cause conjunctivitis. Dilute solutions (less than 10%) would probably cause no to mild irritation.
Serious Eye Damage/Irritation	Eye Irritation test, rabbit: Result: irritating - highly irritating.
Skin Sensitisation	Guinea pig maximization test: not sensitizing.
Carcinogenicity	Cyclohexanone [108-94-1] is evaluated in the IARC Monographs (Vol. 47, Vol. 71; 1999) as Group 3: Not classifiable as to carcinogenicity to humans.
Reproductive Toxicity	Suspected Developmental Toxicant
Mutagenicity	No evidence of mutagenic properties. Mutagenicity (mammal cell test): Negative (in vitro) Bacterial mutagenicity: Salmonella tryphimurium: Negative.
Chronic Effects	Repeated or prolonged contact with spray or mist may produce eye irritation and severe skin irritation, defatting and dermatitis. Material is absorbed through the skin. Long term exposure to high concentration of vapours may cause clouding of the eyes. Prolonged or repeated ingestion or inhalation may affect respiration and behaviour/central nervous system with symptoms similar to that of acute inhalation. Repeated or prolonged exposure to the substance may be irritating to the throat, may cause lethargy and narcosis at high concentrations and can produce lung damage. It may also cause kidney, liver and bone marrow damage and affect metabolism (weight loss).

Section 12 - Ecological Information

Persistence and Degradability	Degradability: 87% / 14 d Readily degradable in water. TOD: 2.608 g/g.
Mobility	Distribution: Log Pow: 0.81
Bioaccumulative Potential	Low bioaccumulation potential. (log Pow < 1)
Environmental Protection	Do not allow to enter waters, waste water, or soil!
Acute Toxicity - Fish	Leuciscus idus LC50: 536 mg/l /48 h.
Acute Toxicity - Daphnia	Daphnia magna EC50: 800 mg/l /24 h.
Acute Toxicity - Algae	Scenedesmus quadricauda IC50: 370 mg/l.
Acute Toxicity - Bacteria	Ps putida EC5: 180 mg/l/16 h.

Section 13 - Disposal Considerations

Disposal Considerations	Dispose of according to relevant local, state and federal government regulations.

Section 14 - Transport Information

Transport Information	Dangerous Goods of Class 3 Flammable Liquids, are incompatible in a placard load with any of the following: - Class 1, Class 2.1, if both the Class 3 and Class 2.1, dangerous goods are in bulk, Class 2.3, Class 4.2, Class 5, Class 6, if the Class 3 dangerous goods are nitromethane and Class 7.

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Product Name **CYCLOHEXANONE LR**

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ADG UN Number	1915
ADG Proper Shipping Name	CYCLOHEXANONE
ADG Transport Hazard Class	3
ADG Packing Group	III
Hazchem Code	3[Y]
EPG Number	3A1
IERG Number	15

Section 15 - Regulatory Information

Poisons Schedule	Not Scheduled

Section 16 - Any Other Relevant Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons .', Commonwealth of Australia. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'. Safe Work Australia, 'National Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals'. Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand. Safe Work Australia, 'Hazardous Chemical Information System'. Safe Work Australia, 'National Code of Practice for the Labelling of Safe Work Hazardous Substances'. Safe Work Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment'.
Contact Person/Point	Paul McCarthy Ph. (08) 8440 2000 DISCLAIMER STATEMENT: All information provided in this data sheet or by our technical representatives is compiled from the best knowledge available to us. However, since data, safety standards and government regulations are subject to change and the conditions of handling and use, or misuse, are beyond our control, we make no warranty either expressed or implied, with respect to the completeness or accuracy to the information contained herein. ChemSupply Australia Pty Ltd accepts no responsibility whatsoever for its accuracy or for any results that may be obtained by customers from using the data and disclaims all liability for reliance on information provided in this data sheet or by our technical representatives.
Empirical Formula & Structural Formula	C6-H10-O

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