Global Chemie ASCC Limited.
www.gcascc.com
CHEMCALL: 0-2324-6888

Safety Data Sheet

1. IDENTIFICATION

Product Name:	**Cyclohexanone**
Other Names:	CYC, cyclo-hexanone;2-cyclohexanone; Cyclohexanone
Recommended Use:	As a solvent for cellulose acetate, nitrocellulose, natural resins, vinyl resins, rubber, waxes, fats, shellac, and manufacture of ketone resins. In the production of adipic acid and caprolactam; production of polymers and resins. Reagent chemical. Used in wood stains; paint varnish and spot remover; degreasing of metals, polishes; textile dyeing and processing and in lubricating oil additives. Occurs naturally in the herb Pennyroyal and is responsible for the toxic effects in the misuse of Pennyroyal Oil in folk medicine, herbal teas.
Supplier:	Global Chemie ASCC Limited
Street Address:	88/123 Moo 2 Bangpoo Industrial Estate (North), Phraek Sa Mai, Mueang Samutprakan, Samutprakan 10280
Telephone:	+66 2324 6888
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Emergency phone:	+66 2324 6888 ext.320

2. HAZARDS IDENTIFICATION

Health Hazard Classification

This product is classified as hazardous under GHS criteria.

Hazardous Categories

Flammable liquids : Category 3

Acute toxicity : Category 4

Hazardous Statement

Highly Flammable liquid and vapour

GHS Pictograms

Hazard Statements

H226: Flammable liquid and vapour

H332: Harmful if inhaled

Precautionary Statements

P210: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P271: Use only outdoors or in a well-ventilated area.

Response

<u>If swallowed</u>

P301+P310: Immediately call a poison centre or doctor/physician.

P331: Do not induce vomiting.

P308+P313: If exposed or concerned: Get medical advice/attention.

Storage

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

P405: Store locked up.

Disposal

P501: Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied.

Signal Word: Warning

3. COMPOSITION: Information on Ingredients

Chemical Ingredient	CAS No.	UN No.	Proportion (%v/v)
Cyclohexanone	108-94-1	1915	99.9

Molecular Formular: $C_6H_{10}O$

Molecular weight: 98.15 g/mol

4. FIRST AID MEASURES

For advice, contact Ramathibodi Poison Center (Phone: 1367) or a doctor.

Ingestion

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Eye Contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin Contact

Wash off with soap and plenty of water. Consult a physician.

Inhalation

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

First Aid facilities

Provide eye baths and safety showers.

Medical Attention

Treat according to symptoms. Avoid gastric lavage: risk of aspiration of product to the lungs with the potential to cause chemical pneumonitis.

5. FIRE FIGHTING MEASURES

Shut off product that may 'fuel' a fire if safe to do so. Allow trained personnel to attend a fire in progress, providing firefighters with this Safety Data Sheet. Prevent extinguishing media from escaping to drains and waterways.

Suitable extinguishing media

Foam, dry chemical powder, carbon dioxide or sand. Water spray or fog - Large fires only.

Hazards from combustion products

Liquid and vapor are flammable. Moderate fire hazard when exposed to heat or flame. Vapor forms an explosive mixture with air. Moderate explosion hazard when exposed to heat or flame. Vapor may travel a considerable distance to source of ignition. Heating may cause expansion or decomposition leading to violent rupture of containers. On combustion, may emit toxic fumes of carbon monoxide (CO).

Precautions for fire fighters and special protective equipment

Keep adjacent containers cool by spraying with water. Wear full protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures

Prevent fluid from escaping to drains and waterways. Contain leaking packaging in a containment drum. Prevent vapours from building up in confined areas. Ensure that drain valves are closed at all times. Clean up and report spills immediately.

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment

Protective Measures

• Observe all relevant local and international regulations.

• Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see chapter 8 this Material Safety Data Sheet. Shut off leaks, if possible, without personal risks. Remove all possible sources of ignition in the surrounding area. Prevent from spreading or entering drains, ditches, or rivers by using sand, earth, or other appropriate barriers.

• Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Clean-Up Methods

- Small spillage (< 200 LT) : Transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
- large spillage (> 200 LT) : Transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Other Information

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapors may form explosive mixtures with air. Vapours may travel to source of ignition and flash back.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid all personal contact, including inhalation. Wear protective clothing when risk of overexposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps.DO NOT enter confined spaces until atmosphere has been checked. Avoid smoking, naked lights or ignition sources. Avoid generation of static electricity.DO NOT use plastic buckets. Earth all lines and equipment. Use spark-free tools when handling. Avoid contact with incompatible materials.

Conditions for safe storage

Store in original containers in approved

flammable liquid storage area. Store away from incompatible materials in a cool, dry, well-ventilated area.DO NOT store in pits, depressions, basements or areas where vapors may be trapped. No smoking, naked lights, heat or ignition sources. Storage areas should be clearly identified, well illuminated, clear ofobstruction and accessible only to trained and authorised personnel - adequate security must be provided so that unauthorised personnel do not have access.

Incompatible materials

Strong oxidizing agents.

Product Transfer

Keep containers closed when not in use. Do not use compressed air for filling, discharging, or handling operations. If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Additional Advice

Containers even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION

National Exposure Standards

Occupational Exposure Limits

Source	Material	TWA ppm	TWA mg/m³
China (Hong Kong) Occupational Exposure Limits	Cyclohexanone	25	100
Taiwan Permissible Concentration of Airborne Harmful Substances	Cyclohexanone	25	100

Engineering Controls: Ventilation

For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required. Ventilation equipment should be explosion resistant.

Personal Protective Equipment

Respiratory Protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye Protection: Chemical splash goggles (chemical monologues).

Skin/ Body Protection: Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.

Hand Protection: Butyl rubber gloves, Nature rubber gloves, Neoprene rubber gloves, Nitrile rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Unit of Measurement	Typical Value
Appearance	-	Colorless Liqiud
Odour	-	Pungent Smell
pH	-	No data available
Boiling point	°C	155.6
Melting point	°C	No data available
Flash point	°C	49
Autoignition Temperature	°C	420
Decomposition Temperature	°C	No data available
Lower/Upper Flammability Limits	%V	No data available
Density @ 20°C	g/cm³	0.946-0.950
Specific Gravity @ 20°C	-	0.946-0.952
Viscosity @ 20°C	cSt	No data available
Vapor pressure	kPa	400 Pa @ 20 °C 1500 Pa @ 50 °C
Vapor density	kPa (Air = 1)	3.4
Evaporation Rate	(n-Butyl acetate = 1)	No data available
Water Solubility	-	Soluble

Property	Unit of Measurement	Typical Value
Solubility in other solvents Partition coefficient	(n-octanol/water)	Log Pow: 0.81
Coefficient of Thermal Expansion	per Deg °C	No data available

The values listed are indicative of this product's physical and chemical properties. For a full product specification, please consult the Product Data Sheet.

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions.

Conditions to avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight

Hazardous decomposition products

Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), other pyrolysis products typical of burning organic material.

Hazardous reactions

None known.

Hazardous Polymerisation

No data

Materials to Avoid

Oxidizing agents, amines, hydrogen peroxide, strong acids. Isocyanates, aldehydes, cyanides, peroxides, and anhydrides.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

- LD_{50} Acute oral toxicity : >2,000 mg/kg
- LD_{50} Acute dermal toxicity : >2,000 mg/kg
- LC_{50} Acute Inhalation Toxicity : >5 mg/l

Eye Contact

material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain. There may be damage to the cornea. Unless treatment is prompt and adequate there may be permanent loss of vision. Conjunctivitis can occur following repeated exposure.

Skin Contact

The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.

Respiratory Irritation

May be harmful if inhaled. May cause respiratory tract irritation. Vapors may cause drowsiness and dizziness.

Carcinogenicity

Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Ingestion: May be harmful if swallowed

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute Toxicity

- LD50 Oral - rat -1400 mg/kg
- LC50 Inhalation -rat - 4 h – 8000 ppm
- LD50 Dermal - rabbit - 948 mg/kg.

Persistence/ degradability

Readily biodegradable.

Mobility

Floats on water.If product enters soil, it will highly mobile and may contaminate groundwater.

Persistence and degradability: Water/Soil: LOW.

Bioaccumulative potential: LOW.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Material Disposal

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. Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material). Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed. According to the European Waste Catalogue, Waste Codes are not product specific but application specific. Waste Codes should be assigned by the User based on the application in which the product is used.

14. TRANSPORT INFORMATION

Road and Rail Transport		Marine Transport		Air Transport	
UN No.	1915	UN No.	1915	UN No.	1915
Class/Item	3	Class/Item	3	Class/Item	3
Hazard Symbol	Flammable Liquid	Hazard Symbol	Flammable Liquid	Hazard Symbol	Flammable Liquid
Proper Shipping Name	CYCLOHEXANONE	Proper Shipping Name	CYCLOHEXANONE	Proper Shipping Name	CYCLOHEXANONE
Packing Group	III	Packing Group	III	Packing Group	III
		Marine Pollutant	No Data Avaliable		

Dangerous Goods Segregation

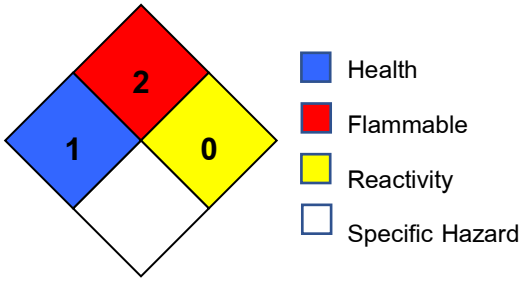
This product is classed as Dangerous Goods Class 3, packing group III. Please consult the Australian Dangerous Goods Code for Transport by Road and Rail for information.

15. REGULATORY INFORMATION

Cyclohexanone (CAS: 108-94-1) is found on the following regulatory lists: "China Inventory of Existing Chemical Substances", "China First Imported Class Two Chemical List", "China Dangerous Chemicals Names List", "China Occupational Exposure Limits for Hazardous Agents in the Workplace", "China Classification and Labeling of Dangerous Chemical Substances". This safety data sheet is in compliance with the following national standards: GB16483-2008 , GB13690-2009 , GB6944-2005 , GB/T15098-2008, GB18218-2009, GB15258-2009, GB6944-2005, GB190-2009, GB191-2009, GB12268-2008, GA57-1993, GB/T 15098-2008, GBZ 2-2007as well as the following national regulations: Dangerous Goods Transport Administrative Regulation, Dangerous Chemicals Safety Administrative Regulation, United Nations Regulations on the Transport of Dangerous Goods (UN RTDG)

16. OTHER INFORMATION

National Fire Protection Association (USA) :



SDS Distribution	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty of guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.
Prepared By	:	Quality Control Department / Global Chemie ASCC Limited

Abbreviations:

AICS: Australian Inventory of Chemical Substances
CAS Number: Chemical Abstracts Number
IARC: International Agency for Research on Cancer
N/A: not available
NOHSC: National Occupational Health and Safety
Council GHS: Global Harmonized System

References:

- Supplier Material Safety Data Sheets
- http://chem.sis.nlm.nih.gov/chemidplus (October 18)
- http://hsis.ascc.gov.au/SearchHS.aspx (October 18)
- Ecotoxicology data: http://cfpub.epa.gov/ecotox/quick_query.htm (October 18)
- *Sax's Dangerous Properties of Industrial Materials*, Richard J. Lewis Snr., pub. Canada (2000)