



# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0  
Creation Date: July 15, 2019  
Revision Date: July 15, 2019

## SECTION 1: Identification

### 1.1 GHS Product identifier

Product name Cyclohexanone

### 1.2 Other means of identification

Product number

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Other names

cyclo-hexanone; 2-cyclohexanone; Cyclohexanone

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses

Industrial and scientific research use.

Uses advised against

no data available

### 1.4 Supplier's details

Company

Shanghai Yien Chemical Technology Co., Ltd

Address

Building 6, 28 Yingong Road, Fengxian District, Shanghai  
Chemical Industry Zone, Shanghai, 201400, China

Telephone

+86-400-133-2688

### 1.5 Emergency phone number

Emergency phone  
number

+86-400-133-2688

Service hours

Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT  
+8 hours).

## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Flammable liquids, Category 3

Acute toxicity - Category 4, Inhalation

### 2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Warning

Hazard statement(s)

H226 Flammable liquid and vapour  
H332 Harmful if inhaled

Precautionary statement(s)

Prevention

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

<b>Response</b>	<p>P233 Keep container tightly closed.</p> <p>P240 Ground and bond container and receiving equipment.</p> <p>P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.</p> <p>P242 Use non-sparking tools.</p> <p>P243 Take action to prevent static discharges.</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</p> <p>P261 Avoid breathing dust/fume/gas/mist/vapours/spray.</p> <p>P271 Use only outdoors or in a well-ventilated area.</p> <p>P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].</p> <p>P370+P378 In case of fire: Use ... to extinguish.</p> <p>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.</p> <p>P317 Get medical help.</p>
<b>Storage</b>	P403+P235 Store in a well-ventilated place. Keep cool.
<b>Disposal</b>	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

### 2.3 Other hazards which do not result in classification

no data available

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Cyclohexanone	Cyclohexanone	108-94-1	203-631-1	100%

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## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

#### If inhaled

Fresh air, rest. Refer for medical attention.

#### Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

#### Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### Following ingestion

Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention .

### 4.2 Most important symptoms/effects, acute and delayed

Inhalation of vapors from hot material can cause narcosis. The liquid may cause dermatitis. (USCG, 1999)

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

#### Absorption, Distribution and Excretion

Absorption of cyclohexanone through skin produces same effects as by other routes but dosage required is larger.

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## SECTION 5: Fire-fighting measures

## **5.1 Suitable extinguishing media**

Alcohol foam, dry chemical or carbon dioxide

## **5.2 Specific hazards arising from the chemical**

Excerpt from ERG Guide 127 [Flammable Liquids (Water-Miscible)]: HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. (ERG, 2016)

## **5.3 Special protective actions for fire-fighters**

Use alcohol-resistant foam, carbon dioxide, powder. In case of fire: keep drums, etc., cool by spraying with water.

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# **SECTION 6: Accidental release measures**

## **6.1 Personal precautions, protective equipment and emergency procedures**

Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Remove all ignition sources. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

## **6.2 Environmental precautions**

Personal protection: chemical protection suit and filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Remove all ignition sources. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

## **6.3 Methods and materials for containment and cleaning up**

Remove all ignition sources. Ventilate area of spill or leak. For small quantities of liquids containing cyclohexanone, absorb on paper towels and place in an appropriate container. Place towels in a safe place (such as a fume hood) for evaporation. Allow sufficient time for evaporation of the vapors so that the hood ductwork is free from cyclohexanone vapors. Burn the paper in a suitable location away from combustible materials.

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# **SECTION 7: Handling and storage**

## **7.1 Precautions for safe handling**

NO open flames, NO sparks and NO smoking. Above 44°C use a closed system, ventilation and explosion-proof electrical equipment. Prevent build-up of electrostatic charges (e.g., by grounding). Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

## **7.2 Conditions for safe storage, including any incompatibilities**

Fireproof. Separated from strong oxidants. Keep containers closed; prohibit open flame. Store in cool and dark place.

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# **SECTION 8: Exposure controls/personal protection**

## **8.1 Control parameters**

### **Occupational Exposure limit values**

TLV: 20 ppm as TWA; 50 ppm as STEL; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: skin absorption (H); carcinogen category: 3B.EU-OEL: 40.8 mg/m<sup>3</sup>, 10 ppm as TWA; 81.6 mg/m<sup>3</sup>, 20 ppm as STEL; (skin)

**Biological limit values**

no data available

**8.2 Appropriate engineering controls**

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

**8.3 Individual protection measures, such as personal protective equipment (PPE)****Eye/face protection**

Wear safety goggles or eye protection in combination with breathing protection.

**Skin protection**

Protective gloves. Protective clothing.

**Respiratory protection**

Use ventilation, local exhaust or breathing protection.

**Thermal hazards**

no data available

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**SECTION 9: Physical and chemical properties and safety characteristics**

<b>Physical state</b>	Liquid.
<b>Colour</b>	Colourless.
<b>Odour</b>	ODOR REMINISCENT OF PEPPERMINT & ACETONE
<b>Melting point/freezing point</b>	-31 °C.
<b>Boiling point or initial boiling point and boiling range</b>	154.3 °C. Atm. press.:1 013 hPa.
<b>Flammability</b>	Class II Combustible Liquid: Fl.P. at or above 100°F and below 140°F.
<b>Lower and upper explosion limit/flammability limit</b>	Lower flammable limit: 1.1% by volume at 212 deg F; Upper flammable limit: 9.4% by volume
<b>Flash point</b>	44 °C. Atm. press.:1 013.25 hPa.
<b>Auto-ignition temperature</b>	420 °C. Atm. press.:1 013.25 hPa.
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	dynamic viscosity (in mPa s) = 2.2. Temperature:25.0°C.
<b>Solubility</b>	Miscible with water
<b>Partition coefficient n-octanol/water</b>	log Pow = 0.86. Temperature:25 °C.
<b>Vapour pressure</b>	7 hPa. Temperature:30 °C.
<b>Density and/or relative density</b>	946.5 kg/m³. Temperature:20 °C.
<b>Relative vapour density</b>	3.4 (vs air)
<b>Particle characteristics</b>	no data available

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**SECTION 10: Stability and reactivity****10.1 Reactivity**

Reacts with strong oxidants such as nitric acid. This generates fire and explosion hazard.

**10.2 Chemical stability**

no data available

### 10.3 Possibility of hazardous reactions

MODERATE, WHEN EXPOSED TO HEAT OR FLAME; CAN REACT VIGOROUSLY WITH OXIDIZING MATERIALS ...The vapour is heavier than air. As a result of flow, agitation, etc., electrostatic charges can be generated. CYCLOHEXANONE forms an explosive peroxide with H<sub>2</sub>O<sub>2</sub>, and reacts vigorously with oxidizing materials (nitric acid). (NTP, 1992)

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Incompatible with oxidizing agents.

### 10.6 Hazardous decomposition products

no data available

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: approximate LD<sub>50</sub> - rat - 1 890 mg/kg bw. Remarks: Test with 2 - 50% aqueous emulsion with tragacanth.
- Inhalation: LC<sub>50</sub> - rat (male/female) - > 6.2 mg/L air.
- Dermal: LD<sub>50</sub> - rabbit (male/female) - > 794 - < 3 160 mg/kg bw.

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

Evaluation: No epidemiological data relevant to the carcinogenicity of cyclohexanone were available. There is inadequate evidence in experimental animals for the carcinogenicity of cyclohexanone. Overall evaluation: Cyclohexanone is not classifiable as to its carcinogenicity to humans (Group 3).

### Reproductive toxicity

no data available

### STOT-single exposure

The substance and the vapour are irritating to the eyes, skin and respiratory tract. Exposure far above the OEL could cause lowering of consciousness.

### STOT-repeated exposure

no data available

### Aspiration hazard

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

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## SECTION 12: Ecological information

## 12.1 Toxicity

- Toxicity to fish: LC50 - Pimephales promelas - 527 - 732 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - > 100 mg/L - 48 h.
- Toxicity to algae: EC50 - Desmodesmus subspicatus (previous name: Scenedesmus subspicatus) - > 100 mg/L - 72 h.
- Toxicity to microorganisms: EC50 - activated sludge, domestic - > 1 000 mg/L - 30 min. Remarks: Respiration rate.

## 12.2 Persistence and degradability

Cyclohexanone is readily biodegradable according to most aerobic screening tests reported in the literature. Cyclohexanone was found to be significantly biodegradable using the Japanese MITI test protocol(3,4). The Japanese Chemical Testing and Inspection Institute obtained 97% of theoretical BOD in a 4-week test using 100 mg/L test concentration and a 30 mg/L sludge inoculum(1). A 5-day 32% theoretical BOD was determined using the AFNOR T 90/103 test (screening biodegradation test) and microbes from 3 polluted surface waters(5). A 96% removal (based on COD) in a mineral salts solution was observed using an acclimated activated sludge inoculum(6). Five-day BODs of 68.2% and 62.4% of theoretical were obtained using standard and seawater dilution methods, respectively(7). In Warburg respirometer studies, 50% of theoretical BOD was observed in 20 and 50 hours using adapted and nonadapted cultures, respectively(8). Fifty percent of theoretical BOD was obtained in a 5-day test using mixed microbial cultures(2).

## 12.3 Bioaccumulative potential

The bioconcentration factor (BCF) for cyclohexanone can be estimated to be 2.4 based on the log Kow of 0.81(1) and a recommended regression equation(2). This BCF indicates that cyclohexanone will not bioconcentrate in aquatic organisms(SRC).

## 12.4 Mobility in soil

The Koc for cyclohexanone estimated using structure activity relationships (SAR) is 15(1). A Koc of 17 can be estimated from the water solubility, 23,000 mg/L(2), using a recommended regression equation(3). According to a suggested classification scheme(4), these Koc values indicate that cyclohexanone will be highly mobile in soil.

## 12.5 Other adverse effects

no data available

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# SECTION 13: Disposal considerations

## 13.1 Disposal methods

### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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# SECTION 14: Transport information

## 14.1 UN Number

ADR/RID: UN1915 (For reference only, please check.)

IMDG: UN1915 (For reference only, please check.)

IATA: UN1915 (For reference only, please check.)

## 14.2 UN Proper Shipping Name

ADR/RID:

IMDG:

IATA: CYCLOHEXANONE

CYCLOHEXANONE (For reference only, please check.)    CYCLOHEXANONE (For reference only, please check.)    (For reference only, please check.)

### 14.3 Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)

IMDG: 3 (For reference only, please check.)

IATA: 3 (For reference only, please check.)

### 14.4 Packing group, if applicable

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

### 14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to IMO instruments

no data available

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## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Cyclohexanone	Cyclohexanone	108-94-1	203-631-1
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

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## SECTION 16: Other information

#### Information on revision

Creation Date                      July 15, 2019

Revision Date                      July 15, 2019

#### Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

#### References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

**Any questions regarding this SDS, Please send your inquiry to [sds@xixisys.com](mailto:sds@xixisys.com)**

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