



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 09/18/2014

Version 1.1

SECTION 1. Identification

Product identifier

Product number	CX2335
Product name	Cyclohexanone GR ACS
CAS-No.	108-94-1

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

Identified uses	Reagent for analysis
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 3, H226
Acute toxicity, Category 4, Oral, H302
Acute toxicity, Category 4, Inhalation, H332
Acute toxicity, Category 3, Dermal, H311

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

GHS-Labeling

Hazard pictograms



Signal Word
Danger

Hazard Statements

H226 Flammable liquid and vapor.
H302 + H332 Harmful if swallowed or if inhaled.

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H311 Toxic in contact with skin.

Precautionary Statements

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 electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash 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.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
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.
P322 Specific measures (see supplemental first aid instructions on this label).
P330 Rinse mouth.
P361 Remove/ Take off immediately all contaminated clothing.
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	C ₆ H ₁₀ O (Hill)
Molar mass	98.14 g/mol

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

Cyclohexanone (>= 90 % - <= 100 %)

108-94-1

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. If breathing stops: mouth-to-mouth breathing or artificial respiration. Oxygen if necessary. Immediately call in physician.

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Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact

After eye contact: rinse out with plenty of water with the eyelid held wide open. Call in ophthalmologist if necessary.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, Dizziness, narcosis, Nausea, Vomiting, Stomach/intestinal disorders, Headache, Salivation, Coma

Risk of corneal clouding.

The following applies to ketones in general: when vapors/aerosols occur, mucosal irritations, coughing, and dyspnoea after inhalation. The absorption of large quantities leads to: CNS depression (narcosis). Repeated skin contact leads to a degreasing effect, with secondary inflammation possible. Toxic effects on the liver and kidneys cannot be excluded after high doses. The inhalation of droplets may result in the formation of oedemas in the respiratory tract.

Indication of any immediate medical attention and special treatment needed

Laxative: Sodium sulfate (1 tablespoon/1/4 l water).

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at elevated temperatures.

Development of hazardous combustion gases or vapors possible in the event of fire.

Pay attention to flashback.

Advice for firefighters

Special protective equipment for fire-fighters

In the event of fire, wear self-contained breathing apparatus.

Further information

Cool closed containers exposed to fire with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

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Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not empty into drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.

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SECTION 8. Exposure controls/personal protection**Exposure limit(s)***Ingredients*

Basis	Value	Threshold limits	Remarks
<i>Cyclohexanone 108-94-1</i>			
ACGIH	Time Weighted Average (TWA): Skin designation:	20 ppm	Can be absorbed through the skin.
NIOSH/GUIDE	Short Term Exposure Limit (STEL):	50 ppm	
	Recommended exposure limit (REL): Skin designation:	25 ppm 100 mg/m ³	Can be absorbed through the skin.
OSHA_TRANS	PEL:	50 ppm 200 mg/m ³	
Z1A	Time Weighted Average (TWA):	25 ppm 100 mg/m ³	
	Skin designation (Final Rule Limit applies):		Can be absorbed through the skin.

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

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.

Other protective equipment:

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	stinging
Odor Threshold	No information available.
pH	ca. 7 at 70 g/l 68 °F (20 °C)
Melting point	-31 °C
Boiling point/boiling range	ca. 311 °F (155 °C) at 1,013 hPa
Flash point	109 °F (43 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.3 %(V)
Upper explosion limit	9.4 %(V)
Vapor pressure	ca. 24 hPa at 122 °F (50 °C) ca. 4.5 hPa at 68 °F (20 °C)
Relative vapor density	No information available.
Density	0.95 g/cm ³ at 68 °F (20 °C)
Relative density	No information available.
Water solubility	ca. 90 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 0.81 (experimental) (IUCLID) Bioaccumulation is not expected.

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Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	2.2 mPa.s
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	806 °F (430 °C) Method: DIN 51794

SECTION 10. Stability and reactivity

Reactivity

Vapor/air-mixtures are explosive at intense warming.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions

Risk of explosion with:

Nitric acid, hydrogen peroxide, Oxidizing agents, mineral acids

Conditions to avoid

Heating.

Incompatible materials

no information available

Hazardous decomposition products

no information available

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Target Organs

Eyes

Skin

Respiratory system

Central nervous system

Liver

Kidneys

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Acute oral toxicity

LD50 Rat: 1,540 mg/kg (External MSDS) (Regulation (EC) No 1272/2008, Annex VI)

Symptoms: Stomach/intestinal disorders, Risk of aspiration upon vomiting., Aspiration may cause pulmonary edema and pneumonitis.

Acute inhalation toxicity

LC50 Rat: 32.65 mg/l; 4 h (External MSDS)

LC50 Rat: > 6.2 mg/l; 4 h (ECHA)

absorption

Symptoms: In high doses:, Irritation symptoms in the respiratory tract.

Acute dermal toxicity

LD50 Rabbit: 948 mg/kg

(External MSDS) (Regulation (EC) No 1272/2008, Annex VI)

Skin irritation

Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

Rabbit

Result: irritating

OECD Test Guideline 404

In vitro study

Result: Corrosive

OECD Test Guideline 431

Eye irritation

Risk of corneal clouding.

In vitro study

Result: irritating

OECD Test Guideline 405

Genotoxicity in vitro

Mutagenicity (mammal cell test):

Result: negative

Method: OECD Test Guideline 476

Ames test

Salmonella typhimurium

Result: negative

(National Toxicology Program)

Teratogenicity

Application Route: Oral

Rabbit

Number of exposures: daily

Method: OECD Test Guideline 414

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

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Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	Confirmed animal carcinogen with unknown relevance to humans.
	Cyclohexanone 108-94-1

Further information

Systemic effects:

After absorption of large quantities:

Headache, Salivation, Nausea, Vomiting, Dizziness, narcosis, Coma

The following applies to ketones in general: when vapors/aerosols occur, mucosal irritations, coughing, and dyspnoea after inhalation. The absorption of large quantities leads to: CNS depression (narcosis). Repeated skin contact leads to a degreasing effect, with secondary inflammation possible. Toxic effects on the liver and kidneys cannot be excluded after high doses. The inhalation of droplets may result in the formation of oedemas in the respiratory tract.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 Pimephales promelas (fathead minnow): 527 mg/l; 96 h
OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates

static test EC50 Daphnia magna (Water flea): 800 mg/l; 24 h
DIN 38412

EC5 Protozoa: 573 mg/l; 48 h (maximum permissible toxic concentration) (IUCLID)

Toxicity to algae

IC5 Scenedesmus quadricauda (Green algae): 370 mg/l; 8 d (IUCLID)
static test EC50 algae: 32.9 mg/l; 72 h
Analytical monitoring: yes (ECHA)

Toxicity to bacteria

EC5 Pseudomonas putida: 180 mg/l; 16 h (maximum permissible toxic concentration) (Lit.)

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static test EC50 activated sludge: > 1,000 mg/l; 30 min
OECD Test Guideline 209

Persistence and degradability

Biodegradability

87 %; 14 d; aerobic

MITI test

Readily biodegradable.

90 - 100 %; 28 d; aerobic

OECD Test Guideline 301F

Readily biodegradable.

Theoretical oxygen demand (ThOD)

2,608 mg/g

Method: (calculated)

(Lit.)

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.81

(experimental)

(IUCLID) Bioaccumulation is not expected.

Mobility in soil

No information available.

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 1915
Proper shipping name	CYCLOHEXANONE
Class	3
Packing group	III
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 1915
Proper shipping name	CYCLOHEXANONE
Class	3
Packing group	III
Environmentally hazardous	--

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Special precautions for user

no

Sea transport (IMDG)

UN number

UN 1915

Proper shipping name

CYCLOHEXANONE

Class

3

Packing group

III

Environmentally hazardous

--

Special precautions for user

yes

EmS

F-E S-D

SECTION 15. Regulatory information

United States of America

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

Cyclohexanone

Pennsylvania Right To Know

Ingredients

Cyclohexanone

New Jersey Right To Know

Ingredients

Cyclohexanone

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

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Notification status

TSCA: All components of the product are listed in the TSCA-inventory.
DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

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

H226 Flammable liquid and vapor.
H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H332 Harmful if inhaled.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 09/18/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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