



UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.
Solvents & Coatings Materials Division



MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE: 08/03/89

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

I. IDENTIFICATION

PRODUCT NAME: CYCLOHEXANONE

CHEMICAL NAME: Cyclohexanone

CHEMICAL FAMILY: Ketones

FORMULA: C₆H₁₀O

MOLECULAR WEIGHT: 98

SYNONYMS: None

CAS # and 108-94-1

CAS NAME: Cyclohexanone

II. PHYSICAL DATA

BOILING POINT, 760 mm Hg: 155.7 C (312.3 F)

FREEZING POINT: -31.1 C (-24.0 F)

SPECIFIC GRAVITY(H₂O = 1):
0.948 at 20/20 C

VAPOR PRESSURE AT 20°C:
3.4 mm Hg

VAPOR DENSITY (air = 1):
3.4

SOLUBILITY IN WATER by wt:
2.3% at 20 C

EVAPORATION RATE
(Butyl Acetate = 1): 0.38

APPEARANCE AND ODOR: Water-white liquid; mildly pungent

PERCENT VOLATILES (BY VOLUME): Nil

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EMERGENCY PHONE NUMBER: 1-800-UCC-HELP (Number available at all times)

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.
Solvents & Coatings Materials Division
39 Old Ridgebury Road, Danbury, CT. 06817-0001

III. INGREDIENTS

<u>MATERIAL</u>	<u>%</u>	<u>EXPOSURE LIMITS</u>	<u>HAZARD</u>
Cyclohexanone (CAS # 108-94-1)	100	See Section V	Corrosive, toxic, combustible

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 111 F (44 C), Pinsky-Martens Closed Cup;
116 F (47 C), Tag Open Cup ASTM D 1310

FLAMMABLE LIMITS IN AIR, LOWER: 1.1 at 212 F
% by volume: UPPER: 9.4

EXTINGUISHING MEDIA: Use water spray for cooling (fog), carbon dioxide, dry chemical, alcohol-type, or universal-type foams applied by manufacturers' recommended techniques.

SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

V. HEALTH HAZARD DATA

TLV AND SOURCE: Cyclohexanone, 25 ppm TWA OSHA & ACGIH
Values from OSHA 29 CFR 1910.1000 Table Z-1-A & ACGIH 1988-89.

EFFECTS OF ACUTE OVEREXPOSURE:

SWALLOWING: May cause nausea, vomiting, burning sensation in the mouth and throat, and abdominal discomfort.

SKIN ABSORPTION: Prolonged or widespread exposure may result in the absorption of harmful amounts of material.

INHALATION: Causes irritation of nose and throat, headache, nausea, vomiting, incoordination, loss of consciousness, and slow breathing which may lead to death from respiratory failure.

SKIN CONTACT: Prolonged contact may cause chemical burns, seen as marked redness with swelling.

EYE CONTACT: Liquid splashes may cause chemical burns, seen as marked redness with swelling of the conjunctiva. Vapors are irritating.

EFFECTS OF REPEATED OVEREXPOSURE: Repeated or prolonged exposure may cause liver and kidney injury.

OTHER HEALTH HAZARDS: Because of irritating properties, may aggravate an existing dermatitis.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None currently known.

PRODUCT NAME: CYCLOHEXANONE

PAGE 3

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING:	Give two glasses of water. Do not induce vomiting. Call a physician.
SKIN:	Remove contaminated clothing and wash skin with plenty of soap and water.
INHALATION:	Remove to fresh air, give artificial respiration if breathing has stopped; give oxygen if breathing is difficult. Call a physician.
EYES:	Immediately flush eyes thoroughly with water and continue washing for at least 15 minutes. Seek immediate medical attention, preferably from an ophthalmologist.

NOTES TO PHYSICIAN: Aspirated material may cause severe lung damage and present a significant hazard. Stomach contents should be evacuated quickly in a manner which avoids aspiration. Otherwise, treatment is directed at the control of symptoms and the clinical condition. No specific antidote is known.

VI. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY (materials to avoid):
Avoid contact with strong bases.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:
Combustion may lead to the production of carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear suitable protective equipment. Avoid contact with liquid and vapors. Small spills can be flushed with large amounts of water. Larger spills should be collected for disposal.

WASTE DISPOSAL METHOD: Incinerate in a furnace where permitted under appropriate Federal, State and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Self-contained breathing apparatus in high concentrations.

VENTILATION: This product should be confined within closed equipment, in which case general (mechanical) room ventilation is expected to be satisfactory. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

PROTECTIVE GLOVES: Neoprene

EYE PROTECTION: Monogoggles

OTHER PROTECTIVE EQUIPMENT:
Chemical apron, eye bath and safety shower.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

DANGER! Causes eye and skin burns.
Harmful if inhaled.
Harmful if absorbed through skin.
Combustible.

Do not get in eyes, on skin, on clothing.
Avoid breathing vapor.
Keep away from heat and flame.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

OTHER PRECAUTIONS: Laboratory studies indicate that, at very low concentration in water (about 10 ppm), cyclohexanone can be rapidly biodegraded in a wastewater treatment system.

WARNING: Hot organic chemical vapors or mists are susceptible to sudden spontaneous combustion when mixed with air. Ignition may occur at temperatures below those published in the literature as "autoignition" or "ignition" temperatures. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time, and are influenced by pressure changes.

Ignition may occur at typical elevated-temperature process conditions, especially in processes operating under vacuum if subjected to sudden ingress of air, or outside process equipment operating under elevated pressure if sudden escape of vapors or mists to the atmosphere occurs.

Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained.

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Cyclohexanone	108-94-1	100

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:
None

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:
None

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

None

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:
HAZARDOUS SUBSTANCES (=> 1%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Cyclohexanone	108-94-1	100

PENNSYLVANIA Right-To-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:
HAZARDOUS SUBSTANCES (=> 1%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Cyclohexanone	108-94-1	100

Toxic Substances Control Act(TSCA) STATUS:

The ingredients of this product are on the TSCA inventory.

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

VOC 946 g/l; Vapor Pressure 3.4 mm Hg @ 20 C

OTHER REGULATORY INFORMATION:

NEW YORK STATE BULK STORAGE REGULATIONS (GNYSRR Parts 595-599)
This product is covered by GNYSRR for Bulk Storage and Release Reporting and Response. Technical guidance and recommended practices are as follows:

MATERIALS OF CONSTRUCTION
Suitable materials of construction are: Steel, stainless steel, aluminum, baked phenolic lined steel, galvanized steel.

Materials not to be used: Copper and copper alloys.
Polyvinyl chloride.

STORAGE SYSTEM DESIGN
Design should comply with applicable industry, Federal, and local codes for a Class II Combustible liquid with regards to mechanical, electrical, safety and

health components. Should also comply with NYS/DEC Chemical Bulk Storage proposed regulations Parts 589.3 to 589.6 (for existing tanks) or Parts 599.2 and 599.7 (for new or substantially modified tanks).

CONDITIONS FOR STORAGE

Usually stored at ambient temperature, but freezes at about -24 F.

INSPECTION AND MAINTENANCE

A testing/inspection program which ensures structural integrity and proper system operation should be established. Inspection and maintenance procedures and testing of equipment should comply with NYS/DEC proposed regulations Parts 598.7 to 598.10.

TRANSFER AND UNLOADING

These operations should comply with NYS/DEC proposed regulations, Part 598.5.

NOTE -----

The opinions expressed herein are those of qualified experts within Union Carbide Chemicals and Plastics Company. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of Union Carbide Chemicals and Plastics Company, it is the user's obligation to determine the conditions of safe use of the product.

REVISED SECTIONS:

Section IX: VAPOR IGNITION HAZARD WARNING

PC: 22052

F NUMBER: C0067A