**Cyclohexanone**

**MATERIAL SAFETY DATA SHEET**

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1. **CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

**Matheson Tri-Gas, Inc.**

The telephone numbers listed below are emergency numbers, please contact your local branch for routine inquiries.

<table>
<thead>
<tr>
<th>USA</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>959 Route 46 East</td>
<td>CHEMTREC 1-800-424-9300</td>
</tr>
<tr>
<td>Parsippany, New</td>
<td>EMERGENCY CONTACT</td>
</tr>
<tr>
<td>Jersey</td>
<td>24 Hour - USA</td>
</tr>
<tr>
<td>07054-0624 USA</td>
<td>Phone: 973-257-1100</td>
</tr>
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<tr>
<td>530 Watson Street</td>
<td>CANUTEC 613-996-6666</td>
</tr>
<tr>
<td>Whitby, Ontario</td>
<td>EMERGENCY CONTACT</td>
</tr>
<tr>
<td>L1N 5R9 Canada</td>
<td>24 Hour - Canada</td>
</tr>
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**SUBSTANCE:** CYCLOHEXANONE

**SYMBOL:** \( C_6H_{10}O \)

**TRADE NAMES/SYNONYMS:**
ANON; ANONE; HEXANON; HYTROL O; NADONE; PIMELIC KETONE; PIMELIN KETONE; SEXTONE; KETOHEXAMETHYLENE; RCRA U057; STCC 4913179; UN 1915; CYCLOHEXYL KETONE; NCI-C55005; KETOXYCLOHEXANE; OXOCYCLOHEXANE; C6H10O; MAT05890; RTECS GW1050000

**CHEMICAL FAMILY:** ketones, alicyclic
2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: CYCLOHEXANONE
CAS NUMBER: 108-94-1
EC NUMBER (EINECS): 203-631-1
EC INDEX NUMBER: 606-010-00-7
PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2  FIRE=2  REACTIVITY=0

EC CLASSIFICATION (ASSIGNED):
Flammable
Xn Harmful
R 10-20

EC Classification may be inconsistent with independently-researched data.

EMERGENCY OVERVIEW:
COLOR: colorless to yellow
PHYSICAL FORM: liquid
ODOR: distinct odor, pleasant odor, minty, sweet odor
MAJOR HEALTH HAZARDS: harmful on contact with the skin, respiratory tract irritation, skin irritation, eye irritation, central nervous system depression
PHYSICAL HAZARDS: Combustible liquid and vapor.

POTENTIAL HEALTH EFFECTS:
INHALATION:
   SHORT TERM EXPOSURE: irritation, nausea, headache, symptoms of drunkenness, coma
   LONG TERM EXPOSURE: low body temperature, kidney damage
SKIN CONTACT:
   SHORT TERM EXPOSURE: irritation (possibly severe), difficulty breathing, symptoms of drunkenness
   LONG TERM EXPOSURE: no information on significant adverse effects
EYE CONTACT:
   SHORT TERM EXPOSURE: irritation, tearing, eye damage
   LONG TERM EXPOSURE: same as effects reported in short term exposure
INGESTION:
   SHORT TERM EXPOSURE: digestive disorders, symptoms of drunkenness, lung damage, liver damage
   LONG TERM EXPOSURE: no information on significant adverse effects
4. FIRST AID MEASURES

**INHALATION:**
Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

**SKIN CONTACT:**
Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

**EYE CONTACT:**
Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

**INGESTION:**
Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

**NOTE TO PHYSICIAN:**
For ingestion, consider gastric lavage and activated charcoal slurry.

5. FIRE FIGHTING MEASURES

**FIRE AND EXPLOSION HAZARDS:**
Moderate fire hazard. Slight explosion hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive above flash point.

**EXTINGUISHING MEDIA:**
alcohol resistant foam, carbon dioxide, regular dry chemical, water, alcohol resistant foam

Large fires: Use alcohol-resistant foam or flood with fine water spray.

**FIRE FIGHTING:**
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck:
Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

**FLASH POINT:**
111 F (44 C) (CC)
LOWER FLAMMABLE LIMIT:
1.1% @ 100 C
UPPER FLAMMABLE LIMIT:
9.4%
AUTOIGNITION:
788 F (420 C)
FLAMMABILITY CLASS (OSHA):
II

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Reportable Quantity (RQ): Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE


8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
CYCLOHEXANONE:
50 ppm (200 mg/m3) OSHA TWA
25 ppm (100 mg/m3) OSHA TWA (skin) (vacated by 58 FR 35338, June 30, 1993)
25 ppm (100 mg/m3) ACGIH TWA (skin)
25 ppm (100 mg/m3) NIOSH recommended TWA 10 hour(s) (skin)

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
625 ppm
Any supplied-air respirator.
Any powered, air-purifying respirator with organic vapor cartridge(s).

700 ppm
Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any powered, air-purifying respirator with a full facepiece and organic vapor cartridge(s).
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.

Escape -
Any air-purifying respirator with a full facepiece and an organic vapor canister.
Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
APPEARANCE: clear
COLOR: colorless to yellow
TEXTURE: oily
ODOR: distinct odor, pleasant odor, minty, sweet odor
MOLECULAR WEIGHT: 98.2
MOLECULAR FORMULA: C6-H10-O
BOILING POINT: 313 F (156 C)
FREEZING POINT: -26 F (-32 C)
VAPOR PRESSURE: 2 mmHg @ 20 C
VAPOR DENSITY (air=1): 3.4
SPECIFIC GRAVITY (water=1): 0.948
WATER SOLUBILITY: slightly soluble
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: 0.12-0.24 ppm
EVAPORATION RATE: 0.23 (butyl acetate=1)
VISCOSITY: 2.133 cP @ 21 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: acetone, benzene, ethanol, ether, chloroform, organic solvents

10. STABILITY AND REACTIVITY

REACTIVITY:
Stable at normal temperatures and pressure.

CONDITIONS TO AVOID:
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat.

INCOMPATIBILITIES:
oxidizing materials, combustible materials
HAZARDOUS DECOMPOSITION:
Thermal decomposition products: miscellaneous decomposition products

POLYMERIZATION:
Will not polymerize.

11. TOXICOLOGICAL INFORMATION

CYCLOHEXANONE:

IRRITATION DATA:
75 ppm eyes-human; 500 mg open skin-rabbit mild; 20 mg eyes-rabbit severe; 250 ug/24 hour(s)
eyes-rabbit severe

TOXICITY DATA:
8000 ppm/4 hour(s) inhalation-rat LC50; 1 ml/kg skin-rabbit LD50; 1620 ul/kg oral-rat LD50

CARCINOGEN STATUS:
IARC: Animal Inadequate Evidence, Group 3; ACGIH: A4 -Not Classifiable as a Human
Carcinogen

LOCAL EFFECTS:
Irritant: inhalation, skin, eye

ACUTE TOXICITY LEVEL:
Toxic: dermal absorption
Moderately Toxic: ingestion
Slightly Toxic: inhalation

TARGET ORGANS:
Central nervous system

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
respiratory disorders, skin disorders and allergies

MUTAGENIC DATA:
Available.

REPRODUCTIVE EFFECTS DATA:
Available.

ADDITIONAL DATA:
Alcohol may enhance the toxic effects.

12. ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY:
630000 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (Pimephales promelas)

INVERTEBRATE TOXICITY:
1240 mg/L 24 hour(s) EC100 (Abundance) Water flea (Daphnia magna)

ALGAL TOXICITY:
573000 ug/L 48 hour(s) (Population Growth) Cryptomonad (Chilomonas paramecium)

ENVIRONMENTAL SUMMARY:
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.
14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101. SHIPPING NAME-UN NUMBER; HAZARD CLASS;
PACKING GROUP; LABEL:
Cyclohexanone-UN1915; 3; III; Flammable liquid

15. REGULATORY INFORMATION

U.S. REGULATIONS:
TSCA INVENTORY STATUS: Y

TSCA 12(b) EXPORT NOTIFICATION: Not listed.
CERCLA SECTION 103 (40CFR302.4): Y
CYCLOHEXANONE: 5000 LBS RQ
SARA SECTION 302 (40CFR355.30): N
SARA SECTION 304 (40CFR355.40): N
SARA SECTION 313 (40CFR372.65): N
SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
ACUTE: Y
CHRONIC: N
FIRE: Y
REACTIVE: N
SUDDEN RELEASE: N
STATE REGULATIONS:
California Proposition 65: N
EUROPEAN REGULATIONS:
EC NUMBER (EINECS): 203-631-1

EC RISK AND SAFETY PHRASES:

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<tr>
<th>R 10</th>
<th>Flammable.</th>
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<tbody>
<tr>
<td>R 20</td>
<td>Harmful by inhalation.</td>
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<tr>
<td>S 2</td>
<td>Keep out of reach of children.</td>
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<tr>
<td>S 25</td>
<td>Avoid contact with eyes.</td>
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CONCENTRATION LIMITS:
C>=25% Xn R 20

16. OTHER INFORMATION

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