



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

|                   |   |
|-------------------|---|
| Material name     | CYCLOHEXANONE   |
| Version #         | 03  |
| Revision date     | 11-22-2011  |
| CAS #             | 108-94-1  |
| Product Codes     | J.T.Baker: 5881, 9209, 9210, G032<br>Macron: 4872                     |
| Synonym(s)        | Pimelic ketone; Cyclohexyl ketone; Ketoexamethylene                   |
| Manufacturer      | Avantor Performance Materials, Inc.                                   |
| Address           | 3477 Corporate Parkway<br>Suite #200<br>Center Valley, PA 18034<br>US |
| Customer Service  | 855-282-6867  |
| 24 Hour Emergency | 908-859-2151  |
| Chemtrec          | 800-424-9300  |

## 2. Hazards Identification

|                                 |   |
|---------------------------------|---|
| Emergency overview              | WARNING<br><br>Flammable liquid and vapor. May be ignited by heat, sparks or flames.<br><br>Harmful if inhaled, absorbed through skin, or swallowed. Causes skin and eye irritation. Causes respiratory tract irritation. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. Prolonged exposure may cause chronic effects. |
| OSHA regulatory status          | This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).   |
| Potential health effects        |   |
| Routes of exposure              | Inhalation. Ingestion. Skin contact. Eye contact.   |
| Eyes                            | Causes eye irritation. High vapor/aerosol concentrations may be irritating.   |
| Skin                            | Harmful if absorbed through skin. Causes skin irritation. Prolonged or repeated contact with skin may cause redness, itching, irritation and eczema/chapping.   |
| Inhalation                      | Harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract. In high concentrations, vapors and aerosol mists have a narcotic effect and may cause headache, fatigue, dizziness and nausea.  |
| Ingestion                       | Harmful if swallowed. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis.   |
| Target organs                   | Eyes. Skin. Respiratory system. Central nervous system.   |
| Chronic effects                 | Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.   |
| Potential environmental effects | The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.  |

## 3. Composition / Information on Ingredients

| Components    | CAS #    | Percent  |
|---------------|----------|----------|
| CYCLOHEXANONE | 108-94-1 | 95 - 100 |

## 4. First Aid Measures

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### First aid procedures

- Eye contact** Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.
- Skin contact** Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
- Inhalation** Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Get medical attention.
- Ingestion** Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

### Notes to physician

Treat symptomatically.

### General advice

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

## 5. Fire Fighting Measures

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### Flammable properties

FLAMMABLE. Heat may cause the containers to explode. Vapors may ignite. Vapors may travel considerable distance to a source of ignition and flash back.

### Extinguishing media

#### Suitable extinguishing media

Water spray. Foam. Dry powder. Carbon dioxide (CO<sub>2</sub>).

#### Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

### Protection of firefighters

#### Specific hazards arising from the chemical

Vapors may ignite. Vapor from the solvent may accumulate in container headspace resulting in flammability hazard.

#### Protective equipment and precautions for firefighters

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Some of these materials, if spilled, may evaporate leaving a flammable residue. Cool containers exposed to flames with water until well after the fire is out.

### Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### Specific methods

In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.

### Hazardous combustion products

Carbon monoxide and carbon dioxide.

## 6. Accidental Release Measures

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### Personal precautions

Wear appropriate protective equipment and clothing during clean-up. Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

### Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

### Methods for containment

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Dike the spilled material, where this is possible.

**Methods for cleaning up**

Use only non-sparking tools. All equipment used when handling the product must be grounded.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Dike far ahead of spill for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Collect in a non-combustible container for prompt disposal.

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination. Clean up in accordance with all applicable regulations.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

**7. Handling and Storage****Handling**

DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Ground container and transfer equipment to eliminate static electric sparks. Wear appropriate personal protective equipment. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. See Section 8 of the MSDS for Personal Protective Equipment.

**Storage**

Keep away from food, drink and animal feedingsuffs. Keep out of the reach of children. Keep container tightly closed in a cool, well-ventilated place. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

**8. Exposure Controls / Personal Protection****ACGIH****Material****Type****Value**

CYCLOHEXANONE (108-94-1)

BEL

80.0000 mg/l

8.0000 mg/l

STEL

50.0000 ppm

TWA

20.0000 ppm

**Occupational exposure limits****U.S. - OSHA****Material****Type****Value**

CYCLOHEXANONE (108-94-1)

PEL

50.0000 ppm

200.0000 mg/m3

**Engineering controls**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Explosion proof exhaust ventilation should be used.

**Personal protective equipment****Eye / face protection**

Wear safety glasses with side shields (or goggles) and a face shield.

**Skin protection**

Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

**Respiratory protection**

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with organic vapor cartridge and full facepiece.

**General hygiene considerations**

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical & Chemical Properties

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|  |                             |
|--|-----------------------------|
| Appearance                                     | Oily.                       |
| Color  | Colorless to light yellow.  |
| Odor   | Acetone-like.               |
| Odor threshold                                 | Not available.              |
| Physical state                                 | Liquid.                     |
| Form   | Liquid.                     |
| pH   | Not available.              |
| Melting point                                  | -23.8 °F (-31 °C)           |
| Freezing point                                 | -23.8 °F (-31 °C)           |
| Boiling point                                  | 311 °F (155 °C) 101.325 kPa |
| Flash point                                    | 111 °F (43.9 °C) Closed Cup |
| Evaporation rate                               | 0.29 BuAc                   |
| Flammability limits in air, upper, % by volume | 9.4 %                       |
| Flammability limits in air, lower, % by volume | 1.1 %                       |
| Vapor pressure                                 | 0.5773 kPa @ 25°C           |
| Vapor density                                  | 3.4                         |
| Specific gravity                               | 0.9421                      |
| Relative density                               | Not available.              |
| Solubility (water)                             | 150 g/l                     |
| Partition coefficient (n-octanol/water)        | 0.81                        |
| Auto-ignition temperature                      | 788 °F (420 °C)             |
| Decomposition temperature                      | Not available.              |
| VOC  | 100 %                       |
| Percent volatile                               | 100 %                       |
| Molecular weight                               | 98.14 g/mol                 |
| Molecular formula                              | C6-H10-O                    |

## 10. Chemical Stability & Reactivity Information

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|                                    |  |
|------------------------------------|--|
| Chemical stability                 | Stable under normal temperature conditions.                                |
| Conditions to avoid                | Heat, sparks, flames.  |
| Incompatible materials             | Strong oxidizing agents.   |
| Hazardous decomposition products   | At thermal decomposition temperatures, carbon monoxide and carbon dioxide. |
| Possibility of hazardous reactions | Hazardous polymerization does not occur.                                   |

## 11. Toxicological Information

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### Toxicological data

#### Product

CYCLOHEXANONE (108-94-1)

#### Test Results

Acute Dermal Rabbit: 1000 mg/kg

Acute Inhalation Rat: 8000 ppm 4.00 Hours

Acute Oral Rat: 1800 mg/kg

#### Sensitization

Not a skin sensitizer.

## US ACGIH Threshold Limit Values: Skin designation

CYCLOHEXANONE (CAS 108-94-1)

Can be absorbed through the skin.

|                 |   |
|-----------------|---|
| Acute effects   | Harmful if inhaled, absorbed through skin, or swallowed.  |
| Local effects   | Causes skin and eye irritation. Irritating to respiratory system. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract.   |
| Chronic effects | Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. |
| Carcinogenicity | This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.   |

### ACGIH Carcinogens

CYCLOHEXANONE (CAS 108-94-1)

A3 Confirmed animal carcinogen with unknown relevance to humans.

### IARC Monographs. Overall Evaluation of Carcinogenicity

CYCLOHEXANONE (CAS 108-94-1)

3 Not classifiable as to carcinogenicity to humans.

|                            |   |
|----------------------------|---|
| Skin corrosion/irritation  | Causes skin irritation.   |
| Epidemiology               | No epidemiological data is available for this product.  |
| Mutagenicity               | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.  |
| Neurological effects       | High vapor/aerosol concentrations (attainable only at elevated temperatures) may cause central nervous system effects such as dizziness, drowsiness or headaches. |
| Reproductive effects       | Contains no ingredient listed as toxic to reproduction  |
| Teratogenicity             | No data available to indicate product or any components present at greater than 0.1% may cause birth defects.   |
| Symptoms and target organs | Irritation. Drowsiness and dizziness.   |

## 12. Ecological Information

### Ecotoxicological data

| Product                                 | Test Results   |
|---|--|
| CYCLOHEXANONE (108-94-1)                | LC50 Fathead minnow (Pimephales promelas): 481 mg/l 96.00 hours  |
| Ecotoxicity                             | The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. |
| Environmental effects                   | Ecological injuries are not known or expected under normal use.  |
| Persistence and degradability           | Expected to be readily biodegradable.  |
| Partition coefficient (n-octanol/water) | 0.81   |

## 13. Disposal Considerations

### Waste codes

#### US RCRA Hazardous Waste U List: Reference

CYCLOHEXANONE (CAS 108-94-1)

U057

|                        |  |
|------------------------|--|
| Disposal instructions  | Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.               |
| Contaminated packaging | Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container. Offer rinsed packaging material to local recycling facilities. |

## 14. Transport Information

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### DOT

Basic shipping requirements:

UN number UN1915  
Proper shipping name Cyclohexanone  
Hazard class 3  
Packing group III

Additional information:

Special provisions B1, IB3, T2, TP1

Basic shipping requirements:

Labels required 3

Additional information:

Packaging exceptions 150  
Packaging non bulk 203  
Packaging bulk 242  
Reportable quantity 5000  
ERG number 127

### IATA

Basic shipping requirements:

UN number 1915  
Proper shipping name Cyclohexanone  
Hazard class 3  
Packing group III

Additional information:

ERG code 3L

### IMDG

Basic shipping requirements:

UN number 1915  
Proper shipping name CYCLOHEXANONE  
Hazard class 3  
Packing group III



DOT



IATA



IMDG

## 15. Regulatory Information

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US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

CERCLA (Superfund) reportable quantity

CYCLOHEXANONE: 5000.0000

## Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories  
Immediate Hazard - Yes  
Delayed Hazard - No  
Fire Hazard - Yes  
Pressure Hazard - No  
Reactivity Hazard - No

Section 311 hazardous chemical  
Yes

## Inventory status

| Country(s) or region        | Inventory name   | On inventory (yes/no)* |
|-----------------------------|--|------------------------|
| Australia                   | Australian Inventory of Chemical Substances (AICS)                     | Yes                    |
| Canada                      | Domestic Substances List (DSL)   | Yes                    |
| Canada                      | Non-Domestic Substances List (NDSL)                                    | No                     |
| China                       | Inventory of Existing Chemical Substances in China (IECSC)             | Yes                    |
| Europe                      | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes                    |
| Europe                      | European List of Notified Chemical Substances (ELINCS)                 | No                     |
| Japan                       | Inventory of Existing and New Chemical Substances (ENCS)               | Yes                    |
| Korea                       | Existing Chemicals List (ECL)  | Yes                    |
| New Zealand                 | New Zealand Inventory  | Yes                    |
| Philippines                 | Philippine Inventory of Chemicals and Chemical Substances (PICCS)      | Yes                    |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory                          | Yes                    |

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations  
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

## US - Pennsylvania RTK - Hazardous Substances: Listed substance

CYCLOHEXANONE (CAS 108-94-1) Listed.

Saf-T-Data  
Health: 2 - Moderate  
Flammability: 2 - Moderate  
Reactivity: 1 - Slight  
Contact: 3 - Severe (Life)  
Lab Protective Equip: DB - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER  
Storage Color Code: R - Red (Flammable)

## 16. Labeling Info

Label Hazard Warning  
WARNING  
  
FLAMMABLE LIQUID AND VAPOR. May be ignited by heat, sparks or flames. Harmful if inhaled, absorbed through skin, or swallowed. Causes skin and eye irritation. Causes respiratory tract irritation. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. Prolonged exposure may cause chronic effects.

Label Precautions  
Keep away from heat, sparks and flame. Do not breathe mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed.

Label First Aid  
Immediately flush eyes with plenty of water for at least 15 minutes. Flush skin thoroughly with water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

## 17. Other Information

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**NFPA ratings**

Health: 2  
Flammability: 2  
Instability: 0

**Disclaimer**

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**Issue date**

11-22-2011

**This data sheet contains changes from the previous version in section(s):**

Physical & Chemical Properties: Color