



Material Safety Data Sheet

Cyclohexane

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Cyclohexane

OTHER/GENERIC NAMES: Hexahydrobenzene

PRODUCT USE: solvent

MANUFACTURER: Honeywell
1953 South Harvey Street
Muskegon, MI 49442

DISTRIBUTOR: VWR International
1310 Goshen Parkway
West Chester, PA 19380

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-932-5000

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-424-9300 (USA Only)
For Transportation Emergencies:
1-800-424-9300 (CHEMTREC - Domestic)
1-613-996-6666(CANUTEC- Canada)

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Cyclohexane	110-82-7	100

Component Information/Information on Non-Hazardous Components

This product is considered to be hazardous according to the criteria specified in 29 CFR 1910.1200 (Hazard Communication Standard) and the Canadian Controlled Product Regulations.

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, volatile, flammable liquid. Has a mild, sweet odor. Highly flammable. Vapours may form explosive mixtures with air. The product causes irritation of eyes, skin and mucous membranes. Harmful by inhalation. Harmful: may cause lung damage if swallowed. Causes headache, drowsiness or other effects to the central nervous system. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not allow product to contact skin, eyes and clothing. Do not breathe vapours.



MATERIAL SAFETY DATA SHEET

Cyclohexane

POTENTIAL HEALTH HAZARDS

SKIN: Irritating to skin. Repeated or extended contact may cause erythema (reddening of the skin) or dermatitis, resulting from a defatting action on tissue.

EYES: Irritating to eyes. Symptoms include itching, burning, redness and tearing.

INHALATION: Vapours may cause drowsiness and dizziness. Inhalation of high vapour concentrations can cause CNS-depression and narcosis. Based on animal testing, severe overexposure may produce more serious symptoms, including coma and risk of kidney damage.

INGESTION: Harmful: may cause lung damage if swallowed. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Based on animal testing, severe overexposure may produce more serious symptoms, including coma and risk of kidney damage.

DELAYED EFFECTS: Repeated or prolonged exposure may cause damage to the liver and kidney.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing liver or kidney dysfunctions or central nervous system disorders may be aggravated by exposure.

HMIS Ratings: Health: 2 Fire: 3 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
No component of this product at levels greater than or equal to 0.1% is identified as a carcinogen by ACGIH, IARC, NTP or OSHA.			

4. FIRST AID MEASURES

SKIN: Wash off immediately with soap and plenty of water. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Obtain medical attention.

EYES: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

INHALATION: Move to fresh air in case of accidental inhalation of vapours. If not breathing, give artificial respiration. If breathing is difficult, give oxygen, provided a qualified operator is available. Call a physician immediately.

INGESTION: DO NOT induce vomiting. Immediate medical attention is required. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration.

ADVICE TO PHYSICIAN: Treat symptomatically.



MATERIAL SAFETY DATA SHEET

Cyclohexane

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: -4°F (-20°C)
FLASH POINT METHOD: Closed Cup
AUTOIGNITION TEMPERATURE: 473°F (245°C)
UPPER FLAME LIMIT (volume % in air): 8.4
LOWER FLAME LIMIT (volume % in air): 1.3
FLAME PROPAGATION RATE (solids): Not applicable
OSHA FLAMMABILITY CLASS: Class 1B Flammable Liquid

EXTINGUISHING MEDIA:

Use regular foam, carbon dioxide (CO₂) or dry chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Highly flammable. Vapours may form explosive mixtures with air. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back.

Hazardous combustion products may include carbon monoxide, carbon dioxide (CO₂).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Water may be ineffective. Do not use a solid water stream as it may scatter and spread fire. Fire or intense heat may cause violent rupture of packages. Fire-fighters should wear self-contained, NIOSH-approved breathing apparatus and full protective clothing. Fire or intense heat may cause violent rupture of packages. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

NFPA Ratings: Health: 2 Fire: 3 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

Containment Procedures: Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Stop flow of material, if this is without risk.

Cleanup Procedures: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Shovel into suitable container for disposal. Do not use sparking tools. Do not allow product to enter sewer or waterways.

Evacuation Procedures: Keep unnecessary people away. Isolate area.

Special Procedures: Use personal protective equipment.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.



MATERIAL SAFETY DATA SHEET

Cyclohexane

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Ensure all equipment is electrically grounded before beginning transfer operations. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Do not breathe vapours. Keep away from fire, sparks and heated surfaces. Keep container tightly closed in a dry and well-ventilated place.

STORAGE RECOMMENDATIONS:

Keep in a well-ventilated place. Empty containers may retain product residue including Flammable or Explosive vapors. Do not cut, drill, grind, or weld near full, partially full, or empty product containers. Keep away from heat and sources of ignition. Store away from incompatible substances. Re-open used containers with caution. Containers that are opened must be carefully resealed and kept upright to prevent leakage. Store in area designed for storage of flammable liquids. Protect from physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapours or mists generated from the handling of this product or use product in closed system. Local exhaust ventilation is preferred. Prevent electrostatic charge build-up by using common bonding and grounding techniques.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Wear impervious gloves and flame retardant antistatic protective clothing. Gloves must be inspected prior to use. For leak, spills, or other emergency, use full protective equipment.

EYE PROTECTION:

For handling in closed ventilation system, wear safety glasses with side-shields. For leak, spill or other emergency, use chemical goggles and face-shield. Remove contact lenses.

RESPIRATORY PROTECTION:

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. For routine operations, wear self contained breathing apparatus.

ADDITIONAL RECOMMENDATIONS:

Provide eyewash stations and quick-drench shower facilities. High standards of skin care and personal hygiene should be exercised at all times.



MATERIAL SAFETY DATA SHEET

Cyclohexane

EXPOSURE GUIDELINES

Component Exposure Limits

Cyclohexane (110-82-7)

ACGIH:	100 ppm TWA
OSHA (Final):	300 ppm TWA; 1050 mg/m ³ TWA
OSHA (Vacated):	300 ppm TWA; 1050 mg/m ³ TWA
NIOSH:	300 ppm TWA; 1050 mg/m ³ TWA
Alberta:	300 ppm TWA; 1030 mg/m ³ TWA
British Columbia:	100 ppm TWA
Manitoba:	300 ppm TWA; 1050 mg/m ³ TWA
New Brunswick:	300 ppm TWA; 1030 mg/m ³ TWA
Northwest Territories:	300 ppm TWA; 1030 mg/m ³ TWA 375 ppm STEL; 1290 mg/m ³ STEL
Nova Scotia:	100 ppm TWA
Nunavut:	300 ppm TWA; 1030 mg/m ³ TWA 375 ppm STEL; 1290 mg/m ³ STEL
Ontario:	100 ppm TWAEV
Quebec:	300 ppm TWAEV; 1030 mg/m ³ TWAEV
Saskatchewan:	1030 mg/m ³ TWA; 300 ppm TWA 1290 mg/m ³ STEL; 375 ppm STEL
Yukon:	300 ppm TWA; 1050 mg/m ³ TWA 375 ppm STEL; 1300 mg/m ³ STEL

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	84.16
CHEMICAL FORMULA:	C ₆ H ₁₂
ODOR:	Mild, sweet. Threshold: 300 ppm (NSC)
SPECIFIC GRAVITY (water = 1.0):	0.779
SOLUBILITY IN WATER (weight %):	0.006% at 77°F (25°C)
pH:	Not applicable
BOILING POINT:	177.3°F (80.72°C)
MELTING POINT:	43.7°F (6.54°C)
VAPOR PRESSURE:	78 mm Hg
VAPOR DENSITY (air = 1.0):	2.9
EVAPORATION RATE:	~6
% VOLATILES:	100
FLASH POINT:	-4°F (-20°C)
COMPARED TO:	Butyl Acetate = 1

(Flash point method and additional flammability data are found in Section 5.)



MATERIAL SAFETY DATA SHEET

Cyclohexane

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable under recommended storage conditions.
Avoid: Heat, flames and sparks. Incompatible products

INCOMPATIBILITIES:

Avoid strong oxidizers, strong acids, plastics and explosives.

HAZARDOUS DECOMPOSITION PRODUCTS:

Hazardous decomposition products include carbon monoxide and carbon dioxide (CO₂).

HAZARDOUS POLYMERISATION:

Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Component Analysis - LD50/LC50

Cyclohexane (110-82-7)

Rat: LD50 - Route: Inhalation; Dose: 13.9 mg/L/4H

LD50 - Route: Oral; Dose: >5000 mg/kg

Rabbit: LD50 - Route: Dermal; Dose: >2000 mg/kg

IMMEDIATE (ACUTE) EFFECTS:

The product causes irritation of eyes, skin and mucous membranes. Harmful by inhalation. Harmful: may cause lung damage if swallowed. Causes headache, drowsiness or other effects to the central nervous system.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Repeated or prolonged exposure may cause damage to the liver and kidney.

Inhalation (Monkey) - NOEL (No observed adverse effect level): 1243 ppm/6 hours/day for 50 days

Inhalation (Rabbit) - Effect on liver and kidney: 786 ppm/6 hours/day for 50 days

NOEL: 434 ppm/6 hours/day/ for 50 days

Mutagenicity: Non-mutagenic at doses up to 10 mg/plate in the Salmonella/microsome preincubation assay (Ames Test).

OTHER DATA:

This material is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.



MATERIAL SAFETY DATA SHEET

Cyclohexane

12. ECOLOGICAL INFORMATION

Prevent from entering sewer or waterway. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Component Analysis - Ecotoxicity - Aquatic Toxicity

Cyclohexane (110-82-7)

Test & Species		Conditions
96 Hr LC50 fathead minnow	4.53 mg/L	flow-through
96 Hr LC50 bluegill	34.72 mg/L	
96 Hr LC50 guppy	48.0 mg/L	
5 min EC50 Photobacterium phosphoreum	85.5 mg/L	
10 min EC50 Photobacterium phosphoreum	93 mg/L	
48 Hr EC50 water flea	400.0 mg/L	

Not readily biodegradable. Bioaccumulation potential in aquatic organisms is moderate. Volatilization from water surfaces is expected to be an important fate process.

13. DISPOSAL CONSIDERATIONS

WASTE INFORMATION: U056. This product is a D001 ignitable waste in supplied form. Dispose of as special waste in compliance with local and national regulations. Waste codes should be assigned by the user based on the application for which the product was used. Incineration of waste material in an EPA-approved facility is recommended, allowing a solid, inert residue to form.

OTHER DISPOSAL CONSIDERATIONS: Observe all Federal, State, and Local Environmental regulations.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Cyclohexane

US DOT HAZARD CLASS: 3

US DOT ID NUMBER: UN1145

PACKING GROUP: II

TDG PROPER SHIPPING NAME: Cyclohexane

TDG HAZARD CLASS: 3

TDG ID NUMBER: UN1145

PACKING GROUP: II

North American Emergency Response Guide (ERG) Number: 128



MATERIAL SAFETY DATA SHEET

Cyclohexane

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

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

OTHER TSCA ISSUES: Additional TSCA information may exist. Contact VWR if you have questions regarding your application or use of this product.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Cyclohexane (110-82-7)	1000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate. Delayed. Fire.

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Cyclohexane (110-82-7)	1.0 % de minimis concentration

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
Cyclohexane (110-82-7)	100	CA, MA, MN, NJ, PA, RI

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by CPR.

WHMIS Classification:

B2- Flammable Liquid

D2B- Toxic Material



MATERIAL SAFETY DATA SHEET

Cyclohexane

FOREIGN INVENTORY STATUS:

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC	AUST	PHIL	MITI	KOREA	CHINA
Cyclohexane	110-82-7	Yes	DSL	EINECS	Yes	Yes	Yes	Yes	Yes

16. OTHER INFORMATION

CURRENT ISSUE DATE: January 4, 2006.

PREVIOUS ISSUE DATE: New MSDS.

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

New MSDS.

OTHER INFORMATION: As per the OSHA Hazard Communication Standard, 1910.1200, the information contained within this MSDS must be given to those persons using this material. For laboratory use only. Not for food or drug use. Do not store with foodstuffs.

KEY/LEGEND: ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; mg/Kg = milligrams per Kilogram; mg/L = milligrams per Liter; mg/m³ = milligrams per Cubic Meter; MSHA = Mine Safety and Health Administration; NA = Not Applicable or Not Available; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; SARA = Superfund Amendments and Reauthorization Act; TDG = Transport Dangerous Goods; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System.

End of Sheet #BDH-160