Material Safety Data Sheet
1,6-Diisocyanatohexane, 99+% (GC)

ACC# 96966

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,6-Diisocyanatohexane, 99+% (GC)
Catalog Numbers: AC115190010, AC115190250, AC115191000
Synonyms: Hexamethylene diisocyanate; Hexane, 1,6-diisocyanato-; Hexamethylene-1,6-diisocyanate; 1,6-Hexamethylene diisocyanate; 1,6-Hexanediol diisocyanate; HMDI; Isocyanic acid, diester with 1,6-hexanediol; Isocyanic acid, hexamethylene ester
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
822-06-0	1,6-Diisocyanatohexane	99 +	212-485-8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless to slightly yellow clear liquid.
Warning! Harmful if absorbed through the skin. Causes eye, skin, and respiratory tract irritation. May cause allergic respiratory and skin reaction. May be harmful if swallowed. May cause lung damage. Moisture sensitive.
Target Organs: Lungs, respiratory system, skin.

Potential Health Effects

Eye: Causes severe eye irritation. Lachrymator (substance which increases the flow of tears). Vapors may cause reversible corneal epithelial edema with impairing of vision.
Skin: Causes severe skin irritation. Harmful if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. If absorbed, causes symptoms similar to those of ingestion.
Ingestion: May cause irritation of the digestive tract. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.
Inhalation: May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Causes irritation of mucous membrane. At high concentrations, isocyanates affect mucous membranes of the respiratory tract and may lead to fatal pulmonary edema. Exposure to low and often even unmeasurable isocyanate concentration results in sensitization. Symptoms of exposure include: increased secretions, cough, pain or respiration, Symptoms of initial exposure may include nocturnal dyspnea (labored breathing) with nocturnal cough with progression to asthmatic bronchitis.
Chronic: Chronic inhalation may cause effects similar to those of acute inhalation. Repeated exposure may cause allergic respiratory reaction (asthma). Effects may be delayed. Prolonged or repeated exposure may cause lung irritation, chest pain, and pulmonary edema. Chronic overexposure to isocyanates has been reported to cause lung damage, including decreased lung fuction, which may be permanent.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid. Do NOT allow victim to rub eyes or keep eyes closed.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively. Persons with asthma, other respiratory disorders (bronchitis, emphysema, hyperreactivity), skin allergies and eczema may be at increased risk from exposure to this product. Effects may be delayed. To treat corneal damage, careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Fire or excessive heat may result in violent rupture of the container due to bulk polymerization.
Extinguishing Media: Use extinguishing media most appropriate for the surrounding fire. Do NOT get water inside containers. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. For small fires, use carbon dioxide, dry

chemical, dry sand, or alcohol-resistant foam. Most foams will react with the material and release corrosive/toxic gases. Cool containers with flooding quantities of water until well after fire is out.
Flash Point: 140 deg C (284.00 deg F)
Autoignition Temperature: Not applicable.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Do not get water on spilled substances or inside containers. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Do not allow contact with water. Keep from contact with moist air and steam.
Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep refrigerated. (Store below 4°C/39°F.) Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,6-Diisocyanatohexane	0.005 ppm TWA	0.005 ppm TWA; 0.035 mg/m3 TWA	none listed

OSHA Vacated PELs: 1,6-Diisocyanatohexane: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid
Appearance: clear colorless to slightly yellow
Odor: sharp odor - pungent odor
pH: Not available.
Vapor Pressure: 0.05 mm Hg @ 25C
Vapor Density: 5.81
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 255 deg C
Freezing/Melting Point:-67 deg C
Decomposition Temperature: Not available.
Solubility: Reacts.
Specific Gravity/Density:1.04
Molecular Formula:C8H12N2O2
Molecular Weight:168.20

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Polymerization may occur upon heating.
Conditions to Avoid: Incompatible materials, moisture, excess heat, temperatures above 300°C.
Incompatibilities with Other Materials: Strong oxidizing agents, strong bases, alcohols, amines, heat, moisture, water, carboxylic acids, organotin catalysts.
Hazardous Decomposition Products: Hydrogen cyanide, nitrogen oxides, carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, nitrogen.
Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 822-06-0: MO1740000
LD50/LC50:
CAS# 822-06-0:
Inhalation, mouse: LC50 = 30 mg/m3;
Inhalation, rat: LC50 = 124 mg/m3/4H;
Inhalation, rat: LC50 = 462 mg/m3/4H;
Oral, mouse: LD50 = 350 mg/kg;
Oral, rat: LD50 = 710 uL/kg;
Skin, rabbit: LD50 = 570 uL/kg;
.

Carcinogenicity:
CAS# 822-06-0: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information available.
Teratogenicity: No information available.
Reproductive Effects: No information available.
Mutagenicity: No information available.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Bacteria: Phytobacterium phosphoreum: EC50 = 15.7 mg/L; 5-30 min; Microtox test 1,6-Diisocyanatohexane exists primarily in the vapor phase and degrades by reaction with photochemically produced hydroxyl radicals with a half-life of 2 days. Atmospheric degradation may also occur through contact with water vapors, clouds, fog or rain. This product reacts readily with water to form amines and polyureas. In soil and water it will be degraded by the reaction with water.
Environmental: No information available.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	HEXAMETHYLENE DIISOCYANATE	HEXAMETHYLENE DIISOCYANATE
Hazard Class:	6.1	6.1
UN Number:	UN2281	UN2281
Packing Group:	II	II

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 822-06-0 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 822-06-0: Effective 6/1/87, Sunset 12/19/95
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
CAS# 822-06-0: Section 4
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 822-06-0: 100 lb final RQ; 45.4 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
Section 313
This material contains 1,6-Diisocyanatohexane (CAS# 822-06-0, 99 +%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40
Clean Air Act:
CAS# 822-06-0 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 822-06-0 can be found on the following state right to know lists: California, New Jersey, Minnesota, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 21/22 Harmful in contact with skin and if swallowed.
R 36/37/38 Irritating to eyes, respiratory system and skin.
R 42/43 May cause sensitization by inhalation and skin contact.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 38 In case of insufficient ventilation, wear suitable respiratory equipment.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 28A After contact with skin, wash immediately with plenty of water .

WGK (Water Danger/Protection)

CAS# 822-06-0: 2

Canada - DSL/NDSL

CAS# 822-06-0 is listed on Canada's DSL List.

Canada - WHMIS

not available.

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

Canadian Ingredient Disclosure List

CAS# 822-06-0 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 5/10/1999
Revision #4 Date: 10/03/2005