

Material Safety Data Sheet

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Version 1.4

According to 91/155/EEC

1 - Product and Company Information

Product Name HEXAMETHYLENE DIISOCYANATE
Product Number 52650

Company Sigma-Aldrich Company Ltd.
 The Old Brickyard
 New Road, Gillingham SP8 4XT
 United Kingdom

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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
1,6-DIISOCYANATOHEXANE	822-06-0	212-485-8	615-011-00-1

Formula C8H12N2O2
Molecular Weight 168.2 AMU
Synonyms Desmodur H * Desmodur N * 1,6-Diisocyanatohexane
 * Hexamethylendiisokyanat (Czech) *
 Hexamethylene diisocyanate (ACGIH) *
 Hexamethylene-1,6-diisocyanate *
 1,6-Hexamethylene diisocyanate * 1,6-Hexanediol
 diisocyanate * HMDI * Isocyanic acid, diester
 with 1,6-hexanediol * Isocyanic acid,
 hexamethylene ester *
 Metyleno-bis-fenyloizocyjanian (Polish) *
 Szesciometylenodwuizocyjanian (Polish) * TL 78 *
 HMDI

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Toxic by inhalation. Irritating to eyes, respiratory system and
skin. May cause sensitization by inhalation and skin contact.

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give
artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for
at least 15 minutes. Remove contaminated clothing and shoes.
Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of

water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Carbon dioxide.

SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

SPECIAL REQUIREMENTS: Moisture sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.05 MG/M3
Poland		NDSch	0.15 MG/M3
Poland		NDSP	-

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.035 mg/m3
		0.005 ppm

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.035 mg/m3
		0.005 ppm

Remarks: =1=

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.035 mg/m3
		0.005 ppm

Remarks: A 3)

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	0.03 mg/m3
		0.005 ppm

Remarks: S

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	TWA	0.02MG(NCO)/M3
OEL	STEL	0.07 mg(NCO)/m3

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Liquid	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	61 °C	0.08 mmHg
MP/MP Range	- 67.0 °C	
Flash Point	135 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	0.05 mmHg	25 °C
SG/Density	1.045 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	5.81 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	

Solvent Content	N/A
Water Content	N/A
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	Other Solvents: ETHER

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Heat. Moisture.

Materials to Avoid: Alcohols, Strong bases, Amines, Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and nitrogen oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: MO1740000

ACUTE TOXICITY

LC50

Inhalation

rat, male

275 mg/m³

40 ppm

1 HR

LD50

Oral

Rat

710 UL/KG

LD50

Oral

Mouse

350 mg/kg

LC50

Inhalation

Mouse

30 mg/m³

LD50

Intravenous

Mouse

5600 UG/KG

LD50

Skin

Rabbit

570 UL/KG

SENSITIZATION

Respiratory: May cause allergic respiratory reaction.

Skin: May cause allergic skin reaction.

SIGNS AND SYMPTOMS OF EXPOSURE

Repeated exposure may cause asthma. Lung irritation, chest pain, and edema which may be fatal. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: Harmful if absorbed through skin.

Eye Contact: Causes eye irritation. Lachrymator.

Inhalation: May be fatal if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 2281

Class: 6.1

PG: II

Proper Shipping Name: Hexamethylene diisocyanate

IMDG

UN#: 2281

Class: 6.1

PG: II

Proper Shipping Name: Hexamethylene diisocyanate

Marine Pollutant: No

Severe Marine Pollutant: No

IATA

UN#: 2281

Class: 6.1

PG: II

Proper Shipping Name: Hexamethylene diisocyanate

Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 615-011-00-1

INDICATION OF DANGER: T

Toxic.

R-PHRASES: 23-36/37/38-42/43

Toxic by inhalation. Irritating to eyes, respiratory system and skin. May cause sensitization by inhalation and skin contact.

S-PHRASES: 26-28-38-45

In case of contact with eyes, rinse immediately with plenty of

water and seek medical advice. After contact with skin, wash immediately with plenty of soap-suds. In case of insufficient ventilation, wear suitable respiratory equipment. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

ID-Number: 6720

Classification according to appendix 3.

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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