Material Safety Data Sheet

1 . Product and company identification

Product name : Hexamethyldisilazane

Synonym : hexamethyldisilazane

Chemical formula : $C_6H_{19}N\text{-}Si_2$

Supplier : Thermo Fisher Scientific
320 Rolling Ridge Drive
Penn Eagle Industrial Park
Bellefonte, PA 16823
814.353.2300 (P)
814.353.0140 (F)

Manufacturer : Thermo Fisher Scientific
Pierce Biotechnology
P.O. Box 117
Rockford, IL 61105
United States
815.968.0747 or
800.874.3723

Product No. : TS-84769 TS-84770

MSDS # : 0583

Validation date : **10/20/2009.**

Print date : 10/20/2009.

Responsible name : **MSDS (Regulatory Affairs)**

In case of emergency : CHEMTREC:
800.424.9300
OUTSIDE US:
202.483.7616

Use of Substance/Preparation : Refer to the instruction booklet for proper and intended use. Otherwise, contact supplier for specific applications.

2 . Hazards identification

Physical state : Liquid. [Clear sparkling liquid.]

Odor : Ammoniacal.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : DANGER !

FLAMMABLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF SWALLOWED. CAN CAUSE TARGET ORGAN DAMAGE.

Flammable liquid. Toxic in contact with skin. Corrosive to eyes and skin. Causes burns. Harmful if swallowed. Keep away from heat, sparks and flame. Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Can cause target organ damage. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Skin : Corrosive to the skin. Causes burns. Toxic in contact with skin.

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

2 . Hazards identification

Eyes : Corrosive to eyes. Causes burns.

Potential chronic health effects

Chronic effects : Can cause target organ damage.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Target organs : Causes damage to the following organs: the nervous system, skin, eyes, eye, lens or cornea.
May cause damage to the following organs: lungs, cardiovascular system, immune system, central nervous system (CNS).

Over-exposure signs/symptoms

Inhalation : No specific data.

Ingestion : Adverse symptoms may include the following:
stomach pains

Skin : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Eyes : Adverse symptoms may include the following:
pain
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing skin and digestive disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

The substance is classified as dangerous according to Directive 67/548/EEC and its amendments.

Classification : F; R11
R18
Xn; R20/21/22
C; R34
Xi; R36

Physical/chemical hazards : Highly flammable. In use, may form flammable/explosive vapor-air mixture.

Human health hazards : Harmful by inhalation, in contact with skin and if swallowed. Causes burns. Irritating to eyes.

See toxicological information (section 11)

3 . Composition/information on ingredients

United States

Name	CAS number	%
hexamethyldisilazane	999-97-3	98 - 100

Europe

Substance/preparation : Substance

Biosciences Division 2202 N. Bartlett Ave. Milwaukee, WI (414) 227-3600 www.thermo.com/gen
Milwaukee Nucleic Acid Technologies 53202 (414) 227-3757 Fax

3 . Composition/information on ingredients

Ingredient name	CAS number	%	EC number	Classification	
hexamethyldisilazane	999-97-3	98 - 100	213-668-5	F; R11 R18 Xn; R20/21/22 C; R34 Xi; R36	[1]

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in section 8.

4 . First aid measures

Inhalation : Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Get medical attention immediately. Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Get medical attention immediately. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing or wear gloves.

Biosciences Division 2202 N. Bartlett Ave. Milwaukee, WI (414) 227-3600 www.thermo.com/gen
Milwaukee Nucleic Acid Technologies 53202 (414) 227-3757 Fax

4 . First aid measures

See section 11 for more detailed information on health effects and symptoms.

5 . Fire-fighting measures

Flammability of the product : Flammable liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Hazardous combustion products : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special remarks on fire hazards : Vapor may travel a considerable distance to source of ignition and flash back.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store between the following temperatures: 20 to 25°C (68 to 77°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Europe

No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Biosciences Division Milwaukee Nucleic Acid Technologies 2202 N. Bartlett Ave. Milwaukee, WI 53202 (414) 227-3600 (414) 227-3757 Fax www.thermo.com/gen

8 . Exposure controls/personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Liquid. [Clear sparkling liquid.]

Flash point : Open cup: 14°C (57.2°F)

Auto-ignition temperature : 325°C (617°F)

Flammable limits : Lower: 0.8%
Upper: 16.3%

Color : Colorless.

Odor : Ammoniacal.

Molecular weight : 161.44 g/mole

Molecular formula : $C_6H_{19}N\text{-}Si_2$

pH : >7

Boiling/condensation point : 125°C (257°F)

Relative density : 0.77

Vapor pressure : 1.8 kPa (13.8 mm Hg)

Vapor density : 4.6 [Air = 1]

Viscosity : Kinematic: 0.009 cm^2/s (0.9 cSt)

Solubility : Soluble in the following materials: diethyl ether and acetone.
Insoluble in the following materials: cold water and hot water.

Octanol/water partition coefficient : >1

10 . Stability and reactivity

Chemical stability : The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Possibility of hazardous reactions : Will not occur.

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

11 . Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
hexamethyldisilazane	LD50 Dermal	Rabbit	540 mg/kg	-
	LD50 Dermal	Rabbit	710 uL/kg	-
	LD50 Intraperitoneal	Rat	800 mg/kg	-
	LD50 Oral	Rat	850 mg/kg	-
	LC50 Inhalation Vapor	Rat	8700 mg/m3	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Chemical pneumonitis. Exposure can cause coughing, chest pains and difficulty in breathing. Causes asthma, dermatitis and pulmonary edema. Effects may be delayed. May cause convulsions.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
hexamethyldisilazane	-	-	-	None.	-	None.

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Europe

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

12 . Ecological information

Environmental effects : This product shows a low bioaccumulation potential.

United States

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Octanol/water partition coefficient : >1

Bioconcentration factor : Not available.

Other adverse effects : No known significant effects or critical hazards.

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI 53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*
DOT Classification	UN2924	Flammable liquid, corrosive, n.o.s. (hexamethyldisilazane)	3 (8)	II
IATA-DGR Class	UN2924	Flammable liquid, corrosive, n.o.s. (hexamethyldisilazane)	3 (8)	II

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Flammable liquid
Toxic material
Corrosive material
Target organ effects

U.S. Federal regulations : TSCA 8(a) PAIR: hexamethyldisilazane
United States inventory (TSCA 8b): This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 accidental release prevention: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-1B: Material causing immediate and serious toxic effects (Toxic).

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

15 . Regulatory information

Canadian lists : **CEPA Toxic substances**: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Canada inventory : **Canada inventory:** This material is listed or exempted.

EU regulations

Hazard symbol or symbols :

Highly flammable, Corrosive

Risk phrases : R11- Highly flammable.
R18- In use, may form flammable/explosive vapor-air mixture.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R34- Causes burns.
R36- Irritating to eyes.

Safety phrases : S7/8- Keep container tightly closed and dry.
S9- Keep container in a well-ventilated place.
S16- Keep away from sources of ignition - No smoking.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

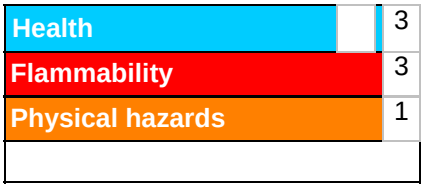
International regulations

International lists : **Australia inventory (AICS):** This material is listed or exempted.
China inventory (IECSC): This material is listed or exempted.
Korea inventory (KECI): This material is listed or exempted.
Philippines inventory (PICCS): This material is listed or exempted.
Japan inventory (ENCS): This material is listed or exempted.

16 . Other information

Label requirements : FLAMMABLE LIQUID AND VAPOR. CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN. MAY BE HARMFUL IF SWALLOWED. CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.) :

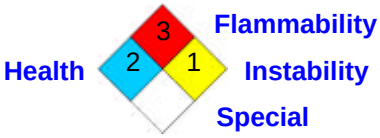


The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen

16 . Other information



Date of printing : **10/20/2009.**

Date of issue : **10/20/2009.**

Date of previous issue : **No previous validation.**

Version : **1**

Indicates information that has changed from previously issued version.

Full text of R-phrases referred to in sections 2 and 3 - Europe : R11- Highly flammable.
R18- In use, may form flammable/explosive vapor-air mixture.
R20/21/22- Harmful by inhalation, in contact with skin and if swallowed.
R34- Causes burns.
R36- Irritating to eyes.

Full text of classifications referred to in sections 2 and 3 - Europe : F - Highly flammable
C - Corrosive
Xn - Harmful
Xi - Irritant

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

Biosciences Division
Milwaukee Nucleic Acid Technologies
2202 N. Bartlett Ave.
Milwaukee, WI
53202
(414) 227-3600
(414) 227-3757 Fax
www.thermo.com/gen