

# Hexamethylcyclotrisiloxane

sc-235302

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Hexamethylcyclotrisiloxane

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY:

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### PRODUCT USE

■ Intermediate.

### SYNONYMS

C6-H18-O3-Si3, "cyclotrisiloxane, hexamethyl-"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	3		
Toxicity:	0		
Body Contact:	2		
Reactivity:	1		
Chronic:	2		

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Irritating to eyes, respiratory system and skin.  
Highly flammable.

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

■ The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.

#### EYE

■ This material can cause eye irritation and damage in some persons.

#### SKIN

- This material can cause inflammation of the skin on contact in some persons.
- The material may accentuate any pre-existing dermatitis condition.
- Skin contact is not thought to have harmful health effects, however the material may still produce health damage following entry through wounds, lesions or abrasions.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

#### INHALED

- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

#### CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

<p>

Cyclotetrasiloxanes are oestrogen-like substances which may produce reproductive effects and may be carcinogenic at high levels of exposure.

On the weight of evidence an important effect of octamethylcyclotetrasiloxane (OMCT) exposure is impaired fertility. The liver as a target organ for OMCT exposures. The critical effect level for repeated-dose toxicity via inhalation is considered to be 420 mg/m<sup>3</sup>, based not only on increased liver weights, but also on effects observed in other organs (adrenals, thymus, lungs) in a three-month rat inhalation study. Comparison of the critical effect level for repeated dose effects via inhalation (420 mg/m<sup>3</sup>) and the conservative upper-bounding exposure estimate via inhalation for OMCT results in an adequate margin of exposure. The critical effect level for repeated-dose toxicity via the oral route is considered to be 100 mg/kg-bw/day, based on decreased serum oestradiol in 7-day mouse studies and decreased body-weights and relative liver weights in foetuses in 8-day rat studies (OMCT administered to pregnant females). Comparison of the critical effect level for repeated dose effects via the oral route (100 mg/kg-bw/day) and the upper-bounding estimate of daily intake of OMCT by the general population results in an adequate margin of exposure.

Rodents given 1600 mg/kg/day of the substance over 14 days, by oral gavage, were found to have increased liver weights. An increased number of liver cells were found to be abnormal (hepatocellular hyperplasia) In inhalation studies female rodents exposed to 300 ppm for 90 days (5 day week) were found to increase liver and ovary weights. Examination of liver and ovary cells did not reveal any abnormal pathology. This result could not be reproduced in rabbits or guinea pigs. [GE Silicones]\*

In developmental toxicity studies in which rats and rabbits were exposed to 700 ppm and 500 ppm respectively, no teratogenic effects were observed. The material has the potential to affect certain reproductive parameters (decrease in implantation sites, live litter size and viability) in laboratory animals exposed to vapour concentrations of 700 ppm or greater. The significance of these findings to humans is not known. [Dow Corning]

Range finding reproductive studies were conducted (whole body inhalation, 70 days prior to mating, through mating, gestation and lactation). Rats were exposed at 70 and 700 ppm. In the 700 ppm group, there was a statistically significant reduction in mean litter size and in implantation sites. No product-related clinical signs were seen in the pups and no exposure related pathology was identified.

Interim results from a 2-generation reproductive study in rats exposed to 500 and 700 ppm product (whole body inhalation, 70 days prior to mating, gestation and lactation) produced a significant decrease in live mean litter size as well as extended periods of off-spring delivery (dystocia). These results were not seen at 70 or 300 ppm dosing levels. \*[GE Silicones].

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hexamethylcyclotrisiloxane	541-05-9	>98

## Section 4 - FIRST AID MEASURES

### SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

### SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

### INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

### NOTES TO PHYSICIAN

■ Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Not available.
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not available.

### EXTINGUISHING MEDIA

■ For SMALL FIRES:

Dry chemical, CO<sub>2</sub>, water spray or foam.

For LARGE FIRES:

Water-spray, fog or foam.

### FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.

· Wear breathing apparatus plus protective gloves.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Flammable solid which burns and propagates flame easily, even when partly wetted with water.

· Any source of ignition, i.e. friction, heat, sparks or flame, may cause fire or explosion.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), silicon dioxide (SiO<sub>2</sub>), other pyrolysis products typical of burning organic material.

### FIRE INCOMPATIBILITY

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

Respirator:

Type A-P Filter of sufficient capacity

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

· Remove all ignition sources.

· DO NOT touch or walk through spilled material.

### MAJOR SPILLS

· Clear area of personnel and move upwind.

· Alert Emergency Responders and tell them location and nature of hazard.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

· Avoid all personal contact, including inhalation.

- Wear protective clothing when risk of overexposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers.

- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

## RECOMMENDED STORAGE METHODS

- For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.

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## STORAGE REQUIREMENTS

- FOR MINOR QUANTITIES:

- Store in an indoor fireproof cabinet or in a room of noncombustible construction

- Provide adequate portable fire-extinguishers in or near the storage area.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
US ACGIH Threshold Limit Values (TLV)	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles)		3						See Appendix B current TLV/BEI Book
US ACGIH Threshold Limit Values (TLV)	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)		10						See Appendix B current TLV/BEI Book
Canada - Ontario Occupational Exposure Limits	hexamethylcyclotrisiloxane (Specified (PNOS))		3 (R)						
Canada - British Columbia Occupational Exposure Limits	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) Not Otherwise Classified (PNOC))		10 (N)						
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	hexamethylcyclotrisiloxane (Particulates Not Otherwise Classified (PNOC))		10						
US - Washington Permissible exposure limits of air contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated - Respirable fraction)		5		10				
US - Washington Permissible exposure limits of air contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated - Total particulate)		10		20				
Canada - Nova Scotia Occupational Exposure	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) [NOS] Respirable particles)		3						See Appendix B current TLV/BEI

Limits			Book
Canada - Nova Scotia Occupational Exposure Limits	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)	10	See Appendix B current TLV/BEI Book
US - California Permissible Exposure Limits for Chemical Contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated Respirable fraction)	5	(n)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated Respirable fraction)	5	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated (PNOR)(f)-Respirable fraction)	5	
US - Michigan Exposure Limits for Air Contaminants	hexamethylcyclotrisiloxane (Particulates not otherwise regulated, Respirable dust)	5	
Canada - Prince Edward Island Occupational Exposure Limits	hexamethylcyclotrisiloxane (Particles (Insoluble or Poorly Soluble) [NOS] Inhalable particles)	10	See Appendix B current TLV/BEI Book

#### ENDOELTABLE

#### PERSONAL PROTECTION



#### RESPIRATOR

Type A-P Filter of sufficient capacity  
Consult your EHS staff for recommendations

#### EYE

- Safety glasses with side shields.
- Chemical goggles.

#### HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Wear physical protective gloves, eg. leather.

#### OTHER

- Overalls.
- Eyewash unit.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

## ENGINEERING CONTROLS

- For large scale or continuous use:
  - Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems
  - Provide dust collectors with explosion vents.
  - Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
  - Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Does not mix with water.

State	DIVIDED SOLID	Molecular Weight	222.47
Melting Range (°F)	147.2- 150.8	Viscosity	Not available
Boiling Range (°F)	273.2	Solubility in water (g/L)	Immiscible
Flash Point (°F)	95	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available.	Vapour Pressure (mmHG)	Not available.
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not available.	Relative Vapor Density (air=1)	1
Volatile Component (%vol)	Not available.	Evaporation Rate	Not available

### APPEARANCE

White crystalline chunky solid; may decompose on exposure to moist air/ water.

Bioaccumulation and Bioconcentration The empirical and modelled log Kow values for OMCT suggest that this substance has the potential to bioaccumulate in the environment. Empirical data indicate that OMCT has the ability to bioconcentrate in aquatic organisms. This has been confirmed by experiment.

Material	Value
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## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

HEXAMETHYLCYCLOTRISILOXANE

### TOXICITY AND IRRITATION

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

HEXAMETHYLCYCLOTRISILOXANE:

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

No significant acute toxicological data identified in literature search.

OCTAMETHYLCYCLOTETRASILOXANE:

### TOXICITY

### IRRITATION

Oral (rat) LD50: 1540 mg/kg Skin (rabbit): 500 mg/24h - Mild

Inhalation (rat) LC50: 36000 mg/m<sup>3</sup>/4H Eye (rabbit): 500 mg/24h - Mild

Inhalation (rat) TClO: 700 ppm/6H/4W-I

Dermal (rabbit) LD50: 794 uL/kg

■ The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
hexamethylcyclotrisiloxane	HIGH		LOW	MED
octamethylcyclotetrasiloxane	HIGH		HIGH	LOW

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: G Hazard class or Division: 4.1

Identification Numbers: UN1325 PG: II

Label Codes: 4.1 Special provisions: A1, IB8,

IP2, IP4,

T3, TP33

Packaging: Exceptions: 151 Packaging: Non- bulk: 212

Packaging: Exceptions: 151 Quantity limitations: 15 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 50 kg Vessel stowage: Location: B aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Flammable solids, organic, n.o.s.

### Air Transport IATA:

ICAO/IATA Class: 4.1 ICAO/IATA Subrisk: None

UN/ID Number: 1325 Packing Group: II

Special provisions: A3

Cargo Only

Packing Instructions: 417 Maximum Qty/Pack: 50 kg

Passenger and Cargo Passenger and Cargo  
Packing Instructions: 415 Maximum Qty/Pack: 15 kg  
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity  
Packing Instructions: Y415 Maximum Qty/Pack: 5 kg  
Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S. \*(CONTAINS  
HEXAMETHYLCYCLOTRISILOXANE)

**Maritime Transport IMDG:**

IMDG Class: 4.1 IMDG Subrisk: None  
UN Number: 1325 Packing Group: II  
EMS Number: F-A , S-G Special provisions: 274 915  
Limited Quantities: 1 kg  
Shipping Name: FLAMMABLE SOLID, ORGANIC, N.O.S.

## Section 15 - REGULATORY INFORMATION

**hexamethylcyclotrisiloxane (CAS: 541-05-9) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Program Chemical List", "US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants", "US Toxic Substances Control Act (TSCA) - Inventory", "US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List", "US TSCA Section 8 (d) - Health and Safety Data Reporting"

**Regulations for ingredients**

**octamethylcyclotetrasiloxane (CAS: 556-67-2) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO Provisional Categorization of Liquid Substances - List 1: Pure or technically pure products", "International Chemical Secretariat (ChemSec) REACH SIN\* List (\*Substitute It Now!) 1.0", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US - Maine Chemicals of High Concern List", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US EPA High Production Volume Program Chemical List", "US EPA Master Testing List - Index I Chemicals Listed", "US Spacecraft Maximum Allowable Concentrations (SMACs) for Airborne Contaminants", "US Toxic Substances Control Act (TSCA) - Inventory", "US TSCA Section 4 - Chemicals Subject to Testing Consent Orders", "US TSCA Section 4/12 (b) - Sunset Date/Status", "US TSCA Section 8 (a) - Preliminary Assessment Information Rules (PAIR) - Reporting List", "US TSCA Section 8 (d) - Health and Safety Data Reporting"

## Section 16 - OTHER INFORMATION

**ND**

Substance CAS Suggested codes hexamethylcyclotrisiloxane 541- 05- 9 octamethylcyclotetrasiloxane 556- 67- 2

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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