

Safety Data Sheet

Version 7.0
Revision Date 12/08/2016

SDS Number 300000005261
Print Date 12/16/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Hexanes, Mixture of Isomers

Synonyms : Hexanes, Hexanes, anhydrous;Hexane mixture of isomers

Product Use Description : Semiconductor Processing

Manufacturer/Importer/Distributor : Versum Materials US, LLC
8555 South River Parkway
Tempe, AZ 85284
Exporter EIN No.475632014
www.versummaterials.com

Telephone : (602)282-1000

Emergency telephone number (24h) : 800-523-9374 USA
+1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

Flammable liquids - Category 2
Skin irritation - Category 2
Eye irritation - Category 2A
Reproductive toxicity - Category 2
Specific target organ toxicity - single exposure - Category 3
Specific target organ toxicity - repeated exposure - Inhalation Category 2
Aspiration hazard - Category 1

GHS label elements

Hazard pictograms/symbols



Signal Word: Danger

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Hazard Statements:

- H225:Highly flammable liquid and vapour.
- H304:May be fatal if swallowed and enters airways.
- H315:Causes skin irritation.
- H319:Causes serious eye irritation.
- H336:May cause drowsiness or dizziness.
- H361:Suspected of damaging fertility or the unborn child.
- H373c:May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary Statements:

- | | | |
|------------|---|--|
| Prevention | : | P201:Obtain special instructions before use.
P202:Do not handle until all safety precautions have been read and understood.
P210:Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
P233:Keep container tightly closed.
P240:Ground/Bond container and receiving equipment.
P241:Use explosion-proof electrical/ventilating/lighting/equipment.
P242:Use only non-sparking tools.
P243:Take precautionary measures against static discharge.
P260:Do not breathe dust/fume/gas/mist/vapours/spray.
P264:Wash hands thoroughly after handling.
P271:Use only outdoors or in a well-ventilated area
P280a:Wear protective gloves and eye/face protection.
P281:Use personal protective equipment as required. |
| Response | : | P301+P310 :IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303+P361+P353 :IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 :IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 :IF exposed or concerned: Get medical advice/attention.
P331 :Do NOT induce vomiting.
P332+P313 :If skin irritation occurs: Get medical advice/attention.
P337+P313 :If eye irritation persists: Get medical advice/attention.
P362 :Take off contaminated clothing and wash before re use.
P370+P378 :In case of fire, use recommended extinguishing media for extinction. |
| Storage | : | P403+P233:Store in a well-ventilated place. Keep container tightly closed.
P403+P235:Store in a well-ventilated place. Keep cool.
P405:Store locked up. |
| Disposal | : | P501:Disposal of contents/container to be specified in accordance with regulations. |

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Hazards not otherwise classified

Keep away from heat and sources of ignition.
Components of the product may affect the nervous system.
Flammable.
Mild skin irritant.
Mild eye irritant.
Mild respiratory tract irritant.
May be fatal if inhaled in high concentrations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
Hexane	110-54-3	< 65 %
Methylcyclopentane	96-37-7	> 10%
3-Methylpentane	96-14-0	< 5 %
2-Methylpentane	107-83-5	< 5 %

Concentration is nominal. For the exact product composition, please refer to technical specifications. Contains no other components or impurities which will influence the classification of the product.

4. FIRST AID MEASURES

- General advice : Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
- Eye contact : Rinse immediately with plenty of water also under the eyelids for at least 20 minutes. Remove contact lenses.
- Skin contact : Wash off immediately with plenty of water for at least 20 minutes. Wash off with soap and water. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay.
- Ingestion : If a person vomits when lying on his back, place him in the recovery position. Do not induce vomiting. Prevent aspiration of vomit. Turn victim's head to the side.
- Inhalation : If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Move to fresh air.
- Most important symptoms/effects - acute and delayed : Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Blurred vision. Headache. Nausea. Anorexia. Cold pulsation in extremities. Depression. Loss of appetite. Swelling of the abdomen. Weight loss. Anemia. Nervous system disorders (such as narcosis, behavioral changes or decrease in motor function).

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5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Alcohol-resistant foam.
Carbon dioxide (CO₂).
Dry chemical.
Dry sand.
Limestone powder.
- Specific hazards : Fire or intense heat may cause violent rupture of packages. May form explosive mixtures in air. Downwind personnel must be evacuated. Burning produces noxious and toxic fumes. In the event of fire, cool tanks with water spray . Hexanes can float on water; therefore, contaminated water can spread the flammable liquid and can spread fire.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

- Personal Precautions, Protective Equipment, and Emergency Procedures : Use self-contained breathing apparatus and chemically protective clothing. Wear suitable protective clothing, gloves and eye/face protection. Remove all sources of ignition. Evacuate personnel to safe areas.
- Environmental precautions : Shut off or remove all ignition sources. Construct a dike to prevent spreading.
- Methods for cleaning up : Approach suspected leak areas with caution. Call Emergency Response number for advice. Absorb with inert absorbent materials such as: Dry sand. Vermiculite. Activated charcoal. Place in appropriate chemical waste container.
- Additional advice : Open enclosed spaces to outside atmosphere. If possible, stop flow of product.

7. HANDLING AND STORAGE

Handling

See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid breathing vapors and/or aerosols. Avoid contact with eyes. Use only in well-ventilated areas. Use personal protective equipment. When using, do not eat, drink or smoke.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from heat and sources of ignition. Keep in a dry, cool place. Keep away from oxidizers.

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Technical measures/Precautions

Keep away from open flames, hot surfaces and sources of ignition.

Storage Temperature : 32 - 104 °F (0 - 40 °C)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Use explosion-proof equipment.

Provide readily accessible eye wash stations and safety showers.

Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Personal protective equipment

Respiratory protection : Wear appropriate respirator when ventilation is inadequate. Wear a NIOSH/MSHA approved full-face respirator with organic vapor cartridges when the airborne concentration of hexanes is less than 50 ppm.

Hand protection : Viton gloves.
Nitrile rubber.
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.

Eye protection : Chemical safety glasses.

Skin and body protection : Long sleeve shirts and trousers without cuffs.

Environmental exposure controls : Shut off or remove all ignition sources. Construct a dike to prevent spreading.

Special instructions for protection and hygiene : Provide readily accessible eye wash stations and safety showers. Wash hands at the end of each workshift and before eating, smoking or using the toilet.
Provide readily accessible eye wash stations and safety showers.

Exposure limit(s)

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Hexane	Time Weighted Average (TWA): ACGIH	50 ppm	-
Hexane	Recommended exposure limit (REL): NIOSH	50 ppm	180 mg/m3
Hexane	Permissible exposure limit: OSHA Z1	500 ppm	1,800 mg/m3
Hexane	Time Weighted Average (TWA): OSHA Z1A	50 ppm	180 mg/m3
Hexane	Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL	50 ppm	180 mg/m3
Hexane	Time Weighted Average (TWA): TN OEL	50 ppm	180 mg/m3
3-Methylpentane	Time Weighted Average (TWA): ACGIH	500 ppm	-
3-Methylpentane	Short Term Exposure Limit (STEL): ACGIH	1,000 ppm	-
3-Methylpentane	Recommended exposure limit (REL): NIOSH	100 ppm	350 mg/m3
3-Methylpentane	Ceiling Limit Value and Time Period (if specified): NIOSH	510 ppm	1,800 mg/m3
3-Methylpentane	Time Weighted Average (TWA): OSHA Z1A	500 ppm	1,800 mg/m3
3-Methylpentane	Short Term Exposure Limit (STEL): OSHA Z1A	1,000 ppm	3,600 mg/m3
3-Methylpentane	Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL	500 ppm	1,800 mg/m3
3-Methylpentane	Short Term Exposure Limit (STEL): US CA OEL	1,000 ppm	3,600 mg/m3
3-Methylpentane	Time Weighted Average (TWA): ACGIH	500 ppm	-
3-Methylpentane	Short Term Exposure Limit (STEL): ACGIH	1,000 ppm	-
3-Methylpentane	Time Weighted Average (TWA): TN OEL	500 ppm	1,800 mg/m3
3-Methylpentane	Short Term Exposure Limit (STEL): TN OEL	1,000 ppm	3,600 mg/m3
2-Methylpentane	Time Weighted Average (TWA): ACGIH	500 ppm	-
2-Methylpentane	Short Term Exposure Limit (STEL): ACGIH	1,000 ppm	-
2-Methylpentane	Recommended exposure limit (REL): NIOSH	100 ppm	350 mg/m3
2-Methylpentane	Ceiling Limit Value and Time Period (if specified): NIOSH	510 ppm	1,800 mg/m3
2-Methylpentane	Time Weighted Average (TWA): OSHA Z1A	500 ppm	1,800 mg/m3
2-Methylpentane	Short Term Exposure Limit (STEL): OSHA Z1A	1,000 ppm	3,600 mg/m3
2-Methylpentane	Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL	500 ppm	1,800 mg/m3
2-Methylpentane	Short Term Exposure Limit (STEL): US CA OEL	1,000 ppm	3,600 mg/m3
2-Methylpentane	Time Weighted Average (TWA): ACGIH	500 ppm	-
2-Methylpentane	Short Term Exposure Limit (STEL): ACGIH	1,000 ppm	-
2-Methylpentane	Time Weighted Average (TWA): TN OEL	500 ppm	1,800 mg/m3
2-Methylpentane	Short Term Exposure Limit (STEL): TN OEL	1,000 ppm	3,600 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid. Colorless.

Odor : Hydrocarbon-like.

Odor threshold : No data available.

pH : No data available.

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Melting point/range	: -245 - 212 °F (-154 - 100 °C)
Boiling point/range	: 154 - 158 °F (68 - 70 °C)
Flash point	: -9 °F (-23 °C)
Evaporation rate	: No data available.
Flammability (solid, gas)	: Not applicable.
Upper/lower explosion/flammability limit	: 7.7 %(V) / 1.2 %(V)
Vapor pressure	: No data available.
Water solubility	: Insoluble.
Relative vapor density	: Not applicable.
Relative density	: 0.672 (water = 1)
Partition coefficient (n-octanol/water)	: No data available.
Auto-ignition temperature	: > 240 °C
Decomposition temperature	: No data available.
Viscosity	: No data available.
Molecular Weight	: No data available.

10. STABILITY AND REACTIVITY

Chemical Stability	: Stable under normal conditions.
Conditions to avoid	: Heat, flames and sparks.
Materials to avoid	: Oxidizing agents.
Hazardous decomposition products	: Hazardous combustion products: Carbon dioxide (CO ₂). Carbon monoxide.
Possibility of hazardous Reactions/Reactivity	: No data available.

11. TOXICOLOGICAL INFORMATION

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11.1. Information on toxicological effects

Likely routes of exposure

- Effects on Eye : Contact with eyes may cause irritation.
- Effects on Skin : If absorbed through the skin, may cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Mild skin irritation.
- Inhalation Effects : May cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. May cause nose, throat, and lung irritation. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system.
- Ingestion Effects : May cause central nervous system effects, such as headache, nausea, vomiting, abdominal pain, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed - can enter lungs and cause damage.
- Symptoms : Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Blurred vision. Headache. Nausea. Anorexia. Cold pulsation in extremities. Depression. Loss of appetite. Swelling of the abdomen. Weight loss. Anemia. Nervous system disorders (such as narcosis, behavioral changes or decrease in motor function).

Acute toxicity

- Acute Oral Toxicity : LD50 : 28,710 mg/kg Species : Rat. Ingestion of large volumes of hexanes can be harmful or fatal.
- Inhalation : LC50 : Harmful by inhalation. Inhalation of high concentrations of the vapors can be fatal.
- Acute Dermal Toxicity : No data is available on the product itself.
- Skin corrosion/irritation : Mild skin irritation.
- Serious eye damage/eye irritation : Mild eye irritation.
- Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

- Carcinogenicity : No data available.
- Reproductive toxicity : No data is available on the product itself.

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Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : May cause drowsiness or dizziness.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : May be fatal if swallowed and enters airways.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. Muscular dysfunction., Chronic inhalation of concentrations of 500 ppm hexanes vapors or higher can affect the nerves in the arms and legs., Eyes and Vision: Abnormal color perception and pigment changes in the eyes have been reported among in workers exposed to 423-1280ppm for 5 years. Nervous system disorders (such as narcosis, behavioral changes or decrease in motor function).

May cause damage to organs through prolonged or repeated exposure., Central nervous system. Chronic inhalation of hexanes vapors can result in abnormal color perception and pigment changes in the eyes., Additionally, long-term exposure can affect the nerves in the arms and legs.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish - Components
Hexane

LC50 (96 h) : 2.5 mg/l

Species : Fathead minnow (Pimephales promelas).

Toxicity to other organisms : No data available.

Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : No data available.

Bioaccumulation : Bioconcentration in aquatic organisms is low.

Further information

n-Hexane has a photo-oxidation reaction half-life of 2.4-24 hours, in air, based on a reaction rate constant.

13. DISPOSAL CONSIDERATIONS

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Waste from residues / unused products : Contact supplier if guidance is required.

Contaminated packaging : Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. TRANSPORT INFORMATION

DOT

UN/ID No. : UN1208
Proper shipping name : Hexanes
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : Yes

** NOTE: This product contains a substance that is regulated as a Marine Pollutant when transported in bulk packages (liquid – volume exceeding 450 liters, gas – water capacity exceeding 454 kilograms).

IATA

UN/ID No. : UN1208
Proper shipping name : Hexanes
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : Yes

** NOTE: This product contains a substance that: 1) is regulated as a Marine Pollutant, or 2) meets the definition of toxic to the aquatic environment.

IMDG

UN/ID No. : UN1208
Proper shipping name : HEXANES
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : Yes

** NOTE: This product contains a substance that: 1) is regulated as a Marine Pollutant, or 2) meets the definition of toxic to the aquatic environment.

TDG

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UN/ID No. : UN1208
Proper shipping name : HEXANES
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : Yes

** NOTE: This product contains a substance that: 1) is regulated as a Marine Pollutant, or 2) meets the definition of toxic to the aquatic environment.

Further Information

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Not on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification

Acute Health Hazard Fire Hazard.

Chronic Health Hazard

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

16. OTHER INFORMATION

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NFPA Rating

Health : 2
Fire : 3
Instability : 0

HMIS Rating

Health : 2
Flammability : 3
Physical hazard : 0

Prepared by : Versum Materials, Product Regulatory Department

Telephone : (602)282-1000

Preparation Date : 12/16/2017

For additional information, please visit Versum Materials' Product Stewardship web site.
<http://www.versummaterials.com/productstewardship/>
