

SAFETY DATA SHEET

1. Identification

Product identifier: HEXANES

Other means of identification

Product No.: 9306, N169, 9367, 9357, 9309, 9277

Recommended use and restriction on use

Recommended use: Not available.

Restrictions on use: Not known.

Details of the supplier of the safety data sheet

Manufacturer

Company Name: Avantor Performance Materials, Inc.
Address: 3477 Corporate Parkway, Suite 200
Center Valley, PA 18034

Telephone: Customer Service: 855-282-6867

Fax: 610-573-2610
Contact Person: Environmental Health & Safety
E-mail: info@avantormaterials.com

Emergency telephone number:

CHEMTREC: 1-800-424-9300 within US and Canada

CHEMTREC: 1-703-527-3887 outside US and Canada

2. Hazard(s) identification

Hazard Classification

Physical Hazards

Flammable liquids Category 2

Health Hazards

Skin Corrosion/Irritation Category 2

Serious Eye Damage/Eye Irritation Category 2B

Toxic to reproduction Category 2

Specific Target Organ Toxicity -
Single Exposure Category 3

Specific Target Organ Toxicity -
Repeated Exposure (Dermal) Category 1

Aspiration Hazard Category 1

Environmental Hazards

Acute hazards to the aquatic
environment Category 2

Chronic hazards to the aquatic
environment Category 2

Label Elements

Hazard Symbol:



Signal Word: Danger

Hazard Statement: Highly flammable liquid and vapor.
Causes skin irritation.
Causes eye irritation.
Suspected of damaging fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Toxic to aquatic life with long lasting effects.

Precautionary Statement

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment.

Response: In case of fire: Use water spray, foam, dry powder or carbon dioxide for extinction. IF exposed or concerned: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting. Collect spillage.

Storage: Store in a well-ventilated place. Keep container tightly closed. Store in a dry place. Store locked up.

Disposal: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in GHS classification: Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
PENTANE		109-66-0	<3%
3-METHYLPENTANE		96-14-0	1 - 2.5%
METHYLCYCLOPENTANE		96-37-7	1 - 2.5%
2-METHYLPENTANE		107-83-5	1 - 2.5%
HEXANE		110-54-3	90 - 100%

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

General information:	Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.
Ingestion:	Call a physician or poison control center immediately. Do NOT induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Inhalation:	Move to fresh air. Get medical attention if symptoms persist. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration.
Skin Contact:	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Eye contact:	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention if irritation persists after washing.

Most important symptoms/effects, acute and delayed

Symptoms: Irritating to eyes, respiratory system and skin. Narcotic effect. May be fatal if swallowed.

Indication of immediate medical attention and special treatment needed

Treatment: Symptoms may be delayed. Treat symptomatically.

5. Fire-fighting measures

General Fire Hazards: Flammable liquid and vapor. Fire may produce irritating, corrosive and/or toxic gases.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Heat may cause the containers to explode.

Special protective equipment and precautions for firefighters

Special fire fighting procedures: Move container from fire area if it can be done without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. See Section 8 of the SDS for Personal Protective Equipment. Keep unauthorized personnel away. Keep upwind. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Methods and material for containment and cleaning up: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

Notification Procedures: Inform authorities if large amounts are involved.

Environmental Precautions: Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling: DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Use personal protective equipment as required. Wash hands thoroughly after handling. Use only with adequate ventilation. Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Avoid contact with eyes, skin, and clothing.

Conditions for safe storage, including any incompatibilities: Keep away from food, drink and animal feeding stuffs. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Chemical Identity	type	Exposure Limit Values	Source
HEXANE	TWA	50 ppm	US. ACGIH Threshold Limit Values (2011)
	REL	50 ppm 180 mg/m ³	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	500 ppm 1,800 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
PENTANE	TWA	50 ppm 180 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	Ceil_Time	610 ppm 1,800 mg/m ³	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	REL	120 ppm 350 mg/m ³	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	1,000 ppm 2,950 mg/m ³	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	600 ppm 1,800 mg/m ³	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

	STEL	750 ppm 2,250 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	1,000 ppm	US. ACGIH Threshold Limit Values (02 2014)
3-METHYLPENTANE	STEL	1,000 ppm	US. ACGIH Threshold Limit Values (02 2012)
	TWA	500 ppm	US. ACGIH Threshold Limit Values (02 2012)
	Ceil_Time	510 ppm 1,800 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	REL	100 ppm 350 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	STEL	1,000 ppm 3,600 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	500 ppm 1,800 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
2-METHYLPENTANE	STEL	1,000 ppm	US. ACGIH Threshold Limit Values (02 2012)
	TWA	500 ppm	US. ACGIH Threshold Limit Values (02 2012)
	Ceil_Time	510 ppm 1,800 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	REL	100 ppm 350 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	STEL	1,000 ppm 3,600 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)
	TWA	500 ppm 1,800 mg/m3	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

Biological Limit Values

Chemical Identity	Exposure Limit Values	Source
HEXANE (2,5-Hexanedion, without hydrolysis: Sampling time: End of shift at end of work week.)	0.4 mg/l (Urine)	ACGIH BEL (03 2013)

Appropriate Engineering Controls

No data available.

Individual protection measures, such as personal protective equipment

General information: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. An eye wash and safety shower must be available in the immediate work area. Use explosion-proof ventilation equipment.

Eye/face protection: Wear safety glasses with side shields (or goggles) and a face shield.

Skin Protection

Hand Protection: Chemical resistant gloves

Other: Wear suitable protective clothing.

Respiratory Protection: In case of inadequate ventilation use suitable respirator. Chemical respirator with organic vapor cartridge and full facepiece.

Hygiene measures: Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing to remove contaminants. Discard contaminated footwear that cannot be cleaned.

9. Physical and chemical properties

Appearance

Physical state: liquid

Form: liquid

Color:	Colorless
Odor:	Slight
Odor threshold:	No data available.
pH:	No data available.
Melting point/freezing point:	-95 °C
Initial boiling point and boiling range:	68 °C
Flash Point:	-23 °C (Pensky-Martens Closed Cup)
Evaporation rate:	9 (butyl acetate=1)
Flammability (solid, gas):	No data available.
Upper/lower limit on flammability or explosive limits	
Flammability limit - upper (%):	7.7 %(V) (Hexane)
Flammability limit - lower (%):	1.2 %(V) (Hexane)
Explosive limit - upper (%):	No data available.
Explosive limit - lower (%):	No data available.
Vapor pressure:	20.2 kPa
Vapor density:	3 AIR=1
Relative density:	0.66 (20 °C)
Solubility(ies)	
Solubility in water:	Insoluble in water
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	No data available.
Auto-ignition temperature:	224 °C (Hexane)
Decomposition temperature:	No data available.
Viscosity:	No data available.

10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical Stability:	Material is stable under normal conditions.
Possibility of hazardous reactions:	Hazardous polymerization does not occur.
Conditions to avoid:	Heat, sparks, flames.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decomposition Products:	Thermal decomposition may release oxides of carbon.

11. Toxicological information

Information on likely routes of exposure

Ingestion:	Irritating. May cause nausea, stomach pain and vomiting.
Inhalation:	May cause irritation to the respiratory system. May cause drowsiness or dizziness.
Skin Contact:	Causes skin irritation.
Eye contact:	Causes eye irritation.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: No data available.
Specified substance(s):
 HEXANE LD 50 (Rat): 15,800 mg/kg

Dermal

Product: No data available.

Inhalation

Product: No data available.
Specified substance(s):
 PENTANE LC 50 (Rat, 4 h): 364 mg/l
Specified substance(s):
 HEXANE LC 50 (Rat, 4 h): < 48000 ppm
 LC 50 (Mouse, 4 h): 48000 ppm

Repeated dose toxicity

Product: No data available.

Skin Corrosion/Irritation

Product: Causes skin irritation.

Serious Eye Damage/Eye Irritation

Product: Causes eye irritation.

Respiratory or Skin Sensitization

Product: Not a skin sensitizer.

Carcinogenicity

Product: This substance has no evidence of carcinogenic properties.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

No carcinogenic components identified

US. National Toxicology Program (NTP) Report on Carcinogens:

No carcinogenic components identified

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: No mutagenic components identified

In vivo

Product: No mutagenic components identified

Reproductive toxicity

Product: Suspected of damaging fertility or the unborn child.

Specific Target Organ Toxicity - Single Exposure

Product: Respiratory tract irritation. Narcotic effect.

Specific Target Organ Toxicity - Repeated Exposure

Product: Dermal Inhalation - vapor: Central nervous system. Peripheral nervous system

Aspiration Hazard

Product: May be fatal if swallowed and enters airways.

Other effects: None known.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: No data available.

Specified substance(s):

HEXANE LC 50 (Fathead minnow (*Pimephales promelas*), 96 h): 2.101 - 2.981 mg/l Mortality
LC 50 (Carp (*Leuciscus idus melanotus*), 48 h): 210 mg/l Mortality

Aquatic Invertebrates

Product: No data available.

Specified substance(s):

HEXANE EC 50 (Brine shrimp (*Artemia salina*), 24 h): 1.36 - 1.66 mg/l Intoxication
LC 50 (Water flea (*Daphnia magna*), 24 h): > 50 mg/l Mortality
LC 50 (Water flea (*Daphnia magna*), 24 h): > 50 mg/l Mortality

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Aquatic Invertebrates

Product: No data available.

Toxicity to Aquatic Plants

Product: No data available.

Persistence and Degradability

Biodegradation

Product: The product is not expected to be biodegradable.

BOD/COD Ratio

Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: Bioaccumulation is unlikely to be significant because of the low water solubility of this product.

Partition Coefficient n-octanol / water (log Kow)

Product: No data available.

Specified substance(s):

PENTANE Log Kow: 3.39

3-METHYLPENTANE Log Kow: 3.60

METHYLCYCLOPENTANE Log Kow: 3.37

2-METHYLPENTANE Log Kow: 3.74

HEXANE Log Kow: 3.90

Mobility in Soil: The product is insoluble in water and will spread on the water surface.

Other Adverse Effects: Toxic to aquatic life with long lasting effects.

13. Disposal considerations

Disposal instructions: Discharge, treatment, or disposal may be subject to national, state, or local laws. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container.

Contaminated Packaging: Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN Number:	UN 1208
UN Proper Shipping Name:	Hexanes
Transport Hazard Class(es)	
Class(es):	3
Label(s):	3
Packing Group:	II
Marine Pollutant:	Yes
Special precautions for user:	—

IMDG

UN Number:	UN 1208
UN Proper Shipping Name:	HEXANES
Transport Hazard Class(es)	
Class(es):	3
Label(s):	3
EmS No.:	F-E, S-D
Packing Group:	II
Marine Pollutant:	Yes
Special precautions for user:	—

IATA

UN Number:	UN 1208
Proper Shipping Name:	Hexanes
Transport Hazard Class(es):	
Class(es):	3
Label(s):	3
Marine Pollutant:	Yes
Packing Group:	II
Special precautions for user:	—

15. Regulatory information

US Federal Regulations

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
 None present or none present in regulated quantities.

CERCLA Hazardous Substance List (40 CFR 302.4):

<u>Chemical Identity</u>	<u>Reportable quantity</u>
HEXANE	5000 lbs.
PENTANE	100 lbs.
3-METHYLPENTANE	100 lbs.
METHYLCYCLOPENTANE	100 lbs.
2-METHYLPENTANE	100 lbs.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Acute (Immediate)
Chronic (Delayed)
Fire

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.

SARA 304 Emergency Release Notification

<u>Chemical Identity</u>	<u>Reportable quantity</u>
HEXANE	5000 lbs.
PENTANE	100 lbs.
3-METHYLPENTANE	100 lbs.
METHYLCYCLOPENTANE	100 lbs.
2-METHYLPENTANE	100 lbs.

SARA 311/312 Hazardous Chemical

<u>Chemical Identity</u>	<u>Threshold Planning Quantity</u>
HEXANE	10000 lbs
PENTANE	10000 lbs
3-METHYLPENTANE	10000 lbs
METHYLCYCLOPENTANE	10000 lbs
E	
2-METHYLPENTANE	10000 lbs

SARA 313 (TRI Reporting)

<u>Chemical Identity</u>	<u>Reporting threshold for other users</u>	<u>Reporting threshold for manufacturing and processing</u>
HEXANE	10000 lbs	25000 lbs.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

<u>Chemical Identity</u>	<u>Reportable quantity</u>
PENTANE	10000 lbs

US State Regulations

US. California Proposition 65

No ingredient regulated by CA Prop 65 present.

US. New Jersey Worker and Community Right-to-Know Act

<u>Chemical Identity</u>
HEXANE
PENTANE
METHYLCYCLOPENTANE
2-METHYLPENTANE

US. Massachusetts RTK - Substance List

Chemical Identity

HEXANE
PENTANE
3-METHYLPENTANE
METHYLCYCLOPENTANE
2-METHYLPENTANE

US. Pennsylvania RTK - Hazardous Substances

Chemical Identity

HEXANE
PENTANE
3-METHYLPENTANE
METHYLCYCLOPENTANE
2-METHYLPENTANE

US. Rhode Island RTK

Chemical Identity

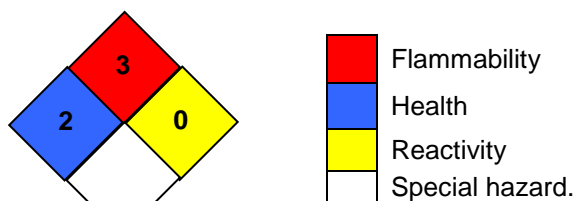
HEXANE
PENTANE
METHYLCYCLOPENTANE

Inventory Status:

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EU EINECS List:	On or in compliance with the inventory
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	Not in compliance with the inventory.
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Switzerland Consolidated Inventory:	Not in compliance with the inventory.
Japan ISHL Listing:	On or in compliance with the inventory
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

16. Other information, including date of preparation or last revision

NFPA Hazard ID



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe; RNP - Rating not possible

Issue Date: 11-17-2015
Revision Date: No data available.
Version #: 1.1

Further Information: No data available.

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