

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Octane

Chemical formula : C₈H₁₈

Synonyms : OCTANE ANHYDROUS, n-Octane;

Product Use Description : Semiconductor Processing

Manufacturer/Importer/Distributor : Versum Materials US, LLC
7201 Hamilton Blvd.
Allentown, PA 18195-1501
Exporter EIN No.475632014
www.versummaterials.com

Telephone : (610)481-4911

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
Specific target organ toxicity - single exposure - Category 3
Aspiration hazard - Category 1

GHS label elements

Hazard pictograms/symbols



Signal Word: Danger

Hazard Statements:

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

H225:Highly flammable liquid and vapour.
H304:May be fatal if swallowed and enters airways.
H315:Causes skin irritation.
H336:May cause drowsiness or dizziness.

Precautionary Statements:

Prevention	: 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. P261:Avoid breathing dust/fume/gas/mist/vapours/spray. P264:Wash hands thoroughly after handling. P271:Use only outdoors or in a well-ventilated area P273:Avoid release to the environment. P280a:Wear protective gloves and eye/face protection.
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. P312 :Call a POISON CENTRE/doctor if you feel unwell. P331 :Do NOT induce vomiting. P332+P313 :If skin irritation occurs: 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. P391 :Collect spillage.
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.

Hazards not otherwise classified

Keep away from heat and sources of ignition.
Components of the product may affect the nervous system.
Flammable.
Irritating to eyes.
Moderate respiratory irritant.
Moderate skin irritant.
Vapors may explode if ignited in an enclosed area .

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
N-Octane	111-65-9	> 99%

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. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay.
Ingestion	: Never give anything by mouth to an unconscious person. If a person vomits when lying on his back, place him in the recovery position. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration of material into the lungs. Call a physician or Poison Control Centre immediately. 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. Neurological disorders Eye disease. Asthma. Skin disorders and Allergies.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical. Dry sand. Limestone powder.
Specific hazards	: Incomplete combustion may form carbon monoxide. Burning produces noxious and toxic fumes. In the event of fire, cool tanks with water spray. Fire or intense heat may cause violent rupture of packages. Flash back possible over considerable distance. May form explosive mixtures in air. A hydrocarbon in this product can float on water; therefore, contaminated water can spread the

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

flammable liquid and can spread fire.

Special protective equipment for fire-fighters : Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

Further information : Water fog or spray can be used to disperse the Octane vapors and to protect personnel.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures : Wear suitable protective clothing, gloves and eye/face protection. Use self-contained breathing apparatus and chemically protective clothing. 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 : Call Emergency Response number for advice. Approach suspected leak areas with caution. Absorb with inert absorbent materials such as: Dry sand. Vermiculite. Activated charcoal. Place in appropriate chemical waste container.

Additional advice : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. If possible, stop flow of product.

7. HANDLING AND STORAGE

Handling

Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Use only in well-ventilated areas. Avoid contact with eyes. Avoid breathing vapors and/or aerosols. See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA. 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.

Technical measures/Precautions

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

Storage Temperature : 5 - 104 °F (-15 - 40 °C)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Use explosion-proof equipment.

Apply process controls to ensure safe operating conditions. Assess potential flammability hazards based on

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

flashpoint and potential ignition sources.

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 supplied air respirator when exposure is possible.
- Hand protection : Polyvinyl Alcohol Gloves (PVA).
Impervious gloves.
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.
Chemical resistant goggles must be worn.
- Skin and body protection : Long sleeve shirts and trousers without cuffs.
- Environmental exposure controls : Shut off or remove all ignition sources.
- Special instructions for protection and hygiene : 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)

N-Octane	Recommended exposure limit (REL): NIOSH	75 ppm	350 mg/m3
N-Octane	Ceiling Limit Value and Time Period (if specified): NIOSH	385 ppm	1,800 mg/m3
N-Octane	Permissible exposure limit: OSHA Z1	500 ppm	2,350 mg/m3
N-Octane	Time Weighted Average (TWA): OSHA Z1A	300 ppm	1,450 mg/m3
N-Octane	Short Term Exposure Limit (STEL): OSHA Z1A	375 ppm	1,800 mg/m3
N-Octane	Time Weighted Average (TWA): ACGIH	300 ppm	-
N-Octane	Time Weighted Average (TWA): ACGIH	300 ppm	-
N-Octane	Time Weighted Average (TWA): TN OEL	300 ppm	1,450 mg/m3
N-Octane	Short Term Exposure Limit (STEL): TN OEL	375 ppm	1,800 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid. Colorless.

Odor : Hydrocarbon-like.

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

Odor threshold	: No data available.
pH	: No data available.
Melting point/range	: -71 °F (-57 °C)
Boiling point/range	: 259 °F (126 °C)
Flash point	: 55 °F (13 °C)
Evaporation rate	: No data available.
Flammability (solid, gas)	: Not applicable.
Upper/lower explosion/flammability limit	: 6.5 %(V) / 1 %(V)
Vapor pressure	: 11.05 mmHg at 68 °F (20 °C)
Water solubility	: 0.001 g/l Insoluble.
Relative vapor density	: Not applicable.
Relative density	: 0.7 (water = 1)
Partition coefficient (n-octanol/water)	: No data available.
Auto-ignition temperature	: 220 °C
Decomposition temperature	: No data available.
Viscosity	: No data available.
Molecular Weight	: 114.22 g/mol

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	: Carbon monoxide. Carbon dioxide (CO ₂).
Possibility of hazardous	: No data available.

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

Reactions/Reactivity

11. TOXICOLOGICAL INFORMATION

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. Causes 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 | : Aspiration hazard if swallowed - can enter lungs and cause damage. Aspiration of this material into the lungs can cause severe lung irritation and tissue damage, which can result in the development of chemical pneumonia or pulmonary edema (which are potentially fatal conditions). If swallowed, symptoms can include nausea, swelling of the abdomen, headache, and depression. |
| Symptoms | : Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat. Neurological disorders, Eye disease., Asthma., Skin disorders and Allergies. |

Acute toxicity

- | | |
|-----------------------------------|---|
| Acute Oral Toxicity | : LD50 : 5,360 mg/kg Species : (Rat) Aspiration into lungs after ingestion can cause chemical pneumonitis or pulmonary edema. |
| Inhalation | : LC50 (4 h) : 118000 ppm Species : Rat. LC50 (4 h) : 13500 ppm Species : Mouse. LC50 (4 h) : 28438 ppm Species : Rat. |
| Acute Dermal Toxicity | : No data is available on the product itself. |
| Skin corrosion/irritation | : Skin irritation. |
| Serious eye damage/eye irritation | : Eye irritation. |
| Sensitization. | : No data available. |

Chronic toxicity or effects from long term exposures

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

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Carcinogenicity	: No data available.
Reproductive toxicity	: No data is available on the product itself.
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. Neurological disorders, Eye disease., Asthma., Skin disorders and Allergies.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity	: EC50 (48 h) : 0.3 mg/l Species : Daphnia magna.
Toxicity to other organisms	: No data available.

Persistence and degradability

Biodegradability	: Readily biodegradable
Mobility	: No data available.
Bioaccumulation	: Log Kow = 5.18. Water Solubility = 0.66 mg/L. Estimated Bioconcentration Factor = 2.89 and 3.71. This material may bioaccumulate to some extent.

13. DISPOSAL CONSIDERATIONS

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.

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

14. TRANSPORT INFORMATION

DOT

UN/ID No. : UN1262
Proper shipping name : Octanes
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. : UN1262
Proper shipping name : Octanes
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. : UN1262
Proper shipping name : OCTANES
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

UN/ID No. : UN1262
Proper shipping name : OCTANES
Class or Division : 3
Packing group : II
Label(s) : 3
Marine Pollutant : Yes

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

Print Date 03/04/2017

** 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	Included 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

NFPA Rating

Health : 1
Fire : 3
Instability : 0

HMIS Rating

10/11

Safety Data Sheet

Version 4.0

Revision Date 12/08/2016

SDS Number 300000005272

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Health : 1
Flammability : 3
Physical hazard : 0

Prepared by : Versum Materials, Product Regulatory Department

Telephone : (610)481-4911

Preparation Date : 03/04/2017

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