



SAFETY DATA SHEET

1. Identification

| | | |
|---|--|-----------------------|
| Product identifier | CYCLOHEXANE, VERITAS® ULTIMATE | |
| Other means of identification | | |
| Product code | 5564 | |
| Synonyms | HEXAHYDROBENZENE | |
| Recommended use | solvent technical function of substance professional, scientific and technical activities: other professional, scientific and technical activities | |
| Recommended restrictions | None known. | |
| Manufacturer/Importer/Supplier/Distributor information | | |
| Manufacturer | | |
| Company name | GFS Chemicals, Inc. | |
| Address | P.O. Box 245 Powell, OH 43065 United States | |
| Telephone | Phone | 740-881-5501 |
| | Toll Free | 800-858-9682 |
| | Fax | 740-881-5989 |
| Website | www.gfschemicals.com | |
| E-mail | service@gfschemicals.com | |
| Emergency phone number | Emergency Assistance | Chemtrec 800-424-9300 |

2. Hazard(s) identification

| | | |
|------------------------------|--|-----------------------------|
| Physical hazards | Flammable liquids | Category 2 |
| Health hazards | Skin corrosion/irritation | Category 2 |
| | Specific target organ toxicity, single exposure | Category 3 narcotic effects |
| | Aspiration hazard | Category 1 |
| Environmental hazards | Hazardous to the aquatic environment, acute hazard | Category 1 |
| | Hazardous to the aquatic environment, long-term hazard | Category 1 |
| OSHA defined hazards | Not classified. | |

Label elements



| | |
|--------------------------------|---|
| Signal word | Danger |
| Hazard statement | Highly flammable liquid and vapor. May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. |
| Precautionary statement | |
| Prevention | Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Avoid breathing mist or vapor. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/eye protection/face protection. |
| Response | If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. Do NOT induce vomiting. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. Collect spillage. |
| Storage | Keep cool. Store in a well-ventilated place. Keep container tightly closed. 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. |

Hazard(s) not otherwise classified (HNOC)

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.

Supplemental information

None.

3. Composition/information on ingredients

Substances

| Chemical name | Common name and synonyms | CAS number | % |
|-----------------------------------|--------------------------|------------|-----|
| CYCLOHEXANE, VERITAS® ULTIMATE | HEXAHYDROBENZENE | 110-82-7 | 100 |

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation

Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact

Rinse skin with water/shower. Take off contaminated clothing and wash before reuse. Get medical attention if irritation develops and persists.

Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

Ingestion

Call a physician or poison control center immediately. Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed

May cause drowsiness and dizziness. Headache. Nausea, vomiting. Aspiration may cause pulmonary edema and pneumonitis. Irritation of eyes and mucous membranes. Skin irritation. May cause redness and pain.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information

Take off all contaminated clothing immediately. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Water fog. Foam. Carbon dioxide (CO₂). Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

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 form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly grounded containers. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Wear SCBA. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions

In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards

Highly flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Transfer by mechanical means such as vacuum truck to a salvage tank or other suitable container for recovery or safe disposal. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Refer to attached safety data sheets and/or instructions for use. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. The product is immiscible with water and will spread on the water surface. This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water. Should not be released into the environment. Prevent entry into waterways, sewers, basements or confined areas.

Large Spills: Stop leak if you can do so without risk. Move the cylinder to a safe and open area if the leak is irreparable. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent entry into waterways, sewer, basements or confined areas. Clean up in accordance with all applicable regulations. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste. For waste disposal, see section 13 of the SDS.

Never return spills in original containers for re-use.

Environmental precautions

Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. Use appropriate containment to avoid environmental contamination.

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. When using do not smoke. Explosion-proof general and local exhaust ventilation. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

For additional information on equipment bonding and grounding, refer to the Canadian Electrical Code in Canada, (CSA C22.1), or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" or National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity" or National Fire Protection Association (NFPA) 70, "National Electrical Code".

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

| Material | Type | Value |
|--|------|------------------------|
| CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) | PEL | 1050 mg/m ³ |
| | | 300 ppm |

US. ACGIH Threshold Limit Values

| Material | Type | Value |
|--|------|---------|
| CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) | TWA | 100 ppm |

| Material | Type | Value |
|---|---|---------------------------|
| CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) | TWA | 1050 mg/m3 300 ppm |
| Biological limit values | No biological exposure limits noted for the ingredient(s). | |
| Appropriate engineering controls | Explosion-proof general and local exhaust ventilation. 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. Eye wash facilities and emergency shower must be available when handling this product. | |
| Individual protection measures, such as personal protective equipment | | |
| Eye/face protection | Wear safety glasses with side shields (or goggles). | |
| Skin protection | | |
| Hand protection | Wear appropriate chemical resistant gloves. Rubber gloves. | |
| Other | Wear appropriate chemical resistant clothing. | |
| Respiratory protection | In case of insufficient ventilation wear suitable respiratory equipment. Chemical respirator with organic vapor cartridge and full facepiece. | |
| Thermal hazards | Wear appropriate thermal protective clothing, when necessary. | |
| General hygiene considerations | When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. | |

9. Physical and chemical properties

| | |
|---|---------------------------------|
| Appearance | Clear. |
| Physical state | Liquid. |
| Form | Liquid. |
| Color | Colorless. |
| Odor | Strong characteristic odor. |
| Odor threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | 43.65 °F (6.47 °C) |
| Initial boiling point and boiling range | 177.26 °F (80.7 °C) 101.325 kPa |
| Flash point | -0.4 °F (-18.0 °C) Closed Cup |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not available. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | 1.3 % |
| Flammability limit - upper (%) | 8.4 % |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | 12.92 kPa at 25 °C |
| Vapor density | 2.98 |
| Relative density | Not available. |
| Solubility(ies) | |
| Solubility (water) | Insoluble |
| Partition coefficient (n-octanol/water) | 3.4 |
| Auto-ignition temperature | 473 °F (245 °C) |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |

Other information

| | |
|---------------------|-----------------------------------|
| Density | 0.778 g/cm ³ at 20 °C |
| Dynamic viscosity | 0.98 mPa.s |
| Flammability class | Flammable IB estimated |
| Flash point class | Flammable IB |
| Kinematic viscosity | 1.26 mm ² /s estimated |
| Molecular formula | C ₆ -H ₁₂ |
| Molecular weight | 84.16 g/mol |
| Percent volatile | 100 % |
| Specific gravity | 0.78 at 20 °C |
| VOC (Weight %) | 100 % |

10. Stability and reactivity

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|------------------------------------|--|
| Reactivity | The product is stable and non-reactive under normal conditions of use, storage and transport. |
| Chemical stability | Stable at normal conditions. No hazardous self-reactivity. Risk of explosion under certain conditions. |
| Possibility of hazardous reactions | Hazardous polymerization does not occur. |
| Conditions to avoid | Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials. |
| Incompatible materials | Oxidizing materials. |
| Hazardous decomposition products | No hazardous decomposition products are known. |

11. Toxicological information

Information on likely routes of exposure

| | |
|--------------|--|
| Inhalation | May cause drowsiness and dizziness. Headache. Nausea, vomiting. Prolonged inhalation may be harmful. |
| Skin contact | Causes skin irritation. |
| Eye contact | Direct contact with eyes may cause temporary irritation. |
| Ingestion | Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. |

| | |
|--|---|
| Symptoms related to the physical, chemical and toxicological characteristics | May cause drowsiness and dizziness. Headache. Nausea, vomiting. Aspiration may cause pulmonary edema and pneumonitis. Irritation of eyes and mucous membranes. Skin irritation. May cause redness and pain. |
|--|---|

Information on toxicological effects

| | |
|----------------|---|
| Acute toxicity | May be fatal if swallowed and enters airways. Narcotic effects. |
|----------------|---|

| Product | Species | Test Results |
|---|---------|---|
| CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) | | |
| Acute | | |
| <i>Inhalation</i> | | |
| NOEL | Monkey | 1243 mg/l, 6 Hours 1243 ppm, 6 Hours |
| <i>Oral</i> | | |
| LD50 | Mouse | 1300 mg/kg |
| | Rat | 29820 mg/kg 12705 mg/kg |

* Estimates for product may be based on additional component data not shown.

| | |
|--|---|
| Skin corrosion/irritation | Causes skin irritation. |
| Serious eye damage/eye irritation | Direct contact with eyes may cause temporary irritation. |
| Respiratory or skin sensitization | |
| Respiratory sensitization | Not available. |
| Skin sensitization | This product is not expected to cause skin sensitization. |
| Germ cell mutagenicity | Mutagenic effects have been investigated. |
| Carcinogenicity | This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. |

| | |
|---|--|
| Reproductive toxicity | This product is not expected to cause reproductive or developmental effects. |
| Specific target organ toxicity - single exposure | May cause drowsiness and dizziness. |
| Specific target organ toxicity - repeated exposure | Not classified. |
| Aspiration hazard | May be fatal if swallowed and enters airways. |
| Chronic effects | Prolonged inhalation may be harmful. |

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects.

| Product | Species | Test Results |
|---|---------|---|
| CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) | | |
| Aquatic | | |
| Fish | LC50 | Fathead minnow (Pimephales promelas) 23.03 - 42.07 mg/l, 96 hours |

* Estimates for product may be based on additional component data not shown.

Persistence and degradability None known.

Bioaccumulative potential Not available.

Partition coefficient n-octanol / water (log Kow)
3.44

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

US RCRA Hazardous Waste U List: Reference

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) U056

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

| | |
|-------------------------------------|---|
| UN number | UN1145 |
| UN proper shipping name | Cyclohexane, MARINE POLLUTANT |
| Transport hazard class(es) | |
| Class | 3 |
| Subsidiary risk | - |
| Label(s) | 3 |
| Packing group | II |
| Environmental hazards | |
| Marine pollutant | Yes |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Special provisions | IB2, T4, TP1 |
| Packaging exceptions | 150 |
| Packaging non bulk | 202 |
| Packaging bulk | 242 |

IATA

| | |
|--------------------------------|-------------|
| UN number | UN1145 |
| UN proper shipping name | Cyclohexane |

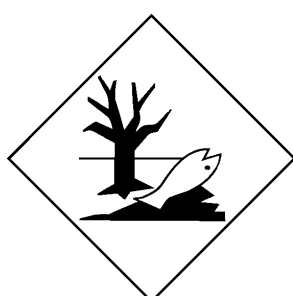
Transport hazard class(es)

| | |
|-------------------------------------|---|
| Class | 3 |
| Subsidiary risk | - |
| Packing group | II |
| Environmental hazards | No. |
| ERG Code | 3H |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Other information | |
| Passenger and cargo aircraft | Allowed. |
| Cargo aircraft only | Allowed. |

IMDG

| | |
|-------------------------------------|---|
| UN number | UN1145 |
| UN proper shipping name | CYCLOHEXANE, MARINE POLLUTANT |
| Transport hazard class(es) | |
| Class | 3 |
| Subsidiary risk | - |
| Packing group | II |
| Environmental hazards | |
| Marine pollutant | Yes |
| EmS | F-E, S-D |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

DOT**IATA; IMDG****Marine pollutant**

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7) Listed.

SARA 304 Emergency release notification

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes

Delayed Hazard - No

Fire Hazard - Yes

Pressure Hazard - No

Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312

Yes

Hazardous chemical

SARA 313 (TRI reporting)

| Chemical name | CAS number | % by wt. |
|--------------------------------|------------|----------|
| CYCLOHEXANE, VERITAS® ULTIMATE | 110-82-7 | 100 |

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

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

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)

Hazardous substance

Safe Drinking Water Act (SDWA)

Not regulated.

US state regulations

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Massachusetts RTK - Substance List

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7)

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

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7)

US. Pennsylvania Worker and Community Right-to-Know Law

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7)

US. Rhode Island RTK

CYCLOHEXANE, VERITAS® ULTIMATE (CAS 110-82-7)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|----------------------|--|------------------------|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | Yes |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | Yes |

Material name: CYCLOHEXANE, VERITAS® ULTIMATE

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Version #: 01

Revision date: Issue date: May-12-2015

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| Country(s) or region | Inventory name | On inventory (yes/no)* |
|--|---|------------------------|
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |
| *A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s) A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s). | | |

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

| | |
|----------------------|--|
| Issue date | May-12-2015 |
| Version # | 01 |
| Disclaimer | GFS Chemicals cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. |
| Revision Information | Product and Company Identification: Product and Company Identification |