

SAFETY DATA SHEET

GHS
United States

Section 1. Product and company identification

| | | |
|-----------------------|--|--|
| Product name | VANLINK® 1 | In case of emergency |
| Code | 50372 | 1-203-853-1400 |
| Supplier/Manufacturer | Vanderbilt Chemicals, LLC 30 Winfield Street Norwalk, CT 06855 | Chemtrec: 1-800-424-9300 Outside US: +1-703-527-3887 |
| Chemical name | (6-aminohexyl)carbamic acid | |
| Synonym | Carbamic acid, N-(6-aminohexyl)- | |
| Material uses | Co-Agent | |
| Product type | Powder. | |

Section 2. Hazards identification

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture FLAMMABLE SOLIDS - Category 2
EYE IRRITATION - Category 2A

[GHS label elements](#)

Hazard pictograms



Signal word

Warning

Hazard statements

Flammable solid.
Causes serious eye irritation.

[Precautionary statements](#)

Prevention

Wear protective gloves. Wear protective clothing: Recommended: lab coat. Wear eye or face protection: Recommended: safety glasses with side-shields.. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Wash thoroughly after handling.

Response

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 or attention.

Storage

Not applicable.

Disposal

Not applicable.

Hazards not otherwise classified

None known.

Section 3. Composition/information on ingredients

Substance/mixture

Substance

| Ingredient name | CAS number | % by weight |
|-----------------------------|------------|-------------|
| (6-aminohexyl)carbamic acid | 143-06-6 | ≥99.5 |

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact

Causes serious eye irritation.

Inhalation

Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

Skin contact

No known significant effects or critical hazards.

Ingestion

No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact

Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation

Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact

No specific data.

Ingestion

No specific data.

Section 4. First aid measures

Indication of immediate medical attention and special treatment needed, if necessary

| | |
|----------------------------|--|
| Notes to physician | In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. |
| Specific treatments | No specific treatment. |
| Protection of first-aiders | No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. |

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

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| Suitable extinguishing media | Extinguishing media suitable for Class A fires. |
| Unsuitable extinguishing media | Do not use water jet. |

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| Specific hazards arising from the chemical | Flammable solid. May form explosible dust-air mixture if dispersed. |
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| Hazardous thermal decomposition products | Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides |
|--|---|

| | |
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| Special protective actions for fire-fighters | Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. |
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| Special protective equipment for fire-fighters | Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. |
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Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

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| For non-emergency personnel | No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. |
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|--------------------------|---|
| For emergency responders | If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". |
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|---------------------------|---|
| Environmental precautions | Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). |
|---------------------------|---|

Methods and materials for containment and cleaning up

Section 6. Accidental release measures

Small spill

Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill

Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. May form explosible dust-air mixture if dispersed. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store between the following temperatures: 15 to 30°C (59 to 86°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls

Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 8. Exposure controls/personal protection

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. If operating conditions cause high dust concentrations to be produced, use dust goggles. Recommended: safety glasses with side-shields.

Skin protection

Hand protection

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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Recommended: lab coat

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Personal protective equipment (Pictograms)



Section 9. Physical and chemical properties

Appearance

Physical state

Solid. [Powder.]

Color

White.

Odor

Ammonia.

Odor threshold

Not available.

pH

9.9 [Conc. (% w/w): 1%]

Melting point

159.19°C (318.5°F)

Section 9. Physical and chemical properties

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|--|------------------------------------|
| Boiling point | 159.19°C (318.5°F) |
| Flash point | Not available. |
| Burning time | Not available. |
| Burning rate | Not available. |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Flammable solid. [EU Method A.10.] |
| Lower and upper explosive (flammable) limits | Not applicable. |
| Vapor pressure | 0.00989 Pa (25°C) |
| Vapor density | Not applicable. |
| Density | Not available. |
| Relative density | 1.284 |
| Solubility | Not available. |
| Solubility in water | 128.65 g/l |
| Partition coefficient: n-octanol/water | 2.36 |
| Auto-ignition temperature | 410°C (770°F) |
| Decomposition temperature | 159.19°C (318.5°F) |
| SADT | Not available. |
| Viscosity | Not available. |

Section 10. Stability and reactivity

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|------------------------------------|---|
| Reactivity | No specific test data related to reactivity available for this product or its ingredients. |
| Chemical stability | The product is stable. |
| Possibility of hazardous reactions | Under normal conditions of storage and use, hazardous reactions will not occur. |
| Conditions to avoid | Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Prevent dust accumulation. |
| Incompatible materials | Reactive or incompatible with the following materials: oxidizing materials acids |
| Hazardous decomposition products | Following thermal decomposition, 1,6-hexanediamine and ammonia may be released. |

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|-----------------------------|-----------|---------|------------|----------|
| (6-aminohexyl)carbamic acid | LD50 Oral | Rat | 2875 mg/kg | - |

Irritation/Corrosion

Not available.

Conclusion/Summary

Skin

(6-aminohexyl)carbamic acid: Non-irritating to the skin. (Reconstructed Human Epidermis Test Method)

Eyes

(6-aminohexyl)carbamic acid: Causes eye irritation. (Bovine Corneal Opacity and Permeability Test Method)

Sensitization

| Product/ingredient name | Route of exposure | Species | Result |
|-----------------------------|-------------------|---------|-----------------|
| (6-aminohexyl)carbamic acid | skin | Mouse | Not sensitizing |

Mutagenicity

| Product/ingredient name | Test | Experiment | Result |
|-----------------------------|----------|---|----------|
| (6-aminohexyl)carbamic acid | OECD 471 | Experiment: In vitro Subject: Bacteria | Negative |
| | OECD 490 | Experiment: In vitro Subject: Mammalian-Animal | Negative |
| | OECD 487 | Experiment: In vitro Subject: Mammalian-Human | Negative |

Carcinogenicity

Not available.

Conclusion/Summary

(6-aminohexyl)carbamic acid: Not classifiable as a human carcinogen.

Reproductive toxicity

Not available.

Conclusion/Summary

(6-aminohexyl)carbamic acid:
NOAEL (oral, rat, reproductive effects) = 50 mg/kg bw/day [OECD 422]
NOAEL (oral, rat, developmental effects) ~ 1000 mg/kg bw/day [OECD 422]

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Section 11. Toxicological information

Aspiration hazard

Not available.

Information on the likely routes of exposure

Not available.

Potential acute health effects

Eye contact

Causes serious eye irritation.

Inhalation

Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

Skin contact

No known significant effects or critical hazards.

Ingestion

May be harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation

Adverse symptoms may include the following:
respiratory tract irritation
coughing

Skin contact

No specific data.

Ingestion

No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Long term exposure

Potential immediate effects

Not available.

Potential delayed effects

Not available.

Potential chronic health effects

Not available.

General

Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Carcinogenicity

No known significant effects or critical hazards.

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Developmental effects

No known significant effects or critical hazards.

Fertility effects

No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 11. Toxicological information

| Route | ATE value |
|-------|------------|
| Oral | 2875 mg/kg |

Other information

Not available.

Section 12. Ecological information

Toxicity

| Product/ingredient name | Result | Species | Exposure |
|-----------------------------|--|--|---|
| (6-aminohexyl)carbamic acid | Acute EC50 >100 mg/l Acute EC50 16.2 mg/l Acute LC50 >15.7 mg/l Acute LC50 902 mg/l | Algae Daphnia Fish Micro-organism | 72 hours 48 hours 96 hours 3 hours |

Persistence and degradability

| Product/ingredient name | Test | Result | Dose | Inoculum |
|-----------------------------|-----------|--------------------------|------|----------|
| (6-aminohexyl)carbamic acid | OECD 301F | 84 % - Readily - 28 days | - | - |

| Product/ingredient name | Aquatic half-life | Photolysis | Biodegradability |
|-----------------------------|-------------------|------------|------------------|
| (6-aminohexyl)carbamic acid | - | - | Readily |

Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|-------------------------|--------------------|-----|-----------|
| VANLINK® 1 | 2.36 | - | low |

Mobility in soil

Soil/water partition coefficient (K_{oc})

Not available.

Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations






Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 13. Disposal considerations

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14. Transport information

| Regulatory information | UN number | Proper shipping name | Classes | PG* | Label | Additional information |
|---------------------------|-----------|--|---------|-----|--|------------------------|
| DOT Classification | UN1325 | FLAMMABLE SOLID, ORGANIC, N.O.S. (6-aminohexyl) carbamic acid) | 4.1 | III |  | - |
| TDG Classification | UN1325 | FLAMMABLE SOLID, ORGANIC, N.O.S. (6-aminohexyl) carbamic acid) | 4.1 | III |  | - |
| ADR/RID Class | UN1325 | FLAMMABLE SOLID, ORGANIC, N.O.S. (6-aminohexyl) carbamic acid) | 4.1 | III |  | - |
| IMDG Class | UN1325 | FLAMMABLE SOLID, ORGANIC, N.O.S. (6-aminohexyl) carbamic acid) | 4.1 | III |  | - |
| IATA-DGR Class | UN1325 | FLAMMABLE SOLID, ORGANIC, N.O.S. (6-aminohexyl) carbamic acid) | 4.1 | III |  | - |

PG* : Packing group

Section 15. Regulatory information

[United States Inventory \(TSCA 8b\)](#) All components are active or exempted.

[U.S. Federal regulations](#)

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

[SARA 302/304](#)

[Composition/information on ingredients](#)

No products were found.

[SARA 304 RQ](#)

Not applicable.

[SARA 311/312](#)

[Classification](#)

FLAMMABLE SOLIDS - Category 2

EYE IRRITATION - Category 2A

[Composition/information on ingredients](#)

| Name | % | Classification |
|-----------------------------|-------|---|
| (6-aminohexyl)carbamic acid | ≥99.5 | FLAMMABLE SOLIDS - Category 2 EYE IRRITATION - Category 2A |

[State regulations](#)

[Massachusetts](#)

None of the components are listed.

Section 15. Regulatory information

| | |
|---|--|
| New York | None of the components are listed. |
| New Jersey | None of the components are listed. |
| Pennsylvania | None of the components are listed. |
| California Prop. 65 | None of the components are listed. |
| International regulations | |
| Australia Inventory (AIIC) | All components are listed or exempted. |
| Canada Inventory | All components are listed or exempted. |
| China Inventory (IECSC) | All components are listed or exempted. |
| Europe inventory | All components are listed or exempted. |
| Japan Inventory (CSCL) | All components are listed or exempted. |
| Korea inventory (KECI) | All components are listed or exempted. |
| New Zealand Inventory of Chemicals (NZIoC) | All components are listed or exempted. |
| Philippines Inventory (PICCS) | All components are listed or exempted. |
| Taiwan Chemical Substances Inventory (TCSI) | All components are listed or exempted. |

Section 16. Other information

[Hazardous Material Identification System \(U.S.A.\)](#)

| | |
|------------------|---|
| Health | 2 |
| Flammability | 2 |
| Physical hazards | 0 |
| | |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

[National Fire Protection Association \(U.S.A.\)](#)



Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

[History](#)

Section 16. Other information

Date of printing 10/24/2022

Validation date 10/24/2022

Date of previous issue 2/9/2022

Version 4

Key to abbreviations

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References Not available.

Information contact **Vanderbilt Global Services, LLC**
Corporate Risk Management
1-203-295-2143

Visit www.vanderbiltchemicals.com for more information.

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