

1. Identification

Product identifier VAPAM[®] HL Soil Fumigant

Other means of identification

SDS number 141

Product registration number 29128

Synonyms Metam sodium * Metam * VAPAM

Recommended use Soil Fumigant.

Recommended restrictions This is a Restricted Use Pesticide and is for use by licensed applicators only.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name AMVAC Chemical Corporation

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Suite 1200
Newport Beach, CA 92660
United States

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AMVAC Chemical Corp 949-260-6270(FAX)
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(USA+Canada)
CHEMTREC[®] (Outside USA) +1-703-527-3887

Supplier Not available.

2. Hazard identification

Physical hazards Corrosive to metals Category 1

Health hazards Acute toxicity, oral Category 4
Acute toxicity, inhalation Category 4
Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2B
Sensitization, skin Category 1

Environmental hazards Hazardous to the aquatic environment, acute hazard Category 1
Hazardous to the aquatic environment, long-term hazard Category 1

Label elements



Signal word Warning

Hazard statement May be corrosive to metals.
Harmful if swallowed.
Harmful if inhaled.
Causes skin irritation.
Causes eye irritation.
May cause an allergic skin reaction.
Very toxic to aquatic life.
Very toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention

Keep only in original packaging.
Use only outdoors or in a well-ventilated area.
Wear protective gloves.
Avoid breathing mist/vapors.
Avoid release to the environment.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Contaminated work clothing should not be allowed out of the workplace.

Response

IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
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.
Absorb spillage to prevent material-damage.

Storage

Store in a corrosion resistant container with a resistant inner liner.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

None known.

Supplemental information

This is a pesticide product registered in Canada under the Pest Control Products Act and is subject to certain labeling requirements. These requirements differ from the classification criteria and hazard information required for GHS compliant safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced in section 15. The pesticide label also includes other important information, including directions for use.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
Sodium Methylthiocarbamate	Metam Sodium Metam	137-42-8	42

Composition comments

All concentrations are in percent by weight.

4. First-aid measures

Inhalation

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. Administer oxygen or artificial respiration if needed. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. Wash contaminated clothing before reuse.

Eye contact

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

Ingestion

Call a physician or poison control center immediately.
Rinse mouth.
Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
Never give anything by mouth to a victim who is unconscious or is having convulsions.

Most important symptoms/effects, acute and delayed

Overexposure to Metam Sodium as sold may result in damage to the skin, skin irritation, excessive salivation, sweating, fatigue, weakness, nausea, headache, dizziness, eye, nose, throat and respiratory tract irritation. In addition, dilution to use levels results in the release of methyl isothiocyanate (MITC) and/or hydrogen sulfide. Overexposure to MITC may result in strong skin and eye irritation, running nose, dizziness, cramps, nausea, vomiting, and mild to severe disturbances of the nervous system. Overexposure to hydrogen sulfide may result in severe irritation to the eyes and mucous membranes. In addition, exposure may result in headache, dizziness, excitement, staggering gait, diarrhea, difficult or painful urination, difficult breathing, chronic pulmonary edema, coma and death.

Chronic exposure may also cause conjunctivitis, photophobia, digestive disturbances, weight loss, general bodily weakness, and blurred vision. In addition, laboratory studies have shown that exposure to the active ingredient, followed by ingestion of alcohol, may cause an adverse reaction, including low blood pressure, rapid heartbeat, and flushing of the skin. Consumption of alcohol during and after exposure to this product should be avoided.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed. Contact your local or State Poison control Center for further information.

General information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media

Material reacts with water. Dilution with water may cause generation of flammable and toxic fumes of MITC and Hydrogen sulfide. See Chemical Stability information in Section 10.

Specific hazards arising from the chemical

Material reacts with water. This product can release toxic fumes of methyl isothiocyanate (MITC) and hydrogen sulfide, as well as nitrogen oxides, when heated to decomposition or diluted with water. Fire may produce irritating, corrosive and/or toxic gases.

Special protective equipment and precautions for firefighters

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

Firefighting equipment/instructions

Evacuate the area promptly. 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

No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas. Siphon the majority of the liquid into drums for use or disposal, depending on the circumstances. Clean the area as described for a small spill.

Small Spills: Absorb spillage with non-combustible, absorbent material. Scoop up used absorbent into drums or other appropriate container. Scrub the area with detergent and water. Rinse with water. Pick up wash liquid with additional absorbent and place in a disposable container.

Never return spills to original containers for reuse.

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. Contact local authorities in case of spillage to drain/aquatic environment.

7. Handling and storage

Precautions for safe handling

Read label before use. Keep out of the reach of children. Keep away from food, drink and animal feedstuffs. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. When using, do not eat, drink or smoke. Use only outdoors or in a well-ventilated area. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse.

Conditions for safe storage, including any incompatibilities

Keep away from food, drink and animal feedstuffs. Store in a cool, dry place out of direct sunlight. Store in corrosive resistant container with a resistant inner liner. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

**US. ACGIH Threshold Limit Values
Decomposition**

	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	STEL	5 ppm
	TWA	1 ppm

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)
Decomposition**

	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	Ceiling	21 mg/m3

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Decomposition	Type	Value
		15 ppm
	TWA	14 mg/m ³
		10 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Decomposition	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	Ceiling	10 ppm

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Decomposition	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	STEL	5 ppm
	TWA	1 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Decomposition	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	STEL	15 ppm
	TWA	10 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety)

Decomposition	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	STEL	21 mg/m ³
		15 ppm
	TWA	14 mg/m ³
		10 ppm

Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)

Decomposition	Type	Value
Hydrogen sulfide (CAS 7783-06-4)	15 minute	15 ppm
	8 hour	10 ppm

Biological limit values	No biological exposure limits noted for the ingredient(s).
Exposure guidelines	No exposure standards allocated.
Appropriate engineering controls	Mechanical ventilation or local exhaust ventilation may be required. Eye wash facilities and emergency shower must be available when handling this product.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Safety glasses with side shields or tight fitting chemical goggles should be used whenever hazardous chemicals are being handled. A full face respirator should be worn whenever there is a chance of splashing or misting.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear appropriate chemical resistant clothing (see label).
Respiratory protection	For exposures that may exceed the TLV, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G) is required. A full-face respirator or a SCBA may be required if misting or splashing are possible.
Thermal hazards	Not applicable.
General hygiene considerations	When using, do not eat, drink or smoke. Do not get this material on clothing. Wash hands after handling. Keep away from food and drink. 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance

Physical state	Liquid.
Form	Liquid.
Color	Light yellow-green

Odor Essentially odorless to fairly strong odor of amine or sulfur.

Odor threshold Not available.

pH 9.5 - 11

Melting point/freezing point 32 °F (0 °C)

Initial boiling point and boiling range 233.6 °F (112 °C)

Flash point > 200 °F (> 93.3 °C) Closed Cup

Evaporation rate 1 (compared to water)

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) Not available.

Flammability limit - upper (%) Not available.

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure 24 mm Hg (77 °F (25 °C))

Vapor density Not available.

Relative density 1.21 at 20 °C/4 °C (68 °F/39 °F)

Solubility(ies)

Solubility (water) Miscible.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not available.

Other information

Bulk density 10.07 lb/gal

Molecular formula C₂H₄N₂S₂Na

Molecular weight 129.18 g/mol

10. Stability and reactivity

Reactivity May be corrosive to metals.

Chemical stability Material is stable under normal conditions.

Metam Sodium decomposes, when diluted with water, to methyl isothiocyanate (MITC, a lachrymator and moderate poison) and/or to hydrogen sulfide (a highly poisonous gas). Use the solution promptly after mixing. Do not allow the solution to stand.

Metam Sodium can also decompose to carbon disulfide and monomethylamine (both highly flammable) if contacted with a strong acid.

Possibility of hazardous reactions Hazardous polymerization does not occur.

Conditions to avoid Contact with incompatible materials. Contact with water liberates flammable gas.

Incompatible materials This product is incompatible with additional water and strong aqueous acids. In addition, it is corrosive to copper, brass, and zinc, and may soften and/or discolor iron.

Hazardous decomposition products When treated with water or heated to decomposition, this product will give off toxic fumes of methyl isothiocyanate (MITC), hydrogen sulfide, and nitrogen oxides. If treated with strong acids, fumes of carbon disulfide and monomethylamine will be given off.

11. Toxicological information

Information on likely routes of exposure

Inhalation Harmful if inhaled.

Skin contact Causes skin irritation. May cause an allergic skin reaction.

Eye contact	Causes eye irritation.
Ingestion	Harmful if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	<p>Overexposure to Metam Sodium as sold may result in damage to the skin, skin irritation, excessive salivation, sweating, fatigue, weakness, nausea, headache, dizziness, eye, nose, throat and respiratory tract irritation. In addition, dilution to use levels results in the release of methyl isothiocyanate (MITC) and/or hydrogen sulfide. Overexposure to MITC may result in strong skin and eye irritation, running nose, dizziness, cramps, nausea, vomiting, and mild to severe disturbances of the nervous system. Overexposure to hydrogen sulfide may result in severe irritation to the eyes and mucous membranes. In addition, exposure may result in headache, dizziness, excitement, staggering gait, diarrhea, difficult or painful urination, difficult breathing, chronic pulmonary edema, coma and death.</p> <p>Chronic exposure may also cause conjunctivitis, photophobia, digestive disturbances, weight loss, general bodily weakness, and blurred vision. In addition, laboratory studies have shown that exposure to the active ingredient, followed by ingestion of alcohol, may cause an adverse reaction, including low blood pressure, rapid heart beat, and flushing of the skin. Consumption of alcohol during and after exposure to this product should be avoided.</p> <p>Impaired pulmonary function and preexisting eye problems may be aggravated. Preexisting skin diseases may also be aggravated by exposure to the decomposition products.</p>

Information on toxicological effects

Acute toxicity Harmful if swallowed. Harmful if inhaled.

Product	Species	Test Results
VAPAM® HL Soil Fumigant		
Acute		
Dermal		
LD50	Rabbit	> 2020 mg/kg
Inhalation		
<i>Mist</i>		
LC50	Rat	2.28 mg/l, 4 h
Oral		
LD50	Rat	812 mg/kg
Decomposition	Species	Test Results

Methyl isothiocyanate (MITC) (CAS 556-61-6)

Acute		
Dermal		
LD50	Rabbit	33 mg/kg
Inhalation		
LC50	Rat	1.9 mg/l, 1 h
Oral		
LD50	Rat	175 mg/kg

Skin corrosion/irritation Causes skin irritation.

Irritation Corrosion - Skin

VAPAM® HL Soil Fumigant

Result: Moderate Irritant
Species: Rabbit

Serious eye damage/eye irritation Causes eye irritation.

Irritation Corrosion - Eye

VAPAM® HL Soil Fumigant

Result: Mild Irritant
Species: Rabbit

Respiratory or skin sensitization

Respiratory sensitization Based on available data, the classification criteria are not met.

Skin sensitization May cause an allergic skin reaction.

Skin sensitization

VAPAM® HL Soil Fumigant

Result: Sensitizer
Species: Guinea pig

Germ cell mutagenicity No evidence of mutagenicity "in vivo", but some evidence has been observed "in vitro", in mutagenicity animal testing.

Carcinogenicity Limited evidence of a carcinogenic effect.

Reproductive toxicity	This product has shown some developmental effects but has not shown any reproductive effects in laboratory animals.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not classified.
Chronic effects	Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects. This product is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Decomposition	Species	Test Results
Hydrogen sulfide (CAS 7783-06-4)		
Aquatic		
<i>Acute</i>		
Crustacea	EC50	Scud (Gammarus pseudolimnaeus) 0.062 mg/l, 2 days
Fish	LC50	Fathead minnow (Pimephales promelas) 0.007 mg/l, 96 hours
Methyl isothiocyanate (MITC) (CAS 556-61-6)		
Aquatic		
<i>Acute</i>		
Crustacea	LC50	Water flea (Daphnia magna) 0.18 - 0.56 mg/l, 48 hours 0.032 - 0.1 mg/l, 14 days

Persistence and degradability Product decomposes rapidly in wet environments.

Bioaccumulative potential Decomposes rapidly - will not bioaccumulate.

Partition coefficient n-octanol / water (log Kow)

Sodium Methylidithiocarbamate < 1

Mobility in soil This product decomposes when diluted with water and the decomposition products will leach from the soil.

Other adverse effects None known.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site according to all applicable regulations. 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 all applicable 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.

Waste from residues / unused products Dispose of in accordance with all applicable 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 methods/information). Avoid discharge into water courses or onto the ground.

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

14. Transport information

TDG

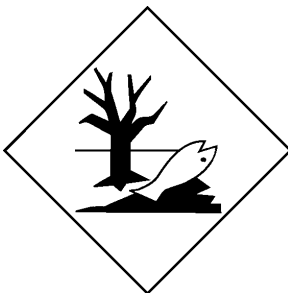
UN number	UN3266
UN proper shipping name	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Metam Sodium 42%), MARINE POLLUTANT
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	Yes
Special precautions for user	Not available.

IATA

UN number	UN3266
UN proper shipping name	Corrosive liquid, basic, inorganic, n.o.s. (Metam Sodium 42%)
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	No
ERG Code	8L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Other information	
Passenger and cargo aircraft	Allowed with restrictions.
Cargo aircraft only	Allowed with restrictions.

IMDG

UN number	UN3266
UN proper shipping name	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Metam Sodium 42%), MARINE POLLUTANT
Transport hazard class(es)	
Class	8
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	Yes
EmS	F-A, S-B
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.

IATA; IMDG; TDG**Marine pollutant****General information**

IMDG Regulated Marine Pollutant.

15. Regulatory information

Canadian regulations

CANADIAN REGULATIONS: This product is registered under the Pest Control Product Act of Canada. It is a violation of Canadian Law to use this product in any manner inconsistent with its labeling. Read and follow all label directions. This product has been classified according to the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

This chemical is a pest control product registered [or regulated] by Health Canada Pest Management Regulatory Agency and is subject to certain labelling requirements under the Pest Control Products Act. These requirements differ from the classification criteria and hazard information required for GHS-consistent safety data sheets. The following is the hazard information required on the pest control product label:

PCP: 29128

RESTRICTED PRODUCT

DANGER POISON
DANGER - CORROSIVE to Eyes
DANGER: Skin Irritant
POTENTIAL SKIN SENSITIZER

PRECAUTIONS:

Keep Out of Reach Of Children.

Fatal or Poisonous if swallowed or absorbed through the skin. DO NOT get on skin or on clothing. Harmful if inhaled. Avoid inhaling/breathing vapour or sprays. CORROSIVE to the eye and to skin. Do NOT get in eyes or on skin. Potential skin sensitizer.

Read the label, authorized under the Pest Control Products Act, prior to using or handling the pest control product.

Symbols Required: Skull and crossbones symbol inside a red diamond-shaped border.

There are Canada-specific environmental requirements for handling, use, and disposal of this pest control product that are indicated on the label.

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	No

*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

Issue date Jul-21-2016
Revision date Nov-04-2022
Version # 3.0

Disclaimer

This information is provided for the limited guidance to the user. While AMVAC believes that the information is, as of the date hereof, reliable, it is the user's responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

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Revision information

This document has undergone significant changes and should be reviewed in its entirety.