Hydroxylamine Hydrochloride

Safety Data Sheet 75486

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	:	Substance
Substance name	:	Hydroxylamine Hydrochloride
CAS No	:	5470-11-1
Product code	:	LC15515
Formula	:	NH2OH.HCl
Synonyms	:	Hydroxylammonium chloride / hydroxylamine chloride / oxammonium, hydrochloride
BIG no	:	13937

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Catalyst

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
Zelienople, PA 16063 - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number	:	CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Met. Corr. 1	H290
Acute Tox. 4 (Oral)	H302
Acute Tox. 4 (Dermal)	H312
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Skin Sens. 1	H317
Carc. 2	H351
STOT RE 2	H373
Aquatic Acute 1	H400

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :

GHS05 GHS07 GHS08 GHS09

Signal word (GHS-US) : Warning

Hazard statements (GHS-US) :
H290 - May be corrosive to metals
H302+H312 - Harmful if swallowed or in contact with skin
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H351 - Suspected of causing cancer
H373 - May cause damage to organs (blood) through prolonged or repeated exposure
H400 - Very toxic to aquatic life

Precautionary statements (GHS-US) :
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P234 - Keep only in original container
P260 - Do not breathe dust
P264 - Wash exposed skin thoroughly after handling
P270 - Do no eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, eye protection, face protection
P301+P312 - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell
P302+P352 - IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P308+P313 - IF exposed or concerned: Get medical advice/attention
P312 - Call a POISON CENTER/doctor/…/if you feel unwell
P314 - Get medical advice and attention if you feel unwell
P330 - If swallowed, rinse mouth
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P337+P313 - If eye irritation persists: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P390 - Absorb spillage to prevent material damage
P391 - Collect spillage
P405 - Store locked up
P406 - Store in corrosive resistant container with a resistant inner liner
P501 - Dispose of contents/container to comply with local, state and federal regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

Name	Product identifier	%	GHS-US classification
Hydroxylamine Hydrochloride (Main constituent)	(CAS No) 5470-11-1	100	Met. Corr. 1, H290 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 Carc. 2, H351 STOT RE 2, H373 Aquatic Acute 1, H400

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

First-aid measures after eye contact : Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Call Poison Information Centre (www.big.be/antigif.htm). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : AFTER INHALATION OF DUST: Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. FOLLOWING SYMPTOMS MAY APPEAR LATER: Risk of lung oedema. Respiratory difficulties. Symptoms similar to those listed under ingestion.

Symptoms/injuries after skin contact : Tingling/irritation of the skin.

Symptoms/injuries after eye contact : Irritation of the eye tissue. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the eye tissue. Permanent eye damage.

Symptoms/injuries after ingestion : Nausea. Vomiting. Gastrointestinal complaints. Methemoglobinemia. Feeling of weakness. Headache. Dizziness. Blue/grey discolouration of the skin. Respiratory difficulties. Cramps/uncontrolled muscular contractions.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Skin rash/inflammation. Methemoglobinemia. Symptoms similar to those listed under acute toxicity.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Quantities of water.

Unsuitable extinguishing media : No unsuitable extinguishing media known.

5.2. Special hazards arising from the substance or mixture

Fire hazard : INDIRECT FIRE HAZARD. Fire/heat: explosive hazard bigger than fire hazard. Reactions involving a fire hazard: see "Reactivity Hazard".

Explosion hazard : DIRECT EXPLOSION HAZARD. Risk of explosion by heating. Risk of explosion by sparks. Risk of explosion by shock or friction. Its dust is explosive with air. INDIRECT EXPLOSION HAZARD. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".

Reactivity : Decomposes slowly in moist air. Decomposes slowly on exposure to water (moisture). Under confinement: risk of explosion on exposure to temperature rise. On burning: release of toxic and corrosive gases/vapours (nitrous vapours, hydrogen chloride). Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion.

5.3. Advice for firefighters

Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: have neighbourhood close doors and windows.

Firefighting instructions : Cool tanks/drums with water spray/remove them into safety. Extinguish/cool from behind cover/unmanned monitors. Do not move the load if exposed to heat. Depending on nature/size of load: consider extinguishment. Dilute toxic gases with water spray. Take account of environmentally hazardous firefighting water.

Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Gloves. Face-shield. Protective clothing. Dust cloud production: compressed air/oxygen apparatus. Dust cloud production: dust-tight suit.

Emergency procedures : Notify experts. Mark the danger area. Prevent dust cloud formation. Consider evacuation. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Keep containers closed. Prevent shock/impact. Wash contaminated clothes.

Measures in case of dust release : In case of dust production: keep upwind. Dust production: have neighbourhood close doors and windows.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection. Do not breathe dust.

Emergency procedures : If a major spill occurs, all personnel should be immediately evacuated and the area ventilated.

6.2. Environmental precautions

Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

For containment : Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the solid spill. Cover with a water blanket. Knock down/dilute dust cloud with water spray. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills.

Methods for cleaning up : Start with disposal only in the presence of experts. Wet with an excess of water. Scoop solid spill into closing containers. Carefully collect the spill/leftovers. Do not use compressed air for pumping over spills. Store under water in containers. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle and open the container with care. Avoid shock and friction. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Avoid raising dust. Use spark-/explosionproof appliances and lighting system. Use earthed equipment. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Observe very strict hygiene - avoid contact. Keep container tightly closed. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Contaminated work clothing should not be allowed out of the workplace. Do no eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Incompatible products	:	Strong oxidizers.
Incompatible materials	:	Moisture.
Heat and ignition sources	:	KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.
Prohibitions on mixed storage	:	KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) bases. metals. water/moisture.
Storage area	:	Store in a cool area. Store in a dry area. Fireproof storeroom. Keep locked up. Unauthorized persons are not admitted. Provide the tank with earthing. Meet the legal requirements.
Special rules on packaging	:	SPECIAL REQUIREMENTS: watertight. hermetical. dry. clean. shock-absorbing. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
Packaging materials	:	SUITABLE MATERIAL: No data available. MATERIAL TO AVOID: steel. aluminium.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.2. Exposure controls

Appropriate engineering controls	:	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.
Materials for protective clothing	:	GIVE EXCELLENT RESISTANCE: No data available. GIVE GOOD RESISTANCE: No data available. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: No data available.
Hand protection	:	Gloves.
Eye protection	:	Face shield. In case of dust production: protective goggles.
Skin and body protection	:	Protective clothing. In case of dust production: head/neck protection. In case of dust production: dustproof clothing.
Respiratory protection	:	Dust production: dust mask with filter type P2.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Appearance	:	Crystalline solid. Crystalline powder.
Molecular mass	:	69.49 g/mol
Colour	:	White.
Odour	:	Odourless.
Odour threshold	:	No data available
pH	:	3.2 (1.4 %)
pH solution	:	1.4 %
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	152 °C
Freezing point	:	No data available
Boiling point	:	Not applicable
Flash point	:	No data available
Self ignition temperature	:	No data available
Decomposition temperature	:	152 °C
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	1.7 (17 °C)
Density	:	1670 kg/m³ (17 °C)
Solubility	:	Soluble in water. Soluble in ethanol. Soluble in methanol. Soluble in glycerol. Soluble in propyleneglycol. Water: 95 g/100ml Ethanol: 437 g/100ml
Log Pow	:	No data available
Log Kow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available

Explosive limits : No data available

9.2. Other information

VOC content : Not applicable

Other properties : Hygroscopic. Substance has acid reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity

Decomposes slowly in moist air. Decomposes slowly on exposure to water (moisture). Under confinement: risk of explosion on exposure to temperature rise. On burning: release of toxic and corrosive gases/vapours (nitrous vapours, hydrogen chloride). Reacts violently with (strong) oxidizers: (increased) risk of fire/explosion.

10.2. Chemical stability

Unstable on exposure to moisture.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Moisture.

10.5. Incompatible materials

Strong oxidizers.

10.6. Hazardous decomposition products

Gaseous ammonia. Hydrogen chloride.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Harmful if swallowed. Harmful in contact with skin.

Hydroxylamine Hydrochloride (\f)5470-11-1	
LD50 oral rat	200 - 2000 mg/kg (Rat)
LD50 dermal rabbit	400 - 2000 mg/kg (Rabbit)

Skin corrosion/irritation : Causes skin irritation.
pH: 3.2 (1.4 %)

Serious eye damage/irritation : Causes serious eye irritation.
pH: 3.2 (1.4 %)

Respiratory or skin sensitisation : May cause an allergic skin reaction.

Germ cell mutagenicity : Not classified

Carcinogenicity : Suspected of causing cancer.

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : May cause damage to organs (blood) through prolonged or repeated exposure.

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : AFTER INHALATION OF DUST: Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. FOLLOWING SYMPTOMS MAY APPEAR LATER: Risk of lung oedema. Respiratory difficulties. Symptoms similar to those listed under ingestion.

Symptoms/injuries after skin contact : Tingling/irritation of the skin.

Symptoms/injuries after eye contact : Irritation of the eye tissue. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the eye tissue. Permanent eye damage.

Symptoms/injuries after ingestion : Nausea. Vomiting. Gastrointestinal complaints. Methemoglobinemia. Feeling of weakness. Headache. Dizziness. Blue/grey discolouration of the skin. Respiratory difficulties. Cramps/uncontrolled muscular contractions.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Skin rash/inflammation. Methemoglobinemia. Symptoms similar to those listed under acute toxicity.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Dangerous for the environment.

Ecology - water : Severe water pollutant (surface water). Ground water pollutant. Maximum concentration in drinking water: 0.50 mg/l (ammonium) (Directive 98/83/EC); 250 mg/l (chloride) (Directive 98/83/EC). Highly toxic to aquatic organisms. pH shift. Inhibition of activated sludge.

Hydroxylamine Hydrochloride (5470-11-1)	
LC50 fishes 1	7.2 mg/l (96 h; Pimephales promelas; Estimated value)
EC50 Daphnia 1	1.62 mg/l (48 h; Daphnia magna; Estimated value)

12.2. Persistence and degradability

Hydroxylamine Hydrochloride (5470-11-1)	
Persistence and degradability	Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

12.3. Bioaccumulative potential

Hydroxylamine Hydrochloride (5470-11-1)	
Bioaccumulative potential	Not bioaccumulative.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Specific incineration with energy recovery. Do not discharge to wastewater treatment installation.

Additional information : LWCA (the Netherlands): KGA category 06. Hazardous waste according to Directive 2008/98/EC.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

14.1. UN number

UN-No.(DOT) : 2923

DOT NA no. UN2923

14.2. UN proper shipping name

DOT Proper Shipping Name : Corrosive solids, toxic, n.o.s.
Hydroxylamine Hydrochloride

Department of Transportation (DOT) Hazard Classes : 8 - Class 8 - Corrosive material 49 CFR 173.136

Hazard labels (DOT) : 8 - Corrosive substances
6.1 - Toxic substances

DOT Symbols : G - Identifies PSN requiring a technical name

Packing group (DOT) : III - Minor Danger

DOT Special Provisions (49 CFR 172.102)	:	IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2). IP2 - When IBCs other than metal or rigid plastics IBCs are used, they must be offered for transportation in a closed freight container or a closed transport vehicle. IP4 - Flexible, fiberboard or wooden IBCs must be sift-proof and water-resistant or be fitted with a sift-proof and water-resistant liner. T3 - 2.65 178.274(d)(2) Normal..... 178.275(d)(2) TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	154
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	212
DOT Packaging Bulk (49 CFR 173.xxx)	:	240
Marine pollutant	:	P

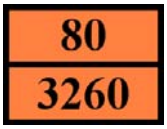
14.3. Additional information

Other information	:	No supplementary information available.
State during transport (ADR-RID)	:	as solid. Substance assigned to class 8 for its corrosion to metals.

Overland transport

Packing group (ADR)	:	III
Class (ADR)	:	8 - Corrosive substances
Hazard identification number (Kemler No.)	:	80
Classification code (ADR)	:	C2
Danger labels (ADR)	:	8 - Corrosive substances

Orange plates :



Tunnel restriction code : E

Transport by sea

DOT Vessel Stowage Location	:	B - (i) The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) ‘‘On deck only’’ on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
DOT Vessel Stowage Other	:	40 - Stow ‘‘clear of living quarters’’
EmS-No. (1)	:	F-A
EmS-No. (2)	:	S-B

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	15 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	50 kg

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydroxylamine Hydrochloride (5470-11-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

15.2. International regulations

CANADA

Hydroxylamine Hydrochloride (5470-11-1)	
Listed on the Canadian DSL (Domestic Sustances List) inventory.	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects Class E - Corrosive Material

EU-Regulations

No additional information available

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Met. Corr. 1	H290
Carc. 2	H351
Acute Tox. 4 (Dermal)	H312
Acute Tox. 4 (Oral)	H302
STOT RE 2	H373
Eye Irrit. 2	H319
Skin Irrit. 2	H315
Skin Sens. 1	H317
Aquatic Acute 1	H400

Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC or 1999/45/EC

E; R2
Carc.Cat.3; R40
Xn; R21/22
Xn; R48/22
Xi; R36/38
Xi; R43
N; R50

Full text of R-phrases: see section 16

15.2.2. National regulations

Hydroxylamine Hydrochloride (5470-11-1)
Not listed on the Canadian Ingredient Disclosure List

15.3. US State regulations

No additional information available

SECTION 16: Other information

Full text of H-phrases: see section 16:

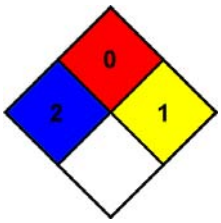
Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — AcuteHazard, Category 1
Carc. 2	Carcinogenicity, Category 2
Eye Irrit. 2A	Serious eye damage/eye irritation, Category 2A
Met. Corr. 1	Corrosive to metals, Category 1
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, category 1
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
H290	May be corrosive to metals

H302	Harmful if swallowed
H312	Harmful in contact with skin
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H351	Suspected of causing cancer
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 0 Minimal Hazard

Physical : 1 Slight Hazard

Personal Protection : F

SDS US (GHS HazCom 2012)

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