



PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 24/03/2015
DLM-9662

Revision date: 03/01/2018

Supersedes: 24/03/2015

Version: 2.0

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

1.1. Product identifier

Product form : Substance
Substance name : PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%)
EC No : 204-648-7 (Unlabeled)
CAS No : 212625-79-1
Product code : DLM-9662
Formula : C4D8HN
Synonyms : Tetrahydropyrrole / Tetramethyleneimine

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

1.2.1. Relevant identified uses

Main use category : Professional use
Industrial/Professional use spec : For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810
USA

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Flam. Liq. 2 H225
Acute Tox. 4 (Oral) H302
Acute Tox. 4 (Inhalation) H332
Skin Corr. 1 H314
Eye Dam. 1 H318
Aquatic Chronic 3 H412

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

C; R35
F; R11
R52/53
Xi; R41
Xn; R20/22

Full text of R-phrases: see section 16

GHS-US classification

Flam. Liq. 2 H225
Acute Tox. 4 (Oral) H302
Acute Tox. 4 (Inhalation) H332
Skin Corr. 1A H314
Eye Dam. 1 H318
Aquatic Acute 3 H402
Aquatic Chronic 3 H412

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Full text of H statements : see section 16

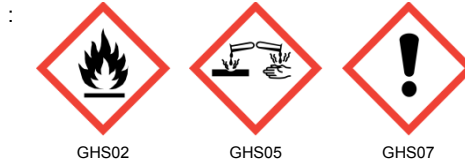
Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Hazard pictograms (CLP)



Signal word (CLP)

: Danger

Hazard statements (CLP)

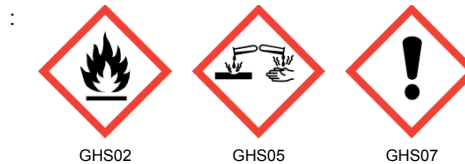
: H225 - Highly flammable liquid and vapor
H302+H332 - Harmful if swallowed or if inhaled
H314 - Causes severe skin burns and eye damage
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP)

: P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P260 - Do not breathe dust, fume, gas, mist, spray, vapors
P264 - Wash hands, forearms and face thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H225 - Highly flammable liquid and vapor
H302+H332 - Harmful if swallowed or if inhaled
H314 - Causes severe skin burns and eye damage
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (GHS-US)

: P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P233 - Keep container tightly closed
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical, lighting, ventilating equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P260 - Do not breathe dust, fume, gas, mist, spray, vapors
P261 - Avoid breathing dust, fume, gas, mist, spray, vapors
P264 - Wash hands, forearms and face thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P273 - Avoid release to the environment
P280 - Wear protective clothing, protective gloves
P301+P312 - If swallowed: Call a doctor, a POISON CENTER if you feel unwell
P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a doctor, a POISON CENTER
P312 - Call a doctor, a POISON CENTER if you feel unwell
P321 - Specific treatment (see Hazardous component(s) for labeling on this label)
P330 - Rinse mouth
P363 - Wash contaminated clothing before reuse
P370+P378 - In case of fire: Use alcohol resistant foam, carbon dioxide (CO2), dry extinguishing powder to extinguish

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P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%)	(CAS No) 212625-79-1 (EC No) 204-648-7 (Unlabeled)	100	C; R35 F; R11 R52/53 Xi; R41 Xn; R20/22

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%)	(CAS No) 212625-79-1 (EC No) 204-648-7 (Unlabeled)	100	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1, H314 Eye Dam. 1, H318 Aquatic Chronic 3, H412

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (Main constituent)	(CAS No) 212625-79-1	100	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Skin Corr. 1A, H314 Eye Dam. 1, H318 Aquatic Acute 3, H402 Aquatic Chronic 3, H412

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.
First-aid measures after inhalation	: When symptoms occur: go into open air and ventilate suspected area. If not breathing, give artificial respiration. Get medical advice/attention.
First-aid measures after skin contact	: Wash with plenty of soap and water. Get immediate medical advice/attention. Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor/physician.
First-aid measures after ingestion	: Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention. Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

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

Symptoms/injuries after inhalation	: Harmful if inhaled. May cause respiratory irritation.
Symptoms/injuries after skin contact	: Causes severe skin burns and eye damage.
Symptoms/injuries after eye contact	: Causes serious eye damage.
Symptoms/injuries after ingestion	: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

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 : Water spray, dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂).

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5.2. Special hazards arising from the substance or mixture

- Fire hazard : Highly flammable liquid and vapor.
- Explosion hazard : May form flammable/explosive vapor-air mixture.
- Reactivity : Highly flammable liquid and vapor. May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters

- Firefighting instructions : Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.
- Other information : Use water spray to cool exposed surfaces.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.

6.1.1. For non-emergency personnel

- Emergency procedures : Use personal protective equipment as required. Avoid breathing vapors, mist, gas. Avoid dust formation. Ensure adequate air ventilation. Eliminate all ignition sources if safe to do so. Evacuate unnecessary personnel. Evacuate area. Special attention should be given to low areas/pits where flammable vapors can accumulate.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

- Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Dike and contain spill. Clean up any spills as soon as possible, using an absorbent material to collect it. Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.
- Methods for cleaning up : This material and its container must be disposed of in a safe way, and as per local legislation.
- Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

- For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Handle empty containers with care because residual vapors are flammable. Avoid all eye and skin contact and do not breathe vapor and mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take precautionary measures to prevent the formation of static electricity.
- Precautions for safe handling : Provide adequate ventilation to minimize dust and/or vapor concentrations. No open flames. No smoking. Use only non-sparking tools.
- Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands, forearms and face thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Store in a well-ventilated place. Keep container tightly closed. Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof Lighting equipment, ventilating equipment.
- Storage conditions : Store refrigerated (-5 C to 5 C). Protect from light.
- Incompatible materials : Heat sources.

7.3. Specific end use(s)

- No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

- No additional information available

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8.2. Exposure controls

- Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
- Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



- Materials for protective clothing : Wear suitable protective clothing and gloves.
- Hand protection : Wear suitable protective clothing and gloves.
- Eye protection : Wear eye protection. Chemical goggles or face shield with safety glasses.
- Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection.
- Respiratory protection : In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator.
- Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Appearance : Liquid
- Molecular mass : 79.17 g/mol (Labeled)
- Color : Colourless to pale yellow
- Odor : No data available
- Odor threshold : No data available
- pH : 12.9 at 100 g/l at 20 °C (68 °F)
- Relative evaporation rate (butyl acetate=1) : No data available
- Melting point : < -60 °C (< -76 °F)
- Freezing point : No data available
- Boiling point : 87 - 88 °C (189 - 190 °F) at 1,013 hPa (760 mmHg) - lit.
- Flash point : 3 °C (37 °F) - closed cup
- Auto-ignition temperature : No data available
- Decomposition temperature : No data available
- Flammability (solid, gas) : Highly flammable liquid and vapor
- Vapor pressure : 65.1 hPa (48.8 mmHg) at 20 °C (68 °F)
- Relative vapor density at 20 °C : 2.46 - (Air = 1.0)
- Relative density : No data available
- Specific gravity / density : 0.852 g/mL at 25 °C (77 °F)
- Solubility : Water: Completely miscible
- Log Pow : 0.22
- Log Kow : No data available
- Viscosity, kinematic : No data available
- Viscosity, dynamic : No data available
- Explosive properties : No data available
- Oxidizing properties : No data available
- Explosion limits : 1.6 - 10.6 vol % (V)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Highly flammable liquid and vapor. May form flammable/explosive vapor-air mixture.

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

Vapors may form explosive mixture with air.

10.4. Conditions to avoid

Heat. Open flame. Sparks. Direct sunlight. Extremely high or low temperatures.

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10.5. Incompatible materials

Acids. Acid anhydrides. Acid chlorides. Carbon dioxide (CO₂). Strong oxidizing agents.

10.6. Hazardous decomposition products

May release flammable gases. Carbon oxides (CO, CO₂). Nitrogen oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation: Harmful if inhaled.

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)	
LD50 oral rat	433 mg/kg
LC50 inhalation rat (mg/l)	11.7 mg/l - 4 h
ATE CLP (oral)	500.000 mg/kg body weight
ATE CLP (gases)	4500.000 ppmV/4h
ATE CLP (vapors)	11.000 mg/l/4h
ATE CLP (dust, mist)	1.500 mg/l/4h

Skin corrosion/irritation	: Causes severe skin burns and eye damage. No data available pH: 12.9 at 100 g/l at 20 °C (68 °F)
Serious eye damage/irritation	: Causes serious eye damage. No data available pH: 12.9 at 100 g/l at 20 °C (68 °F)
Respiratory or skin sensitization	: Not available No data available
Germ cell mutagenicity	: Not available
Carcinogenicity	: No data available
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: Not classified No data available
Specific target organ toxicity – repeated exposure	: Not classified No data available
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Coughing. Headache. Nausea. Shortness of breath.
Symptoms/injuries after inhalation	: Harmful if inhaled. May cause respiratory irritation.
Symptoms/injuries after skin contact	: Causes severe skin burns and eye damage.
Symptoms/injuries after eye contact	: Causes serious eye damage.
Symptoms/injuries after ingestion	: Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water : Harmful to aquatic life with long lasting effects.

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)	
LC50 fish 1	100 - 200 mg/l Danio rerio (zebra fish) - 96 h

12.2. Persistence and degradability

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)	
Persistence and degradability	May cause long-term adverse effects in the environment.
Biodegradation	Does not bioaccumulate.

12.3. Bioaccumulative potential

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)	
Log Pow	0.22

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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : Harmful to aquatic life with long lasting effects. Disposal must be done according to official regulations. Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.

Product/Packaging disposal recommendations: : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Additional information : Handle empty containers with care because residual vapors are flammable.

Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT) : 1922
DOT NA no. UN1922

14.2. UN proper shipping name

Proper Shipping Name (DOT) : Pyrrolidine
Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Hazard labels (DOT) : 3 - Flammable liquid
8 - Corrosive



Packing group (DOT) : II - Medium Danger

DOT Special Provisions (49 CFR 172.102) : IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.
T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)
TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 243

14.3. Additional information

Emergency Response Guide (ERG) Number : 132

Other information : No supplementary information available.

Special transport precautions : Not classified as dangerous in the meaning of transport regulations.

Overland transport

Packing group (ADR) : II
Class (ADR) : 3 - Flammable liquid
Hazard identification number (Kemler No.) : 338
Classification code (ADR) : FC
Hazard labels (ADR) : 3 - Flammable liquids
8 - Corrosive substances



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Orange plates

:



Tunnel restriction code (ADR)

: D/E

Limited quantities (ADR)

11

Excepted quantities (ADR)

: E2

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", 52 - Stow "separated from" acids

MFAG-No

: 132

Air transport

DOT Quantity Limitations Passenger aircraft/rail : 1 L
(49 CFR 173.27)DOT Quantity Limitations Cargo aircraft only (49 : 5 L
CFR 175.75)

Civil Aeronautics Law

: Flammable liquids

14.4. Environmental hazards

Other information

: No supplementary information available.

14.5. Special precautions for user

Special transport precautions

: Not classified as dangerous in the meaning of transport regulations.

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)

SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporting requirements of the United States SARA Section 302.
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SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard
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SARA Section 313 - Emission Reporting	Not subject to reporting requirements of the United States SARA Section 313.
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15.2. International regulations

CANADA

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%) (212625-79-1)

Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

PYRROLIDINE-2,2,3,3,4,4,5,5-D8 (D, 98%)(212625-79-1)

U.S. - California - Proposition 65 - Carcinogens List	No
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U.S. - California - Proposition 65 - Developmental Toxicity	No
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U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
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U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
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State or local regulations	U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Massachusetts - Right To Know List
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SECTION 16: Other information

Other information : This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

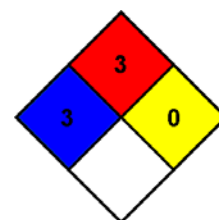
Full text of R-, H- and EUH-phrases:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhalation) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Liq. 2	Flammable liquids Category 2
Skin Corr. 1	Skin corrosion/irritation Category 1
H225	Highly flammable liquid and vapor
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H332	Harmful if inhaled
H412	Harmful to aquatic life with long lasting effects
R11	Highly flammable
R20/22	Harmful by inhalation and if swallowed
R35	Causes severe burns
R41	Risk of serious damage to eyes
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
C	Corrosive
F	Highly flammable
Xi	Irritant
Xn	Harmful

NFPA health hazard : 3 - Materials that, under emergency conditions, can cause serious or permanent injury.

NFPA fire hazard : 3 - Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions.

NFPA reactivity : 0 - Material that in themselves are normally stable, even under fire conditions.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 3 Serious Hazard

Physical : 0 Minimal Hazard

CIL Multi-Solvent Mixture SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product