SAFETY DATA SHEET
ANGUS CHEMICAL COMPANY

Product name : ZOLDINE™ LH 2001, Rapid Cure Liquid Hardener for PRF Wood Adhesives

Issue Date: 01/13/2016

ANGUS CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	ZOLDINE™ LH 2001, Rapid Cure Liquid Hardener for PRF Wood Adhesives

Manufacturer or supplier's details

Company name of supplier	ANGUS CHEMICAL COMPANY
Address	1500 E. LAKE COOK ROAD Buffalo Grove IL 60089-6553
Customer Information Number	844-474-9969
E-mail address	NAR_CC@ANGUS.COM
Emergency telephone number	**800-424-9300**

Recommended use of the chemical and restrictions on use

Recommended use	Resin curing chemical use in wood adhesives The ANGUS Chemical Company recommends that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact the Customer Information Group (see Section 1 of this data sheet).

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids	Category 4
Acute toxicity (Inhalation)	Category 4
Skin irritation	Category 2
Serious eye damage	Category 1
Skin sensitisation	Sub-category 1A

GHS Label elements, including precautionary statements

Hazard pictograms

Signal word

Danger

Hazard statements

Combustible liquid.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.
Harmful if inhaled.

Precautionary statements

Prevention:
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/ eye protection/ face protection.
Response:
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician 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. Immediately call a POISON CENTER or doctor/ physician.
If skin irritation or rash occurs: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep cool.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a substance.

Components

Chemical Name	CAS-No.	Concentration (% w/w)
7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole	7747-35-5	>= 94.0 %
4-Ethyl-4-(hydroxymethyl)oxazolidine	535978-60-0	<= 4.0 %

4. FIRST AID MEASURES

If inhaled	Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
In case of skin contact	Take off contaminated clothing. Wash skin with soap and plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly. Suitable emergency safety shower facility should be available in work area.
In case of eye contact	Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.
If swallowed	Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.
Protection of first-aiders	First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Notes to physician	Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. No specific antidote. Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	Water fog or fine spray. Carbon dioxide fire extinguishers. Dry chemical fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.
Specific hazards during firefighting	Container may rupture from gas generation in a fire situation.
Hazardous combustion products	During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon dioxide. Carbon monoxide. Nitrogen oxides.
Further information	Keep people away. Isolate fire and deny unnecessary entry. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Only trained and properly protected personnel must be

	involved in clean-up operations. Evacuate area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to section 7, Handling, for additional precautionary measures.
Environmental precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up	Contain spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Advice on safe handling	Avoid breathing vapor. Keep away from heat, sparks and flame. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Wash thoroughly after handling. Use with adequate ventilation. Keep container closed. Do not get in eyes. Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.
Conditions for safe storage	Recommend storage in a cool, dry place away from high temperatures, hot pipes and direct sunlight. Do not store in: Aluminum. Aluminum alloys. Copper. Copper alloys.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures	Local exhaust ventilation may be necessary for some operations. Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations.

Personal protective equipment

Respiratory protection	For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator. Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process.
Hand protection	
	Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Butyl rubber. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Avoid gloves made of: Polyvinyl alcohol ("PVA"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.
Eye protection	Use chemical goggles.
Skin and body protection	Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid.
Color	Colorless
Odor	Amine.
Odor Threshold	No test data available
pH	10 (22 °C) Method: Literature (0.1 M in water)
Melting point/range	1 °C (34 °F) Method: EC Method A1
Freezing point	1 °C (34 °F) Method: EC Method A1
Boiling point/boiling range	187 °C (369 °F) Method: Literature

Flash point	79 °C (174 °F) Method: Tag Closed Cup ASTM D56 Test Type: closed cup
Evaporation rate	No test data available
Flammability (solid, gas)	No data available.
Upper explosion limit	No test data available
Lower explosion limit	No test data available
Vapor Pressure	0.45 mmHgMethod: Literature 25°C (77°F)
Relative Vapor Density (air = 1)	No test data available
Relative density	1.08 (20 °C) Method: EC Method A3
Water solubility	Miscible with water in all proportions
Partition coefficient: n-octanol/water	log Pow: -0.32 Method: EC Method A6 Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Auto-ignition temperature	230 °C Method: EC Method A13
Decomposition temperature	No test data available
Viscosity Viscosity, dynamic	 5.2 mPa.s (20 °C) Method: OECD 114
Explosive properties	No data available.
Oxidizing properties	No data available.
Surface tension	71.4 mN/m, 25 °C
Molecular weight	143.19 g/mol Method: Literature

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity	No dangerous reaction known under conditions of normal use.
Chemical stability	Stable under recommended storage conditions. See Storage, Section 7.
Conditions to avoid	Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.
Incompatible materials	Reaction with acid can generate flammable formaldehyde gas. Avoid contact with oxidizing materials. Avoid contact with: Strong acids. Halogenated hydrocarbons. Avoid unintended contact with: Acidic pH.
Hazardous decomposition products	Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic flammable gases can be released during decomposition. Decomposition products can include and are not limited to: Formaldehyde.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Product:

Acute oral toxicity	Remarks: Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. Low toxicity if swallowed. LD50 (Rat): > 3,600 mg/kg
Acute inhalation toxicity	Remarks: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material or mist may cause respiratory irritation. Based on the available data, narcotic effects were not observed. LC50 (Rat): 3.1 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	Remarks: Prolonged skin contact is unlikely to result in absorption of harmful amounts. LD50 (Rat, male and female): > 2,000 mg/kg

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Acute oral toxicity	LD50 (Rat, male): > 3,674 mg/kg Other (Rat, female): 5,249 mg/kg
Acute inhalation toxicity	Remarks: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material or mist may cause respiratory irritation. Based on the available data, narcotic effects were not observed. LC50 (Rat): 3.1 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	LD50 (Rat, male and female): > 2,000 mg/kg

4-Ethyl-4-(hydroxymethyl)oxazolidine

Acute oral toxicity	Remarks: Single dose oral LD50 has not been determined.
Acute inhalation toxicity	Remarks: The LC50 has not been determined.
Acute dermal toxicity	Remarks: The dermal LD50 has not been determined.

Acute oral toxicity	LD50 (Rat, male): > 3,674 mg/kg Other (Rat, female): 5,249 mg/kg
Acute inhalation toxicity	Remarks: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material or mist may cause respiratory irritation. Based on the available data, narcotic effects were not observed. LC50 (Rat): 3.1 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	LD50 (Rat, male and female): > 2,000 mg/kg

Skin corrosion/irritation

Product:

Result: Skin irritation
Remarks: Repeated contact may cause severe skin irritation with local redness and discomfort.
Prolonged contact may cause severe skin irritation with local redness and discomfort.

Remarks: Not classified as corrosive to the skin according to DOT guidelines.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Result: Skin irritation
Remarks: Brief contact may cause slight skin irritation with local redness.
Repeated contact may cause severe skin irritation with local redness and discomfort.
Prolonged contact may cause severe skin irritation with local redness and discomfort.

Remarks: Not classified as corrosive to the skin according to DOT guidelines.

Result: Skin irritation
Remarks: Brief contact may cause slight skin irritation with local redness.
Repeated contact may cause severe skin irritation with local redness and discomfort.
Prolonged contact may cause severe skin irritation with local redness and discomfort.

Remarks: Not classified as corrosive to the skin according to DOT guidelines.

Serious eye damage/eye irritation

Product:

Result: Corrosive
Remarks: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Mist may cause eye irritation.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Result: Corrosive
Remarks: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Mist may cause eye irritation.

Result: Corrosive
Remarks: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Mist may cause eye irritation.

Respiratory or skin sensitization

Product:

Assessment: The product is a skin sensitiser, sub-category 1A.
Remarks: Has caused allergic skin reactions when tested in guinea pigs.
Results from human studies indicate that this material has the potential to cause an allergic skin reaction at high concentrations.
For skin sensitization:

Remarks: No relevant data found.
For respiratory sensitization:

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Assessment: May cause sensitisation by skin contact.
Remarks: Has caused allergic skin reactions when tested in guinea pigs.
Results from human studies indicate that this material has the potential to cause an allergic skin reaction at high concentrations.

Remarks: No relevant data found.
For respiratory sensitization:

Assessment: May cause sensitisation by skin contact.
Remarks: Has caused allergic skin reactions when tested in guinea pigs.
Results from human studies indicate that this material has the potential to cause an allergic skin reaction at high concentrations.

Remarks: No relevant data found.
For respiratory sensitization:

Carcinogenicity

Product:

No relevant data found.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

No relevant data found.

No relevant data found.

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Teratogenicity

Product

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole
Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Mutagenicity

Product
Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were predominantly negative.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole
Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were predominantly negative.

Animal genetic toxicity studies were negative.
In vitro genetic toxicity studies were predominantly negative.

Reproductive toxicity

Product:
In animal studies, did not interfere with reproduction.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

In animal studies, did not interfere with reproduction.

In animal studies, did not interfere with reproduction.

STOT - single exposure

Product:
Assessment: Available data are inadequate to determine single exposure specific target organ toxicity.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Assessment: Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Assessment: Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Repeated dose toxicity

Product:

Remarks: In animals, effects have been reported on the following organs after ingestion: Stomach.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Remarks: In animals, effects have been reported on the following organs: Stomach.

Remarks: In animals, effects have been reported on the following organs: Stomach.

Aspiration toxicity

Product:

Based on physical properties, not likely to be an aspiration hazard.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Based on physical properties, not likely to be an aspiration hazard.

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	Remarks: Material is moderately toxic to fish on an acute basis (LC50 between 1 and 10 mg/L). LC50 (Oncorhynchus mykiss (rainbow trout)): 244 mg/l Exposure time: 96.0 h Test Type: flow-through test Method: OECD Test Guideline 203 or Equivalent LC50 (Lepomis macrochirus (Bluegill sunfish)): 130 mg/l Exposure time: 96.0 h Test Type: static test
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 16.90 mg/l Exposure time: 48.0 h Test Type: flow-through test Method: OECD Test Guideline 202 or Equivalent

GLP: yes

EC50 (eastern oyster (Crassostrea virginica)): 35.00 mg/l
Exposure time: 96.0 h
Test Type: flow-through test

LC50 (pink shrimp (Penaeus duorarum)): 138.00 mg/l
Exposure time: 96.0 h
Test Type: static test

Toxicity to algae

ErC50 (Pseudokirchneriella subcapitata (green algae)): 1.08 mg/l
End point: Growth rate inhibition
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201 or Equivalent

ErC50 (Skeletonema costatum): 2.09 mg/l
End point: Growth rate inhibition
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 201 or Equivalent

NOEC (Scenedesmus capricornutum (fresh water algae)): 0.513 mg/l
End point: Growth rate
Exposure time: 72 d
Test Type: semi-static test
Method: OECD Test Guideline 201 or Equivalent

Toxicity to bacteria

EC50 (activated sludge): 166 mg/l
End point: Respiration rates.
Exposure time: 3 h
Method: OECD 209 Test

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Toxicity to fish

Remarks: Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50 (Oncorhynchus mykiss (rainbow trout)): 244 mg/l
Exposure time: 96.0 h
Test Type: flow-through test
Method: OECD Test Guideline 203 or Equivalent

LC50 (Lepomis macrochirus (Bluegill sunfish)): 130 mg/l
Exposure time: 96.0 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates

EC50 (Daphnia magna (Water flea)): 16.90 mg/l
Exposure time: 48.0 h
Test Type: flow-through test
Method: OECD Test Guideline 202 or Equivalent

EC50 (eastern oyster (Crassostrea virginica)): 35.00 mg/l

	Exposure time: 96.0 h Test Type: flow-through test
	LC50 (pink shrimp (Penaeus duorarum)): 138.00 mg/l Exposure time: 96.0 h Test Type: static test
Toxicity to algae	ErC50 (Pseudokirchneriella subcapitata (green algae)): 1.08 mg/l End point: Growth rate inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent
	ErC50 (Skeletonema costatum): 2.09 mg/l End point: Growth rate inhibition Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent
Toxicity to bacteria	EC50 (activated sludge): 166 mg/l End point: Respiration rates. Exposure time: 3 h Method: OECD 209 Test
Toxicity to terrestrial organisms	dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5,000 ppm Exposure time: 8 d
	dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5,000 ppm Exposure time: 8 d
	oral LD50 (Colinus virginianus (Bobwhite quail)): 1,100 mg/kg Exposure time: 1 d Method: Method Not Specified.
Ecotoxicology Assessment Chronic aquatic toxicity	Harmful to aquatic life with long lasting effects.

4-Ethyl-4-(hydroxymethyl)oxazolidine

Toxicity to fish	Remarks: No relevant data found.
Toxicity to fish	Remarks: Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).
	LC50 (Oncorhynchus mykiss (rainbow trout)): 244 mg/l Exposure time: 96.0 h Test Type: flow-through test Method: OECD Test Guideline 203 or Equivalent
	LC50 (Lepomis macrochirus (Bluegill sunfish)): 130 mg/l Exposure time: 96.0 h Test Type: static test

Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 16.90 mg/l Exposure time: 48.0 h Test Type: flow-through test Method: OECD Test Guideline 202 or Equivalent EC50 (eastern oyster (Crassostrea virginica)): 35.00 mg/l Exposure time: 96.0 h Test Type: flow-through test LC50 (pink shrimp (Penaeus duorarum)): 138.00 mg/l Exposure time: 96.0 h Test Type: static test
Toxicity to algae	ErC50 (Pseudokirchneriella subcapitata (green algae)): 1.08 mg/l End point: Growth rate inhibition Exposure time: 72 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent ErC50 (Skeletonema costatum): 2.09 mg/l End point: Growth rate inhibition Exposure time: 96 h Test Type: static test Method: OECD Test Guideline 201 or Equivalent
Toxicity to bacteria	EC50 (activated sludge): 166 mg/l End point: Respiration rates. Exposure time: 3 h Method: OECD 209 Test
Toxicity to terrestrial organisms	dietary LC50 (Colinus virginianus (Bobwhite quail)): > 5,000 ppm Exposure time: 8 d dietary LC50 (Anas platyrhynchos (Mallard duck)): > 5,000 ppm Exposure time: 8 d oral LD50 (Colinus virginianus (Bobwhite quail)): 1,100 mg/kg Exposure time: 1 d Method: Method Not Specified.
Ecotoxicology Assessment Chronic aquatic toxicity	Harmful to aquatic life with long lasting effects.

Persistence and degradability

Product:

Biodegradability	Result: Not biodegradable Remarks: This material rapidly hydrolyzes to products that are either readily or ultimately biodegradable. Abiotic degradation: The material is rapidly degradable by abiotic means. Biodegradation: 14 %

Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
Remarks: 10-day Window: Not applicable

Biodegradation: 27 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent
Remarks: 10-day Window: Fail

Biodegradation: 19.1 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
Remarks: 10-day Window: Fail

ThOD: 2.350 mg/mg

Method: Estimated.

Stability in water: Test Type: Hydrolysis
Degradation half life (DT50): 0.089 - 9.6 h (15 °C) pH: 4 - 9
Method: OECD Test Guideline 111
Remarks: Hydrolyses readily.

Test Type: Hydrolysis
Degradation half life (DT50): 0.1 - 3.799 h (25 °C) pH: 4 - 9
Method: OECD Test Guideline 111
Remarks: Hydrolyses readily.

Photodegradation: Rate constant: Degradation half life: 1.5 d
Method: Estimated.

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Biodegradability: Result: Readily biodegradable
Remarks: This material rapidly hydrolyzes to products that are either readily or ultimately biodegradable.
Abiotic degradation: The material is rapidly degradable by abiotic means.

Biodegradation: 14 %
Exposure time: 28 d
Method: OECD Test Guideline 301C or Equivalent
Remarks: 10-day Window: Not applicable

Biodegradation: 19.1 %
Exposure time: 28 d
Method: OECD Test Guideline 301F or Equivalent
Remarks: 10-day Window: Fail

Biodegradation: 27 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent
Remarks: 10-day Window: Fail

ThOD: 2.350 mg/mg

Stability in water	Test Type: Hydrolysis Degradation half life (DT50): 0.089 - 9.6 h (15 °C) pH: 4 - 9 Method: OECD Test Guideline 111 Remarks: Hydrolyses readily. Test Type: Hydrolysis Degradation half life (DT50): 0.1 - 3.799 h (25 °C) pH: 4 - 9 Method: OECD Test Guideline 111 Remarks: Hydrolyses readily.
Photodegradation	Rate constant: Degradation half life: 0.0625 h Method: Estimated.

4-Ethyl-4-(hydroxymethyl)oxazolidine

Biodegradability	Remarks: No relevant data found.
Biodegradability	Result: Readily biodegradable Remarks: This material rapidly hydrolyzes to products that are either readily or ultimately biodegradable. Abiotic degradation: The material is rapidly degradable by abiotic means. Biodegradation: 14 % Exposure time: 28 d Method: OECD Test Guideline 301C or Equivalent Remarks: 10-day Window: Not applicable Biodegradation: 19.1 % Exposure time: 28 d Method: OECD Test Guideline 301F or Equivalent Remarks: 10-day Window: Fail Biodegradation: 27 % Exposure time: 28 d Method: OECD Test Guideline 301D or Equivalent Remarks: 10-day Window: Fail
ThOD	2.350 mg/mg
Stability in water	Test Type: Hydrolysis Degradation half life (DT50): 0.089 - 9.6 h (15 °C) pH: 4 - 9 Method: OECD Test Guideline 111 Remarks: Hydrolyses readily. Test Type: Hydrolysis Degradation half life (DT50): 0.1 - 3.799 h (25 °C) pH: 4 - 9 Method: OECD Test Guideline 111 Remarks: Hydrolyses readily.
Photodegradation	Rate constant: Degradation half life: 0.0625 h Method: Estimated.

Bioaccumulative potential

Product:

Bioaccumulation	Species: Fish. Bioconcentration factor (BCF): 2 - 3 Method: Measured
Partition coefficient: n-octanol/water	log Pow: -0.32 Method: EC Method A6 Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Bioaccumulation	Species: Fish. Bioconcentration factor (BCF): 2 - 3 Method: Measured
Partition coefficient: n-octanol/water	log Pow: -0.32 (25 °C) Method: EC Method A6 Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Bioaccumulation	Species: Fish. Bioconcentration factor (BCF): 2 - 3 Method: Measured
Partition coefficient: n-octanol/water	log Pow: -0.32 (25 °C) Method: EC Method A6 Remarks: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Mobility in soil

Product:

Distribution among environmental compartments	Koc: 10 Method: Estimated. Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Distribution among environmental compartments	Koc: 10 Method: Estimated. Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

4-Ethyl-4-(hydroxymethyl)oxazolidine

Distribution among environmental compartments	Remarks: No relevant data found.

Distribution among environmental compartments	Koc: 10 Method: Estimated. Remarks: Potential for mobility in soil is very high (Koc between 0 and 50).

Other adverse effects

Product:

Ozone-Depletion Potential	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:

7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole

Results of PBT and vPvB assessment	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Ozone-Depletion Potential	Remarks: No relevant data found.

4-Ethyl-4-(hydroxymethyl)oxazolidine

Results of PBT and vPvB assessment	This substance has not been assessed for persistence, bioaccumulation and toxicity (PBT).
Ozone-Depletion Potential	Remarks: This substance is not in Annex I of Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Results of PBT and vPvB assessment	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Ozone-Depletion Potential	Remarks: No relevant data found.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws

are the responsibility solely of the waste generator.
AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL.
THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information.
FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted:
Incinerator or other thermal destruction device.
Landfill.

14. TRANSPORT INFORMATION

International Regulation

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

National Regulations

49 CFR (DOT) – NON BULK
Not regulated as a dangerous good

49 CFR (DOT) - BULK

UN/ID/NA number	NA 1993
Proper shipping name	COMBUSTIBLE LIQUID, N.O.S. (7a-Ethyldihydro-1H,3H,5H-oxazolo{3,4-c}oxazole)
Class	CBL
Packing group	III
ERG Code	128
Marine pollutant	no

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

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

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 311/312 Hazards	Fire Hazard Acute Health Hazard
SARA 302	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right To Know

The following chemicals are listed because of the additional requirements of New Jersey law:

Cas No.	Component
53019-53-7	4-Ethyl-1,3-oxazolidine

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

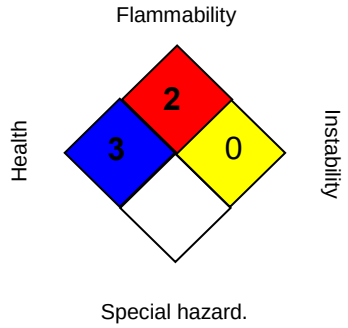
The components of this product are reported in the following inventories:

United States TSCA Inventory
All Components OK

16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	3
FLAMMABILITY	2
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Revision Date	01/13/2016
Version	1.1
Identification Number:	000040000149

US / EN

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Full text of other abbreviations

(Q)SAR - (Quantitative) Structure Activity Relationship; ASTM - American Society for the Testing of Materials; bw - Body weight; DIN - Standard of the German Institute for Standardisation; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying

Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISO - International Organisation for Standardization; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative; DSL - Domestic Substances List (Canada); KECI - Korea Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); AICS - Australian Inventory of Chemical Substances; IECSC - Inventory of Existing Chemical Substances in China; ENCS - Existing and New Chemical Substances (Japan); ISHL - Industrial Safety and Health Law (Japan); PICCS - Philippines Inventory of Chemicals and Chemical Substances; NZIoC - New Zealand Inventory of Chemicals; TCSI - Taiwan Chemical Substance Inventory; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; DOT - Department of Transportation; EHS - Extremely Hazardous Substance; HMIS - Hazardous Materials Identification System; MSHA - Mine Safety and Health Administration; NFPA - National Fire Protection Association; RCRA - Resource Conservation and Recovery Act; RQ - Reportable Quantity; SARA - Superfund Amendments and Reauthorization Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; GLP - Good Laboratory Practice; ERG - Emergency Response Guide; NTP - National Toxicology Program; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods