

Safety Data Sheet
Formic Acid 90 - 95%

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifier

Product name: Formic Acid 90 - 95%

Synonym(s): Methanoic Acid; Hydrogen Carboxylic Acid; Hydroxymethanone

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

General use: Industrial applications

Uses advised against: None known

1.3 Details of the supplier and of the safety data sheet

Manufacturer/Distributor

Silver Fern Chemical, Inc.

121 W De La Guerra Street, Suite B

Santa Barbara, CA 93101 USA

1-866-282-3384

Website - www.silverfernchemical.com; Email - info@silverfernchemical.com

1.4 Emergency telephone number

+1-800-535-5053; Outside USA & Canada +1-352-323-3500

SECTION 2 - HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

Product definition: Substance

Classification in accordance with 29 CFR 1910 (OSHA HCS) and Regulation EC No. 1272/2008

Flammable Liquid - Category 3 [H226]

Acute Toxicity, Oral - Category 4 [H302]

Skin Corrosion - Category 1A [H314]

Acute Toxicity, Inhalation - Category 3 [H331]

2.2 Label elements

Hazard symbol(s):



GHS02



GHS06



GHS05

Signal word: Danger

Hazard statement(s): H226 - Flammable liquid and vapor
H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H331 - Toxic if inhaled

Precautionary statements:

[Prevention]

P210 - Keep away from heat, open flames and hot surface. No smoking.
P233 - Keep container tightly closed.
P240 - Ground and bond container and receiving equipment.
P241 + P242 - Use explosion proof electrical, ventilating and lighting equipment. Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P260 - Do not breathe spray, mist and vapor.
P264 - Wash hands and other exposed skin areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.

[Response]

P280 - Wear protective gloves, protective clothing and eye protection.
P301 + P330 + P331 + P310 - IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a POISON CENTER or doctor.
P303 + P361 + P353 - IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water or shower.
P304 + P340 + P310 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor.
P305 + P351 + P338 + P310 - 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.
P321 - Specific treatment: Immediately contact a POISON CENTER or doctor. Refer to Section 4 of this SDS.

[Storage]
[Disposal]

P363 - Wash contaminated clothing before reuse.
P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide for extinction.
P405 + P403 + P233 + P235 - Store locked up in a well-ventilated place. Keep container tightly closed. Keep cool.
P501 - Dispose of contents and containers in accordance with national and local regulations.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Corrosive to the respiratory tract.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

% by Weight	Ingredient	CAS Number	EC Number	Index Number	GHS Classification
> 90	Formic Acid	64-18-6	200-079-1	607-001-00-0	H226, H302, H314, H331

There are no additional ingredients present in this product which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3.2 Mixtures

Not applicable

SECTION 4 – FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation: If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If unconscious, maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

Eyes: Immediately flush eyes with large amounts of water or saline solution for 20 - 30 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do after first 2 minutes and continue rinsing. Seek immediate medical attention, preferably from an ophthalmologist.

Skin: Flush skin with large amounts of water while removing contaminated clothing and continue rinsing for 20 - 30 minutes. Wash contaminated clothing thoroughly before reuse. Discard contaminated shoes. Seek immediate medical attention for chemical burns.

Ingestion: Rinse mouth with water if the victim is conscious. Remove dentures if present. Give 1 - 2 glasses of water at most to drink if the victim is conscious, alert, able to swallow and not experiencing difficulty breathing. DO NOT induce vomiting unless directed to do so by medical personnel. If vomiting occurs spontaneously keep the head lower than the waist to prevent aspiration of vomitus into the lungs. Never give anything by mouth to an unconscious or convulsing person. Do not leave the victim unattended. Seek immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Potential health symptoms and effects

Eyes: Causes severe burns and serious damage to eyes. Symptoms may include redness, swelling, pain, tearing, burns, blurred vision, conjunctivitis, corneal clouding, permanent eye damage and blindness. Mist or vapor can cause severe eye irritation, tearing and eye damage.

Skin: Causes severe skin irritation and burns. May be harmful if absorbed through the skin. Repeated exposure to unprotected skin can result in dermatitis. Prolonged or repeated exposure may cause allergic skin reactions in certain sensitive individuals.

Inhalation: Harmful if inhaled. Causes chemical burns to the respiratory tract with mucosal irritation, cough and shortness of breath. Exposure to vapor may lead to edemas in and damage to the respiratory tract. Symptoms may include burning of the nose and throat, cough, sore throat, wheezing, laryngitis, difficulty breathing, shortness of breath, bronchial spasms and chest pain. May cause pulmonary edema. Prolonged and repeated exposure may cause an allergic respiratory reaction with asthma-like symptoms in certain sensitive individuals.

Ingestion: Harmful if swallowed. Causes burns to the lips, mouth, throat and gastrointestinal tract. Causes severe pain, nausea vomiting, diarrhea and shock. May cause perforation of the digestive tract. May cause severe and permanent damage to the digestive tract. May cause acidosis (excessively acid condition of the body fluids or tissues), hemolysis (rupture or destruction of red blood cells) and damage to the kidneys.

Chronic: Persons with pre-existing skin disorders, eye problems or impaired respiratory function may be more susceptible to the effects of this substance. Repeated or prolonged inhalation may cause respiratory tract inflammation damage lungs. Chronic absorption of formic acid may cause damage to the kidneys, which is indicated by albuminuria (presence of albumin in the urine, typically as a symptom of kidney disease) and hematuria (blood in the urine). Chronic skin contact may cause sensitization dermatitis, particularly in workers previously sensitized to formaldehyde.

4.3 Indication of any immediate medical attention and special treatment needed

Advice to doctor and hospital personnel

Treat symptomatically and supportively.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable methods of extinction: Use extinguishing media suitable for the surrounding fire.

Unsuitable methods of extinction: None known.

5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapor! Vapors are heavier than air and can travel along the ground to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Closed containers may explode due to the buildup of pressure when exposed to extreme heat. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Obtain medical attention.

Explosion hazards: Vapors may form an explosive mixture with air at high temperatures, especially in confined spaces.

5.3 Advice to firefighters

Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Water contaminated by this material must be contained from being discharged to any waterway, sewer or drain to prevent environmental contamination.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate non-essential personnel. Wear appropriate protective clothing and equipment designated in Section 8.2. Ventilate the area. Remove all sources of ignition. NO SMOKING. Clean up spills immediately. Spill creates a slip hazard.

6.2 Environmental precautions

Avoid dispersal of spilled material or runoff and prevent contact with soil and entry into drains, sewers or waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements.

6.3 Methods and materials for containment and cleaning up

Approach spill from upwind direction. DO NOT FLUSH SPILL DOWN THE DRAIN. Cover drains and contain spill. Cover spill with a large quantity of inert absorbent. Do not use combustible material such as sawdust. Collect product using non-sparking tools and place in an approved container for proper disposal. DO NOT use a metal container for disposal. Observe possible material restrictions (Sections 7.2 and 10.5). Contaminated absorbent may pose the same hazard as the spilled product. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

For indications about waste treatment, see Section 13.

SECTION 7 – STORAGE AND HANDLING

7.1 Precautions for safe handling

Wear all appropriate personal protective equipment specified in Section 8.2. Do not get in eyes or on skin or clothing. Do not inhale mist or vapor. NO SMOKING. If normal use of material presents a respiratory hazard, use only adequate ventilation or wear an appropriate respirator. Material should be used under a hood in the laboratory. Wash contaminated clothing before reuse. Discard contaminated shoes.

Advice on protection against fire and explosion

Avoid high temperatures, hot surfaces, contact with metals and oxidizers.

7.2 Conditions for safe storage, including any incompatibilities

Store below +30°C (+86°F) in dry, cool, well-ventilated areas away from incompatible materials (see Section 10.5), food and drink. Keep away from combustible materials. Do not store in direct sunlight. Concentrated formic acid will slowly decompose to carbon dioxide at room temperature resulting in increased pressure if containers are unvented. Ground and bond containers when transferring material. Transfer only to approved containers having correct labeling. DO NOT store in metal containers. Hygroscopic! Keep containers tightly closed to prevent moisture absorption. Protect container from physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Use appropriate containment to avoid environmental contamination. Ventilate enclosed areas. Keep locked up and out of reach of children.

7.3 Specific end uses

Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limit values

CAS Number	Ingredient	OSHA PEL	ACGIH TLV	NIOSH
64-18-6	Formic Acid	5 ppm, 9 mg/m ³ TWA	5 ppm, 10 mg/m ³ STEL	5 ppm, 9 mg/m ³ TWA; 30 ppm IDLH

8.2 Exposure controls

Engineering measures: Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. Use adequate ventilation. Local exhaust is preferable. Refer to Section 7.1.

Individual protection measures: Wear protective clothing to prevent repeated or prolonged contact with product. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the representative supplier.

Hygiene measures: Facilities storing or using this material should be equipped with an eyewash station and safety shower. Change contaminated clothing. Preventive skin protection is recommended. Wash hands thoroughly after use, before eating, drinking, smoking or using

the lavatory.

Eye/face protection: Wear safety glasses with unperforated side shields or protective splash goggles during use.

Hand protection: Wear gloves made of natural latex, chloroprene or those recommended by glove supplier for protection against materials in Section 3. Gloves should be impermeable to chemicals and oil. Breakthrough time of selected gloves must be greater than the intended use period.

Skin protection: Wear protective clothing. Wear protective boots if the situation requires.

Respiratory protection: Always use an approved respirator when vapor/aerosols exceed permissible exposure limits. Where risk assessment shows air-purifying respirators are appropriate use a half-mask respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Follow OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

Environmental exposure controls: Do not empty into drains.

PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.



* It is recommended that a face shield be worn with splash goggles when handling this product.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Clear, colorless liquid
Odor	Pungent, stinging
Odor Threshold	0.02 - 49 ppm
Molecular Weight	46.02 g/mol
Chemical Formula	CH ₂ O ₂
pH	2.2 (1% aqueous solution)
Freezing/Melting Point	8.2 - 8.4 °C (46.8 - 47.1 °F)
Boiling Point Range	100 - 101 °C (212 - 214 °F)
Evaporation Rate	2.17 [n-BuOAc = 1]
Flammability (solid, gas)	Not applicable
Flash Point	48 °C (118 °F) closed cup
Autoignition Temperature	528 °C (982 °F) [literature]
Decomposition Temperature	350 °C (662 °F) [literature]
Lower Explosive Limit (LEL)	10% (v)
Upper Explosive Limit (UEL)	45% (v)
Vapor Pressure	31.50 mm Hg @ 20 °C
Vapor Density	1.59 [Air = 1] @ 20 °C
Specific Gravity	1.22 @ 25 °C
Viscosity	No data available
Solubility in Water	Miscible
Partition Coefficient (n-octanol/water)	log P _{ow} = -2.1 @ 23 °C
Oxidizing Properties	Not applicable
Explosive Properties	Not applicable
Volatiles by Weight @ 21 °C	No data available

9.2 Other Data

No data available

SECTION 10 – STABILITY AND REACTIVITY

10.1 Reactivity

No special reactivity has been reported during normal conditions of handling and use.

10.2 Chemical Stability

This material is stable under recommended conditions of storage and handling. Hygroscopic material: absorbs moisture from the air. Heat sensitive. Formic acid may decompose to carbon monoxide and water or carbon dioxide and hydrogen gas, creating pressure inside of the container.

10.3 Possibility of hazardous reactions

Risk of explosion in combination with organic nitro compounds, sodium hypochlorite, hydrogen peroxide, furfuryl alcohol. Generates dangerous gases or fumes in contact with alkalis, strong oxidizing agents, sulfuric acid, nonmetallic oxides, metal catalysts, phosphorus oxides, nitric acid,

nitrites. Hazardous polymerization will not occur.

10.4 Conditions to avoid

Avoid high temperatures, incompatible materials, exposure to moist air and direct sunlight.

10.5 Incompatible materials

Strong oxidizing agents, strong bases, powdered metals

10.6 Hazardous decomposition products

Thermal decomposition products may include oxides of carbon, hydrogen gas, irritating and toxic fumes and gases.

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute oral toxicity

LD₅₀, rat: 730 mg/kg

Acute inhalation toxicity

LC₅₀, rat: 7.85 mg/l - 4 h

Acute dermal toxicity

No data available

Skin irritation

Causes severe skin irritation and burns.

Eye irritation

Causes serious eye damage. Risk of blindness!

Sensitization

May cause an allergic skin reaction or allergic respiratory reaction with asthma-like symptoms in certain sensitive individuals.

Genotoxicity in vitro

No data available

Mutagenicity

No data available

Specific organ toxicity - single exposure

May cause respiratory irritation.

Specific organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Further information

This product contains no substances present at levels greater than or equal to the 0.1% threshold (de minimis) that are identified as probable, possible, potential or confirmed carcinogens by ACGIH, IARC, NTP or OSHA. No data is available regarding the mutagenicity or teratogenicity of this product, nor is there any available data that indicates it causes adverse developmental or fertility effects.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12 - ECOLOGICAL INFORMATION

12.1 Toxicity

Large discharges of formic acid to the environment may decrease the pH of aquatic systems to a value < 2, which may be fatal to aquatic life and soil micro-organisms.

Toxicity to fish:

LC₅₀ - Danio rerio (zebra fish), 96 h: 130 mg/l

LC₅₀ - Leuciscus idus (Golden orfe), 96 h: 46 - 100 mg/l

Toxicity to aquatic invertebrates:

LC₅₀ - Daphnia magna (Water flea), 48 h: 365 mg/l

Toxicity to aquatic plants:

ErC₅₀ - Pseudokirchneriella subcapitata, 72 h: 1,240 mg/l

Toxicity to bacteria:

EC₅₀ - Pseudomonas putida (Bacteria), 17 h: 46.7 mg/l

12.2 Persistence and degradability

This substance is readily biodegradable.

12.3 Bioaccumulation potential

This material will not bioaccumulate.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This material is not persistent, bioaccumulative and toxic (PBT) and not very persistent and very bioaccumulative (vPvB).

12.6 Other effects

Additional ecological information

Do not allow material to run into surface waters, wastewater or soil.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13 – DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Methods of disposal: The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

RCRA F-Series: No listings above the reportable threshold (de minimis)

RCRA U-Series: Formic Acid (CAS #64-18-6), U123

SECTION 14 – TRANSPORTATION INFORMATION

Note: Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

Limited quantity for corrosive liquids Packing Group II when inner packagings are not over 1.0 liter (0.3 gallon) net capacity each, packed in a strong outer packaging.

USA DOT (Ground Transportation) - Bulk and Non-bulk

Proper Shipping Name	Formic Acid
Hazard Class	8 (3)
UN/NA	UN1779
Packing Group	II
NEAREG	Guide #153
Packaging Authorization	Non-Bulk: 49 CFR 173.202; Bulk: 173.242
Packaging Exceptions	49 CFR 173.154

IMO/IMDG (Water Transportation)

Proper Shipping Name	Formic Acid
Hazard Class	8 (3)
UN/NA	UN1779
Packing Group	II
Marine Pollutant	No
EMS Number	F-E, S-C

ICAO/IATA (Air Transportation)

Proper Shipping Name	Formic Acid
Hazard Class	8 (3)
UN/NA	UN1779
Packing Group	II
Quantity Limitations	49 CFR 175.27 and 175.75 - Cargo Aircraft Only: 30 l; Passenger Aircraft: 1 l

RID/ADR (Rail Transportation)

Proper Shipping Name	Formic Acid
Hazard Class	8 (3)
UN/NA	UN1779
Packing Group	II

Drum Label(s)



SECTION 15 - REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for substance or mixture

U. S. Federal Regulations

OSHA Hazard Communication Standard: This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200.

OSHA Process Safety Management Standard: This product is not regulated under OSHA PSM Standard 29 CFR 1910.119.

EPA Risk Management Planning Standard: This product is not regulated under EPA RMP Standard (RMP) 40 CFR Part 68.

EPA Federal Insecticide, Fungicide and Rodenticide Act: This product is not a registered Pesticide under the FIFRA, 40 CFR Part 150.

Toxic Substance Control Act (TSCA) Inventory: All substances in this product are listed on the TSCA Inventory. This product is not subject to TSCA 12(b) Export Notification.

Drug Enforcement Administration (DEA) List 2, Essential Chemicals (21 CFR 1310.02(b)) and 1310.4(f)(2)) and Chemical Code Number:
Not listed

Drug Enforcement Administration (DEA) Lists 1 & 2, Exempt Chemical Mixtures (21 CFR 1310.12(c)) and Code Number: Not listed

Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) Chemicals: Not listed

Superfund Amendments and Reauthorization Act (SARA)

SARA Section 311/312 Hazard Categories

Flammable liquid and vapor Harmful if swallowed Causes severe skin burns and eye damage Toxic if inhaled

SARA 313 Information: Formic Acid (CAS #64-18-6) is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to Know Act of 1986.

SARA 302/304 Extremely Hazardous Substance: None of the components of the product exceed the threshold (de minimis) reporting levels of established by these sections of Title III of SARA.

SARA 302/304 Emergency Planning & Notification: None of the components of the product exceed the threshold (de minimis) reporting levels established by of these sections of Title III of SARA.

Comprehensive Response Compensation and Liability Act (CERCLA): This product contains the following CERCLA reportable substance:

Formic Acid (CAS #64-18-6): RQ = 2,267.96 kg (5,000 lb)

Clean Air Act (CAA)

This product does not contain Hazardous Air Pollutants (HAPs) designated in CAA Section 112 (b).

This product does not contain Class 1 Ozone depleters.

This product does not contain Class 2 Ozone depleters.

Clean Water Act (CWA)

Formic Acid (CAS #64-18-6) is a Hazardous Substance under the CWA.

This product does not contain Priority Pollutants.

This product does not contain Toxic Pollutants.

U.S. State Regulations

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986

This product contains no chemical(s) known to the state of California to cause cancer birth defects or reproductive harm in concentrations that exceed the threshold (de minimis) reporting levels established under Proposition 65.

Other U.S. State Inventories

Formic Acid (CAS #64-18-6) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: CA, DE, ID, ME, MA, MN, NJ, NY, PA, RI, WA.

Canada

WHMIS Hazard Classification

Flammable liquid and vapor Causes severe skin burns and eye damage Causes severe damage to the respiratory tract
Harmful if swallowed Toxic if inhaled

Canadian National Pollutant Release Inventory (NPRI): Formic Acid (CAS #64-18-6) is listed on the NPRI.

European Economic Community

WGK, Germany (Water danger/protection): 1 (slightly hazardous to water)

Global Chemical Inventory Lists

Country	Inventory Name	Listed
Canada	Domestic Substance List (DSL)	Yes
Canada	Non-Domestic Substance List (NDSL)	No
Europe	Inventory of New and Existing Chemicals (EINECS)	Yes
United States	Toxic Substance Control Act (TSCA)	Yes
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
New Zealand	New Zealand Inventory of Chemicals (NZIoC)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (KECI)	Yes
Philippines	Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*Yes - All components of this product comply with the inventory requirements administered by the governing country.

No - One or more components of this product are not on the inventory or are exempt from listing.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

SECTION 16 - OTHER INFORMATION

Hazardous Material Information System (HMIS)

HEALTH	3
FLAMMABILITY	2
PHYSICAL HAZARD	0
PERSONAL PROTECTION	H

C = goggles, gloves, apron
& vapor respirator

HMIS Hazard Rating Legend

0 = Minimal 1 = Slight 2 = Moderate

3 = Serious 4 = Severe

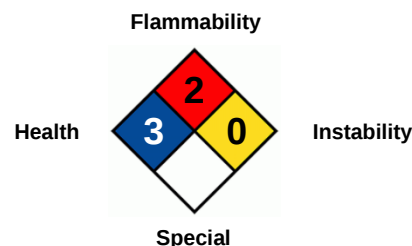
* = Chronic Health Hazard

NFPA Hazard Rating Legend

0 = Insignificant 1 = Slight 2 = Moderate

3 = High 4 = Extreme

National Fire Protection Association (NFPA)



Abbreviation Key

ACGIH	American Conference of Governmental Industrial Hygienists	LD ₅₀	Lowest Lethal Dose
ADR	Accord Dangereux Routier (European regulations concerning the international transport of dangerous goods by road)	mppcf	Millions of Particles Per Cubic Foot
CAS	Chemical Abstract Services	NA	North America
CFR	Code of Federal Regulations	NAERG	North American Emergency Response Guide Book
COC	Cleveland Open Cup	NIOSH	National Institute for Occupational Safety & Health
DOT	Department of Transportation	NTP	National Toxicology Program
EC ₅₀	Half maximal effective concentration	OSHA	Occupational Safety and Health Administration
EMS	Emergency Response Procedures for Ships Carrying	PBT	Persistent, Bioaccumulating and Toxic
EPA	Environmental Protection Agency	PEL	Permissible exposure limit
ErC ₅₀	Reduction of Growth Rate	PMCC	Pensky-Martens Closed Cup
ERG	Emergency Response Guide Book	ppm	Parts Per Million
FDA	Food and Drug Administration	RCRA	Resource Conservation and Recovery Act
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)	RID	Dangerous Goods by Rail
HCS	Hazard Communication Standard	RQ	Reportable Quantity
IARC	International Agency for Research on Cancer	TCC/Tag	Tagliabue Closed Cup
IATA	International Air Transport Association	TLV	Threshold Limit Value
IC ₅₀	Half Maximal Inhibitory Concentration	TSCA	Toxic Substance Control Act
ICAO	International Civil Aviation Organization	TWA	Time-weighted Average
IDLH	Immediately Dangerous to Life and Health	UN	United Nations
IMDG	International Maritime Dangerous Goods	VOC	Volatile Organic Compounds
IMO	International Maritime Organization	vPvB	Very Persistent and Very Bioaccumulating
LC ₅₀	50% Lethal Concentration	WHMIS	Workplace Hazardous Materials Information System
LD ₅₀	50% Lethal Dose		

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