

Safety Data Sheet
N-Methylpyrrolidone

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifier

Product name: N-Methylpyrrolidone

Synonym(s): NMP; 1-Methyl-2-pyrrolidone; N-Methyl-2-pyrrolidone

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

General use: Industrial and laboratory applications

Uses advised against: No data available

1.3 Details of the supplier and of the safety data sheet

Manufacturer/Distributor

Silver Fern Chemical, Inc.

2226 Queen Anne Avenue North, Suite C

Seattle, WA 98109 USA

1-866-282-3384

Website - www.silverfernchemical.com; email address - 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 4 [H227]

Skin Irritation - Category 2 [H315]

Eye Irritation - Category 2A [H319]

Single Target Organ Toxicity, Single Exposure - Category 3; STOT SE 3 [H335]

Reproductive Toxicity - Category 1B [H360d]

2.2 Label elements

Hazard symbol(s):



GHS07



GHS08

Signal word: Danger

Hazard statement(s): H227 - Combustible liquid
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H335 - May cause respiratory irritation
H360d - May damage the unborn child

Precautionary statements:

[Prevention]

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P261 - Avoid breathing mist and vapor.
P264 - Wash hands and other exposed skin areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.

[Response]

P280 - Wear protective gloves, protective clothing and eye protection.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 - IF INHALED: Remove victim to fresh air and keep at rest in a comfortable position for breathing. Call a POISON CENTER or doctor if you feel unwell.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.
P308 + P313 - If exposed or concerned: Get medical attention.
P321 + P312 - Specific treatment: Call a POISON CENTER or doctor if you feel unwell. Refer to Section 4 of this SDS.
P332 + P337 + P313 - If skin irritation occurs or eye irritation persists: Get medical attention.
P362 - Take off contaminated clothing and wash before reuse.
P370 + P378 - In case of fire: Use water fog, foam, dry chemical or carbon dioxide for extinction.

[Storage]

P405 + P403 + P235 - Store locked up in a well-ventilated place. Keep cool.

[Disposal]

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

None as defined under 29 CFR 1900.1200.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

| % by Weight | Ingredient | CAS Number | EC Number | Index Number | GHS Classification |
|-------------|---------------------|------------|-----------|--------------|-------------------------------|
| 100 | N-Methylpyrrolidone | 872-50-4 | 212-828-1 | 606-021-00-7 | H227, H315, H319, H335, H360d |

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 product mist or vapor causes respiratory irritation or distress, move the exposed person to fresh air immediately. If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. If unconscious, maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If symptoms persist or if the victim feels unwell, seek medical attention.

Eyes: Immediately flush eyes with large amounts of water or saline solution for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do after first 2 minutes and continue rinsing. If irritation persists seek medical attention, preferably from an ophthalmologist.

Skin: Flush skin with large amounts of water while removing contaminated clothing. Wash the affected area with soap and water followed by thorough rinsing. Wash contaminated clothing and shoes before reuse. If irritation persists, seek medical attention.

Ingestion: Rinse mouth with water if the victim is conscious. Remove dentures if present. Give 1 - 2 glasses of water to drink if the victim is conscious, alert, able to swallow and not experiencing breathing difficulty. DO NOT induce vomiting unless directed to do so by medical personnel. Vomiting may occur spontaneously. To prevent aspiration of vomit into the lungs, lay the victim on one side with the head lower than the waist. 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 serious eye irritation with inflammation, swelling, tearing, blurred vision and pain. Vapor or mist can cause eye irritation.

Skin: Causes skin irritation with localized redness, itching and discomfort. Prolonged contact with unprotected skin may cause defatting of the skin and dermatitis.

Inhalation: Low inhalation hazard at room temperature; inhalation exposures are not expected unless material is heated or misted. Irritating to mucous membranes and to the respiratory system. Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, drowsiness and dizziness. May be harmful if inhaled.

Ingestion: May cause irritation of the digestive tract with headache, nausea, vomiting, abdominal pain and diarrhea. May damage the unborn child.

Chronic: Individuals with pre-existing skin conditions and respiratory disorders may be more susceptible to the effects of this product. Prolonged or repeated skin contact may cause defatting of the skin, dermatitis or aggravate existing skin conditions. Prolonged and repeated exposure to mist or vapor may cause chronic eye irritation. Chronic exposure may cause bone marrow irregularities. Exposure to N-methylpyrrolidone may damage the unborn child. Refer to Section 11.2.

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 such as water spray or fog, carbon dioxide, foam and dry chemical.

Unsuitable methods of extinction: No data available

5.2 Special hazards arising from the substance or mixture

Combustible liquid! 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. Exposure to ignition sources can ignite vapors, causing a flash fire. 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: Avoid sources of ignition. Vapors may form an explosive mixture with air, especially in confined spaces. Ground and bond containers in storage and when container is in use.

5.3 Advice to firefighters

Firefighters should wear full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Firefighters must control runoff to prevent environmental contamination. Notify appropriate authorities of potential fire and explosion hazard if liquid enters sewers or waterways.

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 material using non-sparking tools and place into an approved container for proper disposal. Observe possible material restrictions (Sections 7.2 and 10.5). Do not allow material or runoff from rinsing contaminated areas to enter floor drains or storm drains and ditches that lead to waterways. 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. Open containers slowly to control possible pressure release. Wash contaminated clothing and shoes thoroughly before reuse.

Advice on protection against fire and explosion

Keep away from heat and sources of ignition. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.

7.2 Conditions for safe storage, including any incompatibilities

Store in dry, cool, well-ventilated areas away from incompatible materials (see Section 10.5), food and drink. Keep away from heat and ignition sources. Do not store in direct sunlight. Transfer only to approved containers having correct labeling. Hygroscopic material. Keep containers tightly closed when not in use to prevent moisture absorption. Protect containers against physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Containers are hazardous when empty as they contain product residue. Do not cut, drill, weld, braze, solder grind or perform similar operations on or near empty containers. Use appropriate containment to avoid environmental contamination. Ventilate closed areas. Keep 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 | US WEEL | CA PEL |
|------------|---------------------|----------|-----------|------------------|--------------------------------|
| 872-50-4 | N-Methylpyrrolidone | ----- | ----- | 10 ppm TWA; Skin | 1 ppm; 4 mg/m ³ TWA |

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material, including eyes and mucous membranes, either by direct contact with vapors or by direct skin contact. It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposure should be considered.

Biological Occupational exposure limit values

| Component | CAS Number | Control Parameters | Biological Specimen | Sampling Time | Permissible Concentration | Basis |
|---------------------|------------|----------------------------------|---------------------|--|---------------------------|----------|
| N-Methylpyrrolidone | 872-50-4 | 5-Hydroxy-N-methyl-2-pyrrolidone | In urine | End of shift (as soon as possible after exposure ceases) | 100 mg/l | ACGH BEI |

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 butyl rubber 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



SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Appearance | Clear, colorless liquid |
| Odor | Ammoniacal |
| Odor Threshold | No data available |
| Molecular Weight | 99.15 g/mol |
| Chemical Formula | C ₅ H ₉ NO |
| pH | 8.5 - 10.0 (10% aqueous solution @ 20 °C) |
| Freezing/Melting Point | - 24 °C (-11.2 °F) |
| Initial Boiling Point | 202 °C (395.6 °F) |
| Evaporation Rate | No data available |
| Flammability (solid, gas) | Not applicable |
| Flash Point | 88 °C (190 °F), closed cup |
| Autoignition Temperature | No data available |
| Decomposition Temperature | No data available |
| Lower Explosive Limit (LEL) | 1.0% (v) |
| Upper Explosive Limit (UEL) | 9.5% (v) |
| Vapor Pressure | > 1.33 hPa @ 20 °C |
| Vapor Density | 3.4 [Air = 1] |
| Density | 1.0304 g/cc (8.60 lb/gal) @ 20 °C |
| Viscosity | No data available |
| Solubility in Water | Miscible |
| Partition Coefficient (n-octanol/water) | log P _{ow} = -0.46 @ 20 °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

This material is stable under normal handling conditions and use.

10.2 Chemical Stability

This material is stable under recommended storage and handling conditions. Hygroscopic material (absorbs moisture from the air). Light sensitive.

10.3 Possibility of hazardous reactions

Hazardous polymerization will not occur.

10.4 Conditions to avoid

High temperatures, sources of ignition, hot surfaces, contact with incompatible materials, moisture, light exposure

10.5 Incompatible materials

Strong oxidizing agents, strong acids, acid anhydrides, aldehydes, isocyanates, halogenated compounds, various rubbers and plastics

10.6 Hazardous decomposition products

Thermal decomposition products include oxides of carbon, nitrogen oxides (NO_x), toxic fumes, dense black smoke and gases.

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute oral toxicity

LD₅₀, rat: 3,914 mg/kg

Acute inhalation toxicity

LC₅₀, rat: >5.1 mg/l - 4 h

Acute dermal toxicity

LD₅₀, rabbit: 8,000 mg/kg

Skin irritation

Causes skin irritation.

Eye irritation

Causes serious eye irritation.

Sensitization

No data available

Genotoxicity

No data available

Mutagenicity

No data available

Specific organ toxicity - single exposure

No data available

Specific organ toxicity - repeated exposure

May cause respiratory irritation.

Aspiration hazard

No data available

11.2 Further information

N-Methyl Pyrrolidone (CAS #872-50-4) may damage the unborn child. Testicular effects in rats were noted after repeated, high-dose oral and inhalation exposures.

Rats exposed to N-methylpyrrolidinone at a concentration of 1 mg/l as an aerosol for 10 days showed depletion of hematopoietic cells in the bone marrow and atrophy of the lymphoid tissues of the thymus, spleen and lymph nodes.

This product contains no substances present at levels greater than or equal to the 0.1% threshold (de minimis) that are identified as a probable, possible, potential or confirmed carcinogens by ACGIH, IARC, NTP or OSHA.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12 - ECOLOGICAL INFORMATION

12.1 Toxicity

Large spills or discharges of this material may be harmful to aquatic life.

Toxicity to fish:

LC₅₀ - Oncorhynchus mykiss (Rainbow trout), static test, 96 h: > 500 mg/l

Toxicity to aquatic invertebrates:

EC₅₀ - Daphnia magna (Water flea), 48 h: 4,897 mg/l

Toxicity to aquatic plants:

EC₅₀ - Desmodesmus subspicatus (Green algae), static test, 72 h: 672.8 mg/l

12.2 Persistence and degradability

This product is readily biodegradable.

12.3 Bioaccumulation potential

This material does not bioaccumulate.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

This substance 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 spilled 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: No listings above the reportable threshold (de minimis)

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.

A flammable liquid with a flash point at or above 38 °C (100 °F) that does not meet the definition of any other hazard class may be reclassified as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation are impracticable.

May be reclassified as not regulated for transport in non-bulk packages having a maximum capacity less than or equal to 450 liters (119 gallons).

USA DOT (Ground Transportation) - Bulk

| | |
|--|--|
| Proper Shipping Name | Combustible liquid, n.o.s. (N-Methylpyrrolidone) |
| Hazard Class | Comb liq |
| UN/NA | NA1993 |
| Packing Group | III |
| NEAREG | Guide #128 |
| Packaging Authorization | Non-Bulk: 49 CFR 173.203; Bulk: 173.241 |
| Packaging Exceptions | 49 CFR 173.150 |
| IMO/IMDG (Water Transportation) | Not regulated for transport |
| ICAO/IATA (Air Transportation) | Not regulated for transport |
| RID/ADR (Rail Transportation) | Not regulated for transport |

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.

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

Combustible liquid Causes skin irritation and serious eye irritation May cause respiratory irritation May damage the unborn child

SARA 313 Information: None of the components of this product exceed the threshold (de minimis) 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 this product exceed the threshold (de minimis) reporting levels established by these sections of Title III of SARA.

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

Comprehensive Response Compensation and Liability Act (CERCLA): This product does not contain any CERCLA reportable substances.

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 depletors.

This product does not contain Class 2 ozone depletors.

Clean Water Act (CWA)

This product does not contain Hazardous Substances.
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

⚠️ WARNING: This product will expose you to N-Methylpyrrolidone, which is known to the state of California to cause birth defects or reproductive harm. For more information go to www.P65Warnings.ca.gov.

Other U.S. State Inventories

N-Methylpyrrolidone (CAS # 872-50-4) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: DE, ME, MA, MN, NJ, PA.

Canada

WHMIS Hazard Classification

Combustible liquid Causes and serious eye irritation May damage fertility or the unborn child

Canadian National Pollutant Release Inventory (NPRI): N-Methylpyrrolidone 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 | * | 2 |
| FLAMMABILITY | | 2 |
| PHYSICAL HAZARD | | 0 |
| PERSONAL PROTECTION | | C |

C = safety glasses & gloves & apron

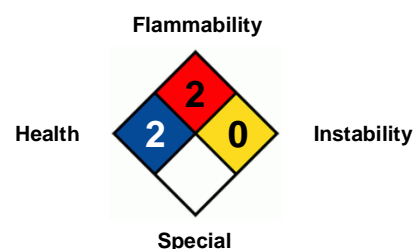
HMIS Hazard Rating Legend

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 | LD₅₀ | 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 |
| EC₅₀ | 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 |
| ErC₅₀ | 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 |
| IC₅₀ | 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 |
| LC₅₀ | 50% Lethal Concentration | WHMIS | Workplace Hazardous Materials Information System |
| LD₅₀ | 50% Lethal Dose | | |

DISCLAIMER OF RESPONSIBILITY

The information on this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume damage or expense arising out of or in any way responsibility and expressly disclaim liability for loss, connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this SDS information may not be applicable.

Revision date: 22 February 2021, Version 3

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