

# Material Safety Data Sheet

## Formic acid

ACC# 45433

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Formic acid

**Catalog Numbers:** AC147930010, AC147930025, AC147930250, AC147932500, AC270480010, AC270480250, AC410770025, AC410770050, AC410775000, AC423750050, AC423755000, S75125, S80019, S93249, A118P-100, A118P-4, A118P-500, A118PJ500, A119P-1, A119P-20, A119P-4, A119P-500, BP1215-500

**Synonyms:** Methanoic acid; Hydrogen carboxylic acid; Aminic acid; Formylic acid.**Company Identification:**

Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410

**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
64-18-6	Formic acid	88-99	200-579-1
7732-18-5	Water	1-12	231-791-2

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 69 deg C.

**Danger!** Strong reducing agent. Fire and explosion risk in contact with oxidizing agents. Causes eye and skin burns. Causes digestive and respiratory tract burns. **Combustible liquid and vapor.** Corrosive to metal. Keep refrigerated. (Store below 4°C/39°F.)

**Target Organs:** Eyes, skin, mucous membranes.**Potential Health Effects**

**Eye:** Contact with liquid is corrosive to the eyes and causes severe burns. Lachrymator (substance which increases the flow of tears). May cause corneal edema, ulceration, and scarring.

**Skin:** Causes skin burns. The severity of injury depends on the concentration of the solution and the duration of exposure.

**Ingestion:** Causes severe digestive tract burns with abdominal pain, vomiting, and possible death.

**Inhalation:** Causes chemical burns to the respiratory tract.

**Chronic:** Chronic absorption of formic acid may cause damage to the kidneys, which is indicated by albuminuria and hematuria. Chronic skin contact may cause sensitization dermatitis, particularly

in workers previously sensitized to formaldehyde.

## Section 4 - First Aid Measures

**Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

**Skin:** In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

**Ingestion:** If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Notes to Physician:** Hemodialysis should be considered in severe intoxication. Persons with chronic respiratory, skin, kidney, or liver diseases or eye disorders may be at increased risk from exposure to this product.

**Antidote:** Folic acid may be of benefit by hastening the metabolism of formic acid to carbon dioxide.

## Section 5 - Fire Fighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire. Contact with metals may evolve flammable hydrogen gas. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

**Extinguishing Media:** Use water fog, dry chemical, carbon dioxide, or regular foam.

**Flash Point:** 69 deg C ( 156.20 deg F)

**Autoignition Temperature:** 434 deg C ( 813.20 deg F)

**Explosion Limits, Lower:** 18 vol %

**Upper:** 57 vol %

**NFPA Rating:** (estimated) Health: 3; Flammability: 2; Instability: 0

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Large spills may be neutralized with dilute alkaline solutions of soda ash (sodium carbonate, Na<sub>2</sub>CO<sub>3</sub>), or lime (calcium oxide, CaO). Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Approach spill from upwind.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse.

Contents may develop pressure upon prolonged storage. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat and flame. Do not breathe vapor or mist.

**Storage:** Keep refrigerated. (Store below 4°C/39°F.) Keep from contact with oxidizing materials. Corrosives area. Do not store in metal containers. Do not store near alkaline substances. Vent periodically. Glacial formic acid will slowly decompose to carbon monoxide at room temperature resulting in increased pressure if containers are sealed or unvented.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Formic acid	5 ppm TWA; 10 ppm STEL	5 ppm TWA; 9 mg/m <sup>3</sup> TWA 30 ppm IDLH	5 ppm TWA; 9 mg/m <sup>3</sup> TWA
Water	none listed	none listed	none listed

**OSHA Vacated PELs:** Formic acid: 5 ppm TWA; 9 mg/m<sup>3</sup> TWA Water: No OSHA Vacated PELs are listed for this chemical.

### Personal Protective Equipment

**Eyes:** Wear chemical goggles and face shield.

**Skin:** Wear butyl rubber gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear, colorless

**Odor:** pungent odor - penetrating odor

**pH:** 2.38 (0.1M aq soln)

**Vapor Pressure:** 33.55 mm Hg @ 20 deg C

**Vapor Density:** 1.6 (air=1)

**Evaporation Rate:** 2.1 (BuOAc=1)

**Viscosity:** 1.607mPa @ 25 deg C

**Boiling Point:** 101 deg C

**Freezing/Melting Point:** 8.4 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Soluble.

**Specific Gravity/Density:** 1.22 @ 20°C

**Molecular Formula:** CH<sub>2</sub>O<sub>2</sub>

**Molecular Weight:** 46.02

## Section 10 - Stability and Reactivity

**Chemical Stability:** Keep refrigerated. Formic acid may decompose to carbon monoxide and water or carbon dioxide and hydrogen gas. These decomposition products develop pressure.

**Conditions to Avoid:** Ignition sources, excess heat, confined spaces.

**Incompatibilities with Other Materials:** Furfuryl alcohol, hydrogen peroxide, sulfuric acid, strong oxidizing agents, strong bases, finely powdered metals, nitromethane, carbon steel, aluminum.

**Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, hydrogen gas, formaldehyde.

**Hazardous Polymerization:** Will not occur.

## Section 11 - Toxicological Information

**RTECS#:**

**CAS# 64-18-6:** LQ4900000

**CAS# 7732-18-5:** ZC0110000

**LD50/LC50:**

**CAS# 64-18-6:**

Draize test, rabbit, eye: 122 mg Severe;

Inhalation, mouse: LC50 = 6200 mg/m<sup>3</sup>/15M;

Inhalation, rat: LC50 = 15 gm/m<sup>3</sup>/15M;

Oral, mouse: LD50 = 700 mg/kg;

Oral, rat: LD50 = 1100 mg/kg;

**CAS# 7732-18-5:**

Oral, rat: LD50 = >90 mL/kg;

**Carcinogenicity:**

**CAS# 64-18-6:** Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**CAS# 7732-18-5:** Not listed by ACGIH, IARC, NTP, or CA Prop 65.

**Epidemiology:** No information available.

**Teratogenicity:** No information available.

**Reproductive Effects:** No information available.

**Neurotoxicity:** No information available.

**Mutagenicity:** Sister Chromatid Exchange: Human, Lymphocyte = 10 mmol/L.; Cytogenetic Analysis: Non-mammalian species Cells - not otherwise specified = 100 mmol/L.; Cytogenetic Analysis: Hamster, Ovary = 10 mmol/L.

**Other Studies:** No data available.

## Section 12 - Ecological Information

**Ecotoxicity:** Fish: Bluegill/Sunfish: LC50 = 5000 mg/L; 24 Hr; Unspecified Water flea Daphnia: EC50 = 34 mg/L; 48 Hr; Unspecified In natural water it has been shown to adsorb to sediment and would probably also biodegrade. Bioconcentration in aquatic organisms is not important. In the atmosphere, formic acid would be scavenged by rain and dissolve in cloud water where it reacts with dissolved hydroxyl radicals. It also reacts in the vapor phase with hydroxyl radicals (half-life 36 days).

**Environmental:** Formic acid is the strongest unsubstituted carboxylic acid with a pKa of 3.74(3) and will exist almost entirely as the anion at environmental pHs. If released on land, formic acid

should leach into some soils where it would probably biodegrade.

**Physical:** Formic acid can be degraded chemically to innocuous substances in most environments.

**Other:** No information available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:**

CAS# 64-18-6: waste number U123 (Corrosive waste, Toxic waste).

## Section 14 - Transport Information

	US DOT	Canada TDG
<b>Shipping Name:</b>	FORMIC ACID	FORMIC ACID
<b>Hazard Class:</b>	8	8
<b>UN Number:</b>	UN1779	UN1779
<b>Packing Group:</b>	II	II

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 64-18-6 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### CERCLA Hazardous Substances and corresponding RQs

CAS# 64-18-6: 5000 lb final RQ; 2270 kg final RQ

#### SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

#### SARA Codes

CAS # 64-18-6: acute, flammable.

#### Section 313

This material contains Formic acid (CAS# 64-18-6, 88-99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

#### Clean Air Act:

This material does not contain any hazardous air pollutants.

This material does not contain any Class 1 Ozone depletors.

This material does not contain any Class 2 Ozone depletors.

**Clean Water Act:**

CAS# 64-18-6 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

None of the chemicals in this product are considered highly hazardous by OSHA.

**STATE**

CAS# 64-18-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

**California Prop 65**

California No Significant Risk Level: None of the chemicals in this product are listed.

**European/International Regulations****European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

**Risk Phrases:**

R 35 Causes severe burns.

**Safety Phrases:**

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**WGK (Water Danger/Protection)**

CAS# 64-18-6: 1

CAS# 7732-18-5: No information available.

**Canada - DSL/NDSL**

CAS# 64-18-6 is listed on Canada's DSL List.

CAS# 7732-18-5 is listed on Canada's DSL List.

**Canada - WHMIS**

This product has a WHMIS classification of E, B3.

**Canadian Ingredient Disclosure List**

CAS# 64-18-6 is listed on the Canadian Ingredient Disclosure List.

<b>Section 16 - Additional Information</b>
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**MSDS Creation Date:** 7/23/1999

**Revision #10 Date:** 11/07/2003

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*