

# Material Safety Data Sheet

## Formic Acid

ACC# 45433

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Formic Acid

**Catalog Numbers:** AC423750030, S80019, 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.

**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	85-98	200-579-1
7732-18-5	Water	2-15	231-791-2

**Hazard Symbols:** C

**Risk Phrases:** 34

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. Flash Point: 69 deg C. Corrosive. **Danger!** May be harmful if swallowed. Causes eye and skin burns. May cause liver and kidney damage. **Combustible liquid and vapor.** May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. Possible sensitizer. May cause central nervous system depression. Lachrymator (substance which increases the flow of tears).

**Target Organs:** Kidneys, central nervous system, liver, respiratory system, eyes, skin.

#### 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:** May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Contact with liquid is corrosive and causes severe burns and ulceration. Absorbed through the skin. May cause erythema (redness) and blistering.

**Ingestion:** Causes severe digestive tract burns with abdominal pain, vomiting, and possible death. May be harmful if swallowed. May cause central nervous system depression. Ingestion may produce corrosive ulceration and bleeding and necrosis of the gastrointestinal tract accompanied by shock and circulatory collapse.

**Inhalation:** May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Causes chemical burns to the respiratory tract. Aspiration may lead to pulmonary edema. Vapors may cause dizziness, nausea, itching, burning, and swelling of the eyes.

**Chronic:** Prolonged or repeated skin contact may cause dermatitis. May cause liver and kidney damage. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects.

### Section 4 - First Aid Measures

**Eyes:** Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

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

**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

**Inhalation:** Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**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. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May polymerize explosively when involved in a fire. Contact with metals may evolve flammable hydrogen gas.

**Extinguishing Media:** Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

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

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

**Explosion Limits, Lower:** 18.0 vol %

**Upper:** 57.0 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:** Large spills may be neutralized with dilute alkaline solutions of soda ash, or lime. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as saw dust. Use a spark-proof tool. Provide ventilation. Do not get water inside containers.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Contents may develop pressure upon prolonged storage. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not get on skin or in eyes. Do not ingest or inhale. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Keep refrigerated. (Store below 4°C/39°F.) Store in a tightly closed container. Keep from contact with oxidizing materials. Corrosives area. Do not store in metal containers. Do not store near alkaline substances. Vent periodically.

## 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 appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear neoprene gloves, apron, and/or clothing. Wear butyl rubber gloves, apron, and/or clothing.

**Clothing:** Wear neoprene gloves, apron, and/or clothing. Wear butyl rubber gloves, apron, and/or clothing.

**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 - benzaldehyde-like

**pH:** Strong acid

**Vapor Pressure:** 44.8 mm Hg @ 20 deg C

**Vapor Density:** 1.59

**Evaporation Rate:** 2.1

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

**Boiling Point:** 100.8 deg C

**Freezing/Melting Point:** 8 deg C

**Decomposition Temperature:** Not available.

**Solubility:** Miscible.

**Specific Gravity/Density:** 1.2267

**Molecular Formula:** HCOOH

**Molecular Weight:** 46.0128

## 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:** Incompatible materials, metals, excess heat, combustible materials, oxidizers, plastics.

**Incompatibilities with Other Materials:** Strong oxidizing agents, strong bases, finely powdered metals, permanganates, sulfuric acid, hydrogen peroxide, nitromethane, furfuryl alcohol, hydrated thallium nitrate.

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

**Hazardous Polymerization:** Has not been reported

## 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, NIOSH, NTP, or OSHA. CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**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 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	IATA	RID/ADR	IMO	Canada TDG
<b>Shipping Name:</b>	FORMIC ACID				FORMIC ACID
<b>Hazard Class:</b>	8				8(9.2)
<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.

#### **SARA**

##### **Section 302 (RQ)**

CAS# 64-18-6: final RQ = 5000 pounds (2270 kg)

##### **Section 302 (TPQ)**

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, 85 98%), 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 depleters. This material does not contain any Class 2 Ozone depleters.

##### **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, Florida, Pennsylvania, Minnesota, Massachusetts.

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

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 34 Causes 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).

S 23C Do not breathe vapour.

##### **WGK (Water Danger/Protection)**

CAS# 64-18-6: 1

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

##### **Canada - DSL/NDL**

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 B3, E.

##### **Canadian Ingredient Disclosure List**

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

##### **Exposure Limits**

CAS# 64-18-6: OEL-ARAB Republic of Egypt: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-AUSTRALIA: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-AUSTRIA: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-BELGIUM: TWA 5 ppm (9.4 mg/m<sup>3</sup>) OEL-DENMARK: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-FINLAND: TWA 5 ppm (9 mg/m<sup>3</sup>); STEL 10 ppm (18 mg/m<sup>3</sup>); Skin OEL-FRANCE: STEL 5 ppm (9 mg/m<sup>3</sup>) OEL-GERMANY: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-HUNGARY: TWA 5 mg/m<sup>3</sup>; STEL 8 mg/m<sup>3</sup> OEL-JAPAN: TWA 5 ppm (9.4 mg/m<sup>3</sup>) OEL-THE NETHERLANDS: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-THE PHILIPPINES: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL-RUSSIA: TWA 5 ppm; STEL 1 mg/m<sup>3</sup>; Skin OEL-SWITZERLAND: TWA 5 ppm (9 mg/m<sup>3</sup>); STEL 10 ppm (18 mg/m<sup>3</sup>) OEL-UNITED KINGDOM: TWA 5 ppm (9 mg/m<sup>3</sup>) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

## Section 16 - Additional Information

**MSDS Creation Date:** 7/23/1999

**Revision #6 Date:** 7/16/2002

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