Section 1 - Chemical Product and Company Identification

MSDS Name: Formic acid
Catalog Numbers: AC147930000, AC147930010, AC147930025, AC147930250, AC147932500, AC270480000, AC270480010, AC270480250, AC410770000, AC410770025, AC410770050, AC410775000, AC423750000, AC423750050, AC423755000, S75125, S80019, S93249, A118P-100, A118P-4, A118P-500, A118PJ500, A119P-1, A119P-20, A119P-4, A119P-500, A119P-500, BP1215-500

Synonyms: Methanoic acid; Hydrogen carboxylic acid; Aminic acid; Formylic acid.

Company Identification: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call:
201-796-7100

Emergency Number US:
201-796-7100

CHEMTREC Phone Number, US:
800-424-9300

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>%</th>
<th>EINECS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>64-18-6</td>
<td>Formic acid</td>
<td>88-99</td>
<td>200-579-1</td>
</tr>
</tbody>
</table>

Hazard Symbols: C

R-phrases: see Section 16

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>%</th>
<th>EINECS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>1-12</td>
<td>231-791-2</td>
</tr>
</tbody>
</table>

Hazard Symbols: C

R-phrases: 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

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.

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### 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.

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### 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.

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

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

**Explosion Limits:**
- Lower: 18 vol %
- Upper: 57 vol %

**NFPA Rating:** health: 3; flammability: 2; instability: 0;

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### 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, Na2CO3), or lime (calcium oxide, CaO). Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. Approach spill from upwind.

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### 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 from contact with oxidizing materials. Corrosives area. Keep refrigerated. (Store below 4°C/39°F.) Do not store in metal containers. Do not store near alkaline substances. Vent periodically. Concentrated 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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formic acid</td>
<td>5 ppm; 10 ppm</td>
<td>5 ppm TWA; 9</td>
<td>5 ppm TWA; 9 ppm STEL</td>
</tr>
<tr>
<td>Water</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: Formic acid: 5 ppm TWA; 9 mg/m3 TWA Water: None listed

Personal Protective Equipment

Eyes: Wear chemical splash 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 respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Color: clear, colorless
Odor: pungent odor - penetrating odor
\[ pH: 2.38 \text{ (0.1M aq soln)} \]

\[ \text{Vapor Pressure: 33.55 mm Hg @ 20 deg C} \]
\[ \text{Vapor Density: 1.6 (air=1)} \]

\[ \text{Evaporation Rate: 2.1 (BuOAc=1)} \]
\[ \text{Viscosity: 1.607 mPa s @ 25 deg C} \]
\[ \text{Boiling Point: 101 deg C (213.80°F)} \]
\[ \text{Freezing/Melting Point: 8.4 deg C (47.12°F)} \]

Decomposition Temperature: Not available
Solubility in water: Soluble
Specific Gravity/Density: 1.22 @ 20°C
Molecular Formula: CH2O2
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: Strong oxidizing agents, strong bases, aluminum, finely powdered metals, sulfuric acid, hydrogen peroxide, nitromethane, carbon steel, furfuryl alcohol.

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:
RTECS:
CAS# 64-18-6: Draize test, rabbit, eye: 122 mg Severe;
Inhalation, mouse: LC50 = 6200 mg/m3/15M;
Inhalation, rat: LC50 = 15 gm/m3/15M;
Oral, mouse: LD50 = 700 mg/kg;
Oral, rat: LD50 = 1100 mg/kg;

RTECS:
CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity: Formic acid - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Water - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: No information found
Reproductive: No information found
Neurotoxicity: No information found
Mutagenicity: Not available
Other: See actual entry in RTECS for complete information.

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

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
Shipping Name: FORMIC ACID
Hazard Class: 8
UN Number: UN1779
Packing Group: II
Canada TDG
Shipping Name: FORMIC ACID  
Hazard Class: 8  
UN Number: UN1779  
Packing Group: II  
USA RQ: CAS# 64-18-6: 5000 lb final RQ; 2270 kg final RQ

### 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 372.

#### 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:

STATE  
Formic acid can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts. Water is not present on state lists from CA, PA, MN, MA, FL, or NJ.

#### California Prop 65

None of the chemicals in this product are listed.

#### 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: Not available

Canada

CAS# 64-18-6 is listed on Canada’s DSL List
CAS# 7732-18-5 is listed on Canada’s DSL List
Canadian WHMIS Classifications: E, B3

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 64-18-6 is listed on Canada’s Ingredient Disclosure List
CAS# 7732-18-5 is not listed on Canada’s Ingredient Disclosure List.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility 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 the company 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 the company has been advised of the possibility of such damages.