



5515 North Service Rd. #306
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megaloid.ca



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RDC
Responsible Distribution Canada
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1. IDENTIFICATION

Name: *Formic Acid 99%*

Synonyms: *methanoic acid, aminic acid, formylic acid, hydrogen carboxylic acid*

Product Uses: *silage additive, animal feed additive, leather tanning, acidulant in dyeing, rubber manufacture, food preservative, etc.*

Supplier: *Megaloid Laboratories Limited*
Identifier: *5515 North Service Road # 306
Burlington, ON L7L 6G4*

EMERGENCY INFORMATION: *Call CHEMTREC - (800) 424-9300
(CCN# 693764)*

2. HAZARD IDENTIFICATION

GHS Class <i>(category)</i>	Flammable liquids <i>(3)</i>	Acute toxicity (inhalation) <i>(3)</i>	Acute toxicity (oral) <i>(4)</i>	Skin Corrosion /irritation <i>(1A)</i>
Signal Word	DANGER			
Hazard Statements	<i>Flammable liquid and vapour (H226)</i>	<i>Toxic if inhaled (H331)</i>	<i>Harmful if swallowed (H302)</i>	<i>Causes severe skin burns and eye damage (H314)</i>

Hazardous Pictograms



GHS Precautionary Statements for Labelling

Prevention:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust or mist.
P261	Avoid breathing vapours.
P264	Wash with plenty of water and soap thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
Response:	
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P330	Rinse mouth.
P370 + P378	In case of fire: Use alcohol-resistant foam, carbon dioxide, dry powder or water spray for extinction.
Storage:	
P403 + P235	Store in a well-ventilated place. Keep cool.
P233	Keep container tightly closed.
P405	Store locked up.
Disposal:	
P501	Dispose of contents/container in accordance with local regulation

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name:	CAS No.	Weight %	Other Identifiers
Formic Acid	64-18-6	>=99	200-579-1

4. FIRST-AID MEASURES

Inhalation

Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** Keep patient still. If breathing stops, administer artificial respiration. Transport to emergency medical facility promptly.

Skin Contact

Wash with plenty of water for several minutes. Remove contaminated clothing. Do not reuse until thoroughly laundered

Eye Contact

Wash eyes with plenty of water, holding eyelids open. Transport to emergency medical facility promptly.

Ingestion

Give plenty of water to rinse mouth. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Transport to emergency medical facility promptly.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause: vomiting, aspiration pneumonia, circulatory collapse, death, acidosis, abdominal cramps, shortness of breath, hypotension, nausea, diarrhea, salivation
The most important known symptoms and effects are described in the labelling (see section 2)

Notes to physician

Treat symptomatically, no known specific antidote.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Foam, dry chemical, water fog or spray only to cool & dilute, product floats on water

Unsuitable Extinguishing Media

High volume water jet.

Specific Hazards Arising from the Product

Combustion Products - carbon monoxide @ 150°C, nitrogen oxides, smoke, formaldehyde forms at 300-400°C

Special Protective Equipment and Precautions for Fire-fighters

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Static Charge Accumulation

Cannot accumulate a static charge on agitation or pumping

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes and clothing. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear self-contained breathing apparatus and protective suit. Rubber gloves.

Methods and materials for containment and cleaning up

Dyke to control spillage and prevent environmental contamination. ventilate contaminated area; recover free liquid with corrosion-resistant suitable pumps; neutralise with sodium carbonate (soda ash) or crushed limestone; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for recycling or disposal

7. HANDLING AND STORAGE

Precautions for Safe Handling

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill & ventilation is impossible or impractical, wear a suitable respirator with organic vapour & acid gas cartridge. Avoid all contact with skin & wash work clothes frequently. An eye bath & safety shower must be available near the workplace. Never cut, drill, weld or grind on or near this container.

When diluting, always add acid to water, and stir continuously to prevent layering.

Conditions for Safe Storage

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. Consider use of non-sparking bronze or aluminium hand tools. It is prudent to ground or electrically bond the source container receiving container and transfer pump before transferring contents. Avoid splashing; keep the product nozzle below the surface in the receiving container.

Keep containers full & tightly sealed. *100% formic acid tends to decompose gradually to carbon monoxide; pressure may accumulate in the drum.* Product is more stable if diluted to 90-95%. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, are tightly sealed unless in use.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Ontario TWAEV 5ppm / 9.4mg/m³
ACGIH TLV 5ppm / 9.4mg/m³
OSHA PEL 5ppm / 9mg/m³

Ontario STEV 10ppm / 19mg/m³
ACGIH STEL 10ppm / 19mg/m³
OSHA STEL Not listed

Ventilation	mechanical ventilation may be required to control airborne titre to regulated limits; have an "escape" respirator (organic vapour & acid gas) available for every worker in the area in case of release – <i>store respirators in airtight containers (such as "Tupperware") to maintain "freshness"</i>
Hands	Barrier(R) - PE/PA/PE, ChemMAX(R), neoprene rubber gloves recommended – <i>confirm suitability with supplier</i>
Eyes	safety glasses with side shields – <i>always protect the eyes</i>
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing

9. PHYSICAL AND CHEMICAL PROPERTIES

Odour & Appearance	clear, colourless, fuming, hygroscopic liquid with intense, pungent, penetrating odour
Odour threshold	11-21ppm – <i>highly variable & unreliable (well above TWAEV / TLV!)</i>
pH	<2 (10% solution) – a strong acid
Melting point/Freezing point	8.4°C / 47°F
Initial boiling point/boiling range	101°C / 213°F (100%); 106.7°C / 224°F (90%)
Flash point	43°C / 109°F (closed cup); also 48-50°C / 118-122°F
Evaporation rate (<i>Butyl Acetate = 1</i>)	2.1
Flammability (solid; gas)	no data available
Lower flammable/explosive limit	12%
Upper flammable/explosive limit	38%
Vapour pressure	33.5mmHg / 4.5kPa (20°C / 68°F); 42.6mmHg / 5.68kPa (25°C / 77°F)
Vapour density (<i>air = 1</i>)	1.6
Relative density	1.22 (100%), 1.21 (90%) - both 20/20°C
Water Solubility	complete
Partition coefficient – n-octanol/water	-0.54
Auto ignition temperature	480°C / 896°F
Decomposition temperature	not known – <i>no decomposition below autoignition temperature</i>
Viscosity	1.8 centipoise (20°C/68°F); 1.61centipoise (25°C/77°F)

10. STABILITY AND REACTIVITY

Reactivity

Dangerously Reactive With:

Strong oxidising agents, strong alkalies, sulphuric acid, phosphorous pentoxide, furfuryl alcohol, sodium hypochlorite

Also Reactive With:

Powdered aluminium and other finely ground metals; corrosive to steel, iron, aluminium, lead; 10-100% formic acid attacks plastics (eg acrylics, nylon, polyurethane, etc.)

Chemical Stability

Stable over the short term but decomposes gradually; will not polymerize

Possibility of Hazardous Reactions

Exothermic reaction. Reacts with alkalies. Reacts with amines. The formation of gaseous decomposition products builds up pressure in tightly closed containers.

Conditions to avoid

Temperature: > 30 degrees Celsius

Incompatible materials

Strong acids and oxidizing agents. Bases, non-coated metals, base metals

Hazardous decomposition products

Decomposition products:

carbon monoxide, carbon dioxide

Thermal decomposition:

350 °C, 2.5 K/min (DSC (DIN 51007))

Thermal decomposition above the indicated temperature is possible. It is not a self-decomposable substance.

Sensitive to Mechanical Impact

No

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	
Skin Contact	corrosive to skin; healing very slow, permanent scarring may occur
Skin Absorption	not generally (<i>one case shows absorption after severe burn of 35% of body causing severe systemic toxicity</i>) ¹
Eye Contact	corrosive; permanent damage likely
Inhalation	highly irritating (coughing, runny nose, sore throat), corrosive damage possible; may cause pulmonary oedema with difficult breathing & shortness of breath; can cause organ damage after a single exposure ¹
Ingestion	corrosive damage to mouth and throat; stomach damage may also occur, vomiting & pain too; other symptoms include intense thirst, nausea, vomiting, diarrhoea, collapse, and death
LD₅₀ (oral)	730, 1100 & 1830mg/kg (rat), 700 & 1100mg/kg ¹ (mouse), 4000mg/kg (dog); >4000mg/kg rabbit
LD₅₀ (skin)	not known
LC₅₀ (inhalation)	3,940 & 8000ppm (rat), 3300ppm (mouse)

11. TOXICITY, CONTINUED

General

Prolonged exposure unlikely due to severe acute effects; bronchitis is possible; chronic absorption of small amounts may damage kidneys

Sensitising

Not a sensitiser in humans or animals

Carcinogen

Not considered a tumorigen or a carcinogen in humans or animals

Reproductive Effect

No known effect in humans or animals

Mutagen

No known effect on humans or animals

Synergistic With

Not known

12. ECOLOGICAL INFORMATION

Bioaccumulation	readily metabolised (biological half-life 2.5hr); cannot bioaccumulate
Biodegradation	biodegrades readily in the presence of oxygen; 35-40% in 5-10 days
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air 36 days; rain dissolves & brings down airborne formic acid, which can be neutralised by soil substances & biodegraded
Mobility in soil, water	water soluble; moves readily in soil and water
Aquatic Toxicity	
LC₅₀ (Fish, 24hr)	175mg/litre (Lepomis macrochirus)
LC₅₀ (Fish, 96hr)	46mg/litre (Leuciscus idus), 46mg/litre (Carassius auratus),
LC₅₀ (Crustacea, 48hr)	34, 120 & 151mg/litre (Daphnia magna)
EC₅₀ (Algae)	27mg/litre (Scenedesmus subspicatus)
EC₅₀ (Bacteria)	47mg/litre (Pseudomonas putida)

13. DISPOSAL CONSIDERATIONS

Waste Disposal

Do not flush to sewer, recycle solvent if possible, local regulations may permit disposal in sanitary landfill, may be incinerated in approved facility after mixing with a suitable flammable waste

Containers

Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.


Pails must be vented and thoroughly dried prior to crushing and recycling.

IBCs (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs).

Steel containers must be inspected, pressure tested & recertified every 5 years.

**Never cut, drill, weld or grind on or near this container,
even if empty**

14. TRANSPORT INFORMATION

Canada TDG	UN / PIN # 1779	
AND	Shipping Name Formic Acid	
U.S.A. 49 CFR	Class & Packing Group 8 (II)	
Marine Pollutant	Not a marine pollutant	
ERAP Required (CA only)	No	
Emergency Response Guide No.	153	
Reportable Quantity (RQ – USA only)	5000 lbs. (2270 kgs.)	

15. REGULATORY INFORMATION

Canada DSL	On Inventory
U.S.A. TSCA	On Inventory
Europe EINECS	On Inventory

U.S.A. Regulations:

Immediately Dangerous to Life or Health: 30 ppm

Allowable Tolerances: The pesticide formic acid is exempted from the requirement of a tolerance in or on honey and honeycomb when used to control tracheal mites and suppress varroa mites in bee colonies, and applied in accordance with label use directions.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 5 ppm (9 mg/cu m).

Niosh Recommendations: Recommended Exposure Limit: 10 Hour Time-Weighted Average: 5 ppm (9 mg/cu m).

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Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 5 ppm; 15 min Short Term Exposure Limit (STEL): 10 ppm.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified & reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non-air quality health & environmental impact & energy requirements. Formic acid is produced, as an intermediate or final product, by process units covered under this subpart.

State Drinking Water Guidelines: Florida 14,000 ug/L

Clean Water Act Requirements: Formic acid is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

RCRA Requirements: As stipulated in 40 CFR 261.33, when formic acid, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5).

FIFRA Requirements: The pesticide formic acid is exempted from the requirement of a tolerance in or on honey and honeycomb when used to control tracheal mites and suppress varroa mites in bee colonies, and applied in accordance with label use directions.

FDA Requirements: Formic acid is a food additive permitted for direct addition to food for human consumption as a synthetic flavoring substance and adjuvant in accordance with the following conditions: a) they are used in the minimum quantity required to produce their intended effect, and otherwise in accordance with all the principles of good manufacturing practice, and 2) they consist of one or more of the following, used alone or in combination with flavoring substances and adjuvants generally recognized as safe in food, prior-sanctioned for such use, or regulated by an appropriate section in this part. The food additive, formic acid, may be safely used in accordance with the following conditions: (a) The additive is used as a preservative in hay crop silage in an amount not to exceed 2.25 percent of the silage on a dry weight basis or 0.45 percent when direct cut, as follows: (1) The top foot of silage stored should not contain formic acid and (2) Silage should not be fed to livestock within 4 weeks of treatment. (b) The additive is used or intended for use as a feed acidifying agent, to lower the pH, in complete swine feeds at levels not to exceed 1.2 percent of the complete feed. (1) The additive consists of not less than 85 percent formic acid (CAS 64-18-6). (2) The additive meets the following specifications: (i) Free methyl alcohol not to exceed 1,000 parts per million (ppm); (ii) Methyl formate not to exceed 1,000 ppm; and (iii) Moisture not to exceed 15 percent. Indirect food substance additives affirmed as generally recognized as safe. (a) Formic acid (CH₂O₂, CAS Reg. No. 64-18-6) is also referred to as methanoic acid or hydrogen carboxylic acid. It occurs naturally in some insects and is contained in the free acid state in a number of plants. Formic acid is prepared by the reaction of sodium formate with sulfuric acid and is isolated by distillation. (b) Formic acid is used as a constituent of paper and paperboard used for food packaging. (c) The ingredient is used at levels not to exceed good manufacturing practice in accordance with part 186.1(b)(1). (d) Prior sanctions for formic acid different from the uses established in this section do not exist or have been waived. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: formic acid is included in pediculicide drug products.

16. OTHER INFORMATION

NFPA RATING	Health 3	Flammability 2	Instability 0
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Prepared for Megaloid Laboratories **by** Rob Cangiano
Preparation Date: December 2003
Revision Dates: July 2006, July 2009, June 2012, July 2013, July 2015, December 2020

Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

(1) European Chemicals Agency (ECHA) dossier for formic acid: http://apps.echa.europa.eu/registered/data/dossiers/DISS-9d82e8c5-65e9-3179-e044-00144f67d249/DISS-9d82e8c5-65e9-3179-e044-00144f67d249_DISS-9d82e8c5-65e9-3179-e044-00144f67d249.html

Key to Abbreviations	<p>ACGIH® = American Conference of Governmental Industrial Hygienists AIHA® = AIHA® Guideline Foundation HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances</p>
References	<p>CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA ("BIOVIA"). Available from Canadian Centre for Occupational Health and Safety (CCOHS).</p>
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