SAFETY DATA SHEET

FORMIC ACID

CAS No.: 64-18-6

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

FORMIC ACID
Methanoic acid; Formylic acid
CAS: 64-18-6

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Textile dyeing/finishing, leather tanning, rubber coagulant, silage/animal feed preservative, descaling agent, chemical intermediate, cleaning agent. For industrial user only.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Flam. Liq. 3	Flammable liquid, Category 3, H226
Acute Tox. 4	Acute oral toxicity, Category 4, H302
Skin Corr. 1A	Skin corrosion, Category 1A, H314
STOT SE 3	Respiratory tract irritation, single exposure, Category 3, H335

GHS label elements, including precautionary statements

GHS: Danger

Hazard statements

Flam. Liq. 3: H226 – Flammable liquid and vapor.
Acute Tox. 4: H302 – Harmful if swallowed.
Skin Corr. 1A: H314 – Causes severe skin burns and eye damage.
STOT SE 3: H335 – May cause respiratory irritation.

Precautionary statements

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233: Keep container tightly closed.
P260: Do not breathe mist/vapors.
P264: Wash hands thoroughly after handling.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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/doctor.
P370+P378: In case of fire: Use dry chemical powder, CO2, alcohol-resistant foam to extinguish.
P403+P235: Store in a well-ventilated place. Keep cool.
P501: Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification

Vapors are heavier than air and may accumulate in low-lying/confined spaces. Corrosive to many common metals.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Formic acid (aqueous solution, industrial grade, typically 85–90% w/w)

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 64-18-6	Formic acid — Flam. Liq. 3: H226; Acute Tox. 4: H302; Skin Corr. 1A: H314; STOT SE 3: H335 – Danger	85–90% (balance water)

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

Non-applicable

4. FIRST AID MEASURES

Description of necessary first-aid measures

Request medical assistance immediately, showing the SDS of this product.

By inhalation

Remove person to fresh air immediately and keep at rest. If breathing is difficult, give oxygen. In case of respiratory arrest, provide artificial respiration. Seek immediate medical attention.

By skin contact

Remove contaminated clothing and footwear immediately. Flush affected skin with plenty of water for at least 20 minutes. Seek immediate medical attention – treat as a chemical burn.

By eye contact

Rinse eyes immediately with plenty of lukewarm water for at least 20 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate medical attention.

By ingestion/aspiration

Do NOT induce vomiting. Rinse mouth with water (do not give anything by mouth if person is unconscious). Seek immediate medical attention; show this SDS to the physician – corrosive, risk of esophageal/gastric burns.

Most important symptoms/effects, acute and delayed

Acute and delayed effects are indicated in sections 2 and 11.

Indication of immediate medical attention and special treatment needed, if necessary

Not relevant

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Dry chemical powder, carbon dioxide (CO2), alcohol-resistant foam, water spray/fog.
Unsuitable: Do not use a solid/jet water stream, which may spread the fire.

Specific hazards arising from the chemical

Flammable liquid; vapors may form flammable/explosive mixtures with air. Vapors are corrosive and irritant. Combustion produces carbon monoxide, carbon dioxide and other irritant fumes. Containers may rupture on exposure to fire heat.

Special protective actions for fire-fighters

Wear self-contained breathing apparatus (SCBA) and full acid-resistant protective clothing. Cool fire-exposed containers with water spray from a safe distance if it can be done without risk.

Additional provisions

If safe to do so, remove exposed containers or cool with water spray from a safe distance. Prevent fire-fighting water from entering drains or watercourses; contain and collect for disposal.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Evacuate non-essential personnel. Remove ignition sources. Ensure adequate ventilation. Use appropriate PPE, including respiratory protection (see section 8).

For emergency responders

Wear full chemical-resistant protective equipment including SCBA for large/uncontrolled releases.

Environmental precautions

Prevent entry into drains, sewers, watercourses and soil. Contain spill; notify authorities for significant environmental releases.

Methods and materials for containment and cleaning up

Contain spill with inert absorbent (sand, vermiculite, diatomaceous earth) or dike far ahead of spill for later disposal. Neutralize residues carefully with soda ash/lime, avoiding vigorous reaction and gas evolution. Collect in suitable closed containers for disposal per section 13. Do not use combustible absorbents.

Reference to other sections

See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use

Avoid contact with skin, eyes and clothing. Avoid breathing vapors/mist. Use only in well-ventilated areas or with local exhaust ventilation. Do not eat, drink or smoke while handling.

B. Technical recommendations for the prevention of fires and explosions

Keep away from heat, sparks, open flames and other ignition sources. Bond and ground containers during transfer operations to control static electricity. Use explosion-proof electrical/ventilating equipment.

C. Technical recommendations on general occupational hygiene

Wash hands and exposed skin after handling and before eating, drinking or smoking. Launder contaminated clothing before reuse.

D. Technical recommendations to prevent environmental risks

Prevent uncontrolled discharge to drains and watercourses. Provide bunding for bulk storage.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage temperature	5–30°C (avoid freezing at <8°C and avoid heat above 30°C)
Maximum time	12 months in original sealed packaging

B. General conditions for storage

Store in a cool, well-ventilated place, away from heat, direct sunlight, oxidizing agents, strong bases and incompatible metals. Store in corrosion-resistant (e.g., HDPE, stainless steel 316) containers/tanks. Keep container tightly closed.

Specific end use(s)

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987):

Identification	Occupational Exposure Limit Type	Value
Formic acid CAS: 64-18-6	Time Weighted average concentration (8 hrs)	5 ppm / 9.4 mg/m³
	Short-term exposure limit (15 min)	10 ppm (commonly referenced STEL)

Appropriate engineering controls

Use local exhaust ventilation to keep vapor concentrations below occupational exposure limits, especially in enclosed/confined spaces.

B. Respiratory protection

Where exposure limits may be exceeded, use an air-purifying respirator with an acid gas/organic vapor cartridge; use SCBA for high concentrations or unknown exposure.

C. Specific protection for the hands

Chemical-resistant gloves – nitrile, neoprene or butyl rubber recommended (consult glove manufacturer's breakthrough data).

D. Eye and face protection

Chemical safety goggles and face shield for operations with splash risk.

E. Bodily protection

Acid-resistant apron/protective clothing; acid-resistant footwear.

F. Additional emergency measures

Emergency eyewash station and safety shower should be available in the immediate work area.

Environmental exposure controls

Avoid environmental spillage of both the product and its container. See subsection 7.1.D.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Liquid
Appearance	Clear, colorless liquid
Color	Colorless
Odor	Pungent, sharp/acrid
Odour threshold	approx. 1–20 ppm
Volatility	
Boiling point at atmospheric pressure	100.8°C (100% acid); approx. 107°C for 85–90% solution
Vapour pressure at 20°C	approx. 35–44 hPa
Evaporation rate (n-BuAc=1)	<1
Product Description	
Density / Relative density at 20°C	approx. 1.20–1.22 g/cm³ (85–90% solution)
Dynamic viscosity at 20°C	approx. 1.6–1.8 mPa·s
pH (as supplied)	<1 (strongly acidic)
Vapour density (air=1)	1.59
Solubility in water	Miscible in all proportions
Melting point/freezing point	approx. 8.4°C (100% acid); lower for 85–90% solution
Flammability	
Flash Point	approx. 50–69°C (closed cup, depending on concentration)
Autoignition temperature	approx. 480–601°C
Lower / Upper flammability limit	approx. 18% / 57% (v/v in air)

** Not relevant / not applicable due to the physical nature of the product.*

Other information

Explosive properties	Not classified as explosive
Oxidising properties	Not oxidising
Corrosive to metals	Corrosive to many common metals (mild steel, aluminium)
Molecular weight	46.03 g/mol

10. STABILITY AND REACTIVITY

Reactivity

Reacts with strong oxidizing agents, strong bases and many metals (evolving flammable hydrogen gas and corrosion). Reducing agent.

Chemical stability

Chemically stable under recommended storage conditions.

Possibility of hazardous reactions

Reaction with strong oxidizers may be vigorous/exothermic. Contact with certain metals (e.g., mild steel, zinc, aluminium) generates flammable hydrogen gas, which can accumulate in enclosed spaces.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Absorbs moisture from air (hygroscopic)	Avoid heat – flammable vapors	No special sensitivity	Miscible with water; keep container closed

Incompatible materials

Strong Oxidizers	Reactive Metals (steel/Al/Zn)
Strong Bases	Sulfuric Acid/Hydrogen Peroxide

Hazardous decomposition products

On combustion or strong heating, produces carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)

Harmful if swallowed; corrosive to mouth, throat, esophagus and stomach. May cause severe gastrointestinal burns.

B. Inhalation (acute effect)

Vapors are irritating to the nose, throat and respiratory tract; may cause respiratory tract irritation and, at high concentrations, pulmonary edema.

C. Contact with skin and eyes (acute effect)

Corrosive: causes severe skin burns and eye damage on contact.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)

Classification criteria for carcinogenicity, mutagenicity and reproductive toxicity are not met based on available data.

E. Sensitizing effects

Not classified as a skin or respiratory sensitizer based on available data.

F. Specific target organ toxicity (STOT) – single exposure

May cause respiratory irritation (H335).

G. Specific target organ toxicity (STOT) – repeated exposure

Classification criteria are not met based on available data.

H. Aspiration hazard

Classification criteria are not met based on available data (low viscosity liquid; aspiration hazard not expected to be significant).

Product-specific toxicological information

Identification	Acute Toxicity	Species
Formic acid CAS: 64-18-6	LD50 oral (rat): approx. 700–1100 mg/kg	Rat
	LC50 inhalation (rat, 4h): approx. 14.4 mg/L	Rat
	LD50 dermal (rabbit): approx. 1100 mg/kg	Rabbit

12. ECOLOGICAL INFORMATION

Not classified as hazardous to the aquatic environment (acute) based on available data, though acidic pH shock can affect aquatic organisms at high concentrations.

Toxicity

Acute Toxicity	Species	Genus
LC50 (fish): 130–180 mg/L (96h)	Not specified	Fish
EC50 (Daphnia): 22–100 mg/L (48h)	Daphnia magna	Crustacean

Persistence and degradability

Readily biodegradable; formic acid is a naturally occurring compound, rapidly metabolized by microorganisms.

Bioaccumulative potential

Low bioaccumulation potential (log Kow approx. -0.54; miscible with water).

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Very low (fully miscible/ionic)	Low	No	Mobile in moist soil

Results of PBT and vPvB assessment

Non-applicable – not assessed as a PBT/vPvB substance.

Other adverse effects

Not described

13. DISPOSAL CONSIDERATIONS

Disposal methods

Neutralize carefully with lime, soda ash or dilute alkaline solution (controlled addition, exothermic) before disposal, in accordance with local regulations. Dispose of via a licensed hazardous/chemical waste contractor. Do not discharge directly to drains or watercourses without neutralization/dilution as permitted by local Pollution Control Board norms.

Refer to national and local regulations on waste management (Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended).

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023)

14.1 UN number	UN1779
14.2 UN proper shipping name	FORMIC ACID with more than 85% acid, by mass
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22)

14.1 UN number	UN1779
14.2 UN proper shipping name	FORMIC ACID with more than 85% acid, by mass
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Marine pollutant	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

EmS Codes: Not relevant

Transport of dangerous goods by air (IATA/ICAO 2024)

14.1 UN number	UN1779
14.2 UN proper shipping name	FORMIC ACID with more than 85% acid, by mass
14.3 Transport hazard class(es)	8
14.4 Packing group	II
14.5 Environmental hazard	No
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation

Manufacture, Storage and Import of Hazardous Chemicals Rules 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
Public Liability Insurance Act, 1991

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H226: Flammable liquid and vapor.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

The United Nations Economic Commission for Europe (UNECE); publicly available GHS classification and labelling data for the substance/CAS number referenced in Section 1.

Abbreviations and acronyms

ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | COD: Chemical Oxygen Demand | BOD5: 5-day biochemical oxygen demand | BCF: Bioconcentration factor | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Log-POW: Octanol-water partition coefficient | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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