SAFETY DATA SHEET

Ethyl fluoroacetate (EFA)

SECTION 1: IDENTIFICATION

Product identifier: Ethyl fluoroacetate

Other identifier: EFA

CAS number: 459-72-3

Recommended use: Laboratory chemical, synthesis of substances

Restrictions on use: Only for uses supported by the supplier’s product specification and applicable regulatory status.

Supplier: Automat Solutions, Inc.

U.S. address: 2100 Williams St, San Leandro, CA 94577, United States.

U.S. telephone: +1 (510) 982-6488.

Email: contact@automatsoln.com.

Emergency telephone: +1 (510) 982-6488 (24 hours/day, 7 days/week).

SECTION 2: HAZARD IDENTIFICATION

GHS classification: Flammable liquids, Category 3.

GHS classification: Acute toxicity (oral), Category 2.

GHS classification: Acute toxicity (dermal), Category 2.

GHS classification: Acute toxicity (inhalation), Category 2.

GHS classification: Serious eye damage, Category 1.

GHS classification: Hazardous to the aquatic environment, acute, Category 1 (supplemental).

Signal word: Danger.

Hazard symbols (named): GHS02 — Flame; GHS05 — Corrosion; GHS06 — Skull and crossbones; GHS09 — Environment.

H226: Flammable liquid and vapor.

H300: Fatal if swallowed.

H310: Fatal in contact with skin.

H330: Fatal if inhaled.

H318: Causes serious eye damage.

H400: Very toxic to aquatic life.

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233: Keep container tightly closed.

P240: Ground and bond container and receiving equipment.

P241: Use explosion-proof electrical, ventilating and lighting equipment.

P242: Use non-sparking tools.

P243: Take action to prevent static discharges.

P260: Do not breathe dust, fume, gas, mist, vapors or spray.

P262: Do not get in eyes, on skin, or on clothing.

P264: Wash hands and exposed skin thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P273: Avoid release to the environment.

P280: Wear protective gloves, protective clothing, eye protection and face protection.

P284: Wear respiratory protection.

P301+P310+P330: IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P302+P352+P310: IF ON SKIN: Wash with plenty of water. Immediately call a POISON CENTER or doctor.

P304+P340+P310: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.

P305+P351+P338+P310: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

P361+P364: Take off immediately all contaminated clothing and wash it before reuse.

P370+P378: In case of fire: Use dry chemical, carbon dioxide or alcohol-resistant foam to extinguish.

P391: Collect spillage.

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

P403+P235: Store in a well-ventilated place. Keep cool.

P405: Store locked up.

P501: Dispose of contents and container through an approved waste disposal facility in accordance with applicable local, state and federal regulations.

Other hazards / hazards not otherwise classified: No additional information available.

Environmental classification is supplemental to OSHA workplace hazard classification.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Type: Substance.

Chemical name: Ethyl fluoroacetate

Synonym / abbreviation: EFA

CAS number: 459-72-3

Molecular formula: C4H7FO2

Molecular weight: 106.10 g/mol

Composition declaration: ≤100%; lower limit not specified.

Hazardous impurities / stabilizers: No additional information available.

SECTION 4: FIRST AID MEASURES

Inhalation: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.

Skin contact: Immediately remove contaminated clothing. Rinse affected skin thoroughly with water or shower. Immediately call a POISON CENTER or doctor.

Eye contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately obtain medical attention, preferably from an ophthalmologist.

Ingestion: Rinse mouth. Do not induce vomiting. Never give anything by mouth to an unconscious person. Immediately call a POISON CENTER or doctor.

Most important acute and delayed effects: Fatal if swallowed. Fatal in contact with skin. Fatal if inhaled. Causes serious eye damage.

Medical attention / treatment: Treat symptomatically. Protect rescuers from exposure.

Emergency treatment: All suspected exposures require immediate poison-center / emergency medical assessment. A specific treatment protocol was not supplied; do not delay care.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable / unsuitable extinguishing media: Water spray, alcohol-resistant foam, dry chemical or carbon dioxide, as appropriate to the surrounding fire. Do not direct a solid water jet at spilled liquid.

Specific hazards: Vapors can form ignitable mixtures, travel along floors and flash back. Heated closed containers may rupture.

Hazardous combustion products: Carbon monoxide, carbon dioxide and hydrogen fluoride.

Firefighter protection: Wear self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance.

Additional precautions: Prevent contaminated firefighting runoff from entering drains and waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Isolate the area. Keep unprotected personnel away. Ensure ventilation; avoid breathing dust, mist or vapor and avoid skin/eye contact. Wear the protection described in Section 8.

Emergency procedures: Evacuate the affected area when exposure cannot be controlled; trained responders only for significant releases.

Environmental precautions: Prevent entry into drains, sewers and waterways. Contain released material.

Ignition control: Remove ignition sources if safe. Use non-sparking tools and suitable explosion-proof equipment.

Containment / cleanup: Absorb with non-combustible inert material such as sand or vermiculite. Collect into a compatible, closed, labeled waste container.

Waste handling: Dispose of collected material and contaminated packaging according to Section 13.

SECTION 7: HANDLING AND STORAGE

Handling: Use suitable local exhaust ventilation. Avoid contact and inhalation. Wash after handling. Do not eat, drink or smoke in work areas.

Storage: Keep containers tightly closed in a dry, well-ventilated location away from incompatible substances. Protect from moisture.

Flammable / combustible handling: Keep away from heat and ignition sources; ground and bond containers during transfer and control static discharge. Use non-sparking tools and explosion-proof equipment as applicable.

Security: Store locked up.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits: No substance-specific occupational exposure limit available in the source information. Apply exposure limits and workplace controls required by the applicable jurisdiction.

Engineering controls: Use local exhaust or a suitable fume hood. Provide an eyewash and safety shower near the work area.

Eye / face protection: Chemical safety goggles; use a face shield in addition to goggles when splashing or corrosive exposure is possible.

Hand protection: Wear chemical-resistant gloves selected for the chemical, exposure duration, temperature and task. Confirm permeation/breakthrough performance with the glove manufacturer; select gloves with a breakthrough time appropriate for the task.

Skin / body protection: Wear protective clothing suitable for the task. Use flame-resistant, antistatic clothing where a flammable atmosphere is possible.

Respiratory protection: Use a properly selected, fit-tested, NIOSH-approved respirator under a respiratory-protection program when engineering controls are insufficient. Cartridge/filter selection must address all relevant gases, vapors and particles. Unknown or immediately dangerous concentrations require appropriate supplied-air protection or SCBA.

Hygiene: Remove contaminated clothing and wash before reuse. Wash hands and exposed skin after handling.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Data basis: Reference values from available supplier and literature information. These values are not batch specifications; estimates and test conditions are identified where available.

Molecular formula: C4H7FO2

Molecular weight: 106.10 g/mol

Appearance / physical state: Colorless to pale-yellow liquid (Automat product information)

Odor: Ethyl acetate-like

Odor threshold: No data available.

Melting / freezing point: No data available

Initial boiling point / boiling range: 119.3 °C at 1,004 hPa

Flammability: Flammable liquids, Category 3

Lower / upper flammability limits: No data available.

Flash point: 31 °C, closed cup

Autoignition temperature: No data available.

Decomposition temperature: No data available.

pH: No data available.

Kinematic viscosity: No data available.

Dynamic viscosity: No data available.

Water solubility: Soluble; may hydrolyze

Other solubility: No data available.

Partition coefficient (n-octanol/water): No data available.

Vapor pressure: No data available.

Density / relative density: 1.098 g/cm³ at 25 °C

Relative vapor density: Approximately 3.7 (calculated from molecular weight; air = 1)

Evaporation rate: No data available.

Particle characteristics: Not applicable to the liquid; no particle data for any solidified phase.

Refractive index: n20/D 1.376

Oxidizing properties: No data available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: No additional data available; follow incompatibility and handling information.

Chemical stability: Stable under recommended dry storage conditions; protect from stated sensitivities.

Possibility of hazardous reactions: Ignitable vapor/air mixtures may form.

Conditions to avoid: Excess heat, incompatible materials and moisture where sensitive. Avoid sparks, flames and static discharge.

Incompatible materials: Acids, bases, oxidizing agents and reducing agents.

Hazardous decomposition products: Carbon monoxide, carbon dioxide and hydrogen fluoride.

SECTION 11: TOXICOLOGICAL INFORMATION

Data basis: Available supplier toxicological information; missing study conditions are stated where applicable. No-data entries do not establish absence of hazard.

Likely routes of exposure: Inhalation, skin contact, eye contact and ingestion.

Acute toxicity / numerical measures: Supplier-based Acute Toxicity Category 2 by oral, dermal and inhalation routes. No product-specific measured Automat LD50/LC50 values available.

Skin corrosion / irritation: No data available.

Serious eye damage / irritation: Causes serious eye damage.

Respiratory / skin sensitization: No sensitization data available.

Germ cell mutagenicity: No data available.

Carcinogenicity: No data available. IARC, NTP and OSHA carcinogen-list information: No data available.

Reproductive toxicity: No data available.

STOT, single exposure: Not classified; no additional data available.

STOT, repeated exposure: No data available.

Aspiration hazard: No data available.

Symptoms / delayed effects: Fatal if swallowed. Fatal in contact with skin. Fatal if inhaled. Causes serious eye damage.

Interactions: No additional information available.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: Very toxic to aquatic life (supplier-based Acute 1); no measured ecotoxicity values supplied.

Persistence / degradability: No data available.

Bioaccumulative potential: No bioaccumulation study data available; partition coefficient, if available, is listed in Section 9.

Mobility in soil: No data available.

Other adverse effects: No additional data available. Prevent release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment: Collect waste and contaminated absorbents in compatible, closed, labeled containers. Use a licensed waste contractor and comply with applicable local, state and federal requirements.

Environmental precautions: Do not discharge to drains, soil or waterways. Do not mix with incompatible wastes.

Contaminated packaging: Handle residues and uncleaned packaging with the same precautions as the product. Empty containers may retain ignitable vapor; do not cut, weld or heat them.

Thermal treatment: Any authorized incineration requires controls suitable for fluorinated decomposition products, including HF.

SECTION 14: TRANSPORT INFORMATION

DOT (U.S.): UN2929; Toxic liquid, flammable, organic, n.o.s. (ethyl fluoroacetate); Class 6.1 (3); Packing Group II. Poison inhalation hazard: not assigned.

IMDG: UN2929; TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. (ethyl fluoroacetate); Class 6.1 (3); Packing Group II.

IATA: UN2929; Toxic liquid, flammable, organic, n.o.s. (ethyl fluoroacetate); Class 6.1 (3); Packing Group II.

Transport hazard labels: 6.1 + 3.

ERG guide: 131 (PHMSA ERG 2024).

Environmental hazards / IMDG marine pollutant: Yes; aquatic acute Category 1 classification.

Transport in bulk under IMO instruments: Not assessed; these entries address packaged product.

Special precautions: Prevent exposure and ignition; use qualified dangerous-goods procedures.

Air shipment details: Apply the current packing instructions, quantity limits and carrier restrictions for the actual shipment.

SECTION 15: REGULATORY INFORMATION

TSCA inventory information: No verified inventory-status data available.

SARA 311/312 hazard categories: Flammable liquids; Acute toxicity (oral); Acute toxicity (dermal); Acute toxicity (inhalation); Serious eye damage.

Additional federal and state regulatory information: No additional verified information available.

SECTION 16: OTHER INFORMATION

Preparation / revision date: 2026-10-22.

Document version: AS-EFA-20261022-01.

Revision description: Selected UN2929/6.1(3)/II transport entry; retained the lab-approved fatal exposure and serious-eye-damage hazards. Supplier address and telephone updated.

Information sources: Existing Automat Solutions SDS and supplier information. Automat lab decision dated 2026-10-21; Sigma-Aldrich 163813, TCI F0030, Thermo H61340, Fluorochem F019465 and source comparison.

Data limitations: Supplier and literature values are reference information and are not measurements on an Automat production lot. Missing test conditions and unavailable data are stated in the relevant sections.

Abbreviations: GHS, Globally Harmonized System; LD50, median lethal dose; LC50, median lethal concentration; ATE, acute toxicity estimate; STOT, specific target organ toxicity; DOT, U.S. Department of Transportation; IMDG, International Maritime Dangerous Goods; IATA, International Air Transport Association.

Disclaimer: This information describes safety precautions for the identified material. It is not a certificate of analysis or a guarantee of product properties. The information may not apply when the material is combined with other substances or used in processes not described here.