



Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name	Ethyl Acrylate, stabilised
Synonyms	ethyl-2-propenoate; 2-propenoic acid, ethyl ester
CAS#	140-88-5
Europe EC#	205-438-8
Product Uses	monomer for acrylic emulsion polymers, chemical synthesis

2. HAZARDS

Quick Guide: flammable liquid, heavy vapour may travel, distant ignition and flashback are possible, severely irritating – even corrosive – to skin and eyes, skin sensitiser; *dangerously reactive in the absence of inhibitor*

Canada – WHMIS

Key:

B 2, D 1A, D 2B, E, F* *(in the absence of inhibitor)
B 2 – Flash Point <38°C, **B 3** – Flash Point >38°C & <93°C
D 1 – Immediately Toxic, **D 2** – Chronic Toxicity
C – Oxidising Substance, **E** – Corrosive, **F** – Reactive Substance



B2 – Flammable Liquid



D1A – Very Toxic



D2A – Very Toxic

U.S.A. – HMIS

Key:

Health – 3, Fire – 3, Reactivity – 1 or 3 (without inhibitor)
0=minimal, **1**=slight, **2**=moderate, **3**=serious, **4**=severe

IN THE ABSENCE OF INHIBITOR



F – Dangerously Reactive



E – Corrosive

3. COMPOSITION

	%	TWAEV / TLV mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
ethyl-2-propenoate	>99.5%	5 / 20 (skin)	800	460	1400
methoxyphenol – or similar inhibitor	10-100ppm	5 / 25	1600	not known	not known

4. FIRST AID

SKIN:	Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES:	Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.
INHALATION:	Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION:	Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

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 & FLAMMABILITY

Flash Point	8°C / 46°F (closed cup)
Autoignition Temperature	355°C / 671°F
Flammable Limits	1.4% – 12.1%
Combustion Products	carbon monoxide, nitrogen oxides, acrid smoke & irritating aldehydes
Firefighting Precautions	foam, dry chemical, water fog or spray, product floats on water – water jet spreads flames; firefighters must wear SCBA
Static Charge Accumulation	not known – probably accumulates a static charge on agitation or pumping

Please ensure that this MSDS is given to, and explained to people using this product.

6. ACCIDENTAL RELEASE MEASURES

Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.

Leak Precaution dyke to control spillage and prevent environmental contamination
 Handling Spill ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store cool, preferably below 20°C / 68°F, and for no longer than 6 months. If stored longer than 30 days, check stabiliser concentration (eg: hydroquinone 10-100ppm) weekly & replenish as necessary. (*The pure monomer (without stabiliser) can only be safely stored below 10°C / 50°F.*) For prolonged storage (but less than 6 months) lower headspace oxygen to 6-8% to reduce likelihood of peroxide formation. Keep dry, dark, away from sources of ignition, heat & oxidising agents. Only use non-sparking bronze or aluminium hand tools. All electrical & mechanical equipment (including lighting, switchgear & forklift trucks) used with or around this product must be explosion-proof.

Always ground or electrically bond the source container, the receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container. The inhibitor only works in the presence of oxygen; ensure containers have a head space & a low (but not zero) oxygen concentration.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour cartridge and appropriate protective clothing (Part 8).

Never cut, drill, weld or grind on or near this container. Avoid all contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	5ppm / 20.5mg/m ³	Ontario STEV	15ppm / 61mg/m ³
ACGIH TLV	5ppm / 20.5mg/m ³ (skin);	ACGIH STEL	15ppm / 61mg/m ³
OSHA PEL	5ppm / 20mg/m ³ (skin);	OSHA STEL	25ppm / 100mg/m ³

Ventilation ethyl acrylate should be used in sealed reaction equipment; mechanical ventilation may be required to control airborne titre to regulated limits; respirators with an organic vapour cartridge should be available for “escape” in case ventilation or containment fails; *store respirators in sealed container (“Tupperware” or “Zip Lock”)* to ensure cartridge freshness

Hands butyl rubber, “Responder” or “Tychem” gloves recommended – *consult supplier to confirm suitability*

Eyes gas-tight safety goggles plus a face shield if there is any danger of splashing

Clothing wear impermeable (above) apron, boots, & long sleeves; if there is any danger of splashing, consider the use of a full-body encapsulating suit

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with pungent, nauseating odour
Odour Threshold	below 0.004ppm
Vapour Pressure	29.5mmHg / 3.9kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	3.3
Vapour Density (air = 1)	3.5
Boiling Range	100°C / 212°F
Freezing Point	-71°C / -96°F
Specific Gravity	0.923 (20/20°C)
Water Solubility	15-20grams per litre (20°C / 68°F)
Also soluble in	ethanol, chloroform, diethyl ether; somewhat soluble in most organic solvents
Viscosity	0.55centipoise (25°C / 77°F)
pH	not known – <i>hydrolyses to acrylic acid & ethanol in water</i>
Conversion Factor	1ppm = 4.09mg/m ³
Molecular Weight	100grams per mole

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10. REACTIVITY

Dangerously Reactive With	strong oxidising agents, azo- compounds; copper or iron (& other catalytic metals), strong acids may initiate polymerization
Also Reactive With	amines or strong alkalis may extract hydroquinone inhibitor with risk of polymerisation;
Stability	stable in the presence of stabiliser (eg: <i>hydroquinone 10-100ppm</i>)
Decomposes in Presence of	moisture or heat may initiate polymerisation
Decomposition Products	apart from Hazardous Combustion Products, moisture causes formation of acrylic acid
Sensitive to Mechanical Impact	no

11. TOXICITY

Effects, Acute Exposure

Skin Contact	irritating (blistering & scarring) if not removed promptly; <i>reacts with moisture to form acrylic acid which is severely irritating & corrosive to skin</i>
Skin Absorption	yes; no toxic effects likely by this route
Eye Contact	lachrymator; severely irritating; corrosive to eyes if not removed promptly; may cause blindness
Inhalation	severely irritating causing coughing, wheezing; may cause life-threatening pulmonary oedema <i>These effects are unlikely because of the highly unpleasant, aversive odour and eye irritation</i>
Ingestion	irritating & corrosive to mouth, throat and stomach; abdominal pain may occur – not a route of industrial exposure

Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis; low levels may cause bronchial hyper-reactivity
Sensitising	skin sensitiser in humans
Carcinogen/Tumorigen	possibly carcinogenic in humans (IARC); not classified by other agencies
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD ₅₀ (oral)	800 & 1020mg/kg (rat), 1800mg/kg (mouse), 370mg/kg (rabbit)
LD ₅₀ (skin)	460 & 1800mg/kg (rabbit), 3050mg/kg (rat), 3000mg/kg (mouse)
LC ₅₀ (inhalation)	1400 & 2180ppm (rat), 3960ppm (mouse)

12. ECOLOGICAL INFORMATION

Bioaccumulation	not a bioaccumulator
Biodegradation	biodegrades readily & rapidly in the presence of oxygen; 60% in 5 days, 50% in 2 weeks, 100% in 7 days & other results
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air 6hr → 5 days (<i>several tests</i>)
Mobility in soil, water	water soluble; moves readily in soil & water
Aquatic Toxicity	
LC ₅₀ (Fish)	2mg/litre (Cyprinodon variegatus, 96hr), 2.5mg/litre (Pimephelas promelas), 4.6mg/litre (Salmo gairdneri & Oncorhynchus mykiss), 10-22mg/litre (Leuciscus idus)
EC ₅₀ (Crustacea, 24hr)	7.9mg/litre (Daphnia magna), 4.4mg/litre (Daphnia magna straus) & others
EC ₅₀ (Algae)	48mg/litre (Scenedesmus subspicatus)
EC ₅₀ (Bacteria)	1536mg/litre (Pseudomonas putida), 47mg/litre (Nitrosomas sp.), 132mg/litre (“mixed methanogens”)

13. DISPOSAL

Waste Disposal	do not flush to sewer , may be incinerated in approved facility with flue gas monitoring and scrubbing
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. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>

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14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN-1917
AND	Shipping Name	ethyl acrylate, stabilised
U.S.A. 49 CFR	Class & Packing Group	3 (II)
Marine Pollutant		not a marine pollutant
ERAP Required		NO

**EMERGENCY INFORMATION**

Canada	Call CANUTEC (collect)	(613) 996-6666
U.S.A.	Call CHEMTREC	(800) 424-9300

15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory

Europe Classification	Harmful Flammable
Europe Risk Phrases <i>if</i>	R: 11, 20/21/22, 36/37/38, 43 – <i>Highly flammable. Harmful by inhalation, in contact with skin & swallowed. Irritating to eyes, respiratory system and skin. May cause sensitisation by skin contact.</i>
Europe Safety Phrases	S: 9, 16, 33, 36/37, 43 – <i>Keep container in a well ventilated place. Keep away from sources of ignition; no smoking. Avoid contact with eyes. Take precautionary measures against static discharge. Wear suitable protective clothing & gloves.</i>

Immediately Dangerous to Life or Health: NIOSH has recommended that ethyl acrylate be treated as a potential human carcinogen.

Allowable Tolerances: Residues resulting from the use of the following substances, that meet the definition of a polymer and the criteria specified for defining a low-risk polymer in 40 CFR 723.250, as an inert ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemical formulations, are exempted from the requirement of a tolerance under FFDC section 408, if such use is in accordance with good agricultural or manufacturing practices. Ethyl acrylate is included on this list.

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time-Weighted Avg: 25 ppm (100 mg/cu m). Skin Designation. Vacated 1989 OSHA PEL TWA 5 ppm (20 mg/cu m); STEL 25 ppm (100 mg/cu m), skin designation, is still enforced in some states.

NIOSH Recommendations: NIOSH recommends that ethyl acrylate be regulated as a potential occupational carcinogen. NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concn.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 5 ppm; 15 min Short Term Exposure Limit (STEL): 15 ppm A4; Not classifiable as a human carcinogen.

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, and 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 and environmental impact and energy requirements. Ethyl acrylate is produced, as an intermediate or a final product, by process units covered under this subpart.

State Drinking Water Guidelines: Florida 5,000 ug/l

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 1000 lb or 454 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).

TSCA Requirements: Pursuant to section 8(d) of TSCA, EPA promulgated a model Health and Safety Data Reporting Rule. The section 8(d) model rule requires manufacturers, importers, and processors of listed chemical substances and mixtures to submit to EPA copies and lists of unpublished health and safety studies. Ethyl acrylate is included on this list. Effective date 4/13/89; Sunset date: 6/30/98.

RCRA Requirements: As stipulated in 40 CFR 261.33, when ethyl acrylate, 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: Residues resulting from the use of the following substances, that meet the definition of a polymer and the criteria specified for defining a low-risk polymer in 40 CFR 723.250, as an inert ingredient in a pesticide chemical formulation, including antimicrobial pesticide chemical formulations, are exempted from the requirement of a tolerance under FFDC section 408, if such use is in accordance with good agricultural or manufacturing practices. Ethyl acrylate is included on this list.

FDA Requirements: Ethyl acrylate is a food additive permitted for direct addition to food for human consumption 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 b) 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. Homopolymers and copolymers of ethyl acrylate are an indirect food additive for use only as a component of adhesives.

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16. OTHER INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577

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

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