



## Safety Data Sheet

### 1. PRODUCT IDENTIFICATION

Name	<b>Monoethanolamine</b>
Synonyms	2-hydroxyethylamine, 2-amino-1-ethanol, 1-amino-2-hydroxyethanol, 2-aminoethanol, MEA
CAS#	141-43-5
Europe EC#	205-483-3
Product Uses	agricultural chemicals, cleaners, polishes, cosmetics, corrosion inhibitor, H <sub>2</sub> S removal from natural gas

### 2. HAZARDS

**Quick Guide:** combustible liquid, may be corrosive to skin & eyes; decomposition products may be toxic

#### Canada – WHMIS

Key:

#### B 3, E

**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



B3 – Combustible Liquid



E – Corrosive

#### U.S.A. – HMIS

Key:

#### Health – 3, Fire – 2, Reactivity – 1

0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe

### 3. COMPOSITION

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> (mg/kg) ORAL	LD <sub>50</sub> (mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
Monoethanolamine	>99%	3 / 7.5	620	1025	>1212
Diethanolamine	0.1-0.4%	0.5 / 2	680	8400	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. <b>CAUTION: Rescuer must not endanger himself!</b> 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	86°C / 186°F (closed cup)
Autoignition Temperature	410°C / 770°F
Flammable Limits	3.0% – 23.5%
Combustion Products	carbon monoxide, nitrogen oxides, ammonia, hydrogen cyanide, nitriles, isocyanates, nitrosamines, formaldehyde & other products
Firefighting Precautions	alcohol-resistant foam, dry chemical, water fog or spray; firefighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge

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**6. ACCIDENTAL RELEASE MEASURES**

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,  
 shovel & store in closed containers for recycling or disposal

**7. HANDLING & STORAGE**

Store above 15°C (60°F), in a dry environment, away from sources of ignition, heat, oxidising agents & other substances listed in Part 10.

On exposure to air, this product may oxidise or react with atmospheric CO<sub>2</sub> to form unstable compounds. Ensure that containers are full and tightly sealed. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

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.

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**

<b>Ontario TWAEV</b>	3ppm / 7.5mg/m <sup>3</sup>	<b>Ontario STEV</b>	6ppm / 15mg/m <sup>3</sup>
ACGIH TLV	3ppm / 7.5mg/m <sup>3</sup>		
OSHA PEL	3ppm / 6mg/m <sup>3</sup>		
Ventilation	mechanical ventilation may be required to maintain airborne titre below regulated limits; depending on handling procedures; if a respirator is (occasionally) used, it must contain an organic vapour cartridge		
Hands	nitrile, butyl, or neoprene gloves recommended – <i>consult supplier to confirm suitability or find substitutes</i>		
Eyes	safety glasses with side shields & face shield – <i>always protect the eyes</i>		
Clothing	wear impermeable (above) apron, boots, hat & long sleeves if there is any danger of splashing,		

**9. PHYSICAL PROPERTIES**

Odour & Appearance	clear, colourless viscous, hygroscopic liquid with a mild ammonia (fishy) odour <i>MEA yellows on exposure to air, ultraviolet or heat, darkening to brown in time</i>
Odour Threshold	2-5ppm
Vapour Pressure	0.4mmHg / 0.053kPa (25°C / 77°F)
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	not known – slower than mineral spirits
Vapour Density (air = 1)	2.1
Boiling Range	171°C / 340°F
Melting Point	10.5°C / 51°F – <i>supercools readily; may take days to freeze @ -10°C</i>
Specific Gravity	1.018 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents; limited solubility in aromatic or aliphatic hydrocarbons
Viscosity	19centipoise (25°C / 77°F)
pH	11.7 (1 Molar solution ~6%)
Conversion Factor	1ppm = 2.49mg/m <sup>3</sup>
Molecular Weight	61grams per mole

**10. REACTIVITY**

Dangerously Reactive With	strong oxidising agents
Also Reactive With	acids or alkalis lowers decomposition temperature ( <i>below</i> ); CO <sub>2</sub> to form unstable carbamates
Stability	stable; will not polymerize
Decomposes in Presence of	above 200°C; self-sustaining decomposition above 250°C
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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## 11. TOXICITY

### Effects, Acute Exposure

Skin Contact	severely irritating skin; may be corrosive if contact is prolonged
Skin Absorption	yes; however, no toxic effects expected by this route
Eye Contact	corrosive; may cause permanent damage
Inhalation	vapour/mist likely to be irritating; may cause laboured breathing, wheezing & pulmonary oedema; symptoms may only develop after 24 hours or longer
Ingestion	corrosive; burns mouth, throat, stomach pain; vomiting – <i>not a route of industrial exposure</i>

### Effects, Chronic Exposure

General	prolonged exposure to vapour/mist can cause bronchitis; prolonged or repeated exposure to low concentrations may cause dermatitis & skin cracking
Sensitising	not a respiratory sensitiser in humans or animals; <i>there have been a very few human cases of skin sensitisation in people working with cutting fluids containing MEA</i>
Carcinogen/Tumorigen	not listed as a tumorigen or a carcinogen in humans or animals; <i>there is a slight, statistically insignificant excess of stomach &amp; oesophageal cancer in people working with MEA</i>
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD <sub>50</sub> (oral)	1515-1725, 1970, 2140-2740, 3320mg/kg (rat), 700-1475mg/kg (mouse), 620 & 820mg/kg (guinea pig), 1000mg/kg (rabbit),
LD <sub>50</sub> (skin)	1025mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	>1212ppm (mouse)

## 12. ECOLOGICAL INFORMATION

Bioaccumulation	highly water soluble & readily metabolised, so cannot bioaccumulate
Biodegradation	biodegrades readily in the presence of oxygen; var. tests: 97% in 4 days, 62% in 28 days, 92% in 28 days, 80% in 19 days, 80-90% in 26 days & others
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 11 hours & 27hours (2 tests)
Mobility in soil, water	water soluble; mobile in soil & water; but expected to become a cation & may adsorb strongly to soil
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	227 & 2070mg/litre (Pimephales promelas); 3680 & >5000mg/litre (Brachydanio rerio), 170 & 190mg/litre (Carassius auratus), 337mg/litre (Gambusia affinis), 330mg/litre (Lepomis macrochirus), 150mg/litre (Oncorhynchus mykiss)
EC <sub>50</sub> (Crustacea, 48hr)	65mg/litre (Daphnia magna), 120 & 140mg/litre (Daphnia magna, 24hr)
EC <sub>50</sub> (Algae)	15mg/litre (Scenedesmus subspicatus), 70mg/litre (“other algae”)
EC <sub>50</sub> (Bacteria)	110mg/litre (Pseudomonas putida), 13.7mg/litre (Photobacterium phosphoreum)

## 13. DISPOSAL

Waste Disposal	<b>do not flush to sewer</b> , recycle solvent if possible, if local regulations permit, may be put in sanitary landfill, may be incinerated in approved facility
Containers	<b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (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 - 2491
AND	Shipping Name	ethanolamine or ethanolamine solution
U.S.A. 49 CFR	Class & Packing Group	8 (III)
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 Corrosive

Europe Risk Phrases **R: 20/21/22, 34** – Harmful by inhalation, in contact with skin & if swallowed. Causes burns.  
 Europe Safety Phrases **S: 26, 36/37/39, 45** – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing gloves and eye/face protection. In case of accident

or

if you feel unwell, seek medical advice immediately

**Immediately Dangerous to Life or Health:** 30 ppm

**OSHA Standards:** Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 3 ppm (6 mg/cu m). Vacated 1989 OSHA PEL TWA 3 ppm (8 mg/cu m); STEL 6 ppm (15 mg/cu m) is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 3 ppm (8 mg/cu m). Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 6 ppm (15 mg/cu m).

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 3 ppm; 15 min Short Term Exposure Limit (STEL): 6 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, 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. Ethanolamines are produced, as an intermediate or a final product, by process units covered under this subpart. /Ethanolamines/

**FIFRA Requirements:** As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. 2-Aminoethanol is found on List D. Case No: 4032; Pesticide type: Fungicide, antimicrobial; Case Status: No products containing the pesticide are actively registered. Therefore, we are characterizing the case as "cancelled." Under FIFRA, pesticide producers may voluntarily cancel their registered products. EPA also may cancel pesticide registrations if registrants fail to pay required fees or make/meet certain reregistration commitments, or if EPA reaches findings of unreasonable adverse effects.; Active ingredient (AI): 2-Aminoethanol; AI Status: The active ingredient is no longer contained in any registered products. Thus, we characterize it as "cancelled." Active Ingredients with Recent Production Pending Cancellation of all Products for Non-payment of 1990 Registration Fees: Ethanolamine (CAS 141-43-5). Use: disinfectant/antimicrobial uses. Year last produced: 1989. Registration N. 058018-00001. Product Name: Pro Way Brand Realclean Spray Concentrate. /From Table 2/

**FDA Requirements:** Ethanolamine is an indirect food additive for use only as a component of adhesives.

**16. OTHER INFORMATION**

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

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