SAFETY DATA SHEET

SECTION 1) CHEMICAL PRODUCT AND SUPPLIER'S IDENTIFICATION

CAS Number:	141-43-5		
Product Name:	Monoethanolamine 85% (Low freeze grade)		
Revision Date:	Jan 29, 2018	**Date Printed:**	Jan 29, 2018
Version:	1.1	**Supersedes Date:**	Oct 02, 2017
Manufacturer's Name:	Thames River Chemical Corp.		
Address:	5230 Harvester Road Burlington, ON, CA, L7L 4X4		
Emergency Phone:	CHEMTREC (800) 424-9300		
Information Phone Number:	905-681-5353		
Fax:	905-681-5377		

Product/Recommended Uses: For laboratory or industrial use only.

SECTION 2) HAZARDS IDENTIFICATION

Classification

Acute toxicity Dermal - Category 4

Acute toxicity Inhalation - Category 4

Acute toxicity Oral - Category 4

Flammable Liquids - Category 4

Serious Eye Damage - Category 1

Skin Corrosion - Category 1B

Specific Target Organ Toxicity - Single Exposure - Category 3

Pictograms

Signal Word

Danger

Hazard Statements - Health

Harmful in contact with skin

Harmful if inhaled

Harmful if swallowed

Causes serious eye damage

Causes severe skin burns and eye damage

Hazard Statements - Physical

Combustible Liquid

Precautionary Statements - General

If medical advice is needed, have product container or label at hand.

Keep out of reach of children.

Read label before use.

Precautionary Statements - Prevention

Wear protective gloves/protective clothing/eye protection/face protection.

Avoid breathing dust/fume/gas/mist/vapors/spray.

Use only outdoors or in a well-ventilated area.

Wash thoroughly/Wash hands thoroughly after handling.

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

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

Do not breathe dust/fume/gas/mist/vapors/spray.

Precautionary Statements - Response

IF ON SKIN: Wash with plenty of water and soap.

Call a POISON CENTER or doctor, if you feel unwell.

Specific treatment (see first-aid on the SDS).

Take off contaminated clothing. And wash it before reuse.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF SWALLOWED: Call a POISON CENTER or doctor, if you feel unwell.

Rinse mouth.

In case of fire: Use carbon dixoxide, alcohol foam, water spray or dry chemical to extinguish.

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.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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

Wash contaminated clothing before reuse.

Precautionary Statements - Storage

Store in a well-ventilated place.

Store locked up.

Precautionary Statements - Disposal

Dispose of contents/container in accordance with local/national/international regulation. Waste management should be in full compliance with national, regional and local laws.

Physical Hazards Not Otherwise Classified

No Data Available

Health Hazards Not Otherwise Classified

No Data Available

SECTION 3) COMPOSITION/INFORMATION ON INGREDIENTS

CAS	Chemical Name	% By Weight
0000141-43-5	ETHANOLAMINE	85%
0007732-18-5	WATER	15%

SECTION 4) FIRST-AID MEASURES

Inhalation

Get medical advice/attention if you feel unwell or are concerned. If experiencing respiratory symptoms: Call a POISON CENTER/doctor. Remove source of exposure or move person to fresh air and keep comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by the POISON CENTER/doctor.

Eye Contact

Immediately call a POISON CENTER/doctor. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a duration of 30 minutes or until medical aid is available. Take care not to rinse contaminated water into the unaffected eye or onto the face.

Skin Contact

Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Wash contaminated clothing before re-use. Immediately call a POISON CENTER/doctor. Rinse skin with lukewarm, gently flowing water/shower for a duration of 30 minutes or until medical aid is available.

Ingestion

If vomiting occurs naturally, lie on your side, in the recovery position. Immediately call a POISON CENTER/doctor.

Most Important Symptoms and Effects, Both Acute and Delayed

Inhalation: Symptoms of exposure may include coughing, wheezing, shortness of breath, difficult breathing, headache, nausea, vomiting and chest pain. Prolonged or severe exposure may lead to pulmonary edema; symptoms of pulmonary edema include chest pain and shortness of breath and can be delayed up to 24 or 48 hours after exposure.

Skin Contact: Direct contact with the liquid causes severe irritation or chemical burns. Symptoms include local discomfort or pain, redness and swelling, chemical burns, blister formation and possible tissue destruction.

Eye Contact: Direct contact with liquid or vapor can cause a burning sensation in the eyes, severe eye irritation or chemical burns. Serious damage, even blindness, may result if treatment is delayed.

Ingestion: Swallowing can cause severe irritation and burns to the lips, tongue, throat and digestive tract, abdominal and chest pain, nausea and vomiting. It may cause a shock-like state, fall in blood pressure, slow pulse, convulsions and coma.

Indication of Any Immediate Medical Attention and Special Treatment Needed

No Data Available

SECTION 5) FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Small Fire : Dry chemical, foam, carbon dioxide, water-spray or alcohol-resistant foam. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Large Fire: Water spray, fog or alcohol-resistant foam.

Unsuitable Extinguishing Media

Do not use straight stream of water.

Specific Hazards in Case of Fire

Corrosive and combustible liquid. Product can burn if heated (Flash point of the MEA component = 86 - 94°C.

Can form explosive mixtures with air at, or above, 86° C. Hazardous decomposition may occur above 200°C. During a fire, smoke may contain vaporized MEA in addition to unidentified toxic and/or irritating compounds. Combustion products may include toxic nitrogen oxide, hydrogen cyanide, formaldehyde carbon monoxide, carbon dioxide and ammonia gases. Vapor is heavier than air and can accumulate in confined spaces and low areas.

Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Containers may explode in fire. Fire will produce irritating and corrosive gases. Contact with metals may evolve flammable hydrogen gas. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive fumes.

Fire-fighting Procedures

Isolate immediate hazard area and keep unauthorized personnel out. Move undamaged containers from immediate hazard area if it can be done safely. Stop spill/release if it can be done safely. Cool containers with flooding quantities of water until well after fire is out. Caution should be exercised when using water or foam as frothing may occur, especially if sprayed into containers of hot, burning liquid. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations. Large Fire: Dike fire-control water for later disposal; do not scatter the material

Special Protective Actions

Evacuate the area and fight fire from a safe distance or a protected location. Ethanolamine and its decomposition products such as nitrogen oxides and hydrogen cyanide are hazardous to health. Do not enter without specialized protective equipment suitable for the situation. Approach the fire from upwind to avoid hazardous vapors. Burning liquids may be extinguished by dilution with water. Water spray may be used to flush spills away from ignition sources.

Avoid all contact with this material during fire-fighting operations. Wear chemical resistant clothing (chemical splash suit) and positive-pressure self-contained breathing apparatus.
Contain water run-off if possible.

Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

SECTION 6) ACCIDENTAL RELEASE MEASURES

Emergency Procedure

Isolate hazard area and keep unauthorized personnel away. Stay uphill and/or upstream. Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Evacuate and isolate hazard area and keep unauthorized personnel away.

Recommended Equipment

Wear chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Wear liquid tight chemical protective clothing in combination with positive pressure self-contained breathing apparatus (SCBA).

Personal Precautions

DO NOT get on skin, eyes or clothing. Avoid breathing vapor or mist.

Environmental Precautions

Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways by using sand, earth, or other appropriate barriers.

Methods and Materials for Containment and Cleaning up

Ventilate area after clean-up is complete. Absorb Liquids in vermiculite, dry sand, earth, or similar inert material and deposit in sealed containers for disposal.

SECTION 7) HANDLING AND STORAGE

General

Wash hands after use. Do not get in eyes, on skin or on clothing. Do not breathe vapors or mists. Use good personal hygiene practices. Eating, drinking and smoking in work areas is prohibited. Remove contaminated clothing and protective equipment before entering eating areas. This product is not intended for human or animal consumption. All containers must be properly labelled. Eyewash stations and showers should be available in areas where this material is used and stored

Ventilation Requirements

Use only with adequate ventilation to control air contaminants to their exposure limits. Report ventilation failures immediately. The use of local ventilation is recommended to control emissions near the source.

Storage Room Requirements

Store in dry, cool areas, out of direct sunlight and away from other sources of heat. Empty container retain residue and may be dangerous. Keep containers securely sealed when not in use. Protect containers against banging or other physical damage when storing, transferring, or using them. Procedures must be conducted in a fume hood, glove box, or other suitable containment device. Segregate from other hazard classes and store in a cool, dry, well ventilated area, away from sources of ignition and incompatibilities. Provide secondary containment for toxic materials. Store, handle, and use corrosive materials in well-ventilated areas. Do not store on metal shelves. Store containers in plastic tubs or trays as secondary containment. Keep the smallest amount of material in work areas. Avoid rapid temperature changes in liquid storage areas. Store at temperatures above their respective freezing/melting point. Never store corrosives above eye level. Label cabinets with "TOXIC CHEMICALS" or similar warning.

SECTION 8) EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye protection

Wear indirect-vent, impact and splash resistant goggles when working with liquids

Skin Protection

Use of gloves approved to relevant standards made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Use an apron and over-boots of chemically impervious materials such as neoprene or nitrile rubber.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker, a respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 should be followed. Check with respiratory protective equipment suppliers.

Appropriate Engineering Controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Chemical Name	CANsmg	CANsppm	CANtmg	CANtppm	OSHA STEL (mg/m3)	OSHA STEL (ppm)	OSHA TWA (mg/m3)	OSHA TWA (ppm)	OSHA Carcinogen	OSHA Tables (Z1, Z2, Z3)	OSHA Skin designation	ACGIH STEL (mg/m3)

ETHANOLAMINE	15	6	7.5	3			6	3		1		15

Chemical Name	ACGIH STEL (ppm)	ACGIH TWA (mg/m3)	ACGIH TWA (ppm)	ACGIH TLV Basis	ACGIH Carcinogen	ACGIH Notations
ETHANOLAMINE	6	7.5	3	Eye & skin irr		

irr - Irritation

SECTION 9) PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

Density	8.42 lb/gal
Specific Gravity	1.03

Appearance	clear, colourless viscous liquid
Odor Description	mild ammonia (fishy) odour
Odor Threshold	N/A
pH	11.7 (1M solution, 6%); 12.1 (4M solution, 25%)
Melting Point	-13 °C
Low Boiling Point	130 °C
High Boiling Point	N/A
Flash Point	86 - 94 °C
Vapor Pressure	53 Pa (for MEA at 20°C)
Vapor Density	2.1 (for MEA)
Evaporation Rate	< 1 (n-Butyl Acetate = 1) (for MEA)
Upper Explosion Level	N/A
Lower Explosion Level	N/A
Water Solubility	Complete
Coefficient Water/Oil	Log P(oct) = -1.31
Viscosity	17 centipoise

SECTION 10) STABILITY AND REACTIVITY

Reactivity

No Data Available

Stability

Stable under normal storage and handling conditions.

Conditions to Avoid

Avoid direct sunlight. Avoid contact with nitrites, chlorides, anhydrides, strong oxidizing, cellulose nitrate and halogenated hydrocarbons.

Avoid heat, sparks, flame, high temperature, freezing and contact with incompatible materials.

Hazardous Reactions/Polymerization

Heating above 60°C in aluminum can result in corrosion and generation of flammable hydrogen gas.
Reacts with cellulose nitrate causing fire and explosion hazard.
Reacts violently with strong acids and strong oxidants.
Contact with nitrosating agents, under acidic conditions such as nitrous acid, nitrite or nitrogen oxides, can form nitrosamines some of which are potent carcinogens.
Absorbs moisture and can react with carbon dioxide in the air to form salts. It is decomposed by light and slowly oxidized by air, turning yellow and then brown. This reaction is accelerated by heat and the presence of metals.
Corrosive to copper, brass, bronze and other copper alloys, zinc and galvanized iron.
Ethanolamine is oxidized by air slowly with evolution of heat. This reaction may lead to spontaneous combustion if the substance is on an

adsorbent or on a high surface area material (e.g. absorbent material or thermal insulation).

Hazardous polymerization will not occur.

Incompatible Materials

Avoid contact with strong acids, strong oxidizing agents, acid anhydrides, acyl halides, alkyl halides. Attacks copper, aluminum and their alloys, and rubber.

Hazardous Decomposition Products

Decomposition products may include nitrogen oxides, ammonia, irritating aldehydes and ketones. Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

SECTION 11) TOXICOLOGICAL INFORMATION

Likely Route of Exposure

Inhalation, ingestion, skin absorption

Acute Toxicity

Harmful in contact with skin

Harmful if inhaled

Harmful if swallowed

Aspiration Hazard

No Data Available

Carcinogenicity

No Data Available

Germ Cell Mutagenicity

No Data Available

Reproductive Toxicity

No Data Available

Respiratory/Skin Sensitization

No Data Available

Serious Eye Damage/Irritation

Causes serious eye damage

Skin Corrosion/Irritation

Causes severe skin burns and eye damage

Specific Target Organ Toxicity - Repeated Exposure

No Data Available

Specific Target Organ Toxicity - Single Exposure

No Data Available

0000141-43-5 ETHANOLAMINE

LD50 (oral, rat): 1720 mg/kg (10); 2100 mg/kg (3); 2740 mg/kg (3,8)
LD50 (oral, mouse): 700 mg/kg (10)
LD50 (oral, guinea pig): 620 mg/kg (10)
LD50 (oral, rabbit): 1000 mg/kg (10)
LD50 (dermal, rabbit): 1018 mg/kg (cited as 1 mL/kg) (10)

SECTION 12) ECOLOGICAL INFORMATION

Toxicity

72 Hr EC50 Scenedesmus subspicatus: 15 mg/L

96 Hr LC50 Brachydanio rerio: 3 684 mg/L
96 Hr LC50 Pimephales promelas: 227 mg/L
96 Hr LC50 Oncorhynchus mykiss: 114-196 mg/L
96 Hr LC50 Oncorhynchus mykiss: >200 mg/L
96 Hr LC50 Lepomis macrochirus: 300-1 000 mg/L
48 Hr EC50 Daphnia magna: 65 mg/L

Mobility in Soil

Volatilization of MEA from water is very slow.
Potential for mobility in soil is very high (Koc between 0 and 50).
Log soil organic carbon partition coefficient (log Koc) is estimated to be 0.70.

Bio-accumulative Potential

Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3).

Persistence and Degradability

Material is readily biodegradable.
Passes OECD Test(s) for ready biodegradability.
Biodegradation reached in CO2 Evolution Test (Modified Sturm Test, OECD Test No. 301 B) after 28 days: 97%.
Biodegradation reached in Modified OECD Screening Test (OECD Test No. 301 E) after 28 days: 94%.
Biodegradation reached in Manometric Respirometry Test (OECD Test No. 301 F) after 28 days: >70%.
Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD >40%).
20-Day biochemical oxygen demand (BOD20) is 1.50 p/p.
Theoretical oxygen demand (ThOD) is calculated to be 2.36 p/p.
Inhibitory concentration (IC50) in OECD Activated Sludge Respiration Inhibition Test (OECD Test No. 209) is >1000 mg/L.

Other Adverse Effects

No Data Available

SECTION 13) DISPOSAL CONSIDERATIONS

Waste Disposal

Empty Containers retain product residue which may exhibit hazards of material, therefore do not pressurize, cut, glaze, weld or use for any other purposes. It is the responsibility of the user of the product to determine at the time of disposal whether the product meets local criteria for hazardous waste. Waste management should be in full compliance with national, provincial and local laws.

SECTION 14) TRANSPORT INFORMATION

U.S. DOT Information

UN number: UN2491

Proper shipping name: Ethanolamine or Ethanolamine solutions

Hazard class: 8

Packaging group: lll

Hazardous substance (RQ): No Data Available

Toxic-Inhalation Hazard: No Data Available

Marine Pollutant: No Data Available

Note / Special Provision: No Data Available

Transport Canada Information

UN number: UN2491

Proper shipping name: Ethanolamine or Ethanolamine solutions

Hazard class: 8

Packaging group: lll

Marine Pollutant: No Data Available

Transport in bulk (according to Annex II of MARPOL 73/78): No Data Available

Note / Special Provision: Note / Special Provision

SECTION 15) REGULATORY INFORMATION

CAS	Chemical Name	% By Weight	Regulation List
0000141-43-5	ETHANOLAMINE	85%	DSL,TSCA,EU_EC_Inventory - EC Inventory
0007732-18-5	WATER	15%	DSL,TSCA,EU_EC_Inventory - EC Inventory

SECTION 16) OTHER INFORMATION

Glossary

ACGIH- American Conference of Governmental Industrial Hygienists; ANSI- American National Standards Institute; Canadian TDG- Canadian Transportation of Dangerous Goods; CANsmg or CANsppm - Canadian Short Term Exposure Level in mg/L or in ppm; CANtmg or CANtppm - Canadian Time Weighted Average in mg/L or in ppm; CAS- Chemical Abstract Service; Chemtrec- Chemical Transportation Emergency Center(US); CHIP- Chemical Hazard Information and Packaging; DSL- Domestic Substances List; EC- Equivalent Concentration; EH40 (UK)- HSE Guidance Note EH40 Occupational Exposure Limits; EPCRA- Emergency Planning and Community Right-To-Know Act; ESL Effects screening levels; HMIS- Hazardous Material Information Service; LC- Lethal Concentration; LD- Lethal Dose; NFPA- National Fire Protection Association; OEL- Occupational Exposure Limits; OSHA- Occupational Safety and Health Administration, US Department of Labor; PEL- Permissible Exposure Limit; SARA (Title III)- Superfund Amendments and Reauthorization Act; SARA 313- Superfund Amendments and Reauthorization Act, Section 313; SCBA- Self Contained Breathing Apparatus; STEL-Short Term Exposure Limit; TCEQ Texas Commission on Environmental Quality; TLV- Threshold Limit Value; TSCA- Toxic Substances Control Act Public Law 94-469; TWA Time Weighted Value; US DOT- US Department of Transportation; WHMIS- Workplace Hazardous Materials Information System.

Version 1.1:

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DISCLAIMER