

**Monomethylamine 40% aqueous solution  
(MMA40)**

Version 1.1      Revision Date: 04/21/2017      SDS Number: 150000103184      Date of last issue: -  
Date of first issue: 09/06/2016  
SDSUS / PRD / 0001

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**SECTION 1. IDENTIFICATION**

Product name : Monomethylamine 40% aqueous solution (MMA40)

Product code : 51008-00, P5100814, P5100803, P5100819

**Manufacturer or supplier's details**

Company name of supplier : Eastman Chemical Company

Address : 200 South Wilcox Drive  
Kingsport TN 37660-5280

Telephone : (423) 229-2000

Emergency telephone : CHEMTREC: +1-800-424-9300, +1-703-527-3887 CCN7321

**Recommended use of the chemical and restrictions on use**

Recommended use : Chemical intermediate

Restrictions on use : None known.

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**SECTION 2. HAZARDS IDENTIFICATION****GHS Classification**

Flammable liquids : Category 2

Acute toxicity (Oral) : Category 4

Acute toxicity (Inhalation) : Category 4

Skin corrosion : Category 1B

Serious eye damage : Category 1

Specific target organ systemic toxicity - single exposure : Category 3 (Respiratory system)

**GHS label elements**

Hazard pictograms :



Signal Word : Danger



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### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### Ingredients

monomethylamine	74-89-5	>= <=
Water	7732-18-5	>= <=

### SECTION 4. FIRST AID MEASURES

- General advice : Show this material safety data sheet to the doctor in attendance.  
Call a physician immediately.
- If inhaled : Move to fresh air.  
If symptoms persist, call a physician.
- In case of skin contact : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes.  
Wash off immediately with plenty of water for at least 15 minutes.  
Wash contaminated clothing before re-use.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.  
Remove contact lenses, if present and easy to do. Continue rinsing.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.  
Do not induce vomiting without medical advice.  
Never give anything by mouth to an unconscious person.
- Most important symptoms and effects, both acute and delayed : Pneumonia  
Lung edema  
superficial burning sensation  
Lachrymation  
Shortness of breath  
Suffocation  
Eye disease  
Harmful if swallowed.  
Causes serious eye damage.  
Harmful if inhaled.  
May cause respiratory irritation.  
Causes severe burns.
- Notes to physician : Treat symptomatically.

### SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Carbon dioxide (CO2)

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- Dry chemical  
Water spray  
Alcohol-resistant foam
- Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.  
Do NOT use water jet.
- Specific hazards during fire fighting : May displace oxygen and cause rapid suffocation.  
The product will float on water and can be reignited on surface water.  
Flash back possible over considerable distance.
- Hazardous combustion products : Nitrogen oxides (NO<sub>x</sub>)  
Carbon monoxide
- Further information : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.  
Flammable gas, may cause flash fire.  
Cool containers/tanks with water spray.  
If the product release cannot be shut off safely, allow the product to burn itself out.  
Do not allow run-off from fire fighting to enter drains or water courses.
- Special protective equipment for fire-fighters : Wear an approved positive pressure self-contained breathing apparatus in addition to standard fire fighting gear.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Wear appropriate personal protective equipment.  
Local authorities should be advised if significant spillages cannot be contained.
- Environmental precautions : Avoid release to the environment.
- Methods and materials for containment and cleaning up : Evacuate personnel to safe areas.  
Prevent further leakage or spillage if safe to do so.

### SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Take precautionary measures against static discharges.
- Advice on safe handling : Avoid contact with skin, eyes and clothing.  
Ensure adequate ventilation.  
Wash thoroughly after handling.  
Sudden Release of Pressure Hazard  
Use equipment rated for cylinder pressure.  
Protect container from physical shock.

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Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.

May displace oxygen and cause rapid suffocation.

Conditions for safe storage : Keep containers tightly closed in a cool, well-ventilated place. Do not enter areas where used or stored until adequately ventilated. Do not store together with oxidizing and self-igniting products. Protect from sunlight. Keep away from heat and sources of ignition. Store in upright position only. Store locked up.

### SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
monomethylamine	74-89-5	TWA	5 ppm	ACGIH
		STEL	15 ppm	ACGIH
		TWA	10 ppm 12 mg/m <sup>3</sup>	NIOSH REL
		TWA	10 ppm 12 mg/m <sup>3</sup>	OSHA Z-1
		TWA	10 ppm 12 mg/m <sup>3</sup>	OSHA P0

**Engineering measures** : Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

#### Personal protective equipment

Respiratory protection : Wear a positive-pressure supplied-air respirator.

Hand protection

Remarks : Nitrile rubber Neoprene gloves Protective gloves against cold The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it. The break through time depends amongst other things from the material, the thickness and the type of glove and therefore has to be measured for each case.

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- Eye protection : Safety glasses with side-shields  
Face-shield  
Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded.
- Skin and body protection : Complete suit protecting against chemicals
- Protective measures : Remove respiratory and skin/eye protection only after vapors have been cleared from the area.  
Ensure that eye flushing systems and safety showers are located close to the working place.  
Use personal protective equipment as required.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
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**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance : liquid
- Color : colorless
- Odor : ammoniacal
- pH : 11.2
- Boiling Point (boils with decomposition): : 49.3 °C
- Flash point : -10 °C
- Upper explosion limit : 20.7 %(V)
- Lower explosion limit : 4.9 %(V)
- Vapor pressure : 32 kPa (20 °C)  
117 kPa (50 °C)
- Relative vapor density : 1.07 (20 °C)  
(Air = 1.0)
- Relative density : 0.9014 (20 °C)
- Density : 0.9014 g/cm<sup>3</sup> (20 °C)
- Solubility(ies)  
Water solubility : completely soluble
- Partition coefficient: n-octanol/water : log Pow: -0.57
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Autoignition temperature : 430 °C

Viscosity  
Viscosity, dynamic : 1.50 mPa,s

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Surface tension : 19.2 mN/m, 20 °C

Molecular weight : 31.06 g/mol

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**SECTION 10. STABILITY AND REACTIVITY**

Reactivity : None reasonably foreseeable.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Hazardous decomposition products formed under fire conditions.

Conditions to avoid : Protect container from physical shock.  
Heat.  
Exposure to sunlight.

Incompatible materials : Mercury  
Strong acids and oxidizing agents  
Halogenated compounds

Hazardous decomposition products : Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide  
Nitrogen oxides (NO<sub>x</sub>)

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**SECTION 11. TOXICOLOGICAL INFORMATION****Acute toxicity****Product:**

Acute oral toxicity : LD50 Oral (Rat): 698 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 2 mg/l

**Skin corrosion/irritation****Product:**

Result: Corrosive

**Ingredients:**

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**monomethylamine:**  
Result: Corrosive

**Serious eye damage/eye irritation**

**Product:**  
Result: Corrosive

**Ingredients:**  
**monomethylamine:**  
Result: Corrosive

**Germ cell mutagenicity**

**Product:**  
Germ cell mutagenicity - Assessment : Did not show mutagenic effects in animal experiments.

**Carcinogenicity**

**Product:**  
Remarks: This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

**IARC**      No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA**      No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**NTP**      No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

**Product:**  
Reproductive toxicity - Assessment : No toxicity to reproduction

**STOT-single exposure**

**Product:**  
Target Organs: Eyes, Respiratory system, Skin



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**Information on likely routes of exposure****Product:**

Inhalation : Remarks: Harmful if inhaled.  
May cause respiratory irritation.

Skin contact : Remarks: Causes severe skin burns.

Eye contact : Remarks: Causes severe eye burns.

Ingestion : Remarks: Harmful if swallowed.

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**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Product:**

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 970 mg/l  
Exposure time: 48 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 163 mg/l  
Exposure time: 48 h

Toxicity to bacteria : EC20 (Bacteria): 240 mg/l  
Exposure time: 0.5 h

**Persistence and degradability****Product:**

Biodegradability : Result: Readily biodegradable.

**Bioaccumulative potential****Product:**

Bioaccumulation : Bioconcentration factor (BCF): 3.16

**Mobility in soil****Product:**

Distribution among environmental compartments : Koc: 10.74, log Koc: 1.03

**Other adverse effects**

No data available

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**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues                      : Dispose of in accordance with local regulations.

Contaminated packaging                 : Empty containers should be taken to an approved waste handling site for recycling or disposal.

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**SECTION 14. TRANSPORT INFORMATION****International Regulations****IATA-DGR**

UN/ID No.                                  : UN 1235  
Proper shipping name                     : Methylamine, aqueous solution  
Class                                         : 3  
Subsidiary risk                             : 8  
Packing group                              : II  
Labels                                        : Flammable Liquids, Corrosive  
Packing instruction (cargo aircraft)   : 363  
Packing instruction (passenger aircraft) : 352

**IMDG-Code**

UN number                                 : UN 1235  
Proper shipping name                     : METHYLAMINE, AQUEOUS SOLUTION

Class                                         : 3  
Subsidiary risk                             : 8  
Packing group                              : II  
Labels                                        : 3 (8)  
EmS Code                                    : F-E, S-C  
Marine pollutant                          : no

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**Domestic regulation****49 CFR**

UN/ID/NA number                         : UN 1235  
Proper shipping name                     : METHYLAMINE, AQUEOUS SOLUTION

Class                                         : 3  
Subsidiary risk                             : 8  
Packing group                              : II  
Labels                                        : Class 3 - Flammable Liquid, Class 8 - Corrosive  
ERG Code                                    : 132

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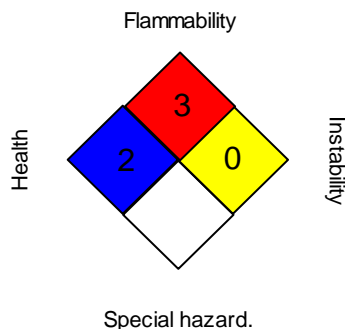
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### Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

### Further information

#### NFPA:



#### HMIS® IV:

HEALTH	/	2
FLAMMABILITY		3
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks.

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