Monomethylamine

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Name of product	Monomethylamine Art-Nr(n).: 1130
Name of substance	Mono-methylamine
Index No	612-001-00-9
EC No	200-820-0
REACH registration number	01-2119475496-25
CAS No	74-89-5

Manufacturer / Distributor:

Ehsan International Gases
40/9, Aurangabad, Nazimabad #3, Karachi 74600, Pakistan.
+92 21 36612091 – 36612907
info@ehsan.com.pk
www.ehsan.com.pk

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Sector of uses [SU]
SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites.

Process categories [PROC]
PROC24 - High (mechanical) energy work-up of substances bound in materials and/or articles.
PROC1 - Use in closed process, no likelihood of exposure.
PROC2 - Use in closed, continuous process with occasional controlled exposure.
PROC3 - Use in closed batch process (synthesis or formulation).
PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises.
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact).
PROC7 - Industrial spraying.
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities.
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing).
PROC14 - Production of preparations or articles by tabletting, compression, extrusion, pelletisation. PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
PROC15 - Use as laboratory reagent
PROC21 - Low energy manipulation of substances bound in materials and/or articles.

Environmental release categories [ERC]
ERC2 - Formulation of preparations.
ERC3 - Formulation in materials.
ERC5 - Industrial use resulting in inclusion into or onto a matrix.
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates). ERC6c - Industrial use of monomers for manufacture of thermoplastics.

Monomethylamine

Uses advised against

Remark
Do not use for private purposes (household).

Recommended intended purpose(s)
Basic substance.
Corrosion inhibitor.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

F+; R12
Xn; R20
Xi; R37/38
Xi; R41

R-phrases

12 Extremely flammable.
20 Harmful by inhalation.
37/38 Irritating to respiratory system and skin. 41 Risk of serious damage to eyes.

! Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements	Classification procedure
Flam. Gas 1	**H220**	
Liquef. Gas	**H280**	
Acute Tox. 4	**H332**	
Skin Irrit. 2	**H315**	
Eye Dam. 1	**H318**	
STOT SE 3	**H335**	

Hazard statements for physical hazards
H220
Extremely flammable gas.
H280
Contains gas under pressure, explode if heated.

Hazard statements for health hazards
H315 Causes skin irritation.

H318 Causes serious eye damage.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.

2.2. Label elements
Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

GHS02 GHS05 GHS07

! Signal word
Danger

Hazard statements for physical hazards
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

! Hazard statements for health hazards

H315	**Causes skin irritation.**
H318	**Causes serious eye damage.**
H332	**Harmful if inhaled.**
H335	**May cause respiratory irritation.**

Precautionary Statements

! **Prevention**

P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P260	Do not breathe gas/vapours.
P280 !	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minuts. Remove contact lenses, if present and easy to do. Continue rinsing.
P315	Get immediate medical advice/attention.

Storage

P403	Store in a well-ventilated place.

Hazardous ingredients for labeling mono-methylamine

2.3. Other hazards

Adverse physicochemical effects

In the case of insufficient ventilation and/or through the formation of a explosive/highly flammable mixture is possible.

Adverse human health effects and symptoms

Contact with liquid may cause cold burns/frostbite.

Information pertaining to special dangers for human and environment

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

SECTION 3: Composition/ information on ingredients

3.1. Substances

CAS No 74-89-5 **Mono-methylamine**

EC No 200-820-0

Index No 612-001-00-9

REACH registration number 01-2119475496-25

3.2. Mixtures

not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Remove contaminated soaked clothing immediately.

Adhere to personal protective measures when giving first aid.

Seek medical advice immediately.

In case of inhalation

Remove the casualty into fresh air and keep him immobile.

In the event of pulmonary irritation treat initially with corticoid spray, e.g. Ventolair- or Pulmicort- metered-dose aerosol (Ventolair and Pulmicort are registrated trademarks).
Seek medical treatment immediately.
In case of respiratory standstill give artifical respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

In case of skin contact
In case of contact with skin wash off with warm water.
In case of frostbite rinse with plenty of water. Don`t remove clothing.
In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact
Rinse cautiously with water for several minuts. Remove contact lenses, if present and easy to do. Continue rinsing. Call for a doctor immediately.

In case of ingestion
Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed
Physician's information / possible symptoms
Coughing

Physician's information / possible dangers
Risk of pulmonary oedema

4.3. Indication of any immediate medical attention and special treatment needed
Treatment (Advice to doctor) Treat symptoms.
If necessary, give oxygen.
Continue to monitor for pneumonia and pulmonary oedema.
Pulmonary oedema prophylaxis.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Foam
Dry powder
Carbon dioxide
Water spray jet

Unsuitable extinguishing media
Full water jet

5.2. Special hazards arising from the substance or mixture
In case of fire formation of dangerous gases possible.
Formation of explosive gas mixtures in air.
In the event of fire the following can be released:
Nitrogen oxides (NOx)
Carbon monoxide (CO)
Carbon dioxide (CO_2)

5.3. Advice for firefighters
Special protective equipment for fire-fighters
Use breathing apparatus with independent air supply (isolated). Wear full protective clothing.

Additional information
Cool endangered containers with water spray jet.

Exposure to fire may cause containers to rupture / explode.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur.
Extinguish any other fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

! **For non-emergency personnel**

Remove persons to safety.
Evacuate area.

! **For emergency responders**

Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Eliminate all ignition sources if safe to do so.
Keep away sources of ignition.

6.2. Environmental precautions

If possible, stop flow of product.
Eliminate ignition sources.
Do not discharge into the drains/surface waters/groundwater.
If necessary, secure leaky pressure receptacles in a salvage packaging.
Suppress gases/vapours/mists with water spray jet Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up

Ensure adequate air ventilation.
Flush away residues with water.

6.4. Reference to other sections

Safe handling: see section 7
Personal protection equipment: see section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling

! **Advice on safe handling**

Use only in thoroughly ventilated areas.
Transfer and handle only in enclosed systems.
Containers' temperature may not be increased above 50 °C.
Do not heat with open flames.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Barrels and installations thoroughly earthing (grounding).
Use antistatic tools.
Treatment only in suitable rooms and systems.
Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backfeed into the container.
Suck back of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

! **General protective measures**
Do not inhale gases.
Avoid contact with the skin.

Hygiene measures
At work do not eat, drink and smoke.

Advice on protection against fire and explosion
The product is combustible.
Because of risk of explosion avoid vapours getting into cellar, sewage system and holes.
Take precautionary measures against static discharges.
Formation of explosive gas mixtures in air.
Use explosion-proof equipment / fittings and non-sparking tools.

7.2. Conditions for safe storage, including any incompatibilities
Requirements for storage rooms and vessels
Keep in closed original container.
Ventilate store-rooms thoroughly.
Use transportable pressure equipment.
Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys.
Valve: Suitable materials: Carbon steels, aluminium alloys, stainless steel. Unsuitable materials: Brass, copper alloys.

Advice on storage compatibility
Do not store with spontaneously flammable materials.
Do not store together with combustible liquids or combustible solids.
Do not store together with animal feedstuffs.
Do not store together with explosives.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with acids.
Do not store together with oxidizing liquids or oxidizing solids.

Further information on storage conditions
Ensure valve protection device is correctly fitted.
Keep container tightly closed and store at cool and aired place.
Prevent cylinders from falling over. Keep
container in a well-ventilated place
Protect of heat.
Storage temperature may not exceed 50°C (=122°F).
Recommended storage temperature: =< 25 °C.

Information on storage stability
Storage time: 24 months.

7.3. Specific end use(s)
Recommendation(s) for intended use
See exposure scenario(s).

Monomethylamine

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
Ingredients with occupational exposure limits to be monitored

CAS No	Name	Code	[mg/m3]	[ppm]	Remark
74-89-5	Methylamine	WEL / TWA, 8 hours	13	10	EH40/2005, withdrawn
74-89-5	Methylamine	PEL, 8 hours	12	10	USA (OSHA)
74-89-5	Methylamine	REL, 8 hours	12	10	USA (NIOSH)

! **Additional advice**
DNEL (workers, inhalation, long-term, systemic effects): 0.9 mg/m³ (0.7 ppm).
DNEL (workers, dermal, long-term, systemic effects): 0.417 mg / kg.
DMEL (workers, inhalation, short-term, systemic effects): 27.7 mg/m³.
DNEL (workers, inhalation, short-term, local effects): 20.21 mg/m³.
DNEL (workers, dermal, short-term, systemic effects): 0.58 mg/kg bw/d

8.2. Exposure controls
! **Respiratory protection**
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Keep self contained breathing apparatus readily available for emergency use.
Short term: filter apparatus, filter AX
Short term: filter apparatus, combination filter ABEK-P3.

! **Hand protection** chemical-resistant gloves
Protective gloves complying with EN 374.
Glove material specification [make/type, thickness, permeation time/life]: IIR, >= 0,7 mm, > 480 min
Glove material specification [make/type, thickness, permeation time/life]: FKM, >= 0,7 mm, > 480 min

Eye protection safety goggles, in case of increased risk add protective face shield

Other protection measures
Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

Limitation and surveillance of the environment
PNEC (freshwater): 0.016 mg/l
PNEC (sea water): 0.0016 mg/l / 0.016 mg/l (sporadic emission)
PNEC (freshwater sediment): 0.016 mg/kg
PNEC (marine sediment): 0.0016 mg/kg
PNEC (soil): 0.0069 mg/kg
PNEC (waste water treatment plant): 0.1263 mg/l
See chapter 7.

Appropriate engineering controls
Transfer and handle only in enclosed systems.

Monomethylamine

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance
Gaseous / liquefied under pressure.

Colour
colourless

Odour
similar to amine

Odour threshold
0,025 - 12 mg/m³

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	14	20 °C	100 g/l		aqueous solution
boiling point	ca. -6,5 °C		1013 hPa		
melting point	-92,5 °C				
Flash point	< -30 °C			DIN 51755	
Vapourisation rate	No information available.				
Flammable (solid)					not applicable
Flammability (gas)					Flammable.
Ignition temperature	430 °C			DIN 51794	
Self ignition temperature	no				
Lower explosion limit	4,9 Vol-%				
Upper explosion limit	20,7 Vol-%				
Vapour pressure	2915 hPa	20 °C			
Relative density	0,663 g/cm3	20 °C	2915 hPa	Calculated	information concerns to liquid phase
Vapour density	1,1				air = 1
Solubility in water	1080 g/l	20 °C			
Solubility/other					soluble in organic solvent
Partition coefficient noctanol/water (log P O/W)	-0,713	25 °C		OECD 107	
Decomposition temperature	No information available.				

Viscosity dynamic	0,236 mPa*s	25 °C

Oxidising properties
no

Explosive properties
not applicable

9.2. Other information
Product smells offensive.

SECTION 10: Stability and reactivity

10.1. Reactivity
See section "Possibility of hazardous reactions".

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
May react violently with oxidants.
Strong exothermic reaction with acids.
Reactions with alkali metals.

10.4. Conditions to avoid
Formation of explosive gas/air mixtures.
Heat sources / heat - risk of bursting.
Sources of ignition.

10.5. Incompatible materials
! **Materials to avoid**
Alkali metals
Oxidising agent
Acids.

10.6. Hazardous decomposition products
Nitrogen oxides (NOx)
Carbon monoxide and carbon dioxide.

Thermal decomposition

Remark	No decomposition if used as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark

Monomethylamine

LC50 acute inhalation	3555 ppm (4 h)	rat	OECD 403	**respiratory system**
Irritability skin	corrosive	rabbit		Aqueous solution.
Irritability eye	irritant	rabbit eye		Aqueous solution.
Skin sensitization		not determined		
Sensitization		not determined		

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subacute Toxicity	NOAEL 75 ppm Sub-acute inhalation toxicity 6 h/d, 5 d/w	rat (male)	OECD 412	
Subchronic Toxicity	NOAEL >= 100 mg/kg (21 - 90 d) Subchronic oral toxicity (feed) 100 mg/kg bw/day	Rat		Also in case of a repeated intake the main effect is the local irritation.
Mutagenicity	0 - 5 mmol/l (4 h) Gene mutation Lymphoma L5178Y cells	Mouse	OECD 476	Information on genotoxicity in vitro available.
Reproduction-Toxicity	LOAEL 5 mg/kg Oral	Rat		No indications of toxic effects were observed in reproduction studies in animals.
Carcinogenicity				not determined

Specific target organ toxicity (single exposure)
May cause respiratory irritation.

Aspiration hazard
no

! **Toxicity test (Additional information)**
No experimental indication of genotoxicity in vivo (micronucleus test negative).

Experiences made from practice
May cause frostbite.

SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 16 mg/l (48 h)	Leuciscus idus	OECD 203	After neutralization a reduction in harmful effect can be observed.

Daphnia	EC50 163 mg/l (48 h)	Daphnia magna	DIN 38412	The product causes changes in the pH value in the test system. The result relates to the unneutralized sample.
Algae	EC20 31 mg/l (60 min)	Pseudokirchneriella subcapitata		
	Value	Species	Method	Validation
Bacteria	EC20 240 mg/l (0,5 h)	activated sludge (kom.)	ISO 8192, oxygen consumption	The product causes changes in the pH value in the test system. The result relates to the unneutralized sample.

12.2. Persistence and degradability

Biological readily degradable **degradability**

The product is readily biodegradable to OECD criteria.

Degradability	84 % (14 d)	BOD in % of theoretical OD	OECD 301 C
Biological eliminability	not determined		

12.3. Bioaccumulative potential

Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

12.4. Mobility in soil

high mobility

Adsorption in the soil is not likely.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

Not known.

Behaviour in sewage plant

When low concentrations are discharged correctly into adapted biological sewage treatment plants, interference with the degradation activity of activated sludge is not likely.

The product is an alkaline solution. Neutralization is normally necessary before waste water is discharged into sewage treatment plants.

Additional ecological information

	Value	Method	Remark
BOD 5 d	380 mg/g		**General regulation** Do not allow uncontrolled leakage of product into the environment.
AOX	The product contains no organically bound halogen.		

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Monomethylamine

Waste code No.	Name of waste
16 05 04*	gases in pressure containers (including halons) containing dangerous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

Recommendations for the product
Dispose of as hazardous waste.
Recommendations for packaging
Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	1061	1061	1061
14.2. UN proper shipping name	METHYLAMINE, ANHYDROUS	METHYLAMINE, ANHYDROUS	Methylamine, anhydrous
14.3. Transport hazard class(es)	2	2.1	2.1
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user
The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable
No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID
Hazard label(s) 2.1 tunnel restriction code B/D
Classification code 2F

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Other regulations (EU)
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

15.2. Chemical Safety Assessment
For this substance a chemical safety assessment has been carried out.
Exposure scenarios (ESs) see http://www.ghc.de/media/en/downloads/expo/1130.pdf.

SECTION 16: Other information

Recommended uses and restrictions

National and local regulations concerning chemicals shall be observed.

Further information

All declarations of safety-data-sheet refer to pure substance.
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 10.2