



Suite 450
One North Shore Center
12 Federal Street
Pittsburgh, PA 15212

Safety Data Sheet

KR-93L

1. IDENTIFICATION

Product name KR-93L
Description Aqueous amine solution
Product class Boiler
Supplier address Suite 450
One North Shore Center
12 Federal Street
Pittsburgh, PA 16212
Telephone numbers
Company Phone Number (412) 321-9800
Emergency Telephone CHEMTREC 800-424-9200

2. HAZARDS IDENTIFICATION

Hazard classification Flammable Liquids, Category 3
Acute Toxicity: Oral, Category 3
Acute Toxicity: Dermal, Category 4
Skin Corrosion, Category 1
Serious Eye Damage, Category 1
Skin Sensitization, Category 1
Specific Organ Toxicity: Single Exposure, Narcotic Effects, Category 3
Reproductive Toxicity, Category 1A

Signal word Danger

Hazard statements Flammable liquid and vapor.
Toxic if swallowed.
Harmful in contact with skin.
Causes severe skin burns and eye damage.
Causes serious eye damage.
May cause an allergic skin reaction.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.

Pictograms of related hazards



Precautionary statementsPrevention

- Keep away from heat/sparks/open flames/hot surfaces – No smoking.
- Keep container tightly closed.
- Ground container and receiving equipment.
- Use explosion-proof electrical equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Wear protective gloves, protective clothing, eye protection, and face protection.
- Wash skin thoroughly after handling.
- Do not eat, drink, or smoke when using this product.
- Do not breathe fumes, mist, vapors, or spray.
- Contaminated work clothing should not be allowed out of the workplace.
- Use only outdoors or in a well-ventilated area.
- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use personal protective equipment as required.

Response

- DO NOT induce vomiting.
- Rinse mouth.
- Wash contaminated clothing before reuse.
- Specific measures:
- IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water or emergency shower.
- In case of fire: Evacuate area.
- IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately contact a POISON CENTER or health care provider.
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately contact a POISON CENTER or health care provider.
- If skin irritation or a rash occurs: Get medical attention.
- IF exposed or concerned: Get medical attention.

Storage

- Protect from sunlight. Store in a well-ventilated place.
- Store locked up.
- Store in a closed container.
- Store in a well-ventilated place. Keep cool.

Disposal

- Dispose of in accordance with local, state, and federal regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS #	Weight %
Morpholine	110-91-8	10–20
2-(Diethylamino)-ethanol (DEAE)	100-37-8	1–10
Cyclohexylamine	108-91-8	1–10
Non-hazardous substances	Proprietary	>60

4. FIRST-AID MEASURES

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally to ensure complete rinsing. Remove contact lenses if present and easy to do, then resume rinsing. Get medical attention immediately.
Skin contact	Immediately remove all contaminated clothing. Rinse with copious amounts of water; use an emergency shower if available. Wash contaminated clothing before reuse.
Ingestion	If swallowed, DO NOT induce vomiting. Rinse mouth and get emergency medical attention. Do not give anything by mouth unless instructed to do so by a poison center or health care provider.
Inhalation	If inhaled, move victim to fresh air. Seek emergency medical attention if breathing is difficult; perform artificial respiration if breathing stops.
Note to health care provider	Esophageal corrosion may contraindicate the use of gastric lavage and/or activated charcoal.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Water spray, foam, dry chemical, carbon dioxide
Unsuitable extinguishing media	No information available
Protective equipment and precautions for firefighters	Exercise caution when fighting any chemical fire. A self-contained breathing apparatus and protective clothing are essential. Use water to keep fire-exposed containers cool.
Specific hazards	Combustion may produce toxic gases. Vapor is dense and may collect near the ground; flammable vapor may flow to distant ignition sources resulting in flashback.
Hazardous combustion products	Carbon oxides, nitrogen oxides, ammonia

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate the area of all non-essential personnel. Do not touch spilled material without proper protective equipment. Ventilate the area and mitigate further release if it is safe to do so. Avoid contact with eyes.
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Methods for clean-up

- Small spills Contain spill and soak up with an inert absorbent material and place residues in a properly labeled container for disposal. Avoid discharge into sewer or surface water.
- Large spills Contain spill using trenches, diking, or absorption with an inert material (i.e. sand or earth). Reclaim spilled material into recovery or salvage drums or tank truck for proper disposal.

7. HANDLING AND STORAGE

- Advice on safe handling** Avoid contact with eyes, skin, and clothing. Avoid breathing vapor or mist. Wash hands thoroughly after handling.
- Storage conditions** Store in a cool, dry, well-ventilated area away from incompatible materials. Keep containers closed when not in use.
- Suitable materials of construction** Corrosion-resistant container; original container only is recommended.
- Unsuitable materials of construction** Metals

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Eye/face protection** Chemical splash goggles, face shield
- Skin protection** Chemical-resistant gloves and body-covering clothing
- Respiratory protection** NIOSH approved respirator in accordance with OSHA respiratory protection requirements (29 CFR 1910.134) if airborne concentrations exceed published exposure limits.
- Engineering controls** Adequate ventilation, eye-wash station, and emergency shower
- General hygiene considerations** Do not eat, drink, or smoke while handling this product.

Chemical Name	OSHA PEL	ACGIH TLV
Morpholine	70 mg/m ³	20 ppm
2-(Diethylamino)-ethanol (DEAE)	50 mg/m ³	2 ppm
Cyclohexylamine	None established	None established
Non-hazardous substances	None established	None established

9. PHYSICAL AND CHEMICAL PROPERTIES

pH	>11.5
Appearance	Clear colorless to pale yellow liquid
Odor	Amine
Odor Threshold	No information available

Melting/freezing point	No information available
Initial boiling point/boiling range	No information available
Flash point	120-130°F (48.9-54.4°C)
Evaporation rate	No information available
Flammability (solid, gas)	No information available
Upper/lower flammability or explosive limits	No information available
Vapor pressure	No information available
Vapor density	>1 [air = 1]
VOC content	No information available
Specific gravity	0.965-1.045
Solubility	Complete
Partition coefficient n-octanol/water	No information available
Auto-ignition temperature	No information available
Decomposition temperature	No information available
Viscosity	No information available

10. STABILITY AND REACTIVITY

Chemical stability	Stable under normal conditions of storage and handling.
Hazardous polymerization	Polymerization will not occur.
Conditions to avoid	Extreme temperatures, incompatibilities
Incompatibilities	Strong acids, oxidizers, bisulfites, nitrites, metals
Hazardous decomposition products	Reaction with nitrites may evolve carcinogenic nitrosamines.

11. TOXICOLOGICAL INFORMATION

Likely routes of exposure Skin, eyes, ingestion

Acute toxicity

Morpholine

Parameter	Result
LD ₅₀ , Oral (rat)	1,450 mg/kg
LC ₅₀ , Inhalation (mouse)	1,320 mg/m ³ /2H
LC ₅₀ , Inhalation (rat)	8,000 ppm

2-(Diethylamino)-ethanol (DEAE)	
Parameter	Result
LD ₅₀ , Oral (rat)	1,300 mg/kg
LD ₅₀ , dermal (rabbit)	1,100 mg/kg
LC _{Lo} , Inhalation (rat)	4,500 mg/m ³ /4hr
Cyclohexylamine	
Parameter	Result
LD ₅₀ , Oral (rat)	11 mg/kg
LD ₅₀ , Dermal (rabbit)	277 mg/kg
LC ₅₀ , Inhalation (rat)	7,500 mg/m ³

Acute symptoms and effects

Eye	Severe eye irritation with serious damage including, but not limited to, tissue destruction, corneal opacification, and temporary or permanent blindness.
Skin	Skin irritation with or without pain, burning, itching, redness, and swelling. Symptoms may be exacerbated by open wounds, excoriations, rashes, or other skin breaches. Onset of symptoms may be delayed relative to exposure.
Ingestion	Gastrointestinal distress with or without nausea, vomiting, and diarrhea. May cause irritation or corrosion of the oral and esophageal mucosa.
Inhalation	Upper respiratory irritation with or without cough, watering of the eyes, and postnasal drip. Inhalation may cause central nervous system depression with or without dizziness, drowsiness, fatigue, syncope, shortness of breath, and loss of consciousness. Aspiration of liquid or vomit may cause severe respiratory distress, airway corrosion, and acute lung damage.
Reproductive effects	Exposure to cyclohexylamine has been implicated in damaging fertility or causing harm to unborn offspring in animal studies.
Teratogenicity	No information available
Mutagenicity	No information available
Embryotoxicity	No information available
Sensitization to product	May cause allergic reaction or delayed hypersensitivity in susceptible individuals.
Synergistic products	No information available
Carcinogenicity	Morpholine has been evaluated by the IARC and categorized as "not classifiable as to carcinogenicity in humans" (group 3). No components have been identified as carcinogenic by OSHA, NTP, or IARC.

Chronic No information available

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Product

Parameter	Result
96 hr LC ₅₀ , Fathead minnow	223.61 mg/L
48 hr LC ₅₀ , Daphnia magna	265.76 mg/L

Persistence No information available

Bioaccumulative potential No information available

Mobility No information available

13. DISPOSAL CONSIDERATIONS

Disposal Dispose of in accordance with federal, state, and local regulations. Do not discharge into sewer or surface water.

RCRA status As sold, discarded product would be considered a RCRA hazardous waste based on the corrosive characteristics. The EPA hazardous waste number is D002.

14. TRANSPORT INFORMATION

US Department of Transportation (DOT)

UN Number UN2734

Proper shipping name Amines, liquid, corrosive, flammable, n.o.s. (contains 2-diethylaminoethanol, cyclohexylamine, morpholine)

Primary hazard class/division 8

Secondary hazard 3

Packing group II

Label Corrosive, flammable

15. REGULATORY INFORMATION

OSHA Hazard Communication Status Flammable Liquids, Category 3
Acute Toxicity: Oral, Category 3
Acute Toxicity: Dermal, Category 4
Skin Corrosion, Category 1
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Specific Organ Toxicity: Single Exposure, Narcotic Effects, Category 3
Reproductive Toxicity, Category 1A

EPA Registration Number Not applicable

TSCA

The ingredients of this product are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory.

CERCLA

EPA Hazardous Substances (40 CFR 302)

Chemical Name	CERCLA Reportable Quantity (RQ)
Morpholine	None
2-(Diethylamino)-ethanol (DEAE)	None
Cyclohexylamine	None
Non-hazardous substances	None

SARA Title III (Sections 302, 311, 312, and 313)

Section 302 Extremely Hazardous Substances (40 CFR 355)

Chemical Name	CAS#	RQ	TPQ
Cyclohexylamine	108-91-8	10,000 lb	10,000 lb

Section 311 and 312 Health and Physical Hazards

Immediate	Delayed	Fire	Pressure	Reactivity
Yes	Yes	Yes	No	No

Section 313 Toxic Chemicals (40 CFR 372)

Chemical Name	CAS Number	Percent by Weight
None		

16. OTHER INFORMATION

HMIS Ratings Health—3; Flammability—2; Reactivity—0

NFPA Ratings Health—3; Flammability—2; Reactivity—0; Special Hazard—None

HMIS and NFPA Rating Scale Minimal—0; Slight—1; Moderate—2; Serious—3; Severe—4

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