

Safety Data Sheet: Morpholine

1. Identification

Product	Morpholine; CAS 110-91-8; EC 203-815-1
Use	Industrial chemical synthesis and steam-condensate pH control.
Company	Hainan Zhongxin Chemical Co., Ltd. (ZXCHEM)
Address	Room 1001, Building A, Caohejing Center, No. 1520 Gumei Road, Xuhui District, Shanghai, China
Telephone / email	+86-21-54265599 / sales@zxchem.com.cn
Emergency contact	ZXCHEM office number above, office hours, China time (UTC+8). For urgent medical assistance contact local emergency services.
Scope	Reference safety information for Morpholine. The reference composition, concentration and supply-grade differences are described in Section 3. This document does not certify the composition or transport status of a specific delivered batch or a different formulation.

2. Hazards Identification

Classification	Flammable liquid Category 3; acute oral toxicity Category 4; acute dermal and inhalation toxicity Category 3; skin corrosion Category 1B; serious eye damage Category 1; reproductive toxicity Category 2; specific target organ toxicity, single exposure Category 3 (respiratory irritation).
Signal word / symbols	Danger; GHS02, GHS05, GHS06, GHS08
Hazard statements	H226: flammable liquid and vapor. H302: harmful if swallowed. H311/H331: toxic skin contact and inhalation. H314: severe burns and eye damage. H335: respiratory irritation. H361: suspected reproductive harm.
Prevention	Use adequate ventilation; avoid inhaling mist. Prevent skin and eye contact. Wear suitable chemical-resistant gloves and eye protection. Wash after handling; keep food and drink out of the work area.
Response	After exposure, stop work and seek medical advice. For severe exposure obtain urgent medical care. Rinse contaminated skin or eyes with water; move an inhalation casualty to fresh air.
Environment	Prevent uncontrolled release to drains, soil or surface water. Collect spills for appropriate disposal.



3. Composition / Information on Ingredients

Reference ingredient	Morpholine, CAS 110-91-8, EC 203-815-1; >95% in the selected high-purity liquid reference. Supply assay ≥99.5%; batch impurities are not assigned.
Supply grade	Assay ≥99.5%
Applicability	The cited concentration or purity describes the reference material. It is not a certificate of analysis for the delivered batch; different solvents or dilutions require the matching supplier safety document.

4. First-Aid Measures

General	Protect rescuers and obtain immediate medical attention after significant exposure. Show this sheet to medical personnel.
Inhalation	Move to fresh air without exposing rescuers and obtain urgent medical assistance. Trained personnel should use appropriate medical equipment for assisted ventilation.
Skin	Remove contaminated clothing while rinsing thoroughly with water for at least 15 minutes. Obtain immediate medical care for significant contact or burns.
Eyes	Immediately irrigate gently with water, including under eyelids, for at least 15 minutes. Remove contact lenses when easy, continue rinsing and obtain urgent medical treatment.
Ingestion	Rinse the mouth, do not induce vomiting and call emergency medical services. Give nothing by mouth to an unconscious person. Corrosive gastrointestinal injury is possible.
Treatment	Treatment is directed by a clinician. Assess corrosive injury, respiratory effects and systemic exposure.

5. Fire-Fighting Measures

Extinguishing media	Use suitable foam, carbon dioxide or dry chemical. Water spray can cool containers; prevent liquid spreading and contain contaminated runoff.
Hazards	Fire or thermal breakdown can produce carbon and nitrogen oxides and irritating fumes.
Protection	Firefighters require suitable protective clothing and self-contained breathing equipment. Prevent contaminated firefighting water entering drains.

6. Accidental Release Measures

Personnel	Isolate the spill and provide ventilation. Use chemical-resistant gloves and eye protection; avoid contact and mist exposure.
Environment	Contain the release and protect drains and waterways. Report significant environmental contamination to the responsible authority.
Cleanup	Stop the leak if safe. Absorb liquid with a compatible inert material and collect in closed labelled containers. Do not wash into drains.

7. Handling and Storage

Handling	Use closed transfer and effective extraction. Bond and ground suitable equipment, use ignition-controlled facilities and wear chemical-resistant gloves, protective clothing and eye/face protection. Avoid vapor, skin and eye exposure.
Storage	Keep tightly closed in a cool, dry, ventilated corrosive/flammable-liquid area. Protect from moisture and heat, eliminate ignition sources and segregate strong oxidizers and incompatible materials.
Incompatibilities	Strong oxidizing agents and incompatible process chemicals.
Specific use	Assess the ordered grade and complete process before industrial use.

8. Exposure Controls / Personal Protection

Exposure limits	reference: ACGIH and OSHA TWA 20 ppm; NIOSH TWA 20 ppm and STEL 30 ppm. Skin absorption is important; verify current local limits.
Engineering controls	Use local extraction where mist can be generated. Maintain accessible eyewash and emergency washing facilities.
Personal protection	Wear chemical-resistant gloves selected for the task, suitable protective clothing and splash goggles. Add face protection for splash-prone tasks.
Respiratory protection	Use a properly selected respirator under a respiratory-protection program where engineering controls do not adequately limit airborne exposure.
Hygiene	Wash after handling, remove contaminated clothing promptly and do not eat, drink or smoke in the work area.

9. Physical and Chemical Properties

Appearance	Clear, colorless liquid
Formula / molecular weight	C ₄ H ₉ NO / 87.12 g/mol
Boiling range, reference	126–130°C at 760 mmHg
Melting point, reference	–5°C
Flash point, reference; method unspecified	32°C
Dynamic viscosity at 20°C	2.23 cP
Vapor pressure at 20°C	11 mbar
Water response	Soluble
Autoignition temperature, reference	255°C
Other properties	Product-specific values for odor threshold, vapor pressure, partition coefficient, autoignition temperature and viscosity are not supplied by the selected reference set. No values are inferred.

10. Stability and Reactivity

Stability	Handle and store under the recommended conditions. Prevent contamination and unnecessary heating.
Incompatibilities	Strong oxidizing agents and incompatible process chemicals.
Decomposition	Fire or thermal breakdown can produce carbon and nitrogen oxides and irritating fumes.

11. Toxicological Information

Exposure effects	Corrosive skin and eye injury, toxic skin/vapor exposure, respiratory irritation and suspected reproductive harm.
Reference classification	Flammable liquid Category 3; acute oral toxicity Category 4; acute dermal and inhalation toxicity Category 3; skin corrosion Category 1B; serious eye damage Category 1; reproductive toxicity Category 2; specific target organ toxicity, single exposure Category 3 (respiratory irritation).
Toxicological data	reference reports oral rat LD ₅₀ 1,050–1,900 mg/kg and dermal rabbit LD ₅₀ 310–500 mg/kg. These reference values do not establish a safe exposure. Corrosive injury and suspected reproductive effects require strict controls.

12. Ecological Information

Environmental effects	Reference algae EC50 28 mg/L at 96 hours. Prevent release to water and drains; water solubility can support environmental mobility.
Controls	Prevent uncontrolled release, collect spills and dispose of contaminated material through an authorized route.
Assessment	No product-specific PBT/vPvB assessment is claimed. Absence of data does not establish absence of environmental effects.

13. Disposal Considerations

Product	Collect surplus product and contaminated cleanup material for disposal by an authorized chemical-waste contractor in accordance with local requirements.
Packaging	Containers may retain product residues. Do not reuse contaminated packaging without an approved cleaning process; use an authorized disposal route.

14. Transport Information

Classification	Class 8 — Corrosive (subsidiary Class 3)
UN number	UN 2054
Shipping name	Morpholine
Class / packing group	DOT, ADR/RID, IMDG and IATA: Class 8, subsidiary Class 3, packing group I.
Transport precautions	Protect packaging and closures from damage, secure loads and prevent releases. This reference is not a shipping declaration for a specific consignment.

15. Regulatory Information

Identity	Morpholine; CAS 110-91-8; EC 203-815-1
HS reference	293499; reference heading rather than a destination customs ruling.
Compliance	Apply applicable workplace, environmental and transport rules. A raw-material listing does not establish finished-product authorization.
Assessment	No ZXCHEM-specific chemical safety assessment or destination registration is asserted.

16. Other Information

Hazard meanings	H226: flammable liquid and vapor. H302: harmful if swallowed. H311/H331: toxic skin contact and inhalation. H314: severe burns and eye damage. H335: respiratory irritation. H361: suspected reproductive harm.
Limitations	Prepared as reference safety information for the identified material. It is not a batch analytical certificate or safety assessment of a different solvent-containing formulation.
Revision	2026.2; prepared 2026-10-06. Customer-document branding and title corrected; technical safety data retained.
Document scope	Reference safety information for the material and grade described in Sections 1 and 3. Different concentrations, solvents or formulations require the applicable safety information. This is not a batch analytical certificate.

Revision: 2026.2 | Revision date: 2026-10-06