

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Product identifier:

Product name: MORPHOLINE
REACH registration number: 01-2119496057-30-XXXX
CAS number: 110-91-8
EC number: 203-815-1

Relevant identified uses of the substance or mixture and uses advised against:

Identified uses: Formulation of preparations Intermediate in chemical synthesis Industrial use: process regulator Corrosion inhibitor. Industrial use for treatment of hydrocarbon mixtures and gas Industrial applications of formulations containing morpholine Industrial use: washing/cleaning formulations Hydraulic oil. Lubricating grease. Industrial use: paper preservation Industrial use in agriculture Professional application of formulations Professional use of washing and cleaning products Professional use of hydraulic fluids and lubricating oils Professional use for paper preservation Professional use in agriculture Professional application in cement/asphalt consumer use of formulations.

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Classification (EC 1272/2008):

Physical hazards: Flam. Liq. 3 - H226
Health hazards: Acute Tox. 4 - H302 Acute Tox. 3 - H311 Acute Tox. 3 - H331 Skin Corr. 1B - H314 Eye Dam. 1 - H318
Environmental hazards: Not Classified

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Label elements:

EC number: 203-815-1

Pictogram:



Signal word: Danger

Hazard statements:
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H311+H331 Toxic in contact with skin or if inhaled.

Precautionary statements:
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311 Call a POISON CENTER/ doctor.

Contains: MORPHOLINE

Supplementary precautionary statements: P240 Ground/ bond container and receiving equipment.
P241 Use explosion-proof electrical equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe vapour/ spray.
P261 Avoid breathing vapour/ spray.
P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+P352 IF ON SKIN: Wash with plenty of water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/ doctor if you feel unwell.
P321 Specific treatment (see medical advice on this label).
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P363 Wash contaminated clothing before reuse.
P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container in accordance with national regulations.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances:	MORPHOLINE >=99.0% W/W - <=100% W/W
CAS number:	110-91-8
EC number:	203-815-1
Classification:	Flam. Liq. 3 - H226 Acute Tox. 4 - H302 Acute Tox. 3 - H311 Acute Tox. 3 - H331 Skin Corr. 1B - H314 Eye Dam. 1 - H318

The full text for all hazard statements is displayed in Section 16.

Product name:	MORPHOLINE
REACH registration number:	01-2119496057-30-XXXX
CAS number:	110-91-8
EC number:	203-815-1

4. FIRST AID MEASURES

Description of first aid measures:

Inhalation:	Get medical attention. Move affected person to fresh air at once. Place unconscious person on their side in the recovery position and ensure breathing can take place. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary.
Ingestion:	Get medical attention immediately. Rinse mouth with water Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Place unconscious person on the side in the recovery position and ensure breathing can take place.
Skin contact:	Get medical attention immediately. Wash skin thoroughly with soap and water. Remove contaminated clothing. Clothes should be laundered before re-issue.
Eye contact:	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if irritation persists after washing. Show this Safety Data Sheet to the medical personnel. Get medical attention immediately. Continue to rinse.

Most important symptoms and effects, both acute and delayed:

General information:	Effects may be delayed. Keep affected person under observation.
Inhalation:	Not available.
Ingestion:	May cause stomach pain or vomiting.
Skin contact:	Severe irritation.
Eye contact:	Irritation of eyes and mucous membranes. Prolonged contact may cause redness and/or tearing.

Indication of any immediate medical attention and special treatment needed:

Notes for the doctor:	Treat symptomatically.
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5. FIRE-FIGHTING MEASURES

Extinguishing media:

Suitable extinguishing media: Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture:

Specific hazards: The product is flammable. Heating may generate flammable vapours. The product is flammable. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Vapours may accumulate to form explosive concentrations.

Hazardous combustion products: Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Oxides of carbon. Oxides of nitrogen.

Advice for firefighters:

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Personal precautions: Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken involving any personal risk or without suitable training. Evacuate area, no smoking, sparks, flames or other sources of ignition near spillage. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.

Environmental precautions: Do not discharge into drains or watercourses or onto the ground. Avoid the spillage or runoff entering drains, sewers or watercourses.

Methods and material for containment and cleaning up:

Methods for cleaning up: Eliminate all sources of ignition. No smoking, sparks, flames or other sources of ignition near spillage. Provide adequate ventilation. USE ANTISPARK TOOLS Avoid the spillage or runoff entering drains, sewers or watercourses. Absorb spillage with sand or other inert absorbent. Sweep up and removed to an approved disposal container. Hold for waste disposal for waste disposal, see Section 13.

Reference to other sections: Wear protective clothing as described in Section 8 of this safety data sheet. See Section 11 for additional information on health hazards. For waste disposal, see section 13.

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7. HANDLING AND STORAGE

Precautions for safe handling:

Usage precautions:

Eliminate all sources of ignition. Avoid contact with skin and eyes. Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Eye wash facilities and emergency shower must be available when handling this product. Avoid eating, drinking and smoking when using the product. Good personal hygiene procedures should be implemented. Mechanical ventilation or local exhaust ventilation may be required.

Conditions for safe storage, including any incompatibilities:

Storage precautions:

Store in tightly-closed, original container in a dry, cool and well-ventilated place. Protect from light. Keep away from heat, sparks and open flame. Earth container and transfer equipment to eliminate sparks from static electricity.

Specific end use(s):

The identified uses for this product are detailed in Section 1.2. For further information, see attached Exposure Scenario.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

Ingredient comments:

No exposure limits known for ingredient(s).

DNEL:

Industry - Inhalation; Long term systemic effects: 91 mg/m³
Industry - Inhalation; Long term local effects: 36 mg/m³
Industry - Dermal; Long term systemic effects: 1.04 mg/kg bw/day
Consumer - Inhalation; Long term systemic effects: 45 mg/m³
Consumer - Inhalation; Long term local effects: 3.2 mg/m³
Consumer - Inhalation; Short term local effects: 18 mg/m³
Consumer - Dermal; Long term systemic effects: 0.52 mg/kg bw/day
Consumer - Oral; Long term systemic effects: 6.3 mg/kg bw/day
Consumer - Oral; Short term systemic effects: 38 mg/kg bw/day

PNEC:

Fresh water; 0.1 mg/L
Marine water; 0.01 mg/L
Intermittent release; 0.28 mg/L
STP; 10 mg/L
Sediment (Freshwater); 1.49 mg/kg sediment dw
Sediment (Marine water); 0.149 mg/kg sediment dw
Soil; 0.239 mg/kg soil dw

Exposure controls:

Protective equipment:



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Appropriate engineering controls: Provide adequate general and local exhaust ventilation.

Eye/face protection: The following protection should be worn: Chemical splash goggles. Safety glasses with side shields conforming to EN166.

Hand protection: Use protective gloves. The gloves must satisfy the specifications of EU directive 89/686/EEC and the standard EN 374 derived from it. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material.

Other skin and body protection: Provide eyewash station and safety shower. Wear chemical protective suit.

Hygiene measures: Wash contaminated clothing before reuse. Wash hands after contact. Wash promptly if skin becomes contaminated.

Respiratory protection: If ventilation is inadequate, suitable respiratory protection must be worn. Use a properly fitting air-purifying or air fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Appearance: Liquid.

Colour: Colourless.

Odour: No data available

Odour threshold: No specific test data are available.

pH: pH (concentrated solution): 11

Melting point: -4.9°C

Initial boiling point and range: 129°C @

Flash point: 32°C CC (Closed cup).

Evaporation rate: Not available.

Evaporation factor: No specific test data are available.

Flammability (solid, gas): No specific test data are available.

Upper/lower flammability or explosive limits: Lower flammable/explosive limit: 1.4-1.8 Upper flammable/explosive limit: 11.2-15.2

Other flammability: Not available.

Vapour pressure: 9.8hPa @ °C

Vapour density: 3

Relative density: 1.0007 @ °C

Bulk density: No specific test data are available.

Solubility(ies): Not available. Soluble in water. Methanol. acetone

Partition coefficient: Not available.

Auto-ignition temperature: 255°C

Decomposition temperature: Not available.

Viscosity: 2.23 mPa s @ 20°C

Explosive properties: Not available.

Oxidising properties: Not available.

Other information: Not available.

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10. STABILITY AND REACTIVITY

Reactivity: No information available

Chemical stability:

Stability: Stable at normal ambient temperatures and when used as recommended.

Possibility of hazardous reactions: NO DANGEROUS REACTION KNOWN UNDER CONDITIONS OF NORMAL USE Evolution of heat under influence of acids. Exothermic reaction.

Conditions to avoid: Avoid heat, flames and other sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials:

Materials to avoid: Strong oxidising agents. Metals Acids. Organic nitrites. Inorganic nitrites.

Hazardous decomposition products: Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours. Oxides of carbon. Oxides of nitrogen.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects:

Acute toxicity – oral:

Acute toxicity oral (LD₅₀ mg/kg): 1,900.0

Species: Rat

Notes (oral LD₅₀): Klimisch 2 1967 OECD 401 standard acute method

ATE oral (mg/kg): 505.05

Acute toxicity – dermal:

Acute toxicity dermal (LD₅₀ mg/kg): 500.0

Species: Rabbit

Notes (dermal LD₅₀): 1954 klimisch 2 OECD 402

ATE dermal (mg/kg): 303.03

Acute toxicity – inhalation:

Notes (inhalation LC₅₀): 1967 klimisch 2 OECD 403 1-hour exposure: 0/12 mortality, 3hour exposure 2/6 mortality, 5.5 hour exposure 6/6 mortality

ATE inhalation (gases ppm): 707.07

ATE inhalation (vapours mg/l): 3.03

ATE inhalation (dusts/mists mg/l): 0.51

Skin corrosion/irritation:

Animal data: KLIMISCH RATING 1 1997 OECD 404 rabbit Corrosive

Serious eye damage/irritation:

Serious eye damage/irritation: OECD405 klimisch rating 1 1985 corrosive to eyes

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Skin sensitisation:

Skin sensitisation: Guinea pig maximization test (GPMT) - Guinea pig: 1988 in vivo Not sensitising.

Germ cell mutagenicity:

Genotoxicity - in vitro: Inconclusive. 1979 klimisch 2 OECD476

Genotoxicity - in vivo: Chromosome aberration: Negative. 1979 klimisch 2

Carcinogenicity:

Carcinogenicity: NOAEL >543 mg/m³, Inhalation, Rat klimisch 2 1989 OECD453

Reproductive toxicity:

Reproductive toxicity – fertility: Not available.

Reproductive toxicity - development: Maternal toxicity: - NOAEL: 75 mg/kg/day, Oral, Rat 2009 KLIMISCH RATING 1 OECD 414 READ ACROSS Morpholine Hydrochloride

Specific target organ toxicity - single exposure:

STOT - single exposure: Not available.

Specific target organ toxicity - repeated exposure:

STOT - repeated exposure: LOAEL 500 mg/kg, Oral, klimisch 2 1969

12. ECOLOGICAL INFORMATION

Toxicity:

Acute toxicity – fish: LC50, 96 hours: 179 mg/l
Klimisch rating 2
1976
Vala mugil engeli

Acute toxicity - aquatic invertebrates: EC₅₀, 48 hours: 45 mg/l, Daphnia magna
Klimisch rating 2
1996
OECD 202

Acute toxicity - aquatic plants: EC₅₀, 96 hours: 28 mg/l, Selenastrum capricornutum
Klimisch rating 2
1980

Acute toxicity microorganisms: EC₅₀, 30 minutes: > 1000 mg/l, Activated sludge
Klimisch rating 2
1990
OECD 209

Persistence and degradability: The product is readily biodegradable.

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Photo transformation: Half-life: 2.79 hours klimisch rating 2 2007 Calculated

Stability (hydrolysis): Not available.

Biodegradation: Water - Degradation (%) 93: 25 days

Klimisch rating 2

1990

OECD 301E

Bioaccumulative potential: BCF: < 2.8, Cyprinus carpio (Common carp) klimisch rating 2 1992 OECD 305 at 0.5 mg/l

Partition coefficient: Not available.

Mobility in soil:

Adsorption/desorption coefficient: Water - Koc: 0.2401 -7.356 @ °C klimisch rating 2 2010 EPIWIN

Henry's law constant: 0.0116 Pa m³/mol @ 25°C klimisch rating 2 2007 Estimated value.

Surface tension: Not available.

Results of PBT and vPvB assessment: This product does not contain any substances classified as PBT or vPvB.

Other adverse effects: Not available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods:

Disposal methods: Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

14. TRANSPORT INFORMATION

UN number:

UN No. (ADR/RID): 2054

UN No. (IMDG): 2054

UN No. (ICAO): 2054

UN proper shipping name:

Proper shipping name (ADR/RID): MORPHOLINE

Proper shipping name (IMDG): MORPHOLINE

Proper shipping name (ICAO): MORPHOLINE

Proper shipping name (ADN): MORPHOLINE

Transport hazard class(es):

ADR/RID class: 8 (3)

IMDG class: 8 (3)

ICAO class/division: 8 (3)

[cont...]

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Transport labels:



Packing group:

ADR/RID packing group: I

IMDG packing group: I

ICAO packing group: I

Environmental hazards:

Environmentally hazardous substance/marine pollutant: No.

Special precautions for user:

Tunnel restriction code: (D/E)

Transport in bulk according to Annex II of MARPOL and the IBC Code:

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not relevant.

15. REGULATORY INFORMATION

Chemical safety assessment: A chemical safety assessment has been carried out.

Note: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the safety data sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

Abbreviations and acronyms used in the safety data sheet:

ECHA: European Chemicals Agency

ATE: Acute Toxicity Estimate

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CLP: Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

CAS# / CAS NO. CAS-numero (eräs kemikaalien tunnistenumero)

DNEL: Derived No Effect Level C&L: Classification and Labelling

EC NO.: EINECS and ELINCS Number (see also EINECS and ELINCS)

EINECS: European Inventory of Existing Commercial Substances

IATA: International Air Transport Association

kow: octanol-water partition coefficient

LC50: Lethal Concentration to 50 % of a test population

LD50: Lethal Dose to 50% of a test population (Median Lethal Dose)

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SDS: Safety Data Sheet

OECD: Organization for Economic Co-operation and Development

PBT: Persistent, Bioaccumulative and Toxic substance

PEC: Predicted Effect Concentration

PNEC: Predicted No Effect Concentration(s)

PPE: Personal Protection Equipment

QSAR: Qualitative Structure Activity Relationship

REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC)

No 1907/2006 SIEF: Substance Information Exchange Forum

STOT: Specific Target Organ Toxicity

STOT (RE): Repeated Exposure STOT (SE): Single Exposure

vPvB: Very Persistent and Very Bioaccumulative

Hazard statements in full:

H226 Flammable liquid and vapour.

H302 Harmful if swallowed.

H311 Toxic in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage. H331 Toxic if inhaled.

Legal disclaimer:

The information contained in this SDS does not constitute a risk assessment, and should not replace the user's own assessment of risks as required by other health and safety legislation.

This advice is given by Nexchem Ltd who accept no legal liability for it except otherwise provided by law. The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be construed as guaranteeing specific properties.