SAFETY DATA SHEET

Preparation Date: 05/09/2019 **Revision date** 05/09/2019 **Revision Number:** G1

1. IDENTIFICATION

Product identifier

Product code: M2253
Product Name: 4-METHYLMORPHOLINE

Other means of identification
Synonyms: Morpholine, N-methyl-
4-Methylmorfolin (Czech)
N-Methylmorpholine
Methylmorpholine
CAS #: 109-02-4
RTECS # QE5775000
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: No information available.
Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com
Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Tom Tyner (USA - West Coast)
Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 4
Acute toxicity - Inhalation (Vapors)	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
Flammable liquids	Category 2

Label elements

Danger

Hazard statements

Harmful if swallowed, in contact with skin or if inhaled
Causes severe skin burns and eye damage
Highly flammable liquid and vapor

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Not available

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Do not breathe dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep container tightly closed
Ground container and receiving equipment
Use explosion-proof equipment
Use only non-sparking tools
Take precautionary measures against static discharge

Precautionary Statements - Response
Immediately call a POISON CENTER or physician
In case of fire: Use CO2, dry chemical, or foam to extinguish.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or physician.
Call a POISON CENTER or physician if you feel unwell
Wash contaminated clothing before reuse
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. Immediately call a POISON CENTER or physician.
IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell
Rinse mouth
Do NOT induce vomiting

Precautionary Statements - Storage
Store locked up
Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal
Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No	Weight-%
4-Methylmorpholine	109-02-4	100

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Eye Contact: Flush eyes with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Harmful by inhalation. Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention.

Ingestion: Harmful if swallowed. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms

Harmful by inhalation and if swallowed
Causes severe skin burns
Causes eye damage
Harmful if absorbed through skin
May cause conjunctivitis
May cause irritation of respiratory tract
May cause chemical pneumonitis
May cause pulmonary edema
Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhea
May cause defatting of the skin
It may cause dermatitis

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Use water spray or water mist, alcohol-resistant foam, Dry chemical or Carbon dioxide (CO2).

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter

and spread fire.

Specific hazards arising from the chemical

Hazardous combustion products

Carbon monoxide. Carbon dioxide (CO2). Nitrogen oxides (NOx).

Specific hazards

Flammable. May be ignited by heat, sparks or flames. Vapor may travel considerable distance to source of ignition and flash back .Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Actions for Firefighters

Specific Methods:

Water mist may be used to cool closed containers For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out

Special Protective Equipment for Firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions:

Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors, but may not prevent ignition in closed spaces.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment

Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up

Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use only non-sparking tools. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:

Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice
Wear personal protective equipment. Use only in well-ventilated areas. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not breathe vapors or spray mist. Do not ingest. When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Store at room temperature in the original container. Store away from incompatible materials. Store in a segregated and approved area.

Incompatible Materials:
Oxidizing agents
Acids
Acid chlorides
Acid anhydrides

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
4-Methylmorpholine	109-02-4	None	None	None	None

Canada

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
4-Methylmorpholine	109-02-4	None	None	None	None

Australia and Mexico

Component	CAS No	Australia	Mexico
4-Methylmorpholine	109-02-4	None	None

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Goggles

Skin and body protection: Chemical resistant apron
Long sleeved clothing
Gloves

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands and face before breaks and immediately after handling the product

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Liquid

Appearance:
Clear.

Color:
Water-white.

Odor:
No information available.

Taste
No information available.

Formula
C5H11NO

Molecular/Formula weight (g/mole):
101.15

Flammability (solid, gas)
no data available

Flashpoint (°C/°F):
14-24°C/ 57-75°F

Flash Point Tested according to:
Closed cup

Autoignition Temperature (°C/°F):
165°C/ 329°F

Lower Explosion Limit (%):
2.2

Upper Explosion Limit (%):
11.8

Melting point/range(°C/°F):
-66.11°C/ -87°F

Decomposition temperature(°C/°F):
No information available

Boiling point/range(°C/°F):
115-116°C/ 239-241°F

Bulk density:
No information available

Density (g/cm3):
No information available

Specific gravity:
0.9

pH
No information available

Vapor pressure @ 20°C (kPa):
No information available

Evaporation rate:
No information available

Vapor density:
3.5

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
-0.32

Viscosity:
No information available

Miscibility:
Miscible with water

Solubility:
Soluble in Methanol
Soluble in Ether

10. STABILITY AND REACTIVITY

Reactivity
No information available

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Incompatible materials.

Incompatible Materials:
Oxidizing agents
Acids
Acid chlorides
Acid anhydrides

Hazardous decomposition products: Carbon oxides. Nitrogen oxides (NOx).

Other Information
Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin. Eyes. Inhalation. Ingestion.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document
Component Information

4-Methylmorpholine	
CAS No	109-02-4

LD50/oral/rat = = 1960 mg/kg Oral LD50 Rat
LD50/oral/mouse = 1970 mg/kg Oral LD50 Mouse
LD50/dermal/rabbit = 1350 uL/kg Dermal LD50 Rabbit
LD50/dermal/rat = 1820 mg/kg Dermal LD50
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = 25200 mg/m^3/2H Inhalation LC50 Mouse
Other LD50 or LC50information = No information available

Product Information

LD50/oral/rat =
Value - Acute Tox = 1960 mg/kg

LD50/oral/mouse =
Value - Acute Tox Oral = 1970 mg/kg

LD50/dermal/rabbit
Value - Acute Tox = 1350 uL/kg

LD50/dermal/rat
VALUE - Acute Tox Dermal = 1820 mg/kg

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = 25200 mg/m^3/2H
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Symptoms

Skin Contact: Harmful in contact with skin. Causes skin burns. May be absorbed through the skin in harmful amounts.

Eye Contact: Causes serious eye damage. May cause conjunctivitis.

Inhalation Harmful by inhalation. May cause irritation of respiratory tract. May cause chemical pneumonitis. It may cause pulmonary edema.

Ingestion Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Aspiration hazard No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Prolonged or repeated skin contact may cause defatting and dermatitis.

Sensitization: No information available.

Mutagenic Effects: No information available

Carcinogenic effects: Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
4-Methylmorpholine	109-02-4	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.
STOT - repeated exposure No information available.
Target Organs: No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility in soil No information available
Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
4-Methylmorpholine	109-02-4	None	None	None	None

14. TRANSPORT INFORMATION

DOT
UN-No: UN2535
Proper Shipping Name: 4-Methylmorpholine
Hazard Class 3
Subsidiary Class 8
Packing group: II
Emergency Response Guide Number 132
Marine Pollutant No data available
DOT RQ (lbs): No information available
Special Provisions B6, IB2, T7, TP1
Symbol(s): No information available
Description: UN2535, 4-Methylmorpholine, 3 (8), II

TDG (Canada)
UN-No: UN2535
Proper Shipping Name: 4-Methylmorpholine
Hazard Class 3
Subsidiary Risk: No information available
Packing Group: II
Marine Pollutant No Information available
Description: UN2535, 4-Methylmorpholine, 3 (8), II

ADR
UN Number UN2535
Proper Shipping Name: 4-Methylmorpholine
Transport hazard class(es) 3
Packing group II
Subsidiary Risk: No information available
Description: UN2535, 4-Methylmorpholine, 3 (8), II

IMDG
UN-No: UN2535
Proper Shipping Name: 4-Methylmorpholine

Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: II
Marine Pollutant No information available
EMS: F-E
Description UN2535, 4-Methylmorpholine, 3 (8), II

RID
UN Number UN2535
Proper Shipping Name: 4-Methylmorpholine
Transport hazard class(es) 3
Subsidiary Risk: No information available
Packing group II
Description: UN2535, 4-Methylmorpholine, 3 (8), II

ICAO (air)
UN-No: UN2535
Proper Shipping Name: 4-Methylmorpholine
Hazard Class 3
Subsidiary Risk: No information available
Packing Group: II
Description: UN2535, 4-Methylmorpholine, 3 (8), II

IATA
UN Number UN2535
Proper Shipping Name: 4-Methylmorpholine
Transport hazard class(es) 3
Subsidiary Risk: No information available
Packing group II
Precautionary Statements - Response 3C
Special Provisions No information available
Description: UN2535, 4-Methylmorpholine, 3 (8), II

15. REGULATORY INFORMATION

International Inventories

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	China IECSC	Australia (AICS)	EINECS-No.
4-Methylmorpholine	109-02-4	PresentACTIVE	Present KE-24448	Present	Present (5)-860	Present	Present	Present 203-640-0

U.S. Regulations

4-Methylmorpholine
Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 1278
Pennsylvania RTK: Present

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Component	CAS No	Carcinogen	Developmental Toxicity	Male	Female

				Reproductive Toxicity	Reproductive Toxicity:
4-Methylmorpholine	109-02-4	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Component	CAS No	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
4-Methylmorpholine	109-02-4	None	None	None	None	None

U.S. TSCA

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
4-Methylmorpholine	109-02-4	Not Applicable	Not Applicable

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information: The WHMIS 2015 classification of this product has not been validated or reviewed yet.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
4-Methylmorpholine	109-02-4	Present	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
4-Methylmorpholine	109-02-4	Not listed
Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
4-Methylmorpholine	109-02-4	Not listed

EU Classification

EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
4-Methylmorpholine	109-02-4	

EU - CLP (1272/2008)

R-phrase(s)

R11 - Highly flammable
R34 - Causes burns
R20/21/22 - Harmful by inhalation, in contact with skin and if swallowed

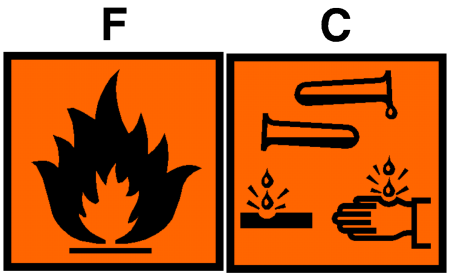
S -phrase(s)

S16 - Keep away from sources of ignition - No smoking
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S24/25 - Avoid contact with skin and eyes
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Component	CAS No	**Classification**	**Concentration Limits:**	**Safety Phrases**
4-Methylmorpholine	109-02-4		No information	

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
F - Highly flammable
C - Corrosive
Xn - Harmful



16. OTHER INFORMATION

Preparation Date: 05/09/2019
Revision date 05/09/2019
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet