

## Material Safety Data Sheet

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Version 1.1

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

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1 - Product and Company Information

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Product Name	4-METHYLMORPHOLINE, REAGENTPLUS(TM), 99%
Product Number	M56557
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
Technical Phone #	+61 2 9841 0555 (1800 800 097)
Fax	+61 2 9841 0500 (1800 800 096)
Emergency Phone #	+44 8701906777 (1800 448 465)

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2 - Composition/Information on Ingredients

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Product Name	CAS #	EC no	Annex I Index Number
4-METHYLMORPHOLINE	109-02-4	203-640-0	None
Formula	C5H11NO		
Molecular Weight	101.15 AMU		
Synonyms	4-Methylmorpholin (Czech) * N-Methylmorpholine * 4-Methylmorpholine * Morpholine, N-methyl-		

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3 - Hazards Identification

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## SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Highly flammable. Harmful by inhalation, in contact with skin and if swallowed. Causes burns.

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4 - First Aid Measures

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## AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

## AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

## AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

## AFTER INGESTION

If swallowed, wash out mouth with water provided person is

conscious. Call a physician.

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## 5 - Fire Fighting Measures

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### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

### SPECIAL RISKS

Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location. Forms explosive mixtures in air.

### SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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## 6 - Accidental Release Measures

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### PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition.

### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

### METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

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## 7 - Handling and Storage

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### HANDLING

Directions for Safe Handling: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

### STORAGE

Conditions of Storage: Keep container closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Handle and store under nitrogen.

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## 8 - Exposure Controls / Personal Protection

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### ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

### GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Discard contaminated shoes. Wash contaminated clothing before reuse.

### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	15 MG/M3
Poland		NDSCh	30 MG/M3

Poland	NDSP	-
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EXPOSURE LIMITS - DENMARK		
Source	Type	Value
OEL	TWA	20 mg/m3
		5 ppm

Remarks: H

EXPOSURE LIMITS - GERMANY		
Source	Type	Value
TRGS 900	OEL	20 mg/m3

Remarks: H,S

#### PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.  
 Hand Protection: Compatible chemical-resistant gloves.  
 Eye Protection: Chemical safety goggles.  
 Special Protective Measures: Faceshield (8-inch minimum).

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### 9 - Physical and Chemical Properties

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Appearance	Physical State: Clear liquid Color: Colorless	
Property	Value	At Temperature or Pressure
pH	10.6	20 °C Concentration: 50 g/l
BP/BP Range	113 - 116 °C	
MP/MP Range	-66 °C	
Flash Point	14 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	165 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 3 %	
Vapor Pressure	22.5 mmHg	20 °C
SG/Density	0.92 g/cm3	
Partition Coefficient	Log Kow: -0.32	
Viscosity	< 0.001 Pas	20 °C
Vapor Density	> 1 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Miscible.	

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### 10 - Stability and Reactivity

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#### STABILITY

Stable: Stable.  
 Materials to Avoid: Acids, Acid chlorides, Acid anhydrides, Strong oxidizing agents Carbon dioxide.

#### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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11 - Toxicological Information

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RTECS NUMBER: QE5775000

ACUTE TOXICITY

LD50  
Skin  
Rabbit  
1,240 mg/kg

LD50  
Oral  
Rat  
1960 mg/kg

LD50  
Skin  
Rat  
1820 mg/kg  
Remarks: Skin and Appendages:Skin: After systemic exposure:  
Dermatitis, other

LD50  
Oral  
Mouse  
1970 mg/kg

LC50  
Inhalation  
Mouse  
25,200 mg/m3  
2H

LD50  
Skin  
Rabbit  
1350 UL/KG

LD50  
Oral  
Mammal  
1917 mg/kg

IRRITATION DATA

Skin  
Rabbit  
460 mg  
Remarks: Open irritation test

Eyes  
Rabbit  
0.92 mg  
Remarks: Severe irritation effect

Eyes  
Rabbit  
20 mg

24H

Remarks: Mild irritation effect

#### SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

#### ROUTE OF EXPOSURE

Skin Contact: Causes burns.  
Skin Absorption: Harmful if absorbed through skin.  
Eye Contact: Causes burns.  
Inhalation: Harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.  
Ingestion: Harmful if swallowed.

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 9 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Specific Developmental Abnormalities: Central nervous system. Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Musculoskeletal system.

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#### 12 - Ecological Information

No data available.

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#### 13 - Disposal Considerations

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#### SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

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#### 14 - Transport Information

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##### RID/ADR

UN#: 2535  
Class: 3  
PG: II  
Proper Shipping Name: 4-Methylmorpholine

##### IMDG

UN#: 2535  
Class: 3  
PG: II  
Subrisk: 8  
Proper Shipping Name: 4-Methylmorpholine  
Marine Pollutant: No

Severe Marine Pollutant: No

IATA

UN#: 2535

Class: 3

PG: II

Subrisk: 8

Proper Shipping Name: 4-Methylmorpholine

Inhalation Packing Group I: No

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15 - Regulatory Information

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CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

INDICATION OF DANGER: F C

Highly Flammable. Corrosive.

R-PHRASES: 11 20/21/22 34

Highly flammable. Harmful by inhalation, in contact with skin and if swallowed. Causes burns.

S-PHRASES: 16 26 36/37/39 45

Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND

SWISS POISON CLASS: 4

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16 - Other Information

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WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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