

SAFETY DATA SHEET

SDS: A6011-0100_E001

Date Prepared: 2019/04/19

Date Revised: 2023/01/10

Product Name: **N-ETHYL MORPHOLINE****1. Identification of the substance/mixture and of the company/undertaking**

Product name: N-ETHYL MORPHOLINE
 Identification of the supplier: Nippon Nyukazai Co., Ltd.
 Address: No.4-1.Nihonbashi Kobuna-cho, Chuo-ku, Tokyo 103-0024, Japan
 Charge section: Business Operation Department
 (TEL:+81-3-5651-5640,FAX:+81-3-5651-5646)
 Emergency telephone number: Business Operation Department
 (TEL:+81-3-5651-5640,FAX:+81-3-5651-5646)
 Recommend use: for urethane , intermediate raw materials
 Restrictions on use: Seek expert judgment when using for purposes other than those recommended.

2. Hazards identification

Hazard category

Flammable liquids	Category 3
Acute toxicity (oral)	Category 4
Acute toxicity(vapour)	Category 3
Skin corrosion/irritation	Category 1B
Serious eye damage/eye irritation	Category 1
Specific target organ systemic toxicity following single exposure	Category 2
Specific target organ systemic toxicity following single exposure	Category 3
Specific target organ systemic toxicity following repeated exposure	Category 2

Label elements

Hazard pictograms:



Signal word:

Danger

Hazard statements:

H226 Flammable liquid and vapour.
 H302 Harmful if swallowed.
 H331 Toxic if inhaled.
 H314 Causes severe skin burns and eye damage.
 H318 Causes serious eye damage.
 H371 May cause damage to organs (nervous system).
 H335+H336 May cause respiratory irritation, or May cause drowsiness or dizziness.
 H373 May cause damage to organs (nervous system) through prolonged or repeated exposure.

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Precautionary statements:

Prevention P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash hands and face thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response P310 Immediately call a POISON CENTER/doctor/healthcare professionals under the supervision of a doctor.

P311 Call a POISON CENTER/doctor/healthcare professionals under the supervision of a doctor.

P312 Call a POISON CENTRE/doctor/healthcare professionals under the supervision of a doctor if you feel unwell.

P314 Get medical advice/attention if you feel unwell.

P330 Rinse mouth.

P363 Wash contaminated clothing before reuse.

P301+P312 IF SWALLOWED: Call a POISON CENTRE/doctor/healthcare professionals under the supervision of a doctor if you feel unwell.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P311 IF exposed or concerned: Call a POISON CENTER/doctor/healthcare professionals under the supervision of a doctor.

P370+P378 In case of fire : Use appropriate extinguishing media for extinction.

Storage P405 Store locked up.

P403+P233 Store in a well ventilated place. Keep container tightly closed.

P403+P235 Store in a well ventilated place. Keep cool.

Disposal P501 Dispose of contents/container in accordance with local/regional/national/international regulation.

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Product Name: **N-ETHYL MORPHOLINE****3. Composition/information on ingredients****3.1. Substances**

Ingredients and Concentration

Ingredient Name	Concentration wt. %	CAS RN®	Existing and New Chemical Substances (JAPAN)	Industrial Safety and Health Law Substances (JAPAN)	Industrial Safety and Health Law (JAPAN)	Pollutant Release Transfer Register Law (JAPAN)	Poisonous and Deleterious Substances Control Act (JAPAN)
			Gazette notice reference number	Gazette notice reference number	Notifiable Substances	Specified Substances	Poisonous and Deleterious Substances
N-Ethylmorpholine	99-100	100-74-3	5-860	Public	Applicable	Not applicable	Not applicable

3.2. Mixtures

Not Applicable

4. First aid measures

Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is stopped, lie on your back and perform cardiopulmonary respiration. Get medical advice/attention.
Skin contact:	Take off contaminated clothing and wash before reuse. Wash with plenty of soap and water. If skin irritation or a rash occurs: Get medical advice/attention.
Eye contact:	Immediately flush eye with plenty of clean water for at least 15 minutes. (If easy to do, remove contact lenses, if worn.) Get medical attention immediately.
Ingestion:	After having swallowed it, Drink a large quantity of water when consciousness becomes clear and receive treatment for the doctor immediately. A mouth must not give a person without the consciousness a thing.
Protection for first aid person:	The rescuer wears a tool for appropriate protection depending on the situation.

5. Firefighting measures

Suitable extinguishing media:	Use water spray(fog), foam, dry chemical or CO2.
Extinguishing media to avoid:	Straight stream water.

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Specific hazards arising from the chemical:	At the time of fire, hazardous gases (carbon monoxide, NO _x and others) can be generated.
Fire fighting:	Keep upwind of fire. Eliminate all ignition sources if safe to do so. In case of fire in the surroundings, move the content/container to the safety place. If it is not possible to move, cool the content/container with water spray.
Special protective equipment and precautions for fire fighters:	Gloves, protection glasses, wear fire, flame resistant, retardant clothing, air respiratory organs wear a tool for appropriate protection.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Promptly remove possible ignition sources from the vicinity. Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.
Environmental precautions:	To environment (area of the sea, the soil) must not release it.
Methods and materials for containment and cleaning up:	Absorb this product with inactive materials (example: dry sand, earth) and recover it into a waste material container. In the case of large amount, stop leakage with earth/sand to begin with, and, then, recover it. In the case of a small quantity, I adsorb it in the earth and sand, a waste and collect it in empty container which I can seal up after having removed it.

7. Handling and storage

Handling	
Technical measures:	During handling, be sure to wear proper protective equipment (refer to the section 8). This product can be charged with static electricity. Take countermeasures for static electricity removal (grounding, others). Wear antistatic clothes and antistatic shoes to prevent human body electrification. Use explosion-proof electrical/ventilating/lighting equipment.
Ventilation requirements:	Use the ventilation equipment described in Section 8.
Precautions for safe handling:	Not especially.
Storage	
Storage conditions:	Store the containers avoiding direct sunlight. Store in less than 40°C in a well-ventilated room.

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Safety adequate
container
materials:

Use the container specified by the Fire Service ACT and the United Nations Transport Regulations.

8. Exposure controls/personal protection

Appropriate engineering controls: Use local ventilation equipment.
Install eye and body washing facilities near the handling place.
Display the position of equipment clearly.

Control parameters

Ingredient Name	Industrial Safety and Health Law (JAPAN)	Japan Society for Occupational Health	ACGIH-TLV	
	Administrative Control Levels	Occupational Exposure Limits	TWA	STEL
N-Ethylmorpholine	Not established	Not established	5ppm Skin, 5mg/m ³	Not established

Personal protective equipment

Respiratory protection: Use a gas mask for organic gases, air-supplied respirator, self-contained compressed air breathing apparatus on the situation.

Hand protection: Organic solvent impermeable protective gloves (Antistatic ones are desirable.)

Eye/face protection: Protective glasses, goggle, protective face shield.

Skin/body protection: Wear long-sleeved working clothes and protective shoes. (Antistatic ones are desirable.)

Use an oiliness apron-resistant, boots depending on the situation.

Hygiene measures: Wash with soap and water after handling.

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9. Physical and chemical properties

Product

Form:	Liquid (20°C)
Color:	Colorless transparent
Odor:	Ammonia odor
Melting point/freezing point:	Freezing point < -70(°C)
Initial boiling point and boiling range:	138.3(°C)
Flammability (solid, gas):	No data
Upper/lower flammability or explosive limits:	No data
Flash point:	33(°C)
Auto-ignition temperature:	No data
Decomposition temperature:	No data
pH:	No data
Kinematic viscosity:	No data
Solubility:	water : Soluble.
Partition coefficient: n-octanol/water:	No data
Vapour pressure:	0.8(kPa)(20°C)
Specific Gravity:	0.914(20°C)
Vapour density:	No data
Particle characteristics:	No data

10. Stability and reactivity

Chemical stability:	Stable under normal temperatures and pressures.
Possibility of hazardous reactions:	It may react with the oxidizing agent and generate heat.
Conditions to avoid:	Avoid heat, flames, sparks and ignition sources.
Incompatible materials:	Acid, Oxidizing agents.
Hazardous decomposition products:	No data available

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Product Name: **N-ETHYL MORPHOLINE****11. Toxicological information**

Product

Acute toxicity (oral):	Category 4 LD50: 1500-2000 mg/kg[rat]
Acute toxicity (dermal):	Classification not possible
Acute toxicity (inhalation):	Exempt classification (Gas) Category 3 (Vapour) Classification not possible (Dust/Mist)
Skin corrosion/irritation:	Category 1B
Serious eye damage/irritation:	Category 1
Respiratory sensitization:	Classification not possible
Skin sensitization:	Classification not possible
Mutagenicity:	Classification not possible
Carcinogenicity:	Classification not possible
Reproductive toxicity:	Classification not possible
Target organ effect/Single exposure:	Category 2(nervous system) Category 3(respiratory tract irritation)
Target organ effect/Multi exposure:	Category 2(nervous system)
Respiratory toxic:	Classification not possible

Ingredient

N-Ethylmorpholine

Acute toxicity (oral):	Category 4 LD50: 1500-2000 mg/kg[rat]
Acute toxicity (dermal):	Classification not possible
Acute toxicity (inhalation):	Effect on animals : No data Exempt classification (Gas) Category 3 (Vapour) LC50: 2000 ppm[rat] Classification not possible (Dust/Mist)
Skin corrosion/irritation:	Category 1B Corrosive [rabbit] Effect on animals : In a skin irritation test with rabbits (equivalent to OECD TG 404), moderate to severe irritation such as erythema and edema were observed 24 hours after application on application of this substance for 1-15 minutes or 20 hours, and necrosis was observed after 8 days on application for 5 minutes or above (SIDS (2007)). Based on this newly added test information, this substance was judged to be corrosive, and it was classified in Category 1B. The category was changed by adding the test information.

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Serious eye damage/irritation:

Category 1

Effect on person : There are reports that reversible corneal edema was observed by exposure to this substance at 40 ppm or above in humans (ACGIH (2001), SIDS (2007)), and that it was irritating to the eyes and may cause visual disturbance (Environmental Risk Assessment for Chemical Substances vol.7, Tentative Hazard Assessment Sheet (Ministry of the Environment, 2009)). In the workplace where this substance was handled, irritation to the eyes, corneal disorder, effects on color vision, etc. were reported.

Effect on animals : In an eye irritation test (equivalent to OECD TG 405) with rabbits, erythema, edema and corneal opacity were observed by application of 0.05 mL of this substance, and erythema and edema persisted until 24 hours after application, with corneal opacity until 8 days after application.

This substance was classified in Category 1B in the classification for Skin corrosion/irritation. From the above results, it was classified in Category 1.

Respiratory sensitization:

Classification not possible

Effect on person : Classification not possible due to lack of data.

Skin sensitization:

Classification not possible

Effect on person : Classification not possible due to lack of data.

Mutagenicity:

Classification not possible

Classification not possible due to lack of data. There was no in vivo data. As for in vitro, it was negative in a chromosomal aberration test with cultured mammalian cells, and it was negative and weakly positive in bacterial reverse mutation tests (JECDB (Access on June 2014), SIDS (2007), NTP DB (Access on July 2014)). Besides, the findings of weakly positive were those at 6,667 and 10,000 microg/plate under the presence of a metabolic activation system in TA1535, and it was negative at the highest dose (5,000 microg/plate) in the current guideline.

Carcinogenicity:

Classification not possible

Classification not possible due to lack of data.

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Reproductive toxicity:

Classification not possible

In a reproduction/developmental toxicity screening test with rats by the oral route (gavage), at a dose (500 mg/kg/day) where parental toxicities (transient salivation, decreased body weight gain, decreased food consumption, death of 1 female animal on Day 2 of lactation) were observed, decreases in number of implantations and indexes for implantations, and 1 maternal animal which delivered 2 dead pups on Day 24 of gestation were observed without significant difference, and decreases in the number of live birth, indexes for live birth and indexes for birth were found without significant difference (JECDB (Access on June 2014), SIDS (2007)).

As in the above, although slight effects on fertility were observed at the dose where parental toxicities were observed, these effects were not statistically significant, therefore, they were not adopted. Since these were the results in the screening test, it was classified as "Classification not possible."

Target organ effect/Single exposure:

Category 2(nervous system)

Category 3(respiratory tract irritation)

In humans, irritation to the respiratory tract was the main effect by the inhalation route (Environmental Risk Assessment for Chemical Substances Vol.7, Tentative Hazard Assessment Sheet (Ministry of the Environment, 2009), SIDS (2007), ACGIH (7th, 2001), HSDB (Access on June 2014)).

In rats, dyspnea, strong irritation of the mucous membranes, trembling and staggering by inhalation exposure around the saturated concentration (1,100 ppm), and convulsions, ventral and lateral posture, hemorrhagic gastroenteritis, and at or above 1,000 mg/kg, tonic and/or clonic convulsions followed by decreased locomotor activity by oral administration were observed (SIDS (2007)). These effects were observed within the guidance value range corresponding to Category 1 by inhalation exposure and to Category 2 by oral administration.

From the above, although relatively strong effects were reported in rats, similar findings were not reported in human findings, and emphasizing that the effects on the nervous system and respiratory tract irritation were the main effects, it was classified in Category 2 (nervous system), Category 3 (respiratory tract irritation).

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Target organ effect/Multi exposure:	Category 2(nervous system) Although some findings of the hazards by occupational exposures in humans were described in ACGIH (7th, 2001) and Environmental Risk Assessment for Chemical Substances Vol.7, Tentative Hazard Assessment Sheet (Ministry of the Environment, 2009), most of them were reports on the effects by acute exposure to this substance including those by acute combined exposure to other substances, and it was described in SIDS (2007) that there were no available data on effects by repeated exposure in humans. As for experimental animals, in a test (OECD TG 407) with rats dosed by gavage for 28 days, cage-licking and chewing were observed in the administration groups of 200 and 800 mg/kg/day, and increased relative weights and histological changes (hypertrophy of the centrilobular hepatocytes, vacuolation of the tubular epithelium) were observed as effects on the liver and kidney in addition to tremors, eyelid closure, crouching position and decreased body weight gain in the administration group of 800 mg/kg/day (SIDS (2007), JECDB (Access on June 2014), Environmental Risk Assessment for Chemical Substances Vol.7, Tentative Hazard Assessment Sheet (Ministry of the Environment, 2009)). In evaluations of SIDS (2007) and the Ministry of the Environment (2009), behavioral changes at 200 mg/kg/day (converted guidance value: 62.2 mg/kg/day) were regarded as adverse effects and the NOAEL was calculated to be 50 mg/kg/day. That is, although behavioral changes (cage-licking and chewing) in the administration group of 200 mg/kg/day were intermittent changes of symptoms observed in 1-2 of 5 males and 1-4 of 5 females, and these were symptoms not necessarily observed in all animals, changes were considered to be a type of stereotypical behavior, therefore, they were judged to be toxicologically significant findings. Furthermore, since tremor and eyelid closure, etc. were also observed in the high dose group, it was considered appropriate to classify it in Category 2 (nervous system).
Respiratory toxic:	Classification not possible Effect on person : Classification not possible due to lack of data.

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Product Name: **N-ETHYL MORPHOLINE****12. Ecological information**

Product

Ecotoxicity	
Acute toxicity:	No Classification
Chronic toxicity:	No Classification
Persistence and degradability :	No information.
Bioaccumulative potential :	No information.
Mobility in soil:	No information.
Hazardous to the ozone layer:	Classification not possible
Other impact :	No information.

Ingredient

N-Ethylmorpholine

Ecotoxicity	
Acute toxicity:	No Classification
Fish:	96hrLC50:> 100 mg/L[Oryzias latipes]
Daphnia:	48hrEC50:> 92 mg/L[Daphnia magna]
Algae:	72hrErC50:> 53 mg/L[Pseudokirchneriella subcapitata]
Chronic toxicity:	No Classification
Fish:	No data
Daphnia:	21dayNOEC: 99 mg/L[Daphnia magna]
Algae:	72hrNOEC: 23 mg/L[Pseudokirchneriella subcapitata]
Persistence and degradability :	Not rapidly biodegradable
Bioaccumulative potential :	Low bioconcentration
Hazardous to the ozone layer:	Classification not possible

13. Disposal considerations

Disposal methods:	When waste materials and waste water are to be treated, collect them into specified containers and entrust the disposal to a disposal contractor having an industrial waste disposal contractor permit. Do not use the used containers for other purposes like filling other substances. Be sure to dispose of them after treating the content according to the above description. In case of recycling the container, return the container as it is after fitting a stopper without filling anything into it.
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Product Name: **N-ETHYL MORPHOLINE**

14. Transport information

International classification regulations	UN classification : 8 (Subsidiary risk 3)
UN number :	2734
Proper shipping name :	AMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S.
Packing group :	II
Domestic restriction:	Transport the material in accordance with the regulations in your country or region.
Specific security precaution and condition of transportation:	Load the containers in such a way as not to wet with water, fall down, tumble, or being damaged. Cover the loaded cargo to prevent direct sunlight.
Emergency Response Guide (ERG) Numbers:	132

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Reference	Information obtained in NITE (National Institute of Technology and Evaluation) and other literature surveys.
Disclaimer	About the description: This SDS was created in accordance with JIS Z 7253 based on the materials and data available at the time of creation. Detailed information such as composition and ingredients corresponding to overseas legal regulation registration confirmation etc. may not be described, so please contact our sales staff separately if necessary. Precautions are for normal handling. In case of special handling, it is the responsibility of the user to take safety measures suitable for the intended use and usage. We have paid close attention to the contents, but we do not guarantee the contents. This product can only be used for industrial purposes. If you want to use it for other purposes, please contact us in advance.