

## Safety Data Sheet

### 1. Identification of the substance/mixture and of the company/undertaking

**Product identifier:**

Product name: N,N-Dimethylformamide

Reference number(SDS):35770jis\_E1-4

**Product type:**

Reagent

**Details of the supplier of the safety data sheet**

Manufacturer/Supplier: JUNSEI CHEMICAL CO., LTD.

Address: 1-6, Ohmano-cho, Koshigaya-shi, Saitama 343-0844, Japan

Division: Quality Assurance Department

Telephone number: +81-48-986-6161

FAX: +81-48-989-2787

e-mail address: shiyaku-t@junsei.co.jp

### 2. Hazards identification

**GHS classification and label elements of the product****Classification of the substance or mixture****PHYSICAL AND CHEMICAL HAZARDS**

Flammable liquids: Category 3

**HEALTH HAZARDS**

Acute toxicity (Inhalation): Category 3

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2B

Germ cell mutagenicity: Category 2

Carcinogenicity: Category 1B

Reproductive toxicity: Category 1B

Specific target organ toxicity – single exposure: Category 1(liver)

Specific target organ toxicity – single exposure: Category 2(respiratory system)

Specific target organ toxicity – repeated exposure: Category 1(liver)

(Note) GHS classification without description: Not classified/Classification not possible

**Label elements**

Signal word: Danger

**HAZARD STATEMENT**

H226-Flammable liquid and vapor

H331-Toxic if inhaled

H315-Causes skin irritation

H320-Causes eye irritation

H341-Suspected of causing genetic defects

H350-May cause cancer

H360-May damage fertility or the unborn child

H370-Causes damage to organs after single exposure

H371-May cause damage to organs after single exposure

H372-Causes damage to organs through prolonged or repeated exposure

**PRECAUTIONARY STATEMENT****Prevention**

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- Keep container tightly closed.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Do not breathe vapors.
- Use only outdoors or in a well-ventilated area.
- Wash contaminated parts thoroughly after handling.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.
- Do not eat, drink or smoke when using this product.

**Response**

- In case of fire: Use appropriate media for extinction.
- Get medical advice/attention if you feel unwell.
- IF exposed or concerned: Get medical advice/attention.
- Call a POISON CENTER or doctor/physician.
- IF exposed or concerned: Call a POISON CENTER or doctor/physician.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- IF ON SKIN: Wash with plenty of soap and water.
- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- If skin irritation occurs: Get medical advice/attention.
- Take off contaminated clothing and wash it before reuse.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- If eye irritation persists: Get medical advice/attention.

**Storage**

- Store in a well-ventilated place. Keep container tightly closed. Keep cool.
- Store locked up.

**Disposal**

- Dispose of contents/container in accordance with local/national regulation.

**Specific Physical and Chemical hazards**

- Flammable liquid. Vapor/air mixture may explode.

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**3. Composition/information on ingredients****Mixture/Substance selection:****Substance**

- Ingredient name: N,N-Dimethylformamide
- Content (%): 99.0
- Chemical formula: C<sub>3</sub>H<sub>7</sub>NO
- Chemicals No, Japan: 2-680
- CAS No.: 68-12-2
- MW: 73.09
- ECNO: 200-679-5

#### 4. First-aid measures

##### Descriptions of first-aid measures

###### General measures

- Get medical attention/advice if you feel unwell.
- Call a POISON CENTER or doctor/physician.
- Keep victim warm and quiet.
- Call emergency medical service.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

###### IF INHALED

- Remove person to fresh air and keep comfortable for breathing.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Call a POISON CENTER or doctor/physician if you feel unwell.

###### IF ON SKIN (or hair)

- Take off immediately all contaminated clothing. Rinse skin with water/shower.
- Wash with plenty of soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water.
- Do not remove clothing if adhering to skin.
- If skin irritation or rash occurs: Get medical advice/attention.
- If skin irritation occurs: Get medical advice/attention.
- Remove and isolate contaminated clothing and shoes.

###### IF IN EYES

- Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- If eye irritation persists: Get medical advice/attention.

###### IF SWALLOWED

- Rinse mouth. Do NOT induce vomiting.
- Call a POISON CENTER or doctor/physician if you feel unwell.

##### Most important symptoms and effects, both acute and delayed

###### (Symptoms when inhalation or ingestion)

- Sore throat. Abdominal pain. Diarrhoea. Vomiting. Jaundice.
- ※Aspiration hazard!

###### (Symptoms when skin and/or eye contact)

- Redness of the eyes. Pain of the eyes.
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#### 5. Fire-fighting measures

##### Extinguishing media

###### Suitable extinguishing media

- In case of fire, use water mist, foam, dry powder, CO<sub>2</sub> to extinguish.
- Unsuitable extinguishing media data is not available.

##### Specific hazards arising from the substance or mixture

- Containers may explode when heated.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

##### Advice for firefighters

###### Specific fire-fighting measures

- Evacuate non-essential personnel to safe area.
- Cool container with water spray.

###### Special protective equipment and precautions for fire-fighters

- Wear fire/flame resistant/retardant clothing.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Firefighters should wear self-contained breathing apparatus with full face piece operated

positive pressure mode.

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## 6. Accidental release measures

### Personnel precautions, protective equipment and emergency procedures

- Keep unauthorized personnel away.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Ventilate area until material pick up is complete.
- Wear proper protective equipment.
- PUBLIC SAFETY:** Ventilate closed spaces before entering.
- Do not touch or walk through spilled material.

### Environmental precautions

- Runoff to sewer may create fire or explosion hazard.
- Vapor explosion hazard indoors, outdoors or in sewers.
- Avoid release to headsprings, rivers, lakes, ocean and groundwater.

### Methods and materials for containment and cleaning up

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Use clean non-sparking tools to collect absorbed material.
- All equipment used when handling the product must be grounded.

### Preventive measures for secondary accident

- Collect spillage.
- Stop leak if you can do it without risk.
- ELIMINATE** all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Prevent entry into waterways, sewers, basements or confined areas.
- A vapor suppressing foam may be used to reduce vapors.
- Keep out of low areas.

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## 7. Handling and storage

### Precautions for safe handling

#### Preventive measures

(Exposure Control for handling personnel)

- Do not breathe vapors/fume.

(Protective measures against fire and explosion)

- Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.

(Exhaust/ventilator)

- Exhaust/ventilator should be available.

(Safety treatments)

- Avoid contact with skin.
- Avoid contact with eyes.

#### Safety Measures

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.
- When using do not eat, drink or smoke.

#### Any incompatibilities

- Strong oxidizing agents, Halogens, Halogenated hydrocarbons, Nitrates should not be mixed

with the chemicals.

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

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

Take off contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Store in a well-ventilated place. Keep container tightly closed.

Keep cool. Protect from sunlight.

Store locked up.

Container and packaging materials for safe handling data is not available.

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## 8. Exposure controls/personal protection

Control parameters

Control value

Japan control value (1995)  $\leq 10$ ppm

Adopted value

JSOH(1974) 10ppm; 30mg/m<sup>3</sup> (dermal)

ACGIH(2017) TWA: 5ppm (Liver dam; eye & URT irr)

Notation...Skin

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Wear positive pressure self-contained breathing apparatus (SCBA).

Hand protection

Wear protective gloves. Recommended material(s): butyl rubber

Consult with your glove and/or personnel equipment manufacturer for selection of appropriate compatible materials.

Eye protection

Wear safety glasses with side-shields.

Wear eye/face protection.

Skin and body protection

Wear impervious clothing and boots in case of repeated or prolonged treatment.

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## 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless~Yellow

Odor: Characteristic odor

Odor threshold: 300 mg/m<sup>3</sup>

Melting point/Freezing point: -61°C

Boiling point or initial boiling point: 153°C

Boiling range data is not available.

Flammability (gases, liquids and solids): Ignitable

Lower and upper explosion limit/flammability limit:

Lower explosion limit: 2.2vol %

Upper explosion limit: 16vol %

Flash point: (C.C.) 58°C

Auto-ignition temperature: 445°C

Decomposition temperature data is not available.

Self-Accelerating Decomposition Temperature/SADT data is not available.

pH: 7 (200g/L, 20°C)

Dynamic viscosity: 0.92mPas(20°C)

Kinematic viscosity: 0.85mm<sup>2</sup>/s(25°C)

Solubility:

Solubility in water: Miscible [1000g/liter(25°C)]

Solubility in solvent: Very soluble in ethanol and diethyl ether.

n-Octanol/water partition coefficient: log Pow=0.87

Vapor pressure: 0.49 kPa (25°C)

Vapor density data is not available.

VOC data is not available.

Evaporation rate data is not available.

Density and/or relative density: 0.95g/cm<sup>3</sup>(20°C)

Relative vapor density (Air=1): 2.5

Relative density of the Vapor/air - mixture at 20°C (Air = 1): 1.00

Critical temperature data is not available.

No Particle characteristics data is not available.

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## 10. Stability and Reactivity

### Reactivity

Runaway polymerization will not occur.

### Chemical stability

Stable under normal storage/handling conditions.

Flammable.

### Possibility of hazardous reactions

Decomposes on heating. This produces toxic fumes.

Reacts violently with strong oxidants, halogens, halogenated hydrocarbons and nitrates.

Attacks some plastics(e.g. Polyvinyl chloride) and rubber(e.g. Natural rubber and Nitrile rubber).

### Conditions to avoid

Contact with incompatible materials.

Open flames. Heat. Sparks.

### Incompatible materials

Strong oxidizing agents, Halogens, Halogenated hydrocarbons, Nitrates.

### Hazardous decomposition products

Carbon oxides, Nitrogen oxides

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## 11. Toxicological Information

### Information on toxicological effects

#### Acute toxicity

##### Acute toxicity (Oral)

[GHS Cat. Japan, base data]

rat LD50=3000~7170 mg/kg (EHC 114, 1991)

##### Acute toxicity (Dermal)

[GHS Cat. Japan, base data]

rat LD50=3500mg/kg (MOE risk assessment vol.1, 2002)

##### Acute toxicity (Inhalation)

[GHS Cat. Japan, base data]

vapor: mouse LC50=4.7mg/L/4hr (HSDB, 2005)

Labor standard law, Japan; Toxic

N,N-Dimethylformamide

Irritant properties

Skin corrosion/irritation

[GHS Cat. Japan, base data]

human : mild to moderate irritation (ACGIH, 2018 et al.)

Serious eye damage/irritation

[GHS Cat. Japan, base data]

rabbit big water blister recover after 48 hours (REACH Registration dossier, Accessed Dec. 2018)

Allergenic and sensitizing effects data is not available.

Germ cell mutagenicity

[GHS Cat. Japan, base data]

cat. 2; CERI/NITE risk assessment No.8, 2005

Carcinogenicity

[GHS Cat. Japan, base data]

cat.1B; (MHLW carcinogenicity examination, 2000)

IARC-Gr.2A : Probably carcinogenic to humans

ACGIH-A3(2017) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

JSOH-2B: Insufficient Evidence of Carcinogenicity for Humans

Reproductive toxicity

[GHS Cat. Japan, base data]

cat. 1B; CERI/NITE risk assessment No.8, 2005

STOT

STOT-single exposure

[cat.1]

[GHS Cat. Japan, base data]

liver (CERI/NITE risk assessment, 2005)

[cat.2]

[GHS Cat. Japan, base data]

respiratory system (CERI/NITE risk assessment No.8, 2005)

STOT-repeated exposure

[cat.1]

[GHS Cat. Japan, base data]

liver (CERI/NITE risk assessment, 2005)

Aspiration hazard data is not available.

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## 12. Ecological Information

Ecotoxicity

Aquatic toxicity

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]

Fish (top minnow) LC50 > 100mg/L/96hr (MOE eco-toxicity tests of chemicals , 1995 et al.)

Water solubility

100 g/100 ml (PHYSPROP\_DB, 2005)

Persistence and degradability

BOD\_Degradation: 4.4% (Registered chemicals data check & review, Japan)

Bioaccumulative potential

BCF=0.3~0.8 (conc. 20 ppm), 0.3~1.2(conc. 2 ppm) (Registered chemicals data check & review, Japan);

log Pow=-0.87 (ICSC, 2014)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

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**13. Disposal considerations**

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Dispose of contents/container in accordance with local/national regulation.

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**14. Transport Information**

UN No., UN CLASS

UN No.: 2265

Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division : 3

Packing group : III

ERG GUIDE No.: 129

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 2265

Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division : 3

Packing group : III

IATA Dangerous Goods Regulations

UN No.: 2265

Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division : 3

Hazard labels : Flamm.liquid

Packing group : III

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : no

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**15. Regulatory Information**

Safety, health and environmental regulations/legislation specific for the substance or mixture

Environmental hazards

MARPOL Annex V – Prevention of pollution by garbage discharge

Carcinogenicity: cat.1, 1A, 1B

N,N-Dimethylformamide

Reproductive toxicity: cat.1, 1A, 1B

N,N-Dimethylformamide

Specific target organ toxicity – repeated exposure: cat.1

N,N-Dimethylformamide

Transport in bulk according to Annex II of MARPOL73/78 and IBC Code

Noxious Liquid ; Cat. Y

N,N-Dimethylformamide

Basel law, Japan

N,N-Dimethylformamide

US Federal Regulations

Chemicals listed in TSCA Inventory

N,N-Dimethylformamide

Other regulatory information

We are not able to check up the regulatory information with regard to the substances in your country or region, therefore, we request this matter would be filled by your responsibility.

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



Ensure this material in compliance with federal requirements and ensure conformity to local regulations. Regulatory information in this section are limited to intentional ingredient(s), but does not contain information on non-intentional ingredients or impurities which are not informed by supplier(s).

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## 16. Other information

### GHS classification and labelling

H226-Flam. Liq. 3: H226 Flammable liquid and vapor  
H331-Acute Tox. 3: H331 Toxic if inhaled  
H315-Skin Irrit. 2: H315 Causes skin irritation  
H320-Eye Irrit. 2B: H320 Causes eye irritation  
H341-Muta. 2: H341 Suspected of causing genetic defects  
H350-Carc. 1B: H350 May cause cancer  
H360-Repr. 1B: H360 May damage fertility or the unborn child  
H370-STOT SE 1: H370 Causes damage to organs after single exposure  
H371-STOT SE 2: H371 May cause damage to organs after single exposure  
H372-STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure

### Reference Book

Globally Harmonized System of classification and labelling of chemicals, (7th revised edition, 2017), UN Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN IMDG Code, 2018 Edition (Incorporating Amendment 39-18)  
IATA Dangerous Goods Regulations (61th Edition) 2020  
Classification, labelling and packaging of substances and mixtures (Table 3 ECNO6182012)  
2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)  
2020 TLVs and BEIs. (ACGIH)  
<http://monographs.iarc.fr/ENG/Classification/index.php>  
JIS Z 7252 : 2019  
JIS Z 7253 : 2019  
2019 Recommendation on TLVs (JSOH)  
Supplier's data/information  
Chemicals safety data management system "GHS Assistant" Version 4.09 (<https://www.asahi-ghs.com/>)  
NITE Chemical Risk Information Platform "NITE-CHRIP"  
([https://www.nite.go.jp/en/chem/chrip/chrip\\_search/systemTop](https://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop))  
GHS Classification Guidance for Enterprises 2019 Revised Edition (Ver. 2.0) (Mar. 2020, METI)

### Definitions and Abbreviations

SDS (Safety Data Sheet)  
LD50 (Lethal Dose, 50%)  
LC50 (Lethal Concentration, 50%)  
IARC (International Agency for Research on Cancer)  
ACGIH (American Conference of Governmental Industrial Hygienists)  
EPA (US Environmental Protection Agency)  
NTP (US National Toxicology Program)  
JSOH (Japan Society for Occupational Health)  
EU (European Union)  
EC50 (Effective Concentration, 50%)  
NOEC (No Observed Effect Concentration)  
BOD (Biochemical Oxygen Demand)  
COD (Chemical Oxygen Demand)  
BCF (Bioconcentration Factor)  
anh (anhydride)

### General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling,



N,N-Dimethylformamide, JUNSEI CHEMICAL CO., LTD., 35770jis\_E1-4, 09/12/2020

and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2019).