

SAFETY DATA SHEET

Preparation Date: 12/15/2015

Revision date 1/15/2019

Revision Number: G3

1. Identification

Product identifier

Product code: D1030
Product Name: N,N-DIMETHYLFORMAMIDE, REAGENT, ACS

Other means of identification

Synonyms: DMF
 DMFA
 Dimethyl formamide
 Dimethylformamide
 DN,N-Dimethyl formamide
 N,N-Dimethylmethanamide
 N-Formyldimethylamine
 Dimetilformamida (Spanish)
 Diméthylformamide (French)

CAS #: 68-12-2
RTECS # LQ2100000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Solvent.
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 - Inhalation (Gases) | Category 3 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Serious eye damage/eye irritation | Category 2 |
| Reproductive toxicity | Category 1B |
| Specific target organ toxicity (repeated exposure) | Category 1 |

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Label elements**Danger****Hazard statements**

Harmful if swallowed

Toxic if inhaled

Causes serious eye irritation

May damage fertility or the unborn child

Causes damage to organs through prolonged or repeated exposure

Flammable liquid and vapor

**Hazards not otherwise classified (HNOC)**

Not Applicable

Other hazards

May be harmful in contact with skin

Causes mild skin irritation

Precautionary Statements - Prevention

Obtain special instructions before use

Do not handle until all safety precautions have been read and understood

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Use only outdoors or in a well-ventilated area

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

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/bond container and receiving equipment

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

Use only non-sparking tools

Take precautionary measures against static discharge

Keep cool

Precautionary Statements - Response*IF exposed or concerned: Get medical advice/attention*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. If eye irritation persists: Get medical advice/attention.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Call a POISON CENTER or doctor/physician. IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

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Rinse mouth

Precautionary Statements - Storage

Store locked up

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

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS No | Weight-% |
|-----------------------|---------|----------|
| N,N-Dimethylformamide | 68-12-2 | 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.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention. If skin irritation persists, call a physician.

Eye Contact: Flush eyes with water for 15 minutes. Get medical attention.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion: 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
Causes serious eye irritation
Causes conjunctival irritation
Mild skin irritation
Lacrimation
Dyspnea (Difficulty breathing and shortness of breath)
Ingestion may cause vomiting and nausea
Abdominal pain
May cause methemoglobinemia and cyanosis
Central nervous system effects
May cause cardiovascular effects
May cause loss of appetite
It may affect the kidneys
May affect the liver

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

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| | |
|---|---|
| Suitable Extinguishing Media: | Carbon dioxide (CO2). Dry chemical. Alcohol-resistant foam. Water spray. |
| Unsuitable Extinguishing Media: | Do not use a solid (straight) water stream as it may scatter and spread fire. |
| <u>Specific hazards arising from the chemical</u> | |
| Hazardous combustion products | Carbon Monoxide, Carbon Dioxide. Nitrogen oxides (NOx). Dimethylamine. |
| 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. |
| <u>Special Protective Actions for Firefighters</u> | |
| Specific Methods: | No information available |
| 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. 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 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).

Methods for cleaning up Use appropriate tools to put the spilled solid in a suitable 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. Take precautionary measures against static discharges. 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. Store at room temperature in the original container. Keep away from heat and sources of ignition. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Materials:

Oxidizing agents
 Reducing agents
 Acids
 Alkali Metals
 Sodium
 Bromine
 Phosphorous trioxide
 Chlorine
 Sodium borohydride
 Sodium tetrahydroborate
 Sodium hydride
 Ethylene bromide
 Hexachlorobenzene
 Cyanuric chloride
 Lithium azide
 Triethylaluminum
 chlorinated hydrocarbons
 Diisocyanatomethane
 Methylene diisocyanate
 halogenated hydrocarbons
 Nitrates
 Carbon tetrachloride
 alkylaluminum compounds
 Sodium hydroborate and heat
 Sulfinyl chloride and traces of zinc or iron
 2,4,6-Trichloro-1,3,5-triazine
 2,5-dimethylpyrrole and phosphorus oxychloride

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters****National occupational exposure limits****United States**

| Component | CAS No | OSHA | NIOSH | ACGIH | AIHA WEEL |
|-----------------------|---------|--|--|-----------|-----------|
| N,N-Dimethylformamide | 68-12-2 | 10 ppm TWA 30 mg/m ³ TWA | 10 ppm TWA 30 mg/m ³ TWA | 5 ppm TWA | None |

Canada

| Component | CAS No | Canada - Alberta | Canada - British | Canada - Ontario | Canada - Quebec |
|-----------|--------|------------------|------------------|------------------|-----------------|
| | | | | | |

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| | | | | | |
|-----------------------|---------|--|-----------------|------|------|
| | | | Columbia | | |
| N,N-Dimethylformamide | 68-12-2 | 10 ppm TWA 30 mg/m ³ TWA | 10 ppm TWA | None | None |

Australia and Mexico

| Component | CAS No | Australia | Mexico |
|-----------------------|---------|--|--|
| N,N-Dimethylformamide | 68-12-2 | 10 ppm TWA 30 mg/m ³ TWA | 10 ppm TWA 30 mg/m ³ TWA 20 ppm STEL 60 mg/m ³ STEL |

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: Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. 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 before breaks and immediately after handling the product

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|---|---|--|
| Physical state: Liquid | Appearance: No information available. | Color: Colorless. Light yellow. |
| Odor: Amine-like. Fishy. | Taste No information available. | Formula C3-H7-N-O or HCON(CH3)2 |
| Molecular/Formula weight (g/mole): 73.09 | Flammability (solid, gas) no data available | Flashpoint (°C/°F): 57.778 °C/136 °F 67 °C/152.6 °F |
| Flash Point Tested according to: Closed cup Open cup | Autoignition Temperature (°C/°F): 445 °C/833 °F | Lower Explosion Limit (%): 2.2% |
| Upper Explosion Limit (%): 15.2% | Melting point/range(°C/°F): -61 °C/-77.8 °F | Decomposition temperature(°C/°F): No information available |
| Boiling point/range(°C/°F): | | |

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153 °C/307.4 °F @ 760 mm Hg

Bulk density:
No information available

Density (g/cm³):
0.9445-0.95 @ 25 °C

Specific gravity:
0.949

pH
No information available

Vapor pressure @ 20°C (kPa):
0.3466

Evaporation rate:
No information available

Vapor density:
2.51

VOC content (g/L):
No information available

Odor threshold (ppm):
100

**Partition coefficient
(n-octanol/water):**
-1.01

Viscosity:
No information available

Miscibility:
Miscible with water
Miscible with many organic solvents

Solubility:
Soluble in Ether
Soluble in Chloroform
Soluble in Benzene
Soluble in hot alcohol
Soluble in Acetone

10. STABILITY AND REACTIVITY

Reactivity

Dimethylformamide forms explosive reactions with: Bromine, Potassium permanganate, Lithium azide, Triethylaluminum and heat, and Uranium perchlorate

Reacts vigorously with oxidizing agents

Reactive with reducing agents

Reactive with acids

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
- Reducing agents
- Acids
- Alkali Metals
- Sodium
- Bromine
- Phosphorous trioxide
- Chlorine
- Sodium borohydride
- Sodium tetrahydroborate
- Sodium hydride
- Ethylene bromide
- Hexachlorobenzene
- Cyanuric chloride
- Lithium azide
- Triethylaluminum
- chlorinated hydrocarbons
- Diisocyanatomethane
- Methylene diisocyanate
- halogenated hydrocarbons
- Nitrates

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Carbon tetrachloride
alkylaluminum compounds
Sodium hydroborate and heat
Sulfinyl chloride and traces of zinc or iron
2,4,6-Trichloro-1,3,5-triazine
2,5-dimethylpyrrole and phosphorus oxychloride

Hazardous decomposition products:

When heated to decomposition it emits toxic fumes. Carbon monoxide. Nitrogen oxides (NOx). Dimethylamine.

Other Information

Corrosivity:

No information available

Special Remarks on Corrosivity: Pure Dimethylformamide is essentially noncorrosive to metals. However, copper, tin and their alloys should be avoided

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Skin. Inhalation.

Acute Toxicity

Component Information

| | |
|-----------------------|---------|
| N,N-Dimethylformamide | |
| CAS No | 68-12-2 |

LD50/oral/rat = 2800 mg/kg Oral LD50 Rat; 2000 mg/kg Oral LD50 Rat

LD50/oral/mouse = 2900 mg/kg (RTECS)

3750 mg/kg (RTECS)

LD50/dermal/rabbit = 4720 mg/kg (RTECS)

LD50/dermal/rat = 1100 mg/kg Dermal LD50; > 3.2 g/kg Dermal LD50

LC50/inhalation/rat = 3421 ppm 1 h (RTECS)

1948 ppm 4 h (RTECS)

LC50/inhalation/mouse = 9.4 g/m³ 2 h (RTECS)

Other LD50 or LC50 information = 5000 mg/kg Oral LD50 Rabbit (LOLI)

Product Information

LD50/oral/rat =

Value - Acute Tox = 2000 mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 2900 mg/kg

LD50/dermal/rabbit

Value - Acute Tox = 4720 mg/kg

LD50/dermal/rat

VALUE - Acute Tox Dermal = 1100 mg/kg

LC50/inhalation/rat

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VALUE-Vapor = No information available
VALUE-Gas = 1948 ppm (4-hr)
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = 9400 mg/m³ 2 hr

Symptoms

Skin Contact: May cause skin irritation. Mild skin irritation. It can be absorbed through the skin. May be harmful in contact with skin. It may facilitate the absorption of other dissolved substances. Absorption through the skin may cause systemic effects similar to those of inhalation or ingestion.

Eye Contact: Causes eye irritation. Severe eye irritation. Causes conjunctivitis. Lachrymator (substance which increases the flow of tears).

Inhalation Toxic by inhalation. May cause irritation of respiratory tract. Symptoms may include coughing and wheezing. Can cause dyspnea (shortness of breath and difficulty breathing). Causes lacrimation. May cause conjunctival irritation. May cause loss of appetite. May cause nausea, vomiting. May cause abdominal pain. May cause diarrhea or constipation. May cause cyanosis. May cause methemoglobinemia (the formation of methemoglobin in the blood which causes deficient oxygenation of the blood due to decreased available hemoglobin). Methemoglobinemia can lead to cyanosis (bluish skin and lips due to deficient oxygenation of the blood), and can result in fatigue, dizziness, lightheadedness, headache, mental impairment, incoordination, muscular weakness, convulsions/seizures, tachycardia or bradycardia (slow or fast heart beat), hypertension, dysrhythmias, dyspnea (shortness of breath and labored breathing), loss of consciousness, and death. Arterial blood with elevated methemoglobin levels has a characteristic chocolate-brown color as compared to normal bright red oxygen containing arterial blood. Severe methemoglobinemia is characterized by bradycardia or tachycardia (slow or fast heart beat), dysrhythmias, seizures, coma and death. May cause carboxyhemoglobinemia (the binding of hemoglobin to carbon monoxide in place of oxygen - also known as carbon monoxide poisoning). May affect the brain. It may affect behavior/central nervous system (convulsions/seizures). May affect behavior/central nervous system (somnolence). May affect behavior/central nervous system (central nervous system depression, headache, confusion, fatigue, irritability, muscle weakness, coma). It may affect the cardiovascular system (bradycardia, hypotension). May affect the kidneys. It may affect the liver (hepatotoxin - enlarged liver, elevated liver enzymes, jaundice). It may affect the blood (changes in serum composition). Exposure to dimethylformamide can cause ethanol intolerance. When occupationally exposed workers also ingest ethanol, it can cause flushing of the face and neck, abnormal taste (dysgeusia), and palpitations.

Ingestion Harmful if swallowed. Ingestion may cause nausea, vomiting. May cause abdominal pain. May cause loss of appetite. May affect liver. May affect urinary system (kidneys). It may affect the blood (leukocytosis). May affect behavior/central nervous system (somnolence, ataxia, tetany, general anesthetic, muscle weakness). May affect the cardiovascular system (hypertension).

Aspiration hazard No information available.

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

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Chronic Toxicity

Prolonged or repeated ingestion may affect metabolism (cause anorexia, weight loss). Prolonged or repeated ingestion may affect the liver, and kidneys. Prolonged or repeated inhalation may affect the cardiovascular system (degenerative changes in the myocardium). Prolonged or repeated inhalation may cause central nervous system effects. Prolonged or repeated inhalation may cause loss of appetite. Prolonged or repeated inhalation may affect metabolism (weight loss). Prolonged or repeated inhalation may affect the brain. Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated inhalation may affect the liver. Prolonged or repeated skin absorption may affect the liver and kidneys. Prolonged or repeated exposure may affect the autonomic nervous system. Chronic intensive skin contact may cause dermatitis. Prolonged or repeated inhalation or ingestion may affect the blood (decrease in platelets and longer blood coagulation times, leukopenia, lymphocytosis, anemia, polycythemia).

Sensitization:

No information available.

Mutagenic Effects:

May affect genetic material
 Mutagenic effects in mammalian somatic cells
 Experiments with animal lymphocytes have shown mutagenic effects
 Mutations in microorganisms
 Experiments with bacteria have shown mutagenic effects

Carcinogenic effects:

Probably carcinogenic to humans.

| Component | CAS No | IARC | ACGIH - Carcinogens | NTP | OSHA HCS - Carcinogens | Australia - Notifiable Carcinogenic Substances | Australia - Prohibited Carcinogenic Substances |
|-----------------------|---------|--|---|------------|------------------------|--|--|
| N,N-Dimethylformamide | 68-12-2 | Group 2A-Probably carcinogenic to humans - Monograph 115 [2018] was on Group 3 | A3 Confirmed Animal Carcinogen with Unknown Relevance to Humans | Not listed | Present | 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

May damage fertility or the unborn child

Reproductive Effects:

May cause adverse reproductive effects
 May impair fertility
 Experiments have shown reproductive toxicity effects on laboratory animals

Developmental Effects:

May cause harm to the unborn child
 May cause adverse developmental effects based on animal data

Teratogenic Effects:

No information available

Specific Target Organ Toxicity**STOT - single exposure**

No information available.

STOT - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

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Target Organs: Liver. Kidneys. Cardiovascular system. Nervous system. Central nervous system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

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Algae/aquatic plants

EC50: >500mg/L (96h, *Desmodesmus subspicatus*)

Fish

LC50: =6300mg/L (96h, *Lepomis macrochirus*) LC50: =9800mg/L (96h, *Oncorhynchus mykiss*) LC50: =10410mg/L (96h, *Pimephales promelas*)

Crustacea

EC50: =7500mg/L (48h, *Daphnia magna*) EC50: =8485mg/L (48h, *Daphnia magna*) EC50: 6800 - 13900mg/L (48h, *Daphnia magna*)

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 |
|-----------------------|---------|------------------------|------------------------|------------------------|------------------------|
| N,N-Dimethylformamide | 68-12-2 | None | None | None | None |

14. TRANSPORT INFORMATION

DOT

UN-No: UN2265

Proper Shipping Name: N,N-Dimethylformamide

Hazard Class 3

Subsidiary Class No information available

Packing group: III

Emergency Response Guide Number 129

Marine Pollutant No data available

DOT RQ (lbs): No information available

Special Provisions B1, IB3, T2, TP2

Symbol(s): [DOT]: (R3) - Identifies a material that is a hazardous substance that has a reportable quantity (RQ) of 100 pounds (45.4 Kilograms).

Description: UN2265, N,N-Dimethylformamide, 3, III

TDG (Canada)

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UN-No: UN2265
Proper Shipping Name: N,N-Dimethylformamide
Hazard Class 3
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant No Information available
Description: UN2265, N,N-Dimethylformamide, 3, III

ADR

UN Number UN2265
Proper Shipping Name: N,N-Dimethyl-formamide
Transport hazard class(es) 3
Packing group III
Subsidiary Risk: No information available
Description: UN2265, N,N-Dimethyl-formamide, 3, III

IMDG

UN-No: UN2265
Proper Shipping Name: N,N-Dimethylformamide
Hazard Class: 3
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant No information available
EMS: F-E
Description UN2265, N,N-Dimethylformamide, 3, III

RID

UN Number UN2265
Proper Shipping Name: N,N-Dimethylformamide
Transport hazard class(es) 3
Subsidiary Risk: 3
Packing group III
Description: UN2265, N,N-Dimethylformamide, 3, III

ICAO (air)

UN-No: UN2265
Proper Shipping Name: N,N-Dimethylformamide
Hazard Class 3
Subsidiary Risk: No information available
Packing Group: III
Description: UN2265, N,N-Dimethylformamide, 3, III

IATA

UN Number UN2265
Proper Shipping Name: N,N-Dimethylformamide
Transport hazard class(es) 3
Subsidiary Risk: No information available
Packing group III
Precautionary Statements - Response 3L
Special Provisions No information available
Description: UN2265, N,N-Dimethylformamide, 3, III

15. REGULATORY INFORMATION

International Inventories

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| Component | CAS No | U.S. TSCA | KOREA KECL | Philippines (PICCS) | Japan ENCS | China IECSC | Australia AICS | EINECS-No. |
|-----------------------|---------|---------------|---------------------|---------------------|--------------------|-------------|----------------|----------------------|
| N,N-Dimethylformamide | 68-12-2 | PresentACTIVE | Present KE-11411 | Present | Present (2)-680 | Present | Present | Present 200-679-5 |


U.S. Regulations

N,N-Dimethylformamide

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 0759
New Jersey (EHS) List: 0759 500 lb TPQ
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
 1 lb RQ
Louisiana Reportable Quantity List for Pollutants: 100lbfinal RQ
 45.4kgfinal RQ
California Directors List of Hazardous Substances: Present

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

Chemicals Known to the State of California to Cause Cancer:

 **WARNING:** This product can expose you to chemicals including (see table below) which is (are) known to the State of California to cause cancer. For more information go to www.p65warnings.ca.gov.

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 Reproductive Toxicity | Female Reproductive Toxicity: |
|-----------------------|---------|------------|------------------------|----------------------------|-------------------------------|
| N,N-Dimethylformamide | 68-12-2 | carcinogen | 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 |
|-----------------------|---------|---|---|--|---------------------------------|------------------------------------|
| N,N-Dimethylformamide | 68-12-2 | 100 lb final RQ 45.4 kg final RQ | None | None | None | 1.0 % de minimis concentration |

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 |
|-----------------------|---------|---|--|
| N,N-Dimethylformamide | 68-12-2 | Not Applicable | Not Applicable |

Canada

WHMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

Component
 N,N-Dimethylformamide
 68-12-2 (100)

WHMIS 2015 Hazard Classification
 Flammable liquids - Category 3: H226 Flammable liquid and vapour.; Acute toxicity - Inhalation - Category 4: H332 Harmful if

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inhaled.; Serious Eye Damage/Eye Irritation - Category 2A: H319 Causes serious eye irritation.; Reproductive Toxicity - Category 1: H360 May damage fertility or the unborn child.; Specific target organ toxicity - Repeated exposure - Category 1: H372 Causes damage to organs through prolonged or repeated exposure.

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) |
|-----------------------|---------|--------------|---------------|
| N,N-Dimethylformamide | 68-12-2 | Present | Not Listed |

| Component | CAS No | CEPA Schedule I - Toxic Substances |
|-----------------------|---------|---|
| N,N-Dimethylformamide | 68-12-2 | Not listed |
| Component | CAS No | CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting |
| N,N-Dimethylformamide | 68-12-2 | Not listed |

EU Classification

EU GHS - SV - CLP 1272/2008

| Component | CAS No | EU GHS - SV - CLP (1272/2008) |
|-----------------------|---------|--|
| N,N-Dimethylformamide | 68-12-2 | Acute toxicity - Dermal - Acute Tox. 4: H312 Harmful in contact with skin. (Minimum classification); Acute toxicity - Inhalation - Acute Tox. 4: H332 Harmful if inhaled. (Minimum classification); Serious Eye Damage/Eye Irritation - Eye Irrit. 2: H319 Causes serious eye irritation.; Reproductive Toxicity - Repr. 1B: H360D May damage the unborn child. (Hazard statements H360 and H361 indicate a general concern for effects on both fertility and development: May damage/Suspected of damaging fertility or the unborn child; According to the criteria, the general hazard statement can be replaced by the hazard statement indicating the specific effect of concern in accordance with section 1.1.2.1.2; When the other differentiation is not mentioned, this is due to evidence proving no such effect, inconclusive data or no data and the obligations in Article 4(3) shall apply for that differentiation)616-001-00-X |

EU - CLP (1272/2008)

R-phrase(s)

- R36 - Irritating to eyes
- R61 - May cause harm to the unborn child
- R20/21 - Harmful by inhalation and in contact with skin

S -phrase(s)

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

S53 - Avoid exposure - obtain special instructions before use

| Component | CAS No | Classification | Concentration Limits: | Safety Phrases |
|-----------------------|---------|--|-----------------------|----------------|
| N,N-Dimethylformamide | 68-12-2 | Xn; R20/21 Xi; R36 Repr.Cat.2; R61 | No information | S53 S45 |

The product is classified in accordance with Annex VI to Directive 67/548/EEC**Indication of danger:**

Xn - Harmful

Xi - Irritant

Xn



Xi

**16. OTHER INFORMATION**

Preparation Date: 12/15/2015
Revision date 1/15/2019
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