

DIMETHYLFORMAMIDE 20173

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Ashland	Regulatory Information Number	1-800-325-3751
P.O. Box 2219	Telephone	614-790-3333
Columbus, OH 43216	Emergency telephone number	1-800-ASHLAND (1-800-274-5263)

Product name	DIMETHYLFORMAMIDE
Product code	20173
Product Use Description	No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid,, clear

WARNING! COMBUSTIBLE LIQUID AND VAPOR. MAY BE HARMFUL IF INHALED OR SWALLOWED. CAUSES EYE IRRITATION. HARMFUL IF ABSORBED THROUGH THE SKIN. PROLONGED OR REPEATED CONTACT MAY DRY THE SKIN AND CAUSE IRRITATION AND BURNS.

Potential Health Effects

Routes of Exposure

Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye Contact

Can cause severe eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure eye tissue.

Skin Contact

May cause mild skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, drying and cracking of skin, and skin burns. Passage of this material into the body through the skin is possible, and skin contact may be harmful. Dimethylformamide enters the body rapidly through the skin and may carry other dissolved chemicals into the body. Skin exposure to dimethylformamide may result in symptoms due to passage of other chemicals into the body, and to dimethylformamide itself.

Ingestion

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Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Inhalation

Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

Aggravated Medical Condition

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), liver, kidney, heart

Symptoms

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: mouth and throat irritation (soreness, dry or scratchy feeling, cough), stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), headache, dizziness, sleep disturbances, pain in the abdomen

Target Organs

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: cardiovascular effects, kidney damage, heart damage, liver damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: liver damage

Carcinogenicity

The International Agency for Research on Cancer (IARC) has classified dimethylformamide as a possible human carcinogen (group 2B) based, in part, on information from two epidemiological studies. One study indicated a possible excess of testicular cancer among a cluster of aircraft mechanics who used DMF without wearing protective equipment. The second study, conducted at a Dupont plant in 1986, indicated a possible excess of mouth, throat, and skin cancer. A follow-up study was initiated by Dupont on an average exposed population of 8700 people per year over 30 years. Results of that study showed no excess of cancers with exposure to DMF. This study had not been published at the time of the IARC classification.

Reproductive Hazard

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

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Other Information

Drinking alcohol may worsen effects such as flushing of the face, neck, hands, arms and chest, along with dizziness, anxiety, and blurred vision in dimethylformamide-exposed workers.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Concentration
DIMETHYLFORMAMIDE	68-12-2	<=100%

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Ingestion

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen. If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Notes to Physician

Hazards: No information available.

Treatment: No information available.

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5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

alcohol-resistant foam, dry chemical, water spray, carbon dioxide (CO₂)

Hazardous Combustion Products

May form: ammonia, carbon dioxide and carbon monoxide, nitrogen oxides, various hydrocarbons

Precautions for Fire-Fighting

If product is heated above its flash point it will produce vapors sufficient to support combustion. Vapors are heavier than air and may travel along the ground and be ignited by heat, pilot lights, other flames and ignition sources at locations near the point of release. Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA).

Flammability Class for Flammable Liquids

Combustible Liquid Class II

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

For personal protection see section 8. Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Environmental Precautions

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

Methods for Cleaning Up

Absorb liquid on vermiculite, floor absorbent or other absorbent material.

7. HANDLING AND STORAGE

Handling

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Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association document NFPA 77.

Storage

Store in a cool, dry, ventilated area, away from incompatible substances.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

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68-12-2

ACGIH	time weighted average	10 ppm
NIOSH	Recommended exposure limit (REL):	10 ppm
NIOSH	Recommended exposure limit (REL):	30 mg/m3
OSHA Z1	Permissible exposure limit	10 ppm
OSHA Z1	Permissible exposure limit	30 mg/m3

General Advice

These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin and Body Protection

Wear resistant gloves such as:

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butyl-rubber

Discard gloves that show tears, pinholes, or signs of wear.

To prevent skin contact, wear impervious clothing and boots.

Respiratory Protection

If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH-approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	liquid,
Colour	clear, colourless
Odour	amine-like
Boiling point/range	307 °F / 153 °C @ 101.3232 kPa
Melting point/range	-78 °F / -61 °C
pH	6.7
Flash point	136 °F / 58 °C Closed Cup
Evaporation rate	0.17 (N-Butyl Acetate)
Explosion limits	2.2 %(V) 15.2 %(V)
Vapour pressure	0.515948 kPa @ 77 °F / 25 °C
Vapour density	2.51
Density	0.951 g/cm ³ @ 68.00 °F / 20.00 °C 7.92 lb/gal @ 68 °F / 20 °C
Solubility	completely miscible in water
Partition coefficient (n-octanol/water)	No data
Autoignition temperature	833 °F / 445 °C

10. STABILITY AND REACTIVITY**Stability**

Stable.

Conditions to Avoid

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Incompatible Products

Avoid contact with:, halogenated hydrocarbons, strong oxidizing agents, triethyl aluminum

Hazardous Decomposition Products

May form:, ammonia, carbon dioxide and carbon monoxide, nitrogen oxides, various hydrocarbons

Hazardous Reactions

Product will not undergo hazardous polymerization., Reaction with inorganic acid chlorides, such as phosphorous oxychloride and thionyl chloride, may form dimethylcarbamoylchloride, a suspect carcinogen.

Thermal Decomposition

No data

11. TOXICOLOGICAL INFORMATION

Acute Oral Toxicity

DIMETHYLFORMAMIDE LD 50 Rat: 2,800 mg/kg

Acute Inhalation Toxicity

DIMETHYLFORMAMIDE LC Lo Rat: 5000 ppm, 6 h

Acute Dermal Toxicity

DIMETHYLFORMAMIDE LD 50 Rabbit: 4,720 mg/kg

12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Acute and Prolonged Toxicity to Fish

No data

Acute Toxicity to Aquatic Invertebrates

No data

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Environmental Fate and Pathways

No data

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION

IMDG:

UN2265, N,N-DIMETHYLFORMAMIDE 3, III

IATA_P:

UN2265, N,N-Dimethylformamide 3, III

IATA_C:

UN2265, N,N-Dimethylformamide 3, III

CFR_ROAD:

UN2265, N,N-Dimethylformamide 3, III

CFR_RAIL:

UN2265, N,N-Dimethylformamide 3, III

CFR_INWTR:

UN2265, N,N-Dimethylformamide 3, III

IMDG_INWTR:

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IMDG_ROAD:

UN2265, N,N-DIMETHYLFORMAMIDE 3, III

IMDG_RAIL:

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Dangerous goods descriptions (if indicated above) may not reflect package size, quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. REGULATORY INFORMATION

ASHLAND
SAFETY DATA SHEET

Page: 10
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Print Date: 11/16/2007
MSDS Number: R0000780
Version: 1.3

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of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).