

Material Safety Data Sheet



N,N-Dimethylformamide

Version 2.1

Revision Date 12/05/2011

Ref. 130000000031

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : N,N-Dimethylformamide
Tradename/Synonym : DMF

MSDS Number : 130000000031

Product Use : Solvent

Manufacturer : DuPont
1007 Market Street
Wilmington, DE 19898

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

Other information : professional use

SECTION 2. HAZARDS IDENTIFICATION

Potential Health Effects

Skin

N,N-Dimethylformamide : May cause skin irritation.
May cause: Discomfort, itching, redness, or swelling.
The material may be absorbed through the skin.

Eyes

N,N-Dimethylformamide : Causes eye irritation.
May cause: Pain, tearing, swelling, redness, or temporary visual impairment.

Inhalation

N,N-Dimethylformamide : May cause: Liver damage, Kidney effects, lung effects.

Ingestion

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N,N-Dimethylformamide : Effects due to ingestion may include: Liver damage, Kidney effects, lung effects.

Repeated exposure N,N-Dimethylformamide : Adverse effects from repeated ingestion may include: Liver damage
Adverse effects from repeated inhalation may include: Liver damage Fluid retention in lungs (pulmonary oedema) Kidney effects Adrenal effects Spleen effects Pancreatic effects
May cause harm to the unborn child.

Target Organs N,N-Dimethylformamide : Liver
Liver Kidney Lungs

Carcinogenicity
None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
N,N-Dimethylformamide	68-12-2	100 %

SECTION 4. FIRST AID MEASURES

Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately.

Eye contact : Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Keep eye wide open while rinsing. Remove contact lenses.

Inhalation : Move to fresh air. Oxygen or artificial respiration if needed. Call a physician immediately.



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- Ingestion : Rinse mouth. Immediately give plenty of water (if possible charcoal slurry). Do NOT induce vomiting. Consult a physician if necessary.
- General advice : Never give anything by mouth to an unconscious person.
- Notes to physician : Note: To prepare activated charcoal slurry, mix thoroughly 50 g of activated charcoal in 400 ml (about 2 cups) water.

SECTION 5. FIREFIGHTING MEASURES

- Flammable Properties
 - Flash point : 58 °C (136 °F) closed cup
Method : Tag closed cup - TCC
 - Ignition temperature : 445 °C (833 °F)
Auto-flammability
 - Lower explosion limit : 2.2 vol%
 - Upper explosion limit : 15.2 vol%
 - Thermal decomposition : > 350 °C (> 662 °F)
- Fire and Explosion Hazard : Vapours may form explosive mixtures with air. pressure build-up
- Suitable extinguishing media : Water, Dry powder, Foam, Carbon dioxide (CO2)
- Firefighting Instructions : Wear self-contained breathing apparatus and protective suit. Decontaminate all equipment used in fire fighting efforts before returning to service. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Cool containers / tanks with water spray.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

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- Safeguards (Personnel)** : Ensure adequate ventilation. Remove all sources of ignition. Wear personal protective equipment. Evacuate personnel to safe areas.
- Spill Cleanup** : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Transfer to steel drums with a lid. Use mechanical handling equipment. After cleaning, flush away traces with water.
- Accidental Release Measures** : Prevent product from entering drains. Do not contaminate surface water.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel)** : Use only in area provided with appropriate exhaust ventilation. Do not use sparking tools. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Avoid contact with skin and eyes. Do not breathe vapours or spray mist. Avoid formation of aerosol. General industrial hygiene practice. Wash hands before breaks and immediately after handling the product. Wash contaminated clothing before re-use.
- Handling (Physical Aspects)** : Keep away from heat and sources of ignition. Do not spray on a naked flame or any incandescent material.
- Storage** : Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep containers tightly closed in a dry, cool and well-ventilated place.
Keep away from: Polyhalogenated compounds Inorganic acid chlorides
Stable under recommended storage conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Engineering controls** : Ensure adequate ventilation. Maintain walking and working surfaces free of liquid product.
- Personal protective equipment**
Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.



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- Hand protection : Additional protection: Impervious gloves
- Eye protection : Tightly fitting safety goggles
- Skin and body protection : Preventive skin protection
Where there is potential for skin contact, have available and wear as appropriate, impervious gloves, apron, pants, jacket, hood and boots.

Exposure Guidelines

Exposure Limit Values

N,N-Dimethylformamide

PEL: (OSHA) 10 ppm 30 mg/m3 8 hr. TWA
Skin designation

TLV (ACGIH) 10 ppm TWA
Skin designation

AEL * (DUPONT) 10 ppm 8 & 12 hr. TWA, Skin

Remarks Biological Exposure Index (BEI) 20 ppm of MMF in an end-of-shift urine sample for several workers doing the same job and 40 ppm for an individual result.
Skin designation

Biological Exposure Indices

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BEI (ACGIH) 15 mg/l N-Methylformamide/Urine
Sampling time: End of shift.

BEI (ACGIH) 40 mg/l N-Acetyl-S-(N-methylcarbamoyl) cysteine/Urine
Sampling time: Prior to last shift of work week.

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: liquid
Color	: colourless
Odor	: slight, amine-like
pH	: 8 at 190 g/l
Freezing point	: -61 °C (-78 °F)
Boiling point	: 153 °C (307 °F) at 760 mm Hg
Vapour Pressure	: 10.7 hPa at 38 °C (100 °F) : 2.6 mm Hg at 20 °C (68 °F) : 8 mm Hg at 38 °C (100 °F)
Specific gravity	: 0.949 at 20 °C (68 °F)
Water solubility	: soluble
Vapour density	: 2.5 at 20 °C (68 °F)
Evaporation rate	: ca. 0.5 (Butyl Acetate=1.0)

SECTION 10. STABILITY AND REACTIVITY

Stability	: No decomposition if stored and applied as directed.
Conditions to avoid	: Decomposes on heating.
Incompatibility	: Inorganic acid chlorides Polyhalogenated compounds
Hazardous decomposition products	: Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

N,N-Dimethylformamide	
Dermal LD50	: > 3,160 mg/kg , rat
Oral LD50	: 2,800 mg/kg , rat
Oral	: animals (unspecified species) Liver effects Kidney effects lung effects



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Inhalation LC50	:	18.3 mg/l , mouse
Inhalation	:	animals (unspecified species) Liver effects Kidney effects lung effects
Skin irritation	:	Mild skin irritation, multiple species
Eye irritation	:	Moderate eye irritation, rabbit
Skin sensitization	:	Did not cause sensitization on laboratory animals., guinea pig
Repeated dose toxicity	:	Oral multiple species Liver damage Inhalation multiple species Liver damage, Fluid retention in lungs (pulmonary oedema), Kidney effects, Adrenal effects, Spleen effects, Pancreas, Thymus effects
Carcinogenicity	:	Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Evidence suggests this substance does not cause genetic damage in animals.
Reproductive toxicity	:	Evidence suggests the substance is not a reproductive toxin in animals.
Teratogenicity	:	Animal testing showed effects on embryo-foetal development at levels below those causing maternal toxicity. Animal testing showed effects on embryo-foetal development including: Delayed foetal development (variations) Foetal malformations

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SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity
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48 h EC50 : Daphnia >100 ppm
: NOEC Daphnia >1 ppm

Environmental Fate
N,N-Dimethylformamide
Biodegradability : no data available

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : In accordance with local and national regulations.

Container Disposal : Triple rinse (or equivalent) empty 55 gallon or 208 liters drums before disposal or reuse.

SECTION 14. TRANSPORT INFORMATION

DOT UN number : 2265

Proper shipping name : N,N-Dimethylformamide
Class : 3
Packing group : III
Labelling No. : 3
Reportable Quantity : 100 lbs N,N-Dimethylformamide

IATA_C UN number : 2265

Proper shipping name : N,N-Dimethylformamide

Class : 3
Packing group : III



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IMDG	Labelling No.	: 3
	UN number	: 2265
	Proper shipping name	: N,N-Dimethylformamide
	Class	: 3
	Packing group	: III
	Labelling No.	: 3

SECTION 15. REGULATORY INFORMATION

TSCA Status	: Listed.
SARA 313 Regulated Chemical(s)	: N,N-Dimethylformamide
Title III hazard classification	: Acute Health Hazard: Yes Chronic Health Hazard: Yes Fire: Yes Reactivity/Physical hazard: No Pressure: No
CERCLA Reportable Quantity	: 100 lbs Based on the percentage composition of this chemical in the product.: N,N-Dimethylformamide
California Prop. 65	: WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.N,N-Dimethylacetamide
PA Right to Know Regulated Chemical(s)	: Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): N,N-Dimethylformamide
NJ Right to Know Regulated Chemical(s)	: Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): N,N-Dimethylformamide

SECTION 16. OTHER INFORMATION

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	NFPA	HMIS
Health :	1	2*
Flammability :	2	2
Reactivity/Physical hazard :	0	0
PPE :		Personal Protection rating to be supplied by user depending on use conditions.

The "Skin" notation indicates that liquid and vapour can penetrate skin and mucous membranes.

Contact person : MSDS Coordinator, DuPont Chemicals and Fluoroproducts, Wilmington, DE 19898, (800) 441-7515

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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