

Dimethylformamide

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SECTION 1. IDENTIFICATION

Product identifier used on the label

: **Dimethylformamide**

Product Code(s) : Not available.

Recommended use of the chemical and restrictions on use

: Solvent for liquids and gases; in synthesis of organic compounds; manufacture of polyacrylic fibers, butadiene, pharmaceuticals, dyes, petroleum products, and other organic chemicals.

Use pattern: Professional Use Only

Restriction on use: None known

Chemical family

: Pure substance .

Name, address, and telephone number
of the supplier:

Comet Chemical Company Ltd.

3463 Thomas Street
Innisfill, ON, Canada
L9S 3W4

Supplier's Telephone # : 705-436-5580

24 Hr. Emergency Tel # : TERRRAPURE ENVIRONMENTAL : 800-567-7455

Name, address, and telephone number of
the manufacturer:

Refer to supplier

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

Clear to light yellow. Unpleasant odour.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015).

Hazard classification:

Flammable Liquid - Category 4

Acute toxicity, inhalation - Category 3

Serious eye damage/eye irritation - Category 2A

Reproductive toxicity- Category 2

Specific Target Organ Toxicity, Repeated Exposure - Category 2

Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects

Label elements

Hazard pictogram(s)



Signal Word

DANGER!

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SAFETY DATA SHEET*Hazard statement(s)*

Combustible liquid.
Toxic if inhaled.
Causes serious eye irritation.
Suspected of damaging the unborn child.
May cause damage to organs through prolonged or repeated exposure.
May cause drowsiness or dizziness.

Precautionary statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from flames and hot surfaces. - No smoking.
Wash hands thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Do not breathe mist or vapor.
Wear protective gloves/clothing and eye/face protection.

If exposed or concerned: Call a POISON CENTER or doctor/physician.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.
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.
In case of fire: Use water fog, dry chemical, CO₂ or 'alcohol' foam to extinguish.

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

Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

Other hazards which do not result in classification:
Direct skin contact may cause slight or mild, transient irritation.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance

<u>Chemical name</u>	<u>Common name and synonyms</u>	<u>CAS #</u>	<u>Concentration (% by weight)</u>
Dimethylformamide	N,N-Dimethylformamide; DMF	68-12-2	100.00

SECTION 4. FIRST-AID MEASURES**Description of first aid measures**

Ingestion : Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

Inhalation : Immediately remove person to fresh air. If breathing has stopped, give artificial respiration. Get medical attention if symptoms persist.

Skin contact : Immediately flush with plenty of water, while removing contaminated clothing. If irritation persists, seek prompt medical attention. Launder clothing before reuse.

Eye contact : Flush eyes with water for at least 15 minutes. If irritation persists, seek prompt medical attention.

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Most important symptoms and effects, both acute and delayed

- : Toxic if inhaled. May cause drowsiness or dizziness. Prolonged or repeated overexposure may cause liver effects. Symptoms may include pain, headache, nausea, vomiting, dizziness, drowsiness and other central nervous system effects. Causes serious eye irritation. Symptoms may include tearing, redness and discomfort. Suspected of damaging the unborn child.

Indication of any immediate medical attention and special treatment needed

- : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media

- : Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.

Unsuitable extinguishing media

- : Do not use a solid water stream as it may scatter and spread fire.

Special hazards arising from the substance or mixture / Conditions of flammability

- : Combustible liquid and vapour. Burning produces obnoxious and toxic fumes.

Flammability classification (OSHA 29 CFR 1910.106)

- : Flammable Liquid - Category 4

Hazardous combustion products

- : Carbon oxides

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

- : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

Special fire-fighting procedures

- : Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode. Move containers from fire area if safe to do so. Water spray may be useful in cooling equipment exposed to heat and flame.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

- : Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment including self-contained breathing apparatus. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

Environmental precautions

- : Ensure spilled product does not enter drains, sewers, waterways, or confined spaces. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers, or any natural waterway or drinking supply.

Methods and material for containment and cleaning up

- : Ventilate the area. Stop spill or leak at source if safely possible. Dike for water control. Contain and absorb spilled liquid with non-combustible, inert absorbent material (e.g. sand), then place absorbent material into a container for later disposal (see Section 13).

Special spill response procedures

- : In case of transportation accident, contact TERRAPURE ENVIRONMENTAL at 1-800-567-7455.
US CERCLA Reportable quantity (RQ): Dimethylformamide (100 lbs/45.4 kg)

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SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

- : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. This material is a harmful liquid. Wear protective gloves/clothing and eye/face protection. Use with adequate ventilation. Do not breathe the mist or vapor. Avoid contact with eyes, skin and clothing. Wash with soap and water after handling. Keep away from extreme heat and flame. Keep away from acids and other incompatibles. Keep away from flames and hot surfaces. - No smoking.

- Conditions for safe storage** : Store in a cool, dry, well-ventilated area. Store away from areas of excessive heat, open flames, sparks, and other possible sources of ignition. Keep away from incompatibles. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks.

- Incompatible materials** : Strong oxidizing agents .

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<u>Exposure Limits:</u>			
<u>Chemical Name</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u> <u>STEL</u>
Dimethylformamide	10 ppm	N/Av	10 ppm ; 30 mg/m ³ (skin) N/Av

Exposure controls

Ventilation and engineering measures

- : Use sufficient mechanical ventilation to maintain exposures below the TLV. Use local exhaust if mist or spray is generated. Use explosion-proof electrical and ventilating equipment.

- Respiratory protection** : Respiratory protection is required if the concentrations exceed the TLV. NIOSH-approved respirators are recommended. Seek advice from respiratory protection specialists. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02.

- Skin protection** : Wear protective gloves/clothing. Advice should be sought from glove suppliers.

- Eye / face protection** : Wear eye/face protection. Chemical splash goggles are recommended.

- Other protective equipment** : Emergency showers and eyewash facilities should be nearby. Wear a chemically resistant apron and long sleeves when dispensing, to prevent skin contact.

General hygiene considerations

- : Do not breathe mist or vapor. Avoid contact with eyes, skin and clothing. When using do not eat or drink. When using do not smoke. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Remove soiled clothing and wash it thoroughly before reuse.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Clear to yellow liquid.
- Odour** : Ammonia odour.
- Odour threshold** : 0.046 ppm
- pH** : 6.7
- Melting/Freezing point** : - 61°C (-77.8°F)

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Initial boiling point and boiling range

: 153°C (307.4°F)

Flash point : 58°C (136.4°F)

Flashpoint (Method) : closed cup

Evaporation rate (BuAe = 1) : 0.17

Flammability (solid, gas) : Not applicable.

Lower flammable limit (% by vol.) : 2.2%

Upper flammable limit (% by vol.) : 15.2%

Oxidizing properties : None known.

Explosive properties : Not explosive

Vapour pressure : 2.6 mmHg

Vapour density : 2.5(Air = 1)

Relative density / Specific gravity : 0.953(water = 1)

Solubility in water : Complete

Other solubility(ies) : Soluble in most organic solvents.

Partition coefficient: n-octanol/water or Coefficient of water/oil distribution : 0.87

Auto-ignition temperature : 442°C (827.6°F)

Decomposition temperature : Not available.

Viscosity : 0.82 mPa.s at 20°C

Volatiles (% by weight) : No information available.

Volatile organic Compounds (VOC's) : N/Av

Absolute pressure of container : N/Av

Flame projection length : N/Av

Other physical/chemical comments : None known or reported by the manufacturer.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : No dangerous reaction known under conditions of normal use.

Conditions to avoid : Avoid excessive heat, sparks and open flame. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.

Incompatible materials : See Section 7 (Handling and Storage) for further details.

Hazardous decomposition products : None known, refer to hazardous combustion products in Section 5.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES

Routes of entry skin & eye : YES

Routes of entry Ingestion : YES

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Routes of exposure skin absorption

: YES

Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

: Toxic if inhaled. If mists are inhaled, may cause tearing, general anesthesia, headache, coughing, respiratory stimulation, nausea, vomiting, pulmonary, kidney and liver damage.

Sign and symptoms ingestion

: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Sign and symptoms skin

: May cause mild skin irritation. Product may be absorbed and cause symptoms similar to those listed for ingestion.

Sign and symptoms eyes

: Causes serious eye irritation. Symptoms may include tearing, redness and discomfort.

Potential Chronic Health Effects

: Prolonged or repeated overexposure may cause liver effects.

Mutagenicity

: Not expected to be mutagenic.

Carcinogenicity

: No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

Reproductive effects & Teratogenicity

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Reproductive toxicity -Category 2
Suspected of damaging the unborn child.

Sensitization to material

: Not expected to be a skin or respiratory sensitizer.

Specific target organ effects

: This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Specific Target Organ Toxicity, Repeated Exposure - Category 2 Liver -
Specific Target Organ Toxicity, Single Exposure - Category 3 narcotic effects
May cause damage to organs through prolonged or repeated exposure.
May cause drowsiness or dizziness.

Medical conditions aggravated by overexposure

: Pre-existing skin or eye disorders, and impaired liver or kidney functions.

Synergistic materials

: Not available.

Toxicological data

: See below for toxicological data on the substance.

<u>Chemical name</u>	<u>LC₅₀(4hr)</u>	<u>LD₅₀</u>	
	<u>inh, rat</u>	<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Dimethylformamide	>5900 mg/m ³ >5.85mg/L	3040 mg/kg	>3160 mg/kg

Other important toxicological hazards

: None known or reported by the manufacturer.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

: See the following tables for individual ingredient ecotoxicity data.

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Ecotoxicity data:

<u>Ingredients</u>	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Dimethylformamide	68-12-2	7100 mg/L (Bluegill sunfish)	3200 mg/L NOEC (Fathead minnow)	None.

<u>Ingredients</u>	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Dimethylformamide	68-12-2	>100 mg/L Water flea	1500 mg/L NOEC Water flea	None.

<u>Ingredients</u>	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Dimethylformamide	68-12-2	>1000 mg/L/96hr (Green algae)	N/Av	None.

Persistence and degradability

: Ethylene glycol is considered to be readily biodegradable.

Bioaccumulation potential

: No data is available on the product itself.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Dimethylformamide (CAS 68-12-2)	-1.028	0.3 - 1.2 BCF method: OECD 305C

Mobility in soil : No data is available on the product itself.

Other Adverse Environmental effects

: No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Handling for Disposal

: Handle waste according to recommendations in Section 7.

Methods of Disposal

: Dispose in accordance with all applicable federal, state, provincial and local regulations.

RCRA

: If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.



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SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
49CFR/DOT	UN2265	N, N-DIMETHYLFORMAMIDE	3	III	
49CFR/DOT Additional information	US CERCLA Reportable quantity (RQ): (100 lbs / 45.4 kg)				
TDG	UN2265	N,N-DIMETHYLFORMAMIDE	3	III	
TDG Additional information	May be shipped as a Limited Quantity when transported in containers no larger than 5 L (1.3 gallons); in packages not exceeding 30 kg (66 pounds) gross mass.				
ICAO/IATA	UN2265	N,N-Dimethylformamide	3	III	
ICAO/IATA Additional information	Refer to ICAO/IATA Packing Instruction				
IMDG	UN2265	N, N-DIMETHYLFORMAMIDE	3	III	
IMDG Additional information	Consult the IMDG regulations for exceptions.				

Special precautions for user : None known or reported by the manufacturer.

Environmental hazards : This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See ECOLOGICAL INFORMATION, Section 12.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: Not available.

SECTION 15 - REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

<u>Ingredients</u>	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
Dimethylformamide	68-12-2	Yes	100 lb/ 45.4 kg	None.	Yes	1%

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Immediate (Acute) health hazard; Chronic health hazard. Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds for the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.



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US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

<u>Ingredients</u>	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
Dimethylformamide	68-12-2	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes

Canadian Information:

WHMIS Classification: Refer to Section 2 for a WHMIS Classification for this product.

All ingredients are present on the DSL.

International Information:

Components listed below are present on the following International Inventory list:

<u>Ingredients</u>	CAS #	European EINECS	Australia AICS	Philippines PICCS	Japan ENCS	Korea KECI/KECL	China IECSC	NewZealand IOC
Dimethylformamide	68-12-2	200-679-5	Present	Present	(2)-680	KE-11411	Present	HSR001133

SECTION 16. OTHER INFORMATION

Legend

: ACGIH: American Conference of Governmental Industrial Hygienists
CA: California
CAS: Chemical Abstract Services
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR: Code of Federal Regulations
CNS: Central Nervous System
COC: Cleveland Open Cup
CSA: Canadian Standards Association
DOT: Department of Transportation
EPA: Environmental Protection Agency
HMIS: Hazardous Materials Identification System
HSDB: Hazardous Substances Data Bank
IARC: International Agency for Research on Cancer
Inh: Inhalation
LC: Lethal Concentration
LD: Lethal Dose
MA: Massachusetts
MN: Minnesota
N/Ap: Not Applicable
N/Av: Not Available
NFPA: National Fire Protection Association
NIOSH: National Institute of Occupational Safety and Health
NJ: New Jersey
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PA: Pennsylvania
PEL: Permissible exposure limit
RCRA: Resource Conservation and Recovery Act
RI: Rhode Island

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RTECS: Registry of Toxic Effects of Chemical Substances
SARA: Superfund Amendments and Reauthorization Act
STEL: Short Term Exposure Limit
TLV: Threshold Limit Values
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References

- : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2016
- 2. International Agency for Research on Cancer Monographs, searched 2016
- 3. Canadian Centre for Occupational Health and Safety, CCHInfoWeb databases, 2016(Chempendium, HSDB and RTECs).
- 4. Material Safety Data Sheets from manufacturer.
- 5. US EPA Title III List of Lists - 2016 version.
- 6. California Proposition 65 List - 2016 version.
- 7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2016.

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Other special considerations for handling

: Provide adequate information, instruction and training for operators.

<p><u>Prepared for:</u> Comet Chemical Company Ltd. 3463 Thomas Street Innisfill, ON L9S 3W4 Information (M-F 8:00-5:00): 705-436-5580 www.cometchemical.com</p>	 <p>COMET COMET CHEMICAL COMPANY LTD.</p>
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