

# SAFETY DATA SHEET

## 1. Identification

**Product identifier:** DIMETHYLFORMAMIDE

**Other means of identification**

**Product No.:** 9213, 5362, 9344, 4929, 9222, 9221, 9220

**Recommended use and restriction on use**

**Recommended use:** Not available.

**Restrictions on use:** Not known.

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

**Company Name:** Avantor Performance Materials, Inc.  
**Address:** 3477 Corporate Parkway, Suite 200  
Center Valley, PA 18034

**Telephone:** Customer Service: 855-282-6867

**Fax:**  
**Contact Person:** Environmental Health & Safety  
**e-mail:** info@avantormaterials.com

**Emergency telephone number:**

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

## 2. Hazard(s) identification

**Hazard classification**

**Physical hazards**

Flammable liquids Category 3

**Health hazards**

Acute toxicity (Inhalation - vapor) Category 4  
Serious eye damage/eye irritation Category 2A  
Toxic to reproduction Category 1B  
Specific target organ toxicity - single exposure Category 3  
Specific target organ toxicity - repeated exposure Category 1

**Environmental hazards**

Acute hazards to the aquatic environment Category 3

**Label elements**

**Hazard symbol:**



**Signal word:** Danger

**Hazard statement:** Flammable liquid and vapor.  
Harmful if inhaled.  
Causes serious eye irritation.  
May damage fertility or the unborn child.  
May cause respiratory irritation.  
May cause drowsiness or dizziness.  
Causes damage to organs through prolonged or repeated exposure.  
Harmful to aquatic life.

**Precautionary statement**

**Prevention:** 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. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust or mists. Do not eat, drink or smoke when using this product.

**Response:** IF INHALED: Remove person to fresh air and keep comfortable for breathing. 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): Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a POISON CENTER/doctor if you feel unwell.

**Storage:** Store in well-ventilated place. Keep cool. Store locked up. Keep container tightly closed.

**Disposal:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Other hazards which do not result in GHS classification:** None.

**3. Composition/information on ingredients**

**Substances**

Chemical identity	Common name and synonyms	CAS number	Content in percent (%)*
DIMETHYLFORMAMIDE		68-12-2	98 - 100%

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

**4. First-aid measures**

**General information:** Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

**Ingestion:** Rinse mouth. Call a POISON CENTER or doctor/physician if you feel unwell.

**Inhalation:** IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

**Skin contact:** IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention.

**Eye contact:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**Most important symptoms/effects, acute and delayed**

**Symptoms:** Narcotic effect. Respiratory tract irritation.

**Indication of immediate medical attention and special treatment needed**

**Treatment:** Treat symptomatically. Symptoms may be delayed.

**5. Fire-fighting measures**

**General fire hazards:** Flammable liquid and vapor.

**Suitable (and unsuitable) extinguishing media**

**Suitable extinguishing media:** Water spray, foam, dry powder or carbon dioxide.

**Unsuitable extinguishing media:** Avoid water in straight hose stream; will scatter and spread fire.

**Specific hazards arising from the chemical:** Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations. Heat may cause the containers to explode.

**Special protective equipment and precautions for firefighters**

**Special fire fighting procedures:** Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire. Fight fire from a protected location. Move containers from fire area if you can do so without risk.

**Special 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.

**6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Keep unauthorized personnel away. Keep upwind. Use personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. See Section 8 of the MSDS for Personal Protective Equipment.

**Methods and material for containment and cleaning up:** Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharges. Stop leak if possible without any risk. Use only non-sparking tools. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Dike far ahead of larger spill for later recovery and disposal.

**Notification Procedures:** Prevent entry into waterways, sewer, basements or confined areas. Inform authorities if large amounts are involved.

**Environmental precautions:** Do not contaminate water sources or sewer. Prevent further leakage or spillage if safe to do so.

## 7. Handling and storage

**Precautions for safe handling:** DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting/equipment. Use only non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash hands thoroughly after handling.

**Conditions for safe storage, including any incompatibilities:** Keep away from food, drink and animal feeding stuffs. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

## 8. Exposure controls/personal protection

### Control parameters

#### Occupational exposure limits

Chemical identity	Type	Exposure Limit values	Source
DIMETHYLFORMAMIDE	TWA	10 ppm	US. ACGIH Threshold Limit Values (2011)
	REL	10 ppm 30 mg/m <sup>3</sup>	US. NIOSH: Pocket Guide to Chemical Hazards (2010)
	PEL	10 ppm 30 mg/m <sup>3</sup>	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	TWA	10 ppm 30 mg/m <sup>3</sup>	US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989)

#### Biological limit values

Chemical identity	Exposure Limit values	Source
DIMETHYLFORMAMIDE (N-Methylformamide: Sampling time: End of shift.)	15 mg/l (Urine)	ACGIH BEL (2011)
DIMETHYLFORMAMIDE (N-Acetyl-S-(N-methylcarbamoyl) cysteine: Sampling time: Prior to last shift of work week.)	40 mg/l (Urine)	ACGIH BEL (2011)

**Appropriate engineering controls** No data available.

### Individual protection measures, such as personal protective equipment

**General information:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Eye/face protection:** Wear safety glasses with side shields (or goggles).

#### Skin protection

**Hand protection:** Wear protective gloves.

**Other:** Wear suitable protective clothing.

<b>Respiratory protection:</b>	In case of inadequate ventilation use suitable respirator.
<b>Hygiene measures:</b>	Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical and chemical properties

### Appearance

<b>Physical state:</b>	Liquid
<b>Form:</b>	Liquid
<b>Color:</b>	Colorless
<b>Odor:</b>	Pungent, Amine-like odor
<b>Odor threshold:</b>	No data available.
<b>pH:</b>	6.7 0.5 molar aqueous solution
<b>Melting point/freezing point:</b>	-61 °C
<b>Initial boiling point and boiling range:</b>	153 °C (101.3 kPa)
<b>Flash Point:</b>	58 °C (Closed Cup)
<b>Evaporation rate:</b>	No data available.
<b>Flammability (solid, gas):</b>	Class II Combustible Liquid
<b>Upper/lower limit on flammability or explosive limits</b>	
<b>Flammability limit - upper (%):</b>	15.2 %(V)
<b>Flammability limit - lower (%):</b>	2.2 %(V)
<b>Explosive limit - upper (%):</b>	No data available.
<b>Explosive limit - lower (%):</b>	No data available.
<b>Vapor pressure:</b>	0.50 kPa (25 °C)
<b>Vapor density:</b>	2.51 AIR=1
<b>Relative density:</b>	0.95 (20 °C) 4 °C
<b>Solubility(ies)</b>	
<b>Solubility in water:</b>	Miscible with water.
<b>Solubility (other):</b>	No data available.
<b>Partition coefficient (n-octanol/water):</b>	-1.01
<b>Auto-ignition temperature:</b>	445 °C
<b>Decomposition temperature:</b>	> 350 °C Temperatures >350°C may cause decomp to form dimethylamine and carbon dioxide, with pressure developing in closed containers.
<b>Viscosity:</b>	No data available.
<b>Other information</b>	
<b>Molecular weight:</b>	73.09 g/mol (C <sub>3</sub> H <sub>7</sub> NO)

## 10. Stability and reactivity

<b>Reactivity:</b>	No dangerous reaction known under conditions of normal use.
<b>Chemical stability:</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions:</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid:</b>	Heat, sparks, flames.

<b>Incompatible materials:</b>	Strong acids. Strong alkalis. Strong oxidizing agents. Aluminum. Nitrates. Halogens. Phosphorus. Isocyanates.
<b>Hazardous decomposition products:</b>	Thermal decomposition may produce oxides of carbon and nitrogen. Amines.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion:</b>	May be harmful if swallowed.
<b>Inhalation:</b>	May cause irritation to the respiratory system.
<b>Skin contact:</b>	Causes mild skin irritation.
<b>Eye contact:</b>	Causes serious eye irritation.

### Information on toxicological effects

#### Acute toxicity (list all possible routes of exposure)

<b>Oral</b>	
<b>Product:</b>	LD 50 (Rat): 2,800 mg/kg
<b>Dermal</b>	
<b>Product:</b>	LD 50 (Rabbit): 4,720 mg/kg
<b>Inhalation</b>	
<b>Product:</b>	LC 50 (Mouse, 2 h): 9.4 mg/l

<b>Repeated dose toxicity</b>	
<b>Product:</b>	No data available.

<b>Skin corrosion/irritation</b>	
<b>Product:</b>	Causes mild skin irritation.

<b>Serious eye damage/eye irritation</b>	
<b>Product:</b>	Causes serious eye irritation.

<b>Respiratory or skin sensitization</b>	
<b>Product:</b>	Not a skin sensitizer.

<b>Carcinogenicity</b>	
<b>Product:</b>	This substance has no evidence of carcinogenic properties.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**  
No carcinogenic components identified

**US. National Toxicology Program (NTP) Report on Carcinogens:**  
No carcinogenic components identified

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):**  
No carcinogenic components identified

#### Germ cell mutagenicity

<b>In vitro</b>	
<b>Product:</b>	No mutagenic components identified

<b>In vivo</b>	
<b>Product:</b>	No mutagenic components identified

#### Reproductive toxicity

**Product:** May damage fertility or the unborn child.

**Specific target organ toxicity - single exposure**

**Product:** Narcotic effect., Respiratory tract irritation.

**Specific target organ toxicity - repeated exposure**

**Product:** Liver

**Aspiration hazard**

**Product:** Not classified

**Other effects:** None known.

**12. Ecological information**

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Specified substance(s):**

DIMETHYLFORMAMIDE LC 50 (Fathead minnow (*Pimephales promelas*), 96 h): 5,714 - 18,967 mg/l Mortality  
LC 50 (Bluegill (*Lepomis macrochirus*), 96 h): 6,700 - 7,500 mg/l Mortality

**Aquatic invertebrates**

**Product:** No data available.

**Specified substance(s):**

DIMETHYLFORMAMIDE EC 50 (Water flea (*Daphnia magna*), 21 d): 3,721 mg/l Intoxication  
EC 50 (Water flea (*Daphnia magna*), 48 h): 12.5 - 14.4 mg/l Intoxication  
LC 50 (Water flea (*Daphnia magna*), 48 h): 13,260 - 15,920 mg/l Mortality

**Chronic hazards to the aquatic environment:**

**Fish**

**Product:** No data available.

**Aquatic invertebrates**

**Product:** No data available.

**Toxicity to Aquatic Plants**

**Product:** No data available.

**Persistence and degradability**

**Biodegradation**

**Product:** The product is expected to be biodegradable.

**BOD/COD ratio**

**Product:** No data available.

**Bioaccumulative potential**

**Bioconcentration factor (BCF)**

**Product:** No data available on bioaccumulation.

**Partition coefficient n-octanol / water (log Kow)**

**Product:** Log Kow: -1.01

**Mobility in soil:**

The product is partly soluble in water. May spread in the aquatic environment.

**Other adverse effects:** Harmful to aquatic organisms.

### 13. Disposal considerations

**General information:** This product is highly flammable. Don't use fire to cut empty container after use.

**Disposal instructions:** Discharge, treatment, or disposal may be subject to national, state, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

**Contaminated packaging:** Since emptied containers retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

#### DOT

UN number:	UN 2265
UN proper shipping name:	N,N-Dimethylformamide
Transport hazard class(es)	
Class(es):	3
Label(s):	3
Packing group:	III
Marine Pollutant:	No

#### IMDG

UN number:	UN 2265
UN proper shipping name:	N,N-DIMETHYLFORMAMIDE
Transport hazard class(es)	
Class(es):	3
Label(s):	3
EmS No.:	F-E, S-D
Packing group:	III
Marine Pollutant:	No

#### IATA

UN number:	UN 2265
Proper Shipping Name:	N,N-Dimethylformamide
Transport hazard class(es):	
Class(es):	3
Label(s):	3
Marine Pollutant:	No
Packing group:	III

### 15. Regulatory information

#### US federal regulations

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**  
**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**  
 None present or none present in regulated quantities.

**CERCLA Hazardous Substance List (40 CFR 302.4):**  
 DIMETHYLFORMAMIDE Reportable quantity: 100 lbs.

**Superfund amendments and reauthorization act of 1986 (SARA)**

**Hazard categories**

Acute (Immediate)  Chronic (Delayed)  Fire  Reactive  Pressure Generating

**SARA 302 Extremely hazardous substance**

None present or none present in regulated quantities.

**SARA 304 Emergency release notification**

Chemical identity	RQ
DIMETHYLFORMAMIDE	100 lbs.

**SARA 311/312 Hazardous chemical**

Chemical identity	Threshold Planning Quantity
DIMETHYLFORMAMIDE	500 lbs

**SARA 313 (TRI reporting)**

Chemical identity	Reporting threshold for other users	Reporting threshold for manufacturing and processing
DIMETHYLFORMAMIDE	10000 lbs	25000 lbs.

**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**

None present or none present in regulated quantities.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**

None present or none present in regulated quantities.

**US state regulations**

**US. California Proposition 65**

No ingredient regulated by CA Prop 65 present.

**US. New Jersey Worker and Community Right-to-Know Act**

DIMETHYLFORMAMIDE Listed

**US. Massachusetts RTK - Substance List**

DIMETHYLFORMAMIDE Listed

**US. Pennsylvania RTK - Hazardous Substances**

DIMETHYLFORMAMIDE Listed

**US. Rhode Island RTK**

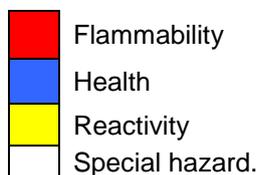
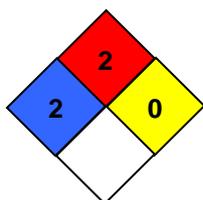
DIMETHYLFORMAMIDE Listed

**Inventory Status:**

Australia AICS:	On or in compliance with the inventory
Canada DSL Inventory List:	On or in compliance with the inventory
EU EINECS List:	On or in compliance with the inventory
EU ELINCS List:	Not in compliance with the inventory.
Japan (ENCS) List:	On or in compliance with the inventory
EU No Longer Polymers List:	Not in compliance with the inventory.
China Inv. Existing Chemical Substances:	On or in compliance with the inventory
Korea Existing Chemicals Inv. (KECI):	On or in compliance with the inventory
Canada NDSL Inventory:	Not in compliance with the inventory.
Philippines PICCS:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory
New Zealand Inventory of Chemicals:	On or in compliance with the inventory
Switzerland Consolidated Inventory:	Not in compliance with the inventory.
Japan ISHL Listing:	On or in compliance with the inventory
Japan Pharmacopoeia Listing:	Not in compliance with the inventory.

**16. Other information, including date of preparation or last revision**

**NFPA Hazard ID**



Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

<b>Issue date:</b>	06-11-2014
<b>Revision date:</b>	No data available.
<b>Version #:</b>	1.1
<b>Further information:</b>	No data available.

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