

# SAFETY DATA SHEET

## Dimethylformamide, n,n- (DMF)

This MSDS is valid for all grades that start with catalog number  
324

### 1. IDENTIFICATION OF SUBSTANCE / MIXTURE AND OF SUPPLIER

**Product Identifier:** High Purity Chemicals  
**Synonyms:** N-Formyldimethylamine; DMF; Dimethylformamide  
**Other means of identification:** CAS No. 68-12-2  
EINECS No. 200-679-5

**Recommended use of the chemical and restrictions on use:**  
General use solvent

#### Supplier Details:

**Pharmco Products, Inc.**  
1101 Isaac Shelby Drive, Shelbyville,  
KY 40065, USA.  
Tel: 502.232.7600  
Fax: 502.633.6100  
CCN17213

**Pharmco Products, Inc.**  
58 Vale Road, Brookfield,  
CT 06804, USA.  
Tel: 203.740.3471  
Fax: 203.740.3481  
CCN17213



**Emergency Contact:** CHEMTREC: 1.800.424.9300 (USA) / +1.703.527.3887 (International)

### 2. HAZARDS IDENTIFICATION

#### OSHA Hazards:

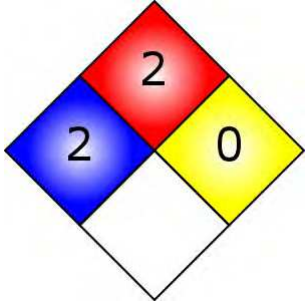
Combustible liquid, Harmful by skin absorption, Irritant, Teratogen

#### Target Organs:

Blood, Cardiovascular system, Central nervous system, Kidney, Liver

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)

**NFPA**



**GHS label elements, including precautionary statements**



**Signal Word:**

DANGER!

**Hazard statement(s)**

H226	Flammable liquid and vapor
H312	Harmful in contact with skin
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H360	May damage fertility or the unborn child.

**Precautionary statement(s)**

P261	Avoid breathing dust/fumes/gas/mist/vapors.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical attention.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P280	Wear protective gloves and eye and face protection.

**GHS Classification(s)**

Acute Toxicity, Dermal (Category 4)  
Acute Toxicity, Inhalation (Category 4)  
Eye irritation (Category 2A)

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

Flammable Liquids (Category 3)  
Reproductive toxicity (Category 1B)

**Other hazards which do not result in classification:**

**Potential Health Effects:**

Organ	Description
Eyes	Can be irritating to the eyes.
Ingestion	Can be harmful if swallowed.
Inhalation	Can be harmful, causing irritation to the respiratory tract, if inhaled.
Skin	Can be irritating to the skin.

### 3. COMPOSITION AND INFORMATION ON INGREDIENTS

**Chemical identity:** n,n-Dimethylformamide  
**Common name / Synonym:** N-Formyldimethylamine; DMF; Dimethylformamide  
**CAS number:** 68-12-2  
**EINECS number:** 200-679-5  
**ICSC number:** 0457  
**RTECS #:** LQ2100000  
**UN #:** 2265  
**EC #:** 616-001-00-X

% Weight	Material	CAS
100	n,n-Dimethylformamide	68-12-2

### 4. FIRST AID MEASURES

#### General advice

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

#### Skin

Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing/shoes.

#### Inhalation

Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.

#### Eyes

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

#### **Ingestion**

DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give anything by mouth to an unconscious individual.

---

## **5. FIRE FIGHTING MEASURES**

#### **Suitable (and unsuitable) extinguishing media:**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

#### **Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):**

Carbon oxides and nitrogen oxides expected to be the primary hazardous combustion products.

#### **Special protective equipment and precautions for firefighters:**

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

#### **Flammable Properties**

##### **Classification**

OSHA/NFPA Class II Combustible Liquid.

##### **Flash point**

58 °C (136 °F) - closed cup

##### **Autoignition temperature**

445 °C (833 °F)

---

## **6. ACCIDENTAL RELEASE MEASURES**

#### **Personal precautions, protective equipment and emergency procedures:**

Wear respiratory protection. Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

#### **Environmental precautions:**

Stop leak. Contain spill if possible and safe to do so. Prevent product from entering drains.

#### **Methods and materials for containment and cleaning up:**

Contain spill, then collect with an electrically protected vacuum cleaner or by wet-brushing and put the material into a convenient waste disposal container. Keep container closed.

---

## **7. HANDLING AND STORAGE**

#### **Precautions for safe handling:**

Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

measures to prevent the buildup of electrostatic charge.

**Conditions for safe storage, including any incompatibilities:**

Container must be sealed tightly and kept in a dry, well-ventilated space. Product should be stored under inert gas.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Control parameters, e.g., occupational exposure limit values or biological limit values:**

**Occupational Exposure Limits**

Component	Source	Type	Value	Note
n,n-Dimethylformamide	US (OSHA)	TWA	10 ppm, 30 mg/m <sup>3</sup>	29 CFR 1910.1000 Table Z-1 Limits for Air Contaminants
n,n-Dimethylformamide	US (ACGIH)	TWA	10 ppm	ACGIH Threshold Limit Value

**Appropriate engineering controls:**

General room or local exhaust ventilation is usually required to meet exposure limit(s). Electrical equipment should be grounded and conform to applicable electrical code.

**Individual protection measures, such as personal protective equipment:**

**Respiratory protection:**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection:**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection:**

Use chemical safety goggles and/or a full face shield where splashing is possible. Use equipment approved by appropriate government standards, such as NIOSH (US) or EN166 (EU) Maintain eye wash fountain and quick-drench facilities in work area.

**Skin and body protection:**

Wear impervious, flame retardant, antistatic protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Hygiene measures:**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Liquid. Colorless, clear.
Odor	Specific data not available
Odor threshold	Specific data not available
pH	6.7
Freezing point	-61 °C (-78 °F)
Initial boiling point and boiling range	153 °C (307 °F)
Flash point	58 °C (136 °F) - closed cup
Evaporation rate	Specific data not available
Flammability (solid, gas)	Flammable
Upper / Lower flammability or explosive limits	15.2 %(V) / 2.2% (V)
Vapor pressure	3.60 hPa (2.70 mmHg) at 20 °C (68 °F)
Vapor Density	2.52
Relative Density	0.948 g/cm <sup>3</sup> at 25 °C (77 °F)
Solubility(ies)	Miscible
Partition coefficient n-octanol/water(ies)	log Pow: -1.0
Auto-ignition temperature	445 °C (833 °F)
Decomposition temperature	Specific data not available
Formula (N,N-DIMETHYLFORMAMIDE)	C <sub>3</sub> H <sub>7</sub> NO
Molecular Weight (N,N-DIMETHYLFORMAMIDE)	73.09 g/mol

## 10. STABILITY AND REACTIVITY

Chemical Stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	No data available
Conditions to avoid (e.g., static discharge, shock or vibration)	Heat, flames, and sparks.
Incompatible materials	Strong oxidizing agents
Hazardous decomposition products	Carbon oxides and nitrogen oxides are expected to be, under fire conditions, the primary hazardous decomposition products.

## 11. TOXICOLOGICAL INFORMATION

- n,n-Dimethylformamide 68-12-2

### Product Summary:

Laboratory tests have shown mutagenic, reproductive, and teratogenic effects. No data available to designate products as an aspiration hazard or to cause specific target organ toxicity through single or repeated exposure.

### Acute Toxicity:

LC50 (Inhalation)	Rat	15 mg/L	4 hours
LD50 (Dermal)	Rabbit	1,500 mg/kg	

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

LD50 (Oral)	Rat	2,800 mg/kg	
-------------	-----	-------------	--

**Irritation:**

**Eyes**

Rabbit - moderate eye irritation - 24 hours

**Respiratory or Skin Sensitization**

No data available

**Skin**

Human - mild skin irritation

**Germ cell mutagenicity**

Genotoxicity in vitro - mouse - lymphocyte. Mutation in mammalian somatic cells.

**Reproductive toxicity**

Presumed human reproductive toxicant

**Teratogenicity**

May cause congenital malformation in the fetus.

**Carcinogenicity**

IARC: Not classifiable as a human carcinogen.

ACGIH: No data is available.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Other Hazards**

Organ	Description
Eyes	Irritating to the eyes.
Ingestion	Can be harmful if ingested.
Inhalation	Can be harmful if inhaled. Irritating to the respiratory tract.
Skin	Irritating to the skin.

---

## 12. ECOLOGICAL INFORMATION

- n,n-Dimethylformamide 68-12-2
-

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

**Ecotoxicity (aquatic and terrestrial, where available):**

**Acute Fish Toxicity (N,N-DIMETHYLFORMAMIDE)**

LC50 / 96 hours Bluegill - 6,300 mg/L

**Acute Fish Toxicity (N,N-DIMETHYLFORMAMIDE)**

LC50 / 96 hours Rainbow Trout - 9,800 mg/L

**Persistence and degradability:**

Readily biodegradable.

**Bioaccumulative potential:**

No data available

**Other adverse effects:**

No data available

### 13. DISPOSAL CONSIDERATIONS

**Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

### 14. TRANSPORT INFORMATION

**Description of waste residues and information on their safe handling and methods of disposal:**

<b>UN number</b>	2265
<b>UN proper shipping name</b>	N,N-Dimethylformamide
<b>Transport hazard class(es)</b>	3
<b>Packing group (if applicable)</b>	III

**Reportable Quantity**

100 lbs

**IMDG**

UN-Number: 2265 Class: 3 Packing Group: III

EMS-No: F-E, S-D

Proper shipping name: N,N-DIMETHYLFORMAMIDE

Marine pollutant: No

**IATA**

UN-Number: 2265 Class: 3 Packing Group: III



**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

Proper shipping name: N,N-Dimethylformamide

## 15. REGULATORY INFORMATION

**Safety, health and environmental regulations specific for the product in question:**

### OSHA Hazards

Combustible liquid, Harmful by skin absorption, Irritant, Teratogen

All ingredients are on the following inventories or are exempted from listing

Country	Notification
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS/ISHL
Korea	ECL
New Zealand	NZIoC
Philippines	PICCS
United States of America	TSCA

### SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

### SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:  
N,N-DIMETHYLFORMAMIDE CAS-No. 68-12-2 Revision Date 2007-07-01

### SARA 311/312 Hazards

Acute Health Hazard  
Chronic Health Hazard  
Fire Hazard

### CERCLA

Dimethylformamide CAS-No. 68-12-2, RQ: 100 lbs

### Massachusetts Right To Know Components

N,N-Dimethylformamide CAS-No. 68-12-2 Revision Date 2007-07-01

### Pennsylvania Right To Know Components

N,N-Dimethylformamide CAS-No. 68-12-2 Revision Date 2007-07-01

**Product Information: 203.740.3471 Emergency Assistance (CHEMTREC): 1.800.424.9300 (USA)  
+1.703.527.3887 (INT)**

**New Jersey Right To Know Components**

N,N-Dimethylformamide CAS-No. 68-12-2 Revision Date 2007-07-01

**California Prop 65 Components**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

---

**16. OTHER INFORMATION:  
INCLUDING INFORMATION ON PREPARATION AND REVISION OF THE SDS**

**Disclaimer**

PHARMCO-AAPER believes that the information on this MSDS was obtained from reliable sources. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, PHARMCO-AAPER does not assume responsibility and expressly disclaims liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable. Information is correct to the best of our knowledge at the date of the MSDS publication.