

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 8.7

Revision Date 14.04.2023

Print Date 11.08.2023

GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifiers

Product name : *N,N*-Dimethylformamide

Product Number : 227056

Brand : Sigma-Aldrich

Index-No. : 616-001-00-X

REACH No. : 01-2119475605-32-XXXX

CAS-No. : 68-12-2

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

### 1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemie GmbH  
Eschenstrasse 5  
D-82024 TAUFKIRCHEN

Telephone : +49 (0)89 6513-1130

Fax : +49 (0)89 6513-1161

E-mail address : [technischerservice@merckgroup.com](mailto:technischerservice@merckgroup.com)

### 1.4 Emergency telephone

Emergency Phone # : 0800 181 7059 (CHEMTREC Deutschland)  
+49 (0)696 43508409 (CHEMTREC weltweit)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

#### Classification according to Regulation (EC) No 1272/2008

Flammable liquids (Category 3), H226  
Acute toxicity, Inhalation (Category 4), H332  
Acute toxicity, Dermal (Category 4), H312  
Eye irritation (Category 2), H319  
Reproductive toxicity (Category 1B), H360D

For the full text of the H-Statements mentioned in this Section, see Section 16.



## 2.2 Label elements

### Labelling according Regulation (EC) No 1272/2008

Pictogram



Signal Word

Danger

Hazard statement(s)

H226

Flammable liquid and vapor.

H312 + H332

Harmful in contact with skin or if inhaled.

H319

Causes serious eye irritation.

H360D

May damage the unborn child.

Precautionary statement(s)

P210

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P303 + P361 + P353

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304 + P340 + P312

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.

P305 + P351 + P338

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

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard Statements

none

Restricted to professional users.

### Reduced Labeling (<= 125 ml)

Pictogram



Signal Word

Danger

Hazard statement(s)

H360D

May damage the unborn child.

Precautionary statement(s)

P280

Wear protective gloves/ protective clothing/ eye protection/ face protection.

P308 + P313

IF exposed or concerned: Get medical advice/ attention.

Supplemental Hazard Statements

none

## 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Rapidly absorbed through skin.



## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Synonyms	:	DMF
Formula	:	C <sub>3</sub> H <sub>7</sub> NO
Molecular weight	:	73,09 g/mol
CAS-No.	:	68-12-2
EC-No.	:	200-679-5
Index-No.	:	616-001-00-X

Component	Classification	Concentration
<b>N,N-dimethylformamide</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
CAS-No. 68-12-2 EC-No. 200-679-5 Index-No. 616-001-00-X	Flam. Liq. 3; Acute Tox. 4; Eye Irrit. 2; Repr. 1B; H226, H332, H312, H319, H360D	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: First aid measures

### 4.1 Description of first-aid measures

#### General advice

Show this material safety data sheet to the doctor in attendance.

#### If inhaled

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

#### In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

#### In case of eye contact

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

#### If swallowed

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

### 4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.3 Indication of any immediate medical attention and special treatment needed

No data available



---

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

#### Suitable extinguishing media

Water Foam Carbon dioxide (CO<sub>2</sub>) Dry powder

#### Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

### 5.2 Special hazards arising from the substance or mixture

Carbon oxides

Nitrogen oxides (NO<sub>x</sub>)

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at elevated temperatures.

Development of hazardous combustion gases or vapours possible in the event of fire.

### 5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

### 5.4 Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.

Evacuate the danger area, observe emergency procedures, consult an expert.  
For personal protection see section 8.

### 6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

### 6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

### 6.4 Reference to other sections

For disposal see section 13.

---

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

#### Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

#### Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.



### Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

For precautions see section 2.2.

## 7.2 Conditions for safe storage, including any incompatibilities

### Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Handle and store under inert gas.

### Storage class

Storage class (TRGS 510): 3: Flammable liquids

## 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

---

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Ingredients with workplace control parameters

##### Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Workers	Skin contact	Acute systemic effects	26,3mg/kg BW/d
Workers	Inhalation	Acute systemic effects	30 mg/m <sup>3</sup>
Workers	Skin contact	Long-term systemic effects	3,31mg/kg BW/d
Workers	Inhalation	Long-term systemic effects	15 mg/m <sup>3</sup>
Workers	Inhalation	Long-term local effects	15 mg/m <sup>3</sup>
Workers	Inhalation	Acute local effects	30 mg/m <sup>3</sup>

##### Predicted No Effect Concentration (PNEC)

Compartment	Value
Water	30 mg/l
Soil	16,235 mg/kg
Sea water	3 mg/kg
Fresh water	30 mg/l
Fresh water sediment	25,05 mg/kg
Onsite sewage treatment plant	123 mg/l

### 8.2 Exposure controls

#### Personal protective equipment

##### Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses



### **Skin protection**

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Full contact

Material: butyl-rubber

Minimum layer thickness: 0,7 mm

Break through time: 480 min

Material tested: Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: [www.kcl.de](http://www.kcl.de)).

Splash contact

Material: Viton®

Minimum layer thickness: 0,7 mm

Break through time: 240 min

Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

### **Body Protection**

Flame retardant antistatic protective clothing.

### **Respiratory protection**

Recommended Filter type: Filter A-(P2)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

### **Control of environmental exposure**

Do not let product enter drains. Risk of explosion.

---

## **SECTION 9: Physical and chemical properties**

### **9.1 Information on basic physical and chemical properties**

- |  |                                |
|--|--------------------------------|
| a) Physical state                          | liquid, clear                  |
| b) Color                                   | colorless                      |
| c) Odor                                    | amine-like                     |
| d) Melting point/freezing point            | Melting point/range: -61 °C    |
| e) Initial boiling point and boiling range | 153 °C                         |
| f) Flammability (solid, gas)               | No data available              |
| g) Upper/lower                             | Upper explosion limit: 16 %(V) |



flammability or explosive limits	Lower explosion limit: 2,2 %(V)
h) Flash point	57,5 °C - closed cup - DIN 51755 Part 2
i) Autoignition temperature	435 °C at 1.013 hPa - DIN 51794
j) Decomposition temperature	> 350 °C
k) pH	7 at 200 g/l at 20 °C
l) Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 0,86 mPa.s at 20 °C
m) Water solubility	1.000 g/l at 20 °C completely miscible
n) Partition coefficient: n-octanol/water	log Pow: -0,85 at 25 °C - Bioaccumulation is not expected.
o) Vapor pressure	3,77 hPa at 20 °C
p) Density	0,944 g/mL
Relative density	No data available
q) Relative vapor density	No data available
r) Particle characteristics	No data available
s) Explosive properties	No data available
t) Oxidizing properties	none

## 9.2 Other safety information

Relative vapor density	2,52 - (Air = 1.0)
------------------------	--------------------

---

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Vapor/air-mixtures are explosive at intense warming.

### 10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

### 10.3 Possibility of hazardous reactions

Violent reactions possible with:

Alkali metals  
halogens  
halides  
Reducing agents  
triethylaluminium  
nitrates



metallic oxides  
nonmetallic oxides  
Halogenated hydrocarbon  
Isocyanates  
sodium  
Sodium borohydride  
hydrides  
Oxidizing agents  
Oxides of phosphorus  
Tin  
Strong oxidizing agents  
rubber  
Copper  
Copper alloys  
various metals  
A risk of explosion and/or of toxic gas formation exists with the following substances:  
azides  
Bromine  
Chlorine  
chromium(VI) oxide  
potassium permanganate  
triethylaluminium  
chlorates  
Halogenated hydrocarbon  
with  
Iron

#### **10.4 Conditions to avoid**

Heating.

#### **10.5 Incompatible materials**

various plastics, Copper, Copper alloys, Tin, Strong oxidizing agents

#### **10.6 Hazardous decomposition products**

In the event of fire: see section 5

---

### **SECTION 11: Toxicological information**

#### **11.1 Information on toxicological effects**

##### **Acute toxicity**

LD50 Oral - Rat - male and female - 3.010 mg/kg  
(OECD Test Guideline 401)

Acute toxicity estimate Inhalation - 4 h - 11,1 mg/l - vapor

(Expert judgment)

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

LD50 Dermal - Rabbit - 1.500 mg/kg

Remarks: (Regulation (EC) No 1272/2008, Annex VI)  
(IUCLID)





**Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation - 20 h

Remarks: (ECHA)

**Serious eye damage/eye irritation**

Eyes - Rabbit

Result: Irritating to eyes.

(OECD Test Guideline 405)

Remarks: (Regulation (EC) No 1272/2008, Annex VI)

**Respiratory or skin sensitization**

Local lymph node assay (LLNA) - Mouse

Result: negative

(OECD Test Guideline 406)

**Germ cell mutagenicity**

Test Type: sister chromatid exchange assay

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: unscheduled DNA synthesis assay

Test system: human diploid fibroblasts

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Result: negative

Remarks: (ECHA)

Test Type: Micronucleus test

Species: Mouse

Cell type: Bone marrow

Application Route: Intraperitoneal injection

Result: negative

Remarks: (ECHA)

Test Type: dominant lethal test

Species: Rat

Application Route: Inhalation

Result: negative

Remarks: (ECHA)

Test Type: dominant lethal test

Species: Mouse

Application Route: Intraperitoneal





---

## SECTION 12: Ecological information

### 12.1 Toxicity

Toxicity to fish	flow-through test LC50 - <i>Lepomis macrochirus</i> (Bluegill sunfish) - 7.100 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - <i>Daphnia magna</i> (Water flea) - 13.100 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - <i>Desmodesmus subspicatus</i> (green algae) - > 1.000 mg/l - 72 h (DIN 38412)
Toxicity to bacteria	static test EC50 - <i>Vibrio fischeri</i> - 12.300 - 17.500 mg/l - 5 min Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	semi-static test NOEC - <i>Daphnia magna</i> (Water flea) - 1.500 mg/l - 21 d Remarks: (ECHA)

### 12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 21 d Result: 100 % - Readily biodegradable. (OECD Test Guideline 301E)
Biochemical Oxygen Demand (BOD)	900 mg/g Remarks: (Lit.)
Theoretical oxygen demand	1.863 mg/g Remarks: (Lit.)

### 12.3 Bioaccumulative potential

Bioaccumulation	<i>Cyprinus carpio</i> (Carp) - 56 d at 25 °C - 0,002 mg/l(N,N-dimethylformamide)  Bioconcentration factor (BCF): 0,3 - 1,2 (OECD Test Guideline 305C)  Remarks: Does not significantly accumulate in organisms.
-----------------	---

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.





**Authorisations and/or restrictions on use**

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : N,N-dimethylformamide

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : N,N-dimethylformamide

**National legislation**

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. : FLAMMABLE LIQUIDS

**Other regulations**

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

**15.2 Chemical Safety Assessment**

A Chemical Safety Assessment has been carried out for this substance.

---

**SECTION 16: Other information****Full text of H-Statements referred to under sections 2 and 3.**

H226	Flammable liquid and vapor.
H312	Harmful in contact with skin.
H312 + H332	Harmful in contact with skin or if inhaled.
H319	Causes serious eye irritation.
H332	Flammable liquid and vapor.
H360D	Harmful in contact with skin or if inhaled.



## Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

## Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See [www.sigma-aldrich.com](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2020 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact [mlsbranding@sial.com](mailto:mlsbranding@sial.com).



Sigma-Aldrich- 227056

The life science business of Merck operates as MilliporeSigma in the US and Canada

Page 15 of 15

