

According to EC Regulation 1907/2006/EC

## DMF (N,N-Dimethylformamide)

Revision Date 22-Nov-2010

Revision Number 1

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

#### Product Identifier

Product Name DMF (N,N-Dimethylformamide)  
REACH Registration Number 01-2119475605-32-0000

#### Use of the Substance/Mixture Identified uses

Solvent

#### Manufacturer or supplier's details

##### Company/Undertaking Identification Address

Taminco BVBA  
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9000 GENT  
BELGIUM

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Telephone

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##### Company/Undertaking Identification Address

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Telephone

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Telefax

+49 3461 43 6444

#### Emergency Telephone Number

Emergency Telephone Number

(+32) 9 254 10 36

### 2. HAZARDS IDENTIFICATION

#### Classification of the substance or mixture

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Repro. Cat 2 : R61

Xn : R20/21

Xi : R36

S53, S45

REGULATION (EC) No 1272/2008

<b>Classification of the substance or mixture</b>	H226 : Flam. Liq. cat. 3 H312 : Acute dermal Tox. cat. 4 H332 : Acute inhalation Tox. cat. 4 H319 : Eye Irrit. cat. 2 H360D : Repr. cat. 1B
<b>Precautionary Statement - Prevention</b>	P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking P233 - Keep container tightly closed P240 - Ground/bond container and receiving equipment P241 - Use explosion-proof electrical/ventilating/lighting/equipment P242 - Use only non-sparking tools P243 - Take precautionary measures against static discharge P261 - Avoid breathing dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P271 - Use only outdoors or in a well-ventilated area P280 - Wear protective gloves/protective clothing/eye protection/face protection
<b>Precautionary Statement - Response</b>	P302 + P352 - IF ON SKIN: Wash with plenty of soap and water P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower P363 - Wash contaminated clothing before reuse P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing 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 P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
<b>Precautionary Statement - Storage</b>	P403 + P235 - Store in a well-ventilated place. Keep cool P405 - Store locked up
<b>Precautionary Statement - Disposal</b>	P501 - Dispose of contents/container to an approved incineration plant

**Label elements****Product Name**

DMF (N,N-Dimethylformamide)

**Hazard pictograms****Signal Word**

Danger

**Hazard Statements**

H226 - Flammable liquid and vapor

H312 - Harmful in contact with skin

H332 - Harmful if inhaled

H319 - Causes serious eye irritation

H360D - May damage the unborn child

**Precautionary Statements**

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water

P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing

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

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

None known

**For the full text of the R phrases mentioned in this Section, see Section 16****3. COMPOSITION/INFORMATION ON INGREDIENTS****Haz/Non-haz**

Chemical Name	CAS-No	Weight %	EINECS	Registration number
N,N-Dimethylformamide	68-12-2	>99,9	200-679-5	01-2119475605-32-0000

**4. FIRST AID MEASURES****FIRST AID MEASURES****General Advice**

Remove to fresh air immediately. Get medical attention immediately. Show this material safety data sheet to the doctor in attendance. Take off contaminated clothing and shoes immediately. Use of alcoholic beverages may enhance toxic effects.

**Eye Contact**

Remove contact lenses  
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes  
Consult a physician

**Skin Contact**

Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes  
Wash contaminated clothing before re-use  
Discard contaminated shoes  
Obtain medical attention

**Inhalation**

Move to fresh air  
If breathing is difficult, give oxygen  
If not breathing, give artificial respiration  
Obtain medical attention

**Ingestion**

Clean mouth with water and afterwards drink plenty of water  
Do not induce vomiting  
Treat symptomatically  
Ingest activated charcoal  
Never give anything by mouth to an unconscious person  
If swallowed, seek medical advice immediately and show this container or label  
Loosen tight clothing such as collar, tie, belt and waistband

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

- Use of alcoholic beverages may enhance toxic effects
- Pregnant women or women of child-bearing age should not be exposed to this product
- May cause harm to the unborn child
- Lachrymation
- Irritating to eyes
- Harmful by skin absorption
- Harmful by inhalation
- H373 - May cause damage to organs through prolonged or repeated exposure
- Ingestion or inhalation of high concentrations may cause injuries to gastrointestinal tract, liver, kidneys and central nervous system
- Chronic intensive skin contact may cause dermatitis
- Exposure may result in reddening, tears and itching of the eyes and soreness in the nose and throat, together with coughing
- Prolonged exposure can be harmful for certain organs, e.g. liver, kidneys, blood, nervous system and skin
- nausea
- Diarrhea
- Vomiting
- Dizziness
- Abdominal pain
- headache
- Dermal absorption possible

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

- Biomonitoring possible at chronic exposure
- Determination of formamide in urine at the end of the workday/workweek
- Determination of formamide in blood at the end of the workday/workweek
- Lab testing in blood for delayed effects

<b>5. FIRE-FIGHTING MEASURES</b>
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**Suitable Extinguishing Media**

- carbon dioxide (CO<sub>2</sub>)
- dry chemical
- Alcohol-resistant foam
- water spray

**Extinguishing media which must not be used for safety reasons**

- high volume water jet

**Specific Hazards Arising from the Chemical**

**Specific hazards**

- Combustible material
- Vapors are heavier than air and may spread along floors
- Vapors may form explosive mixture with air
- Heating or fire can release toxic gas  
Nitrogen oxides (NO<sub>x</sub>)  
Carbon monoxide

**Specific methods**

- Cool containers / tanks with water spray
- Keep product and empty container away from heat and sources of ignition
- Do not flush into surface water or sanitary sewer system
- Prevent product from entering drains
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains

**Protective Equipment and Precautions for Firefighters**

Wear full protective clothing and self-contained breathing apparatus

<b>6. ACCIDENTAL RELEASE MEASURES</b>
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**Personal precautions, protective equipment and emergency procedures**

- Avoid contact with skin, eyes and clothing
- Evacuate personnel to safe areas
- Keep people away from and upwind of spill/leak
- Wear self-contained breathing apparatus and protective suit
- Rubber gloves

**Environmental precautions**

- Should not be released into the environment
- Remove immediately adhering matter
- Prevent product from entering drains
- Do not flush into surface water or sanitary sewer system

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

- Use explosion-proof equipment
- Remove all sources of ignition
- Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container
- Large spills should be collected mechanically (remove by pumping) for disposal

<b>7. HANDLING AND STORAGE</b>
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**Precautions for safe handling**

- Use only in area provided with appropriate exhaust ventilation
- Use spark-proof tools and explosion-proof equipment
- Wear personal protective equipment
- Do not eat, drink or smoke when using this product
- Wash hands after handling
- Remove contaminated clothing and protective equipment before entering eating areas
- Ensure that eyewash stations and safety showers are close to the workstation location
- Avoid breathing vapors or mists
- Use product only in closed system

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

- Keep away from open flames, hot surfaces and sources of ignition
- Keep container tightly closed
- Keep in a dry, cool and well-ventilated place
- Keep in properly labelled containers

**Specific end uses**

See also section 1  
Exposure scenario : Annex

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### Exposure Guidelines

Chemical Name	ACGIH TLV	EU	Japan
N,N-Dimethylformamide	TWA: 10 ppm		

### Exposure controls

#### Engineering Controls

- Ensure adequate ventilation, especially in confined areas

#### Personal Protective Equipment

##### Eye/face Protection

- Tightly fitting safety goggles
- Face-shield
- Respirator with a full face mask

##### Skin Protection

- Wear suitable protective equipment
- Complete suit protecting against chemicals
- Take note of occupational restrictions for women of child bearing age

##### Hand Protection

- Solvent-resistant gloves (butyl-rubber)
- Neoprene gloves
- The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it
- The suitability for a specific workplace should be discussed with the producers of the protective gloves

##### Respiratory Protection

- In the case of vapor formation use a respirator with filter model A
- self-contained breathing apparatus (EN 133)  
(in case of higher concentration)

##### Environmental exposure controls

- Prevent product from entering drains
- Do not contaminate surface water
- Avoid subsoil penetration

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### General Information

Physical State	Liquid
Color	Colorless
Odor	characteristic

### Important Health Safety and Environmental Information

Boiling Point/Range	152-153°C
Flash Point	57.5°C
Viscosity	0.802 mPas @ 25 °C
Vapor Pressure	3.77 hPa @ 20 °C
Vapor Density	2.52 (Air =1.0)

Partition coefficient: n-octanol/water	log Pow = -0.85
pH	6.5 - 8.5 ( 20 % solution)
Water solubility	200 g/l @ 20°C
Oxidizing Properties	none
Explosion Limits	2.2 - 16 vol. %
Explosive Properties	Not explosive
Melting Point/Range	-61°C
Density	0.94 g/cm <sup>3</sup> @ 20 °C
Flammability	flammable
	The substance or mixture is not classified as pyrophoric
Autoignition Temperature	445°C
Dissociation constant	pKa: -0.3 @ 20°C

## 10. STABILITY AND REACTIVITY

### Reactivity

#### Chemical Stability

- Stable under normal conditions
- Hazardous polymerisation does not occur

#### Possibility of hazardous reactions

None under normal processing

#### Conditions to Avoid

- Heat, flames and sparks
- Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors)

#### Incompatible materials to avoid

- Tin
- Zinc
- Copper
- Aluminum
- Strong acids and oxidizing agents
- Halogenated hydrocarbons

#### Hazardous Decomposition Products

- Heating or fire can release toxic gas
  - Nitrogen oxides (NO<sub>x</sub>)
  - Carbon monoxide
  - Ammonia

## 11. TOXICOLOGICAL INFORMATION

### Product Information

LD50/oral/rat =	3010 mg/kg
LD50/dermal/rabbit =	3160 mg/kg
LC50/inhalation/4h/rat =	5900 mg/m <sup>3</sup>
Eye irritation	Severe eye irritation
Skin irritation	Non-irritating to the skin
Sensitization	Did not cause sensitization on laboratory animals
Mutagenic Effects	Did not show mutagenic effects in animal experiments

## 11. TOXICOLOGICAL INFORMATION

<b>Reproductive toxicity</b>	Experiments have shown reproductive toxicity effects on laboratory animals (in case of higher concentration)
<b>Carcinogenic effects</b>	Did not show carcinogenic effects in animal experiments
<b>Specific target organ systemic toxicity (repeated exposure)</b>	No-observed-effect level : 238 mg/kg/d, rat, Oral, after 28 days
<b>Target Organ Effects</b>	Liver
<b>Human experience</b>	
<b>Human experience</b>	<p>Irritating to eyes</p> <p>May cause harm to the unborn child</p> <p>Pregnant women or women of child-bearing age should not be exposed to this product</p> <p>Prolonged exposure can be harmful for certain organs, e.g. liver, kidneys, blood, nervous system and skin</p> <p>More severe effects if alcohol is consumed</p> <p>May cause vomiting</p> <p>nausea</p> <p>Liver disorders</p> <p>headache</p> <p>abdominal pain</p>

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

<b>Toxicity to fish</b>	LC50 : 7100 mg/l - 96hour
<b>EC50/48h/daphnia =</b>	13100 mg/l
<b>EC50/72h/algae =</b>	> 1000 mg/l
<b>Toxicity to bacteria</b>	EC50 (5 min) :12300 mg/l

### Mobility

Koc = 2.4

### Persistence and degradability

Readily biodegradable

### Bioaccumulative Potential

Bioconcentration factor (BCF) after 56 days = 0.3 - 1.2 l/kg (20µg/l @ 25°C)

### Results of PBT and vPvB assessment

- This substance is not considered to be persistent, bioaccumulating nor toxic (PBT)
- This substance is not considered to be very persistent nor very bioaccumulating (vPvB)

### Other adverse effects

None known based on information supplied



### 13. DISPOSAL CONSIDERATIONS

#### Waste Disposal Method

- Should not be released into the environment
- Dispose of contents/container in accordance with local regulation

#### Contaminated Packaging

- Empty containers should be taken to an approved waste handling site for recycling or disposal

### 14. TRANSPORT INFORMATION

#### Road transport

**Class** 3  
**UN-No** UN2265  
**Packing Group** III  
**Marine pollutant** no  
**Proper Shipping Name** N,N-Dimethylformamide

#### Sea transport

**Class** 3  
**UN-No** UN2265  
**Packing Group** III  
**Marine pollutant** no  
**Proper Shipping Name** N,N-Dimethylformamide

#### Air transport

**Class** 3  
**UN-No** UN2265  
**Packing Group** III  
**Marine pollutant** no  
**Proper Shipping Name** N,N-Dimethylformamide

### 15. REGULATORY INFORMATION

#### Safety, health and environmental regulations/legislation specific for the substance or mixture

#### International Inventories

Chemical Name	TSCA	EINECS	DSL	ENCS	AICS
N,N-Dimethylformamide	X	200-679-5	DSL - Listed	(2)-68	Listed.

#### Chemical Safety Assessment

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

### 16. OTHER INFORMATION

#### This data sheet contains changes from the previous version in section(s)

Revision Date 22-Nov-2010

Reason for revision                      Classification and hazard labeling

Literary Reference                      -Taminco Proprietary Studies

**List of relevant R-phrases**

- R20/21 - Harmful by inhalation and in contact with skin
- R36 - Irritating to eyes
- R61 - May cause harm to the unborn child
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
- S53 - Avoid exposure - obtain special instructions before use

**Training advice**

Provide adequate information, instruction and training for operators

**Further information for the material safety data sheet**

The information provided on 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text..

**End of Material Safety Data Sheet**