Material Safety Data Sheets

Revision 3

1. IDENTIFICATION

Product Name	**N,N-Dimethylformamide**
Other Names	**Dimethylformamide; DMF**
Uses	**No Data Available**
Chemical Family	**No Data Available**
Chemical Formula	**$HCON(CH_3)_2$**
Chemical Name	
Product Description	**No Data Available**
Company	**Arman sina.co**
Contact Information	**info@armansina.com** **www.armansina.com**

2. HAZARD IDENTIFICATION

Hazard Categories

Flammable liquids, Category 3
Eye irritation, Category 2A
Reproductive toxicity, Category 1B
Specific target organ toxicity - repeated exposure, Category 1,Liver

Signal Word

Danger

Hazard Statements

Flammable liquid and vapour.
Causes serious eye irritation.
May damage fertility or the unborn child.
Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements

Prevention:

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
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.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear eye/face protection.

Response

IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage

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

if present and easy to do. Continue rinsing.

symbol

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Dimethylformamide; DMF	$HCON(CH_3)_2$	**68-12-2**	**>= 99 %**

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician.

Eye

Rinse immediately with plenty of water, also under the eyelids,for at least 15 minutes. Call a physician.

Skin

Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.

Inhaled

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.

Advice to Doctor

Treat symptomatically.

5. FIRE FIGHTING MEASURES

General Measures	Keep away from fire, sparks and heated surfaces. Take precautionary measures against static discharges. Ensure all equipment is electrically grounded before beginning transfer operations. Use explosion-proof equipment. Keep product and empty container away from heat and sources of ignition. No sparking tools should be used. No smoking.
Flammability Conditions	No Data Available
Extinguishing Media	Suitable extinguishing media : Dry chemical Carbon dioxide (CO2) Alcohol-resistant foam Cool closed containers exposed to fire with water spray.
Fire and Explosion Hazard	Flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may spread along floors. Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
Hazardous Products of Combustion	In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO2) nitrogen oxides (NOx) Dimethylamine
Special Fire Fighting Instructions	No Data Available
Personal Protective Equipment	**Wear self-contained breathing apparatus and protective suit**
Flash Point	**No Data Available**
Lower Explosion Limit	**No Data Available**
Upper Explosion Limit	**No Data Available**
Auto Ignition Temperature	**No Data Available**
Hazchem Code	**No Data Available**

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	No information available.
Clean Up Procedures	Ventilate the area. No sparking tools should be used. Use explosion-proof equipment. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
Containment	No information available.
Decontamination	No information available.
Environmental Precautionary Measures	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Discharge into the environment must be avoided. Do not flush into surface water or sanitary sewer system. Do not allow run-off from fire fighting to enter drains or water courses.
Evacuation Criteria	No information available.
Personal Precautionary Measures	Wear personal protective equipment. Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Remove all sources of ignition. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.

7. HANDLING AND STORAGE

Handling	Wear personal protective equipment. Use only in well-ventilated areas. Keep container tightly closed. Do not smoke. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing.

Storage	Store in area designed for storage of flammable liquids. Protect from physical damage. Keep containers tightly closed in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep away from heat and sources of ignition. Keep away from direct sunlight. Store away from incompatible substances. Container hazardous when empty. Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Container	**Tightly closed.**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	In case of insufficient ventilation, wear suitable respiratory equipment. for rescue and maintenance work in storage tanks use self-contained breathing apparatus. Use NIOSH approved respiratory protection.
Exposure Limits	No Data Available
Biological Limits	No Data Available
Engineering Measures	Use with local exhaust ventilation. Prevent vapour buildup by providing adequate ventilation during and after use.
Personal Protection Equipment	Eye protection : Do not wear contact lenses.Wear as appropriate: Safety glasses with side-shields if splashes are likely to occur, wear: Goggles or face shield, giving complete protection to eyes Hand protection : Solvent-resistant gloves Gloves must be inspected prior to use. Replace when worn. Skin and body protection : Wear as appropriate: solvent-resistant apron Flame retardant antistatic protective clothing. If splashes are likely to occur, wear: Protective suit
Special Hazards Precaustions	No Data Available
Work Hygienic Practices	When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Keep working clothes separately. Remove and wash contaminated clothing before re-use. Do not swallow. Avoid breathing vapours, mist or gas. Avoid contact with skin, eyes and clothing. This material has an established AIHA ERPG exposure limit.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Clear liquid
Odour	mild amine-like
Colour	Colourless
pH	No Data Available
Vapour Pressure	3.6 hPa
Relative Vapour Density	2.5 (Air = 1.0)
Boiling Point	153 °C
Melting Point	No Data Available
Freezing Point	-60.4 °C
Solubility	at 20 °C (20 °C) soluble
Specific Gravity	1.05 (Water = 1)
Flash Point	136 °F (58 °C) Method: closed cup
Auto Ignition Temp	445 °C
Evaporation Rate	136 ° F (58 ° C) Method: closed cup
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available

Density	0.949 g/cm3 at 20 °C
Specific Heat	No Data Available
Molecular Weight	73.1 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No Data Available
Potential for Dust Explosion	No Data Available
Fast or Intensely Burning Characteristics	Risk of violent reaction or explosion on contact with incompatible materials.
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	No Data Available
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

General Information	No Data Available
Chemical Stability	Stable under recommended storage conditions.
Conditions to Avoid	Heat, flames and sparks. Keep away from direct sunlight.
Materials to Avoid	Strong oxidizing agents. Halogenated compounds .Iron. Carbon tetrachloride. Alkyl aluminums . Inorganic nitrates
Hazardous Decomposition Products	In case of fire hazardous decomposition products may be produced such as: Carbon monoxide; Carbon dioxide (CO2) nitrogen oxides (NOx); Toxic gases/vapours; Dimethylamine
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information No Data Available

Acute

Acute oral toxicity :	LD50: 2,800 mg/kg Species: Rat
Acute inhalation toxicity :	LC50: > 5.9 mg/l , vapour Exposure time: 4 h Species: Rat
Acute dermal toxicity :	LD50: 4,720 mg/kg Species: Rabbit
Skin irritation :	Species: Rabbit Result: slight irritation
Eye irritation :	Species: Rabbit Result: Irritating to eyes.
Repeated dose toxicity :	Species: Rat Application Route: Inhalation Note: Liver toxicity (100 or 400 ppm for 6h/day, 5 days/week for 2 yr.) : Species: Mouse Application Route: Inhalation Note: Liver toxicity (100 or 400 ppm, males and 400 ppm, females for 6h/day, 5days/week for 18 mos.)

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects
Toxicity to fish : LC50: > 500 mg/l
Exposure time: 48 h
Species: Leuciscus idus (Golden orfe)
Toxicity to daphnia and other aquatic invertebrates
: LC50: 12.4 g/l
Exposure time: 48 h
Species: Daphnia magna (Water flea)
Toxicity to algae : LC50: > 1,000 mg/l
Exposure time: 96 h
Species: Scenedesmus capricornutum (fresh water algae)

Persistence/Degradability No Data Available

Mobility No Data Available

Environmental Fate No Data Available

Bioaccumulation Potential No Data Available

Environmental Impact No Data Available

13. DISPOSAL CONSIDERATIONS

General Information Dispose of contents/ container in accordance with local, state, and federal regulations.
Contaminated packaging : Empty remaining contents.Empty containers should be taken to an approved waste handling site for recycling or disposal.

Special Precautions for Land Fill Dispose of contents/ container in accordance with local, state, and federal regulations.

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	N,N-DIMETHYLFORMAMIDE
Class	3
Subsidiary Risk(s)	No Data Available
EPG	No Data Available
UN Number	UN 2265
Hazchem	No Data Available
Pack Group	III
Special Provision	No Data Available

Sea Transport

Proper Shipping Name	N,N-DIMETHYLFORMAMIDE
Class	3
Subsidiary Risk(s)	No Data Available
UN Number	UN 2265
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	III
EMS	No Data Available
Marine Pollutant	No Data Available

Air Transport

Proper Shipping Name	N,N-DIMETHYLFORMAMIDE
Class	3
Subsidiary Risk(s)	No Data Available
UN Number	UN 2265
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	III

15. OTHER INFORMATION

Revision	3
Key/Legend	**< Less Than** **> Greater Than** **atm Atmosphere** **CAS Chemical Abstracts Service (Registry Number)** **cm² Square Centimetres** **CO2 Carbon Dioxide** **COD Chemical Oxygen Demand** **deg C (° C) Degrees Celcius** **deg F (° F) Degrees Farenheit** **g Grams** **g/cm³ Grams per Cubic Centimetre** **g/l Grams per Litre** **HSNO Hazardous Substance and New Organism** **IDLH Immediately Dangerous to Life and Health** **immiscible Liquids are insoluable in each other.** **inHg Inch of Mercury** **inH2O Inch of Water** **K Kelvin** **kg Kilogram** **kg/m³ Kilograms per Cubic Metre** **lb Pound** **LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50%** (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours. **LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one** half) of a group of test animals. **ltr or L Litre** **m³ Cubic Metre** **mbar Millibar** **mg Milligram** **mg/24H Milligrams per 24 Hours** **mg/kg Milligrams per Kilogram** **mg/m³ Milligrams per Cubic Metre** **Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.** **mm Millimetre** **mmH2O Millimetres of Water** **mPa.s Millipascals per Second** **N/A Not Applicable** **NIOSH National Institute for Occupational Safety and Health** **NOHSC National Occupational Heath and Safety Commission** **OECD Organisation for Economic Co-operation and Development** **Oz Ounce** **PEL Permissible Exposure Limit** **Pa Pascal** **ppb Parts per Billion** **ppm Parts per Million** **ppm/2h Parts per Million per 2 Hours** **ppm/6h Parts per Million per 6 Hours** **psi Pounds per Square Inch** **R Rankine** **RCP Reciprocal Calculation Procedure** **STEL Short Term Exposure Limit** **TLV Threshold Limit Value** **tne Tonne** **TWA Time Weighted Average** **ug/24H Micrograms per 24 Hours** **UN United Nations** **wt Weight**