

SAFETY DATA SHEET**1. PRODUCT AND COMPANY IDENTIFICATION****1.1 Product identifiers****Product Name: Carbon Nanotubes - Dimethylformamide Solution****Product Code: EM-CNT-DMF-01****1.2 Details of the supplier of the safety data sheet**

Nano3D Systems LLC, 1110 NE Circle Blvd., ATAMI/Bldg. 11, Corvallis, OR 97330

1.3 Emergency telephone number

Emergency number: CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable liquids (Category 3), H226

Acute toxicity, Dermal (Category 4), H312

Eye irritation (Category 2A), H319

Germ cell mutagenicity (Category 1B), H340

Reproductive toxicity (Category 1B), H360

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

2.2 GHS Label elements, including precautionary statements

Pictogram(s)



Signal word

Danger**Hazard statement(s)**

H226

Flammable liquid and vapour.

H312

Harmful in contact with skin.

H319

Causes serious eye irritation.

H340

May cause genetic defects.

H360

May damage fertility or the unborn child.

Precautionary statements(s)

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+P243

Use only nonsparking tools. Take precautionary measures against static discharge.

P264

Wash skin thoroughly after handling.

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/shower.

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.

P337+P313

If eye irritation persists: Get medical advice/ attention.

P363

Wash contaminated clothing before reuse.

P370+P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P403+P235

Store in a well-ventilated place. Keep cool.

P405

Store locked up.

P510

Dispose of contents/ container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1

Name	CAS number	%	GHS-US classification
N,N-Dimethylformamide	68-12-2	98-100	Flam. Liq. 3; Acute Tox. 4; Eye Irrit. 2A; Repr. 1B; H226, H312 + H332, H319, H360
Single-Wall Carbon Nanotubes	308068-56-6	Trade Secret	Muta. 1B; H340

4. FIRST AID MEASURES

4.1 Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Assure fresh air breathing. Allow the victim to rest.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

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

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries after eye contact : Causes eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available

5. FIREFIGHTING MEASURES

5.1 Suitable extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand. Unsuitable extinguishing media : Do not use a heavy water stream.

5.2 Special hazards arising from the substance or mixture

Carbon oxides, nitrogen oxides (NOx)

5.3 Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Avoid (reject) fire-fighting water to enter environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Protective equipment : Safety glasses. Gloves. Emergency procedures : Evacuate unnecessary personnel.

6.2 Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour. Keep away from sources of ignition – No smoking. Take measures to prevent the build up of electrostatic charge.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions : Keep cool. Keep container closed when not in use. Incompatible products : Strong oxidizers. Strong acids. Incompatible materials : Moisture. Heat sources.

7.3 Specific end user(s)

No additional information available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameter

Components with workplace control parameters

Component	CAS-No.	Control parameters	Value
N,N-Dimethylformamide	68-12-2	TWA, US ACGIH Threshold Limit	10 ppm

8.2 Exposure controls

Appropriate engineering controls : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

Personal protective equipment : Avoid all unnecessary exposure. Hand protection : Wear protective gloves.

Eye protection : Chemical goggles or safety glasses.

Respiratory protection : Wear appropriate mask.

Other information : Do not eat, drink or smoke during use.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless

Upper/lower flammability or explosive limits: No data available
Odor: Pungent, Amine-like color

Odor threshold: No data available

Vapor pressure: No data available

Vapor density: No data available

pH: 6.7 (0.5 molar aqueous solution)

Relative density: 0.95 (20°C) 4°C

Melting point: -61 °C

Freezing point: No data available

Initial Boiling point and boiling range: No data available

Flash point: No data available

Evaporation rate: No data available

Flammability (solid, gas): No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No additional information available

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Reacts vigorously with strong oxidizers and acids

10.4 Conditions to avoid

Moisture. Incompatible materials. High temperature.

10.5 Incompatible materials

Strong acids. Strong oxidizers.

10.6 Hazardous decomposition products

Carbon monoxide. Carbon dioxide.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

LD50 oral - rat – 3,010 mg/kg

LD50 Dermal – Rabbit – 1,500 mg/kg

Serious eye damage/irritation : Causes eye irritation. pH: 8.3 0.1M solution

Respiratory or skin sensitization : Not classified

Germ cell Mutagenicity : May cause genetic defects

Carcinogenicity : May cause cancer

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Carbon Nanotubes)

2B - Group 2B: Possibly carcinogenic to humans (Carbon Nanotubes)

3 - Group 3: Not classifiable as to its carcinogenicity to humans (Carbon Nanotubes)

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 on OSHA's list of regulated carcinogens.

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects : Based on available data, the classification criteria are not met.

Symptoms/injuries after eye contact : Causes eye irritation.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

LC50 fishes 1 8250 - 9000 mg/l

EC50 Daphnia 1 2350 mg/l

12.2 Persistence and degradability

Not established.

12.3 Bioaccumulative potential

Not established.

12.4 Mobility in soil

No additional information available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials : Avoid release to the environment.

14. TRANSPORT INFORMATION

DOT (US)

UN number: UN 2265

Class: 3

Packing group: III

Proper shipping name: N,N-Dimethylformamide

IMDG

UN number: UN 2265

Class: 3

Packing group: III

EMS-No: F-E, S-D

Proper shipping name: N,N-Dimethylformamide

IATA

UN number: UN 2265

Class: 3

Packing group: III

Proper shipping name: N,N-Dimethylformamide

15. REGULATORY INFORMATION

SARA Section 311/312 Hazard Classes Immediate (acute) health hazard, fire hazard, chronic health hazard
WHMIS Classification Class D Division 2 Subdivision B - Toxic material causing other toxic effects

SARA 302 Components

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:

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

Massachusetts Right To Know Components

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

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
N,N-Dimethylformamide	68-12-2	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**Full test of H-Statement referred to under sections 2 and 3.**

H226	Flammable liquid and vapour.
H312	Harmful in contact with skin.
H312+H332	Harmful in contact with skin or if inhaled.
H335	May cause respiratory irritation.
H340	Germ cell mutagenicity
H360	May damage fertility or the unborn child.

HMIS Rating

Health : 2 Moderate Hazard - Temporary or minor injury may occur

Flammability : 2 Moderate Hazard

Physical : 1 Slight Hazard

Personal Protection : E

Further Information

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Preparation Information

Current Revision:

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