

Section 1: Substance identification

1.1 Product identifier:

Material name	-	Graphene nanoplatelets (GNP)
Synonyms	-	Graphene, graphene sheets, graphene flakes, graphene powder, few layer graphene.
Tradename	-	Nanene, NANENE, +Nanene, + Nanene, +NANENE

This SDS is valid for the following Graphene Grades: Nanene, NANENE, +Nanene, + Nanene, +NANENE

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

Identified uses	-	Laboratory chemicals, Manufacture of substances
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1.3 Details of supplier of the safety data sheet:

Company	-	2-DTech Limited Registered in England No: 08082567 Registered Office: Unit 2 Chosen View Road Cheltenham GL519LT UNITED KINGDOM
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Telephone	-	+44 (0)1242 269122
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1.4 Emergency Contact Telephone

Emergency Telephone	-	+44 (0)870 8200418 (CHEMTREC)
	-	+44 (0)1242 269122 (UK Office hours only)

Section 2: Hazards identification

2.1 Classification of the substance mixture

GHS Classification

Not yet classified

Classification - EU Directives 67/548/EEC or 1999/45/EC

Symbol(s)	-	Xi – Irritant
	-	F – Highly flammable
R-phrases	-	R11 – Highly flammable
	-	R36 – Irritation to eyes
	-	R67 – Vapours may cause drowsiness and dizziness

For full text of R-phrases and H statements see section 16

2.2 Label elements



Signal word: Danger

Hazard statements

- Fine carbon powder and dust can cause irritation to eyes and respiratory system.
- May form combustible dust concentrations in the air.

H319 – May cause serious eye irritation

Precautionary Statements

- P202 – Do not handle until all safety precautions have been read and understood.
- P280 – Wear Protective gloves/protective clothing/eye protection/face protection
- P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking
- P240 – Ground/Bond container and receiving equipment
- P261 – Avoid breathing dust/fume/gas/mist/vapours/spray

P305/P351/P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

HMIS Classification: Health hazard: 2

Flammability: 0

Physical hazards: 0

Potential Health Effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Skin: May be harmful if absorbed through skin. Causes skin irritation. Eyes Causes eye irritation. Ingestion May be harmful if swallowed.

2.3 Other Hazards

CAUTION: This form of carbon has not yet been fully tested regarding health, safety and environmental effects. There is evidence to suggest that similar carbonaceous nano-materials could have serious genotoxicological effects upon exposure.



Section 3: Composition/information on ingredients

3.1 Substances

- | | | |
|--------------------|---|--|
| Graphene platelets | - | Graphene sheets, exfoliated graphite, graphite powder
CAS: 7782-42-5 (graphite)
EC: 231-955-3 (graphite) |
|--------------------|---|--|

Section 4: Description of first aid measures

4.1 Description of first aid measures

- | | | |
|-----------------------------------|---|--|
| Eye Contact | - | Rinse immediately with plenty of water, also under eyelids, for at least 15 min. Obtain medical attention |
| Skin contact | - | Wash off immediately with plenty of water for at least 15 min. Obtain medical attention |
| Ingestion | - | Do not induce vomiting. Obtain medical attention |
| Inhalation | - | Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention. |
| Protection of first aiders | - | Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. |

4.2 Most important symptoms and effects, both acute and delayed

Breathing difficulties. May cause central nervous systems depressions. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Inhalation of high vapour concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

4.3 Indication of any immediate medical attention and special treatment needed

- | | | |
|---------------------------|---|--|
| Notes to physician | - | Treat symptomatically. Symptoms may be delayed |
|---------------------------|---|--|

Section 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

CO₂, dry chemical, dry sand, alcohol-resistant foam. Cool closed containers exposed to fire with water spray.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary

5.4 Further information

Use water spray to cool opened containers. Do not use water jet for safety reasons.

Section 6: Accidental release measures

6.1 Further information

Use personal protective equipment. Avoid breathing areas, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. See section 8 for personal protection equipment.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let products enter drains.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electricity protected vacuum cleaner or by wet brushing and place in container for disposal according to local regulations (section 13)

6.4 Reference to other sections

See section 13 for disposal

Section 7: Handling and storage

7.1 Precautions for safety handling

Avoid contact with skin and eyes
Keep container tightly closed
Keep away from source of ignition – No smoking
Prevent sources of electrostatic discharge

7.2 Precautions for safety handling

Keep containers tightly closed in a dry and cool area
Ensure area is well-ventilated

7.3 Specific and uses

See section 1.2

Section 8: Exposure controls/personal protection

8.1 Control parameters

Component	CAS – no.	Value	Control parameters	Basis
None				

8.2 Exposure limit values:

Occupational Safety and Health Administration Permissible Exposure Limit (OSHA PEL; United States). Time Weighted Average (TWA): 5 mg/m³ Form: Respirable TWA: 10 mg/m³

American Conference of Governmental Industrial Hygienists Threshold Limit Value (ACGIH TLV; United States, 4/2014). TWA: 2 mg/m³ 8 hours. Form: Respirable fraction

OSHA PEL Z3 (United States, 2/2013) according to OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances TWA: 15 mppcf 8 hours.

Occupational exposure controls: Respiratory protection: Occupational risk management applied to engineered nanomaterials -- Part 1: Principles and approaches, as well as ISO/TS 12901-2:2014 : Occupational risk management applied to engineered nanomaterials -- Part 2: Use of the control banding approach. Hand protection: Handle with protecting gloves. Wash and dry hands after manipulation. Eye protection: Wear safety glasses conforming to an approved standard, such as NIOSH (US) or EN 166 (EU). Skin protection: Wear protective clothing to prevent contact with skin. The type of clothing must depend on the level of exposure to the product.

8.3 Exposure controls

Engineering controls

Install and operate general and/or local exhaust ventilation systems of sufficient power to maintain airborne concentration below the defined or recommended limit. If possible, manipulate under fume hood to avoid exposure. Ensure Eyewash and safety showers are close to working area

Personal protective equipment

Eye protection – goggles

Hand protection – Protective gloves (Ensure contaminated gloves are disposed of in accordance with applicable laws and good laboratory practice)

Body protection – Must be chosen in accordance to the concentration and amount of dangerous substance at the workplace.

Respiratory protection – Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard, such as NIOSH (US) or EN 143 (EU). Respirator selection must be based on known or anticipated exposure levels, the hazards of the material, and the safe working limits of the selected respirator. For little exposure, use type P95 (NIOSH) or type P1 (EN 143) respirators. For high exposure, use type P99 (NIOSH) or type P2 (EN 143) respirators. For further details, please consult the following ISO documents ISO/TS 12901-1:2012:

Environmental protection – Do not let product enter drains

Section 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

Appearance	-	Grey/black
State	-	Solid powder
Odour	-	None
Odour threshold	-	No data available
pH	-	No data available
Melting point	-	No data available
Boiling point	-	No data available
Sublimation point	-	No data available
Flash point	-	No data available
Evaporation rate	-	No data available
Flammability	-	Not applicable
Ignition temperature	-	No data available
Decomposition Temperature	-	No data available
Danger of explosion	-	No data available
Vapour pressure	-	No data available
Vapour density	-	No data available
Bulk density	-	No data available
Water solubility	-	No data available
Partition coefficient		
(n-octanol/water)	-	No data available
Auto-ignition Temperature	-	No data available
Viscosity	-	No data available
Explosive properties	-	No data available
Oxidising properties	-	No data available

9.2 Other safety information

No data available

Section 10: Stability and reactivity**10.1 Reactivity** – No data available**10.2 Chemical stability** – Stable under normal conditions**10.3 Possibility of hazardous reactions** – None under normal conditions**10.4 Conditions to avoid** – Heat, flames and sparks. Sources of ignition**10.5 Incompatible materials** – Acids. Halogens. Acid anhydrides. Strong oxidising agents**10.6 Hazardous decomposition products** – CO₂, CO and peroxides

Section 11: Toxicological information

11.1 Information on toxicological effects

This product contains engineered nanoparticles which have structural features with at least one dimension of 100 nanometers or less.

Acute toxicity

Primary irritant effect on skin – Irritation to skin and mucous membranes

Primary irritant effect on eye – irritating effect

Sensitisation – No effects known

Chronic toxicity – Inhalation of graphite (natural and synthetic) have shown to cause pneumoconiosis. Similar to coal worker's pneumoconiosis.

Additional toxicological information – chronic toxicity is not fully known. No classification of carcinogenic properties is available from the EPA, IARC, NTP, OSHA or ACGIH.

Section 12: Ecological information

12.1 Toxicity	-	No data available
12.2 Persistence and degradability	-	No data available
12.3 Bioaccumulative potential	-	No data available
12.4 Mobility in soil	-	No data available
12.5 Other adverse effects	-	No data available
12.6 General notes	-	Do not release without adequate government authorisation

Section 13: Disposal considerations

13.1 Waste treatment methods

Product	-	Contact local regulations for proper disposal
Soiled packaging	-	Official regulations must be met

Section 14: Transport information

IMDG/IMO

14.1 UN number	-	UN1219
14.2 Transport hazard class	-	3
14.3 Packaging group	-	II

ADR

14.4 UN number	-	UN1219
14.5 Transport hazard class	-	3
14.6 Packaging group	-	II

IATA

14.7 UN number	-	UN1219
14.8 Transport hazard class	-	3
14.9 Packaging group	-	II
14.10 Environmental hazard	-	No data available
14.11 Specific precautions to user	-	No special precautions required

Section 15: Regulatory information**Product related hazard information**

Hazard symbol	-	Xi Irritant
Risk Phase	-	36/37 irritation to eyes and respiratory system
Limitations of use	-	Technically qualified personnel only

Section 16: Other information...**Full text R-phrases**

R36 – Irritation to eyes

Full text H-phrases

H319 – Causes serious eye irritation

The above information is believed to be correct based on our knowledge on its present state. The properties of the product are not guaranteed to be exactly described as outlined. Employers should use their independent judgement of this information to ensure proper handling, use and protective equipment are used to protect the health and safety of the worker. Any use of this product is the responsibility of the user.