

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

1.1. Product identifier

Product name:	Multi-walled Carbon Nanotubes (MWCNTs)
Product number:	EM110001
CAS-No.:	Not available

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

Identified uses:

Research use.

1.3. Details of the supplier of the safety data sheet

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mail@emfutur.com

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Not classified as a hazardous substance according to GHS (rev. 7).

2.2. Label elements

P233	Keep container tightly closed.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment
P280	Wear protective gloves/protective clothing/eye protection/face protection

2.3. Other hazards

Other hazards which do not result in classification: Dust may form explosive mixture with air.

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name	Multi-walled Carbon Nanotubes (MWCNTs)
Description	Thin multiwall carbon nanotubes

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	In case of discomfort provide fresh air, warmth and rest, preferably in a comfortable upright sitting position. Rinse nose and mouth with water. Get medical attention if any discomfort continues. If breathing stops, provide artificial respiration.
Ingestion	NEVER MAKE AN UNCONSCIOUS PERSON VOMIT OR DRINK FLUIDS! Rinse nose, mouth and throat with water, and then drink plenty of water. Get medical attention.
Skin contact	Wash skin with soap and water. Continue to rinse for at least 15 minutes. Get medical attention if irritation appears after washing.
Eye contact	Do not rub eye. Immediately flush with plenty of water for up to 15-20 minutes. Remove any contact lenses after 5 minutes, maintain open eyes wide apart. Get medical attention promptly if symptoms occur after washing.

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

Inhalation	It may cause irritation to respiratory tract/inhalation
Ingestion	No effects recorded
Skin contact	It may cause skin irritation.
Eye contact	It may cause eye irritation.
Delayed effects	No delayed effects known.

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

Treat symptomatically. Contact medical centre immediately in case of ingestion or inhalation of a large amount of product. Specific treatment: No specific treatment.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: The substance is not combustible, use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Special hazards arising from the substance or mixture

In the event of combustion or thermal decomposition, this material may release carbon monoxide (CO) or carbon dioxide (CO₂) or other toxic gases. At temperatures over 300°C, this material may react with potassium, sodium, rubidium, or cesium to create intercalation compounds that may ignite and may react explosively with water.

5.3. Advice for firefighters

Wear self-contained breathing apparatus. Wear suitable protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Emergency responders should wear suitable protective equipment to prevent inhalation or skin contact. In case of spills, beware of slippery floors and surfaces.

6.2. Environmental precautions

Do not allow to enter drains, sewers or watercourses. The product should not be dumped in nature but collected and delivered according to local regulations.

6.3. Methods and material for containment and cleaning up

Spilled or released material should be collected mechanically and disposed of in suitable containers. Prevent dust generation.

6.4. Reference to other sections

For personal protection, see section 8.
For waste disposal, see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Avoid contact with skin and eyes. Wear personal protective equipment to prevent skin and eye contact. Do not wear contact lenses when using this product. Prevent dust generation. Avoid dust inhalation using local ventilation or appropriate filters.

7.2. Conditions for safe storage, including any incompatibilities

This material should be stored in labelled closed containers away from sources of ignition or heat. Care should be taken to avoid creating accumulations or concentrations of dust.

7.3. Specific end use(s)

Research use.

SECTION 8: Exposure controls/personal protection


8.1. Control parameters

No official Occupational Exposure Limit has been established yet.

Obtain special instructions before use.

Derived No Effect Level (DNEL) for MWCNT – Inhalation - long term exposure of workers: 0.05 mg/m³

8.2. Exposure Control / Personal protection

Protective equipment	
	
Engineering measures	
Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust. Local exhaust ventilation should be employed if dust is generated when handling. Provide eyewash station.	
Personal Protective Equipment	
Respiratory equipment	Respiratory protection must be used if the general level exceeds the recommended occupational exposure limit. A respiratory protection program that meets applicable OHSA (USA) or CEN (UE) requirements should be maintained in the workplace.
Hand protection	Wear protective gloves.
Eye protection	Wear approved safety goggles. Use face shield in case of splash risk.
Body protection	Wear full body industrial type work clothing.
Environmental exposure controls	
All ventilation systems should be filtered before discharge to atmosphere. Avoid releasing to the environment. Avoid uncontrolled releases. Inform competent authorities in case large spillage into water courses.	

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

Appearance	Solid
Colour	Black
Odour	Odourless
Initial boiling point and boiling range (°C)	> 400°C
Melting point (°C)	> 400°C
Vapour density (air=1)	Not applicable.
Vapour pressure	Not applicable.
Evaporation rate	Not applicable.
pH-Value, Conc. Solution	Not applicable.
Viscosity 40°C	Not applicable.
Bulk density (gr/mL)	0.06-0.08
Solubility Value	Insoluble (water)
Decomposition temperature (°C)	> 450°C
Flash point (°C)	Not applicable.
Auto Ignition Temperature (°C)	> 390°C at 1013 hPa
Oxidising properties	Not applicable

9.2. Other information

No information required.

SECTION 10: Stability and reactivity

10.1. Reactivity

There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stable under normal temperature conditions.

10.3. Possibility of hazardous reactions

At temperatures over 300°C, this material may react with potassium, sodium, rubidium, or cesium to create intercalation compounds that may ignite and may react explosively with water.

10.4. Conditions to avoid

Not known

10.5. Incompatible materials

Avoid contact with strong oxidizing agents, fluorine, or chlorine trifluoride.

10.6. Hazardous decomposition products

Under fire conditions, this material may release carbon monoxide (CO) or carbon dioxide (CO₂) or other toxic gases.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Absorption, distribution, metabolism	
Absorption	No data available
Distribution	No data available
Potential for accumulation	No data available
Toxicologically significant metabolite	No data available
Acute toxicity	
Rat LD50 oral	> 5000 mg/kg
Rat LD50 dermal	> 2000 mg/kg
Rat LC50 inhalation	No data available
Skin irritation	No data available
Eye irritation	No data available
Skin sensitization	No data available
Genotoxicity	
In vitro - negative	
Long term toxicity and Carcinogenicity	
No data available	
Reproductive toxicity	
No data available	

SECTION 12: Ecological information

12.1. Toxicity

Test material	Study type	Result
MWCNT	Fish, 14 days	LC50: > 100 mg/l
MWCNT	Daphnia, 48 hours	EC50: > 100 mg/l
MWCNT	Algae, 72 hours	EC50: 134 mg/l

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 information required.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information

When handling waste, consideration should be made to the safety precautions applying to handling of the product. Waste should not be disposed of by release to sewers. Uncleaned packagings: Disposal must be made according to official regulations.

SECTION 14: Transport information

14.1. UN number

Not classified as a dangerous good for transport under DOT, IMDG, ADR, RID, or ICAO/IATA

14.2. UN proper shipping name

No information required.

14.3. Transport hazard class(es)

No information required.

14.4. Packing group

No information required.

14.5. Environmental hazards

No information required.

14.6. Special precautions for user

No information required.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

No information required.

SECTION 15: Regulatory information

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

Specific regulatory dossiers were established based on data generated on the above-mentioned product. For all dossiers, no CAS number was provided to the authorities and this product was registered under the chemical name "short tangled multi-walled carbon nanotubes obtained by catalytic chemical vapour deposition".

European Union

REACH

The substance "short tangled multi-walled carbon nanotubes obtained by catalytic chemical vapour deposition" (MWCNT) has been registered under REACH (RRN: 01-2119879048-26-0001). The substance as registered had no corresponding CAS number. The European Agency ECHA has however assigned the provisional EC List Number 936-414-1

Other regulations (EU)

Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances (SEVESO III): Not listed on Annex I.

This substance/mixture does not contain any volatile organic compounds (VOCs) in the sense of Directive 2010/75/EU.

Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer (Ozone Depleting Substances): Not applicable.

Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (PIC), as revised in 2015: Not applicable.

United States of America

Toxic Substance Control Act

The substance in this product is listed on the TSCA Inventory and is considered as Active.

This product contains one or more substance(s) which is/are subject to a TSCA Section 5(e) consent order that imposes certain restrictions on handling, storage, distribution, use and disposal.

Canada

Since a component of this product was not listed on the Canadian Domestic Substance List (DSL) or non-Domestic Substances List (NDSL), a schedule 5 of the New Substances Notification Regulations (Chemicals and Polymers) of the Canadian Environmental Protection Act, 1999, has been granted.

SECTION 16: Other information

Advice on any training appropriate for workers	To ensure protection of human health and environment, workers must be provided with proper training about how to handle and store chemicals used at work.
Revision Date	01 May 2022
Substituted version	

This information is based on our present state of knowledge and our research into available scientific literature as well as information obtained from our vendors. EMFUTUR Technologies makes no responsibility regarding the accuracy of the scientific literature or any third-party information and, therefore, cannot guarantee any specific material properties. Use of this information shall not establish a legally binding relationship.

The information provided in this SDS must be considered as a starting point for a comprehensive program of health and safety in your company. If further data on the product is required to perform your risk assessment, contact us and we will try to assist as much as possible.