

# NC7000™

Multiwall carbon nanotubes

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

### 1.1 Product identifier:

|                                       |                                                                                                                                                       |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product identifier used on the label: | NC7000™                                                                                                                                               |
| Other means of identification:        | Multi-walled carbon nanotubes (MWCNTs)<br>Short tangled MWCNTs obtained by catalytic chemical vapour deposition - Synthetic graphite in tubular shape |
| EC Number/ List Number:               | - / 936-414-1                                                                                                                                         |
| CAS Number:                           | -                                                                                                                                                     |
| REACH Registration Number (RRN):      | 01-2119879048-26-0001                                                                                                                                 |
| Belgium Nanoregister Number:          | BE-000924 (as substance)                                                                                                                              |

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

|                           |                                                                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Relevant Identified Uses: | Additive for Industrial and Professional use.                                                                                                   |
| Uses Advised against:     | The product is not intended for food contact applications, prolonged or repeated contact with skin/oral cavity, use in toys or medical devices. |

### 1.3 Details of the supplier of the safety data sheet

|               |                                                                  |
|---------------|------------------------------------------------------------------|
| Manufacturer: | Nanocyl S.A.<br>Rue de l'Essor, 4 - B-5060 Sambreville - Belgium |
| Phone:        | + 32 71 750 380 (office hours) - Fax: + 32 71 750 390            |
| E-mail:       | info@nanocyl.com                                                 |

### 1.4 Emergency telephone number

|        |                                                    |
|--------|----------------------------------------------------|
| Phone: | + 32 71 750 380 (office hours, English and French) |
|--------|----------------------------------------------------|

## SECTION 2. Hazards identification

### 2.1 Classification of the substance or mixture

#### 2.1.1 Classification according to Regulation (EC) No 1272/2008 (CLP)

This substance does not meet the criteria for classification according to Regulation (EC) 1272/2008 [CLP].

#### 2.1.2 Additional information: See Section 2.3.

### 2.2 Label elements

- \* Pictograms: not applicable
- \* Signal words: not applicable
- \* Hazard statements: not applicable
- \* Precautionary statements (assigned based on expert judgement):
  - 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

Dust may form explosive mixture with air.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

| Main constituent                                                                                                                                                    | CAS nr / EC nr / List Nr | % (wt.) | Classification CLP |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------|--------------------|
| Short tangled Multi-walled carbon nanotubes (MWCNTs) obtained by catalytic chemical vapour deposition - Synthetic graphite in tubular shape<br><br>Nanoform NC7000™ | - / - / 936-414-1        | ~ 90    | Not classified     |

The substance is covered by a nanoform registration.

|                                       |         |                                                                            |
|---------------------------------------|---------|----------------------------------------------------------------------------|
| Name of Nanoform / Description        | NC7000™ | Pristine thin, short (ca. 1.5 µm), entangled multi-walled carbon nanotubes |
| Name of Set of nanoform / Description | -       | -                                                                          |

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|                                                                              |                                   |                                          |
|------------------------------------------------------------------------------|-----------------------------------|------------------------------------------|
| External diameters                                                           | d10                               | 6,8 nm                                   |
|                                                                              | d50                               | 9,2 nm                                   |
|                                                                              | d90                               | 12,9 nm                                  |
| Shape and aspect ratio of particles                                          | elongated                         | ca 163:1                                 |
| Crystallinity                                                                | ca 90%                            | hexagonal graphitic carbon structures    |
| Surface functionalisation / treatment                                        | pristine                          | no coating or functionalisation intended |
| Specific surface area                                                        | 240 - 300 m <sup>2</sup> /g       |                                          |
| Average number-based Particle Size Distribution of agglomerates at 1 / 4 bar | d10                               | 72 µm / 46 µm                            |
|                                                                              | d50                               | 303 µm / 186 µm                          |
|                                                                              | d90                               | 866 µm / 547 µm                          |
| Additional information                                                       | Short and flexible (ca 7,8 walls) |                                          |

## SECTION 4. First aid measures

### 4.1 Description of first aid measures

|                     |                                                                                                                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| After skin contact: | Remove contaminated clothing immediately. Wash contacted skin areas with plenty of cold to lukewarm water and soap. If irritation develops, consult a physician.                                       |
| After eye contact:  | Hold the eyes open and rinse with water for a sufficiently long period of time (at least 10 minutes). Obtain medical attention if pain, blurred vision, swelling, burning or redness persists.         |
| After inhalation:   | If high concentration of dust is inhaled, move the person into fresh air, keep warm and allow to rest. If breathing is difficult, oxygen may be administered and medical attention should be obtained. |
| Ingestion:          | Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Obtain medical attention.                                                                        |

4.2 Most important symptoms and effects, both acute and delayed: See Section 2.

4.3 Indication of any immediate medical attention and special treatment needed: See Section 4.1.

## SECTION 5. Firefighting measures

### 5.1 Extinguishing media

|                   |                                                |
|-------------------|------------------------------------------------|
| Suitable media:   | Water fog, Foam, Carbon Dioxide, Dry Chemical. |
| Unsuitable media: | High volume water jet                          |

### 5.2 Special hazards arising from the substance or mixture

|                   |                                           |
|-------------------|-------------------------------------------|
| Specific hazards: | Dust can form explosive mixture with air. |
|-------------------|-------------------------------------------|

Combustion products: May form toxic fumes, carbon monoxide, carbon dioxide, metal oxides

### 5.3 Advice for firefighters

Protective equipment's: Wear self-contained breathing apparatus. Wear suitable protective clothing.

## **SECTION 6. Accidental release measures**

### 6.1 Personal precautions, protective equipment and emergency procedures

Equip cleanup crew with proper protection (see Section 8). Ensure adequate ventilation/exhaust extraction. Prevent formation of explosive dust-air mixture.

### 6.2 Environmental precautions:

Collect for disposal. Avoid discharge to natural waters, sewers and biological waste water treatment plants.

### 6.3 Methods and material for containment and cleaning up:

Collect the spilled material using a vacuum with a suitable filter or damp sweep. Industrial HEPA vacuum cleaners are recommended. Avoid formation of dust. Use sealable dedicated containers.

### 6.4 Reference to other sections: See Sections 8 and 13.

## **SECTION 7. Handling and storage**

### 7.1 Precautions for safe handling

Avoid dust formation. Do not inhale dust.

Avoid contact with eyes and skin. Ensure there is no direct skin contact with product. Avoid direct eye contact with product, also via contamination on hands. Contact with skin and eyes and inhalation of dust should be avoided under all circumstances.

Handle in accordance with good industrial hygiene and safety procedures. Wash hands with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities.

See also Section 8.

In case of contact, ensure prompt removal from eyes, skin and clothing. See also Section 4.

### 7.2 Conditions for safe storage, including any incompatibilities

Keep only in the original closed container in a dedicated place. Keep containers in a cool, dry place with adequate ventilation. Keep away from open flames and high temperature.

Storage class Germany (Lagerungsklasse - LGK): 11 Combustible solids

### 7.3 Specific end use(s):

Recommendations: use the product as supplied in powder form in industrial or professional settings only.

## SECTION 8. Exposure controls / Personal protection

### 8.1 Control parameters

#### Components with workplace parameters:

No official Occupational Exposure Limit has been established yet. Obtain special instructions before use.

Worker exposure to dust should be evaluated taking into account all activities carried out on site. The type of dust (respirable / breathable, organic / inorganic, ...) depends on these activities.

Derived No Effect Level (DNEL) for MWCNT – Inhalation - long term exposure of workers: 0.05 mg/m<sup>3</sup>

### 8.2 Exposure controls

#### 8.2.1 Appropriate engineering controls:

##### *Technical measures to prevent release:*

Process enclosure and automation are advised to prevent release.

##### *Organisational measures to prevent exposure:*

Wash hands and other exposed areas with mild soap and water before leaving work.

Depending on the exposure and activity, use disposable coveralls for cleanliness. Always remove contaminated clothing before entering clean areas.

##### *Technical measures to prevent exposure:*

Good ventilation of the workplace is required.

Local Exhaust Ventilation may be used to further reduce exposure.

Facilities handling or storing this material should be equipped with an emergency eyewash station.

#### 8.2.2 Personal protection equipment:

##### 8.2.2.1 Eye and face protection:

Chemical goggles or safety glasses.  
Recommended: Use eye protection according to EN 166.

##### 8.2.2.2 Skin protection:

Body protection:

Hand protection:

Wear gloves and other clothing as required to avoid contact  
Wear suitable protecting gloves (EN 374-3) to prevent soiling of hands.  
Recommended materials include nitrile rubber (NBR; > 0.35 mm).  
Unsuitable material: neoprene may absorb nanoparticles.

##### 8.2.2.3 Respiratory protection:

Use respiratory protection when required by the workplace risk assessment. The inhalative risk assessment should consider the cumulative exposure to aerosols, vapours and dust on the workplace.

When directly exposed or handling the powder wear suitable respiratory equipment.

Recommended: filter P3 (EN 143).

##### 8.2.2.4 Thermal hazards:

Not applicable.

## SECTION 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

|                                          |                                                                |
|------------------------------------------|----------------------------------------------------------------|
| Appearance/Form:                         | solid; powder – nanomaterial, no surface modification intended |
| Odour/Odour threshold:                   | odorless                                                       |
| pH:                                      | Not applicable.*                                               |
| Solubility in water:                     | insoluble.                                                     |
| Dispersion stability:                    | Not conclusive according to OECD criteria.                     |
| Melting point/freezing point:            | > 400°C                                                        |
| Initial boiling point and boiling range: | > 400°C                                                        |
| Flash point:                             | Not applicable.*                                               |
| Decomposition temperature:               | ~ 480°C (TGA)                                                  |
| Smouldering temperature:                 | > 400°C (EN 50281-2-1)                                         |
| Auto-ignition temperature:               | > 390°C at 1013 hPa                                            |
| Evaporation rate                         | Not applicable.*                                               |
| Viscosity:                               | Not applicable.*                                               |
| Vapour pressure:                         | Not applicable.*                                               |
| Vapour density:                          | Not applicable.*                                               |
| Density:                                 | No data available                                              |
| Flammability (solid, gas):               | Not fulfilling GHS/CLP criteria.                               |
| Oxidising properties                     | Not fulfilling GHS/CLP criteria.                               |
| Explosive properties                     | Not fulfilling GHS/CLP criteria.                               |

\* Testing can be waived because substance is a solid.

### Formation of explosive dust/air mixtures

|                          |                      |              |
|--------------------------|----------------------|--------------|
| Explosibility class:     | ST1                  | (VDI 2263)   |
| Explosive properties:    | Kst = 42 bar.m/s     | (VDI 2263)   |
| Minimum Ignition Energy: | > 10 J               | (VDI 2263)   |
| Upper explosion limit    | No data available.   |              |
| Lower Explosion Limit:   | 180 g/m <sup>3</sup> | (EN 14034-3) |

### 9.2 Other information

|                          |                |
|--------------------------|----------------|
| Bulk density:            | ~ 60 g/L       |
| Particle characteristics | See Section 3. |

NOTE: The physical data presented above are typical values and should not be construed as a specification.

## SECTION 10. Stability and Reactivity

10.1 Reactivity: No hazardous reaction when handled and stored according to provisions.

10.2 Chemical stability: Stable under normal handling and storage conditions.

10.3 Possibility of hazardous reactions: Hazardous polymerization will not occur.

10.4 Conditions to avoid: Exposure to moisture. Avoid dust formation

10.5 Incompatible materials: Strong oxidizing and reducing agents.

10.6 Hazardous decomposition products:

No hazardous decomposition products known at room temperature.

## SECTION 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity:

| Test material | Route of exposure | LD50         |
|---------------|-------------------|--------------|
| MWCNT         | Oral              | > 5000 mg/kg |
| MWCNT         | Dermal            | > 2000 mg/kg |

#### Skin corrosion/irritation - Serious eye damage/irritation:

| Test material | Organ | Result       |
|---------------|-------|--------------|
| MWCNT         | skin  | Not irritant |
| MWCNT         | eye   | Not irritant |

Respiratory or skin sensitization: No data available.

#### Germ cell mutagenicity:

| Test material | Method                      | Result   |
|---------------|-----------------------------|----------|
| MWCNT         | <i>In vitro</i> , AMES test | Negative |

#### Carcinogenicity:

| Test material | Exposure                 | Species | Result                   |
|---------------|--------------------------|---------|--------------------------|
| MWCNT         | 2-years, intraperitoneal | rat     | No carcinogenic response |

#### Reproductive toxicity:

| Test material | Method   | Exposure                  | Species | Result                                                                                                  |
|---------------|----------|---------------------------|---------|---------------------------------------------------------------------------------------------------------|
| MWCNT         | OECD 421 | Inhalation<br>(nose only) | Rat     | NOAEL (maternal): 1,5 mg/m <sup>3</sup><br>No adverse reproductive effects at<br>highest concentration. |

#### Summary of evaluation of the CMR properties:

Practical experiences do not give any evidence for CMR activity of categories 1 or 2.

STOT-single exposure: No data available.

| Test material | Method          | Result                     |
|---------------|-----------------|----------------------------|
| MWCNT         | Possible hazard | May be harmful if inhaled. |

STOT-repeated exposure:

| Test material | Exposure            | Species, Target organ                             | Result                       |
|---------------|---------------------|---------------------------------------------------|------------------------------|
| MWCNT         | 28 days, oral       | rat                                               | NOAEL: 0.5 mg/kg             |
| MWCNT         | 5 days, inhalation  | rat, lung (pulmonary inflammation)                | LOAEC: 2 mg/m <sup>3</sup>   |
| MWCNT         | 90 days, inhalation | rat, lung (multifocal granulomatous inflammation) | LOAEC: 0.1 mg/m <sup>3</sup> |

Aspiration hazard: No data available

## SECTION 12. Ecological information

### 12.1 Toxicity

#### Acute 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   |

#### Chronic toxicity

| Test material | Study type           | Result          |
|---------------|----------------------|-----------------|
| MWCNT         | Fish, semi static    | EC10: 100 mg/l  |
| MWCNT         | Daphnia, semi static | NOEC: > 25 mg/l |

12.2 Persistence and degradability: Not readily biodegradable (according to OECD criteria).

#### 12.3 Bioaccumulative potential

Partition coefficient n-octanol /water (log Kow): Not applicable.

Bioconcentration factor (BCF): No data available.

12.4 Mobility in soil: No data available.

#### 12.5 Results of PBT and vPvB assessment:

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6 Other adverse effects: The substance has no ozone depleting potential.

## SECTION 13. Disposal considerations

### 13.1 Waste treatment methods

#### 13.1.1 Product / Packaging disposal:

Product: Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, use the appropriate code according to the European Waste Catalogue (EWC).

Waste Catalogue (EWC) code: 061399 "wastes not otherwise specified"

Container: Empty containers can be landfilled after have been emptied as thoroughly as possible, when in compliance with the Environmental Protection Regulation and with local, state and federal regulations.

13.1.2 Waste treatment-relevant information: Avoid losses to the environment

13.1.3 Sewage disposal-relevant information: Do not allow to enter ground soil, sewage, drains.

13.1.4 Other disposal recommendations: No data available

## SECTION 14. Transport information

No dangerous good in sense of these transport regulations:

Land transport (ADR/RID); Inland waterway transport (ADN); Sea transport (IMDG); Air transport (ICAO-TI / IATA-DGR); USA Department of Transport (DOT); Canada Transportation of Dangerous Goods (TDG).

14.1. UN number : None.

14.2. UN proper shipping name: Not applicable.

14.3. Transport hazard class(es) : Not applicable.

14.4. Packing group: Not applicable.

14.5. Environmental hazards: No.

14.6. Special precautions for user: Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code": Not applicable.

## SECTION 15. Regulation 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.

This product has been registered under the nanoform "NC7000".

##### 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.

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): Not listed in Annex III (consulted on 26/04/2019).

#### 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. Nanocyl S.A. has filled a Pre-Manufacture Notice and submitted a Notice of Commencement in 2010. Please contact Nanocyl S.A. for information about the Consent Order, the Pre-Manufacture Notice (PMN) and the Significant New Use Rule (SNUR).

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

Please contact Nanocyl S.A..

## **Canada**

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

## **Inventories**

All components of this product are compliant with the following chemical inventories: Japanese Existing and New Chemical Substances (ENCS), Korean Existing Chemicals List (ECL), Philippines Inventory of Chemicals and Chemical Substances (PICCS), Chinese Chemical Inventory of Existing Chemical Substance (IECS) and Taiwan Existing chemical Substance Nomination (ECN).

## **15.2 Chemical Safety Assessment:**

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

Safe use information was integrated in the core sections of the Safety Data Sheet.

## **SECTION 16. Other information**

Voluntary safety information following the Safety Data Sheet format according to Regulation (EC) No. 1907/2006 (REACH).

### **Abbreviations and acronyms:**

|       |                                                                      |
|-------|----------------------------------------------------------------------|
| EC    | European Commission                                                  |
| CLP   | Classification Labelling and Packaging                               |
| REACH | Registration, Evaluation, Authorisation and restriction of Chemicals |
| TSCA  | Toxic Substance Control Act                                          |
| SDS   | Safety Data Sheet                                                    |

Vertical lines in the left hand margin indicate an amendment from the previous version.

### **Safety Data Sheet revision history:**

|                   |                  |       |
|-------------------|------------------|-------|
| Previous version: | 19 December 2019 | (V14) |
| Current version:  | 7 March 2022     | (V15) |

## **Disclaimer:**

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