AQUACYL™
CNT water dispersions

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

1.1 Product identifier:

| | |
|---|---|
| Product identifier used on the label: | AQUACYL™ AQ0303 |
| Other means of identification: | Multi-walled carbon nanotubes aqueous solution<br>Water-based nanoform dispersion |
| REACH Registration Number (RRN): | Not applicable. |
| Belgium Nanoregister Number: | Please consult Nanocyl S.A. |

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

| | |
|---|---|
| General use: | Manufacturing.<br>For Research & Development only. |
| Identified Uses: | For Industrial and Professional use only. |
| Uses Advised against: | Not intended for food contact applications, 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 mixture does not meet the criteria for classification according to Regulation (EC) 1272/2008 [CLP].

This product is not classified as hazardous according to Regulation OSHA GHS 29 CFR 1910.1200.

2.1.2 Additional information: None.

2.2 Label elements

* Pictograms: not applicable.
* Signal words: not applicable.
* Hazard statements: not applicable.
* Precautionary statements: not required but assigned based on expert assessment.

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

2.3 Other hazards

If the product is dried, dust may form explosive mixture with air. See also Sections 6, 7 and 8.

The product may contain up to 5% of ingredient(s) with unknown acute toxicity.

## SECTION 3: Composition/information on ingredients

3.2 Mixtures

| Substances | EC Number / List number | CAS Number | Reach Registrierungs-Nummer | % (wt.) | Classification |
|---|---|---|---|---|---|
| *Water* | 231-791-2 | 7732-18-5 | n.a. | > 90 | - |
| *Proprietary dispersant(s)* | Proprietary | Proprietary | n.a. | < 5 | - |
| Short tangled Multi-walled carbon nanotubes (MWCNTs) obtained by catalytic chemical vapour deposition- Synthetic graphite in tubular shape<br><br>Nanoform name: Pristine thin, short (ca. 1.5 µm), entangled multi-walled carbon nanotubes | - / 936-414-1 | - | 01-2119879048-26 | < 5 | - |



www.nanocyl.com
info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

## SECTION 4. First aid measures

4.1 Description of first aid measures

After skin contact: Take off contaminated clothing. 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). Remove contact lenses and rinse again. Obtain medical attention if pain, blurred vision, swelling, burning or redness persists.

After inhalation: If vapours/aerosols/dried product are inhaled, move the person into fresh air, keep warm and allow to rest. If breathing is difficult, oxygen may be administered. Seek medical attention.

Ingestion: Rinse out mouth with water, and then drink sips of water to remove taste from mouth. Never give anything to drink or swallow to an unconscious person. 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: Treat symptomatically.

## 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: None known.

Hazardous combustion products: May form toxic fumes, carbon monoxide, carbon dioxide and metal oxides.

5.3 Advice for firefighters

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

Further information: Water used to extinguish fire should not enter drainage systems, soil or stretches of water. Ensure that there are sufficient retaining facilities for media used to extinguish fire.



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info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

## SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Equip cleanup crew with proper protection (see chapter 8). Avoid contact with skin, eyes and clothing.

Special danger of slipping by leaking/spilling product.

Immediately wipe up any spills to avoid dust formation. Do not inhale aerosols or dehydrated product.

6.2 Environmental precautions:

Stop leak if safe to do so. Contain spilled product. Collect for disposal.

Discharge into the environment must be avoided. Do not allow to enter into surface water or drains. Avoid discharge to sewers and biological waste water treatment plants.

Do not allow to enter into soil/subsoil. Promptly shovel and dispose of contaminated soil to prevent further infiltration through soil.

6.3 Methods and material for containment and cleaning up:

Collect in closed and suitable containers for disposal.

| | |
|---|---|
| Small spills: | Clear spills immediately to avoid dust formation. Wipe up with absorbent material (eg. cloth, fleece). Damp sweep any residues. |
| Large spills: | Soak up inert absorbent (eg. clay, sand,…) and dispose as waste requiring special attention. Wash carefully any residues. |
| Dried up product: | Do not brush or use compressed air to avoid dust formation. Wet clean or vacuum up solids. Use approved industrial vacuum cleaner for removal. Recommended: High efficiency particulate air filter (HEPA filter). |

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

## SECTION 7. Handling and storage

7.1 Precautions for safe handling

Avoid spilling the product, as it might cause falls.

Prevent aerosol formation or splashes. Avoid dust formation when the product dries up.

Handle in accordance with good industrial hygiene and safety procedures. See Section 8. Avoid contact with skin, eyes and clothes. Avoid breathing dust/fume/gas/mist/vapours/spray. In case of contact, ensure prompt removal from eyes, skin and clothing.



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info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

7.2 Conditions for safe storage, including any incompatibilities

Keep/store only in original container. Keep container tightly closed. Keep the container clean. Store in a well-ventilated place. Store in a dry place.

Keep away from sources of heat (e.g. hot surfaces), sparks and open flames. Do not store at temperatures above: 30°C. Do not freeze. Do not store at temperatures below: 5°C.

Storage class: 10 Combustible liquids

7.3 Specific end use(s): Not applicable.

## SECTION 8. Exposure controls / Personal protection

8.1 Control parameters

Apply technical measures to comply with the Occupational Exposure Limits. The Occupational Exposures Limits values are country or region specific. Please check which values are applicable at your workplace.

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

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

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

*Measures to prevent aerosol and dust generation:*
Do not allow uncontrolled product dry up. Avoid aerosol formation in open systems without suitable ventilation and/or extraction.

*Organisational measures to prevent exposure:*
Change contaminated clothing immediately. Wash with soap and water before eating, drinking, smoking, applying cosmetics or using toilet facilities. Wash hands and other exposed areas with mild soap and water before leaving work.

*Technical measures to prevent exposure:*
When bringing the material to high temperatures (> 80°C), vapours, gases and dust might be generated. For such processing conditions, good ventilation of the workplace is required. Facilities handling or storing this material should be equipped with an emergency eye-wash station.



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

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: Wear gloves and other clothing as required to avoid contact

Hand protection: Wear suitable protecting gloves according to EN 374.
Recommended materials include nitrile rubber (NBR; > 0.35 mm).
Unsuitable material: neoprene.

8.2.2.2 Skin protection:

Body protection: Suitable protective clothing.

8.2.2.3 Respiratory protection:

Dust/aerosol formation: In case of inadequate ventilation wear suitable respiratory protection.
Recommended: P3 Particle filter device (DIN EN 143) or NIOSH-approved respirator.

Elevated temperature: In case of inadequate ventilation wear suitable respiratory protection.
Recommended: P3 Particle filter device (DIN EN 143) or NIOSH-approved respirator.

8.2.2.4 Thermal hazards:

Elevated temperature: Wear heat resistant gloves.

8.2.3 Environmental exposure controls: Collect for disposal. See Section 6.2.

## SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Appearance: | Black liquid, dispersion. |
| Odour/Odour threshold: | Odorless. |
| pH: | No data available. |
| Solubility in water: | Dispersible. |
| Melting point/freezing point: | 0°C / 32°F (estimated) |
| Initial boiling point and boiling range: | 100°C/ 212°F (estimated) |
| Flash point: | No flash point up to 100 °C. |
| Decomposition temperature: | No data available. |
| Smouldering temperature: | No data available. |
| Auto-ignition temperature: | No data available. |
| Evaporation rate | No data available. |
| Viscosity: | No data available. |
| Vapour pressure: | ~18 mmHg at 20°C / 68°F (estimated) |
| Vapour density: | No data available. |



www.nanocyl.com
info@nanocyl.com
+32 (0)71 75 03 80
Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

| | |
|---|---|
| Density: | ~1g/cm$^3$ at 20°C / 68°F (estimated) |
| Flammability (solid, gas): | Not fulfilling GHS/CLP criteria. |
| Oxidising properties | Not fulfilling GHS/CLP criteria. |
| Explosive properties | Not fulfilling GHS/CLP criteria. |

9.2 Other information

Bulk density: Not applicable.

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: Avoid heating up above 80°C. Avoid dust formation when the product is dried.

10.5 Incompatible materials: Strong oxidizing and reducing agents.

10.6 Hazardous decomposition products:

No hazardous decomposition products known at room temperature.

May form hazardous decomposition products when exposed to high temperatures (see also Section 5.2). Thermal decomposition or combustion of the additives may produce smoke of carbon oxides and/or low molecular weight organic compounds.

## SECTION 11. Toxicological information

11.1 Information on toxicological effects

No data available on the product itself.

Acute toxicity:

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



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

Skin corrosion/irritation - Serious eye damage/irritation:

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

Respiratory or skin sensitization: No data available.

Germ cell mutagenicity:

| Test material | Method | Result |
|---|---|---|
| MWCNT | *In vitro*, AMES test | Negative |

Carcinogenicity:

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

Reproductive toxicity: No data available.

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$^3$ |
| MWCNT | 90 days, inhalation | rat, lung (multifocal granulomatous inflammation) | LOAEC: 0.1 mg/m$^3$ |

Aspiration hazard: No data available



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

## SECTION 12. Ecological information

12.1 Toxicity

No data available on the product itself.

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 |
| Dispersant | Fish, 96 hours | LC50: 600 mg/l |
| Dispersant | Daphnia, 48 hours | LC50: > 1000 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 of waste according to applicable legislation. For disposal within the European Union, use the appropriate code according to the European Waste Catalogue (EWC).



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
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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

**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. The MWCNT dispersed in this product is NC7000™.

The substance(s) in this product has (have) been Registered or are exempted from registration according to Regulation (EC) REACH 1907/2006.



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l’Essor N°4
B-5060 Sambreville
Belgium

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), as revised in 2015: Not applicable.

**United States of America**

Toxic Substance Control Act

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. Please contact Nanocyl S.A. for information about the Consent Order, the Pre-Manufacture Notice (PMN) and the Significant New Use Rule (SNUR).

**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, have been granted.

**Inventories**

All components of this product are compliant with the following chemical inventories:

European Inventory of Existing Commercial Chemical Substances (EINECS), Canadian Domestic Substance List (DSL) or non-Domestic Substances List (NDSL), Japanese Existing and New Chemical Substance (ENCS), Korean Existing Chemical Substance (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:

No Chemical Safety Assessment has been carried out for this mixture by the supplier.

A Chemical Safety Assessment is not required as product is not classified as hazardous.



www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium

## SECTION 16. Other information

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

The contents and format of this SDS are in accordance with OSHA GHS Regulation 29 CFR 1910.1200 and its amendments.

Abbreviations and acronyms:

| | |
|---|---|
| EC | European Commission |
| CLP | Classification Labelling and Packaging |
| CFR | Code of Federal Regulations |
| GHS | Globally Harmonized System |
| HCS | Hazard Communication Standard |
| NIOSH | National Institute for Occupational Safety and Health |
| OSHA | Occupational Safety and Health Administration |
| 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: | 9 January 2020 | (V03) |
| Current version: | 6 January 2023 | (V04) |

## Disclaimer:

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www.nanocyl.com

info@nanocyl.com
+32 (0)71 75 03 80

Nanocyl SA
Rue de l'Essor N°4
B-5060 Sambreville
Belgium