

PLASTICYL™

CNT thermoplastic concentrates

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

1.1 Product identifier:

Product identifier used on the label: PLASTICYL™ TPU1001

Other means of identification: Carbon/Thermoplastic polyurethane mixture.

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: Raw material for plastics industry

Identified Uses: Extrusion; Injection
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.
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 applicable

2.3 Other hazards

Explosion hazard: dust generated during processing/handling may form explosive mixture with air.

When grinded to a fine powder, the product may be classified as Combustible Dust in accordance with regulation OSHA GHS 29 CFR 1910.1200.

If dust is generated, it could scratch the eyes and cause minor irritation to the respiratory tract.

When heated, the vapors/fumes given off may cause respiratory tract irritation.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Substances	EC Number / List number	CAS Number	Reach Registration Number	% (wt.)	Classification
Thermoplastic polyurethane (TPU)	polymer	Not available	-	~ 90	-
Short tangled Multi-walled carbon nanotubes (MWCNTs) obtained by catalytic chemical vapour deposition- Synthetic graphite in tubular shape*	- / 936-414-1	-	01-2119879048-26	~ 10	-

SECTION 4. First aid measures

4.1 Description of first aid measures

After skin contact: In case of contact with molten product, immediately flood the affected area with cold water. Do not pull solidified product away from the skin. Transport to nearest medical facility for additional treatment.

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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 persist.
After inhalation:	If vapours are 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:	Get medical if necessary. No specific measures have to be taken if the product is swallowed. Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

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: Dust can form explosive mixture with air.

Hazardous combustion products: May form toxic fumes, carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxides, hydrogen cyanide and isocyanates.

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.

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 with molten product. Do not inhale vapours and dust.

Avoid dust formation.

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 spilled polymer, pellets; it could cause falls (danger of slipping).

If molten, allow material to cool and place into an appropriate marked container for disposal.

Avoid dust formation.

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

SECTION 7. Handling and storage

7.1 Precautions for safe handling

No specific requirements necessary, if handled at room temperature.

Avoid spilling the product, as it might cause falls.

When bringing the material to processing temperatures gases might develop. Provide appropriate ventilation for such processing conditions.

Take precautionary measures against explosion risks, as all type of polymers may develop dust during transporting or grinding of pellets. Avoid dust formation. Dust can be ignited by static discharge. Open flames prohibited. Do not smoke.

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. Avoid dust formation.

| Storage class: 11 Combustible solids

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

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Limits values are country or region specific. Please check which values are applicable at your workplace.

Particulates, not otherwise regulated	Limit value - 8 hours		Limit value - Short term		Notes
	ppm	mg/m ³	ppm	mg/m ³	
Belgium		10			
Belgium		3			Respirable fraction
Canada - Québec		10			
New Zealand		10			Inhalable aerosol
New Zealand		3			Respirable aerosol
Singapore		10			
South Korea		10			Respirable fraction
USA - OSHA		15			total dust
USA - OSHA		5			respirable dust

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.

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/m³

8.2 Exposure controls

8.2.1 Appropriate engineering controls:

Technical measures to prevent exposure: Ensure good ventilation and/or provide local exhaust ventilation appropriate to the product decomposition risk. The following substances are contained only in traces in the product: 4,4'-methylenediphenyl diisocyanate (CAS 101-68-8).

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:

Hand protection:

Wear heat resistant gloves when handling molten material.

Body protection:

No special skin protection requirements during normal handling and use.

8.2.2.3 Respiratory protection:

Dust formation:

In case of inadequate ventilation wear respiratory protection.

Use appropriate respiratory protection. Recommended: P filter (EN 143 or NIOSH approved respirator).

Elevated temperature:

In case of inadequate ventilation wear suitable respiratory protection.

8.2.2.4 Thermal hazards:

Elevated temperature: Wear heat resistant gloves when handling molten material.

8.2.3 Environmental exposure controls:

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

In case of contact, ensure prompt removal from eyes, skin and clothing. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and leaving work. Facilities storing or using this material should be equipped with an eyewash facility. Immediately change clothing when contaminated with molten product.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	solid; black pellets, granules or powder
Odour/Odour threshold:	odorless
pH:	Not applicable.*
Solubility in water:	insoluble
Melting point/freezing point:	135-145°C / 275-293°F (estimated)
Initial boiling point and boiling range:	Not applicable.
Flash point:	Not applicable.*
Decomposition temperature:	> 230°C / 446°F (estimated)
Smouldering temperature:	No data available.
Auto-ignition temperature:	> 400°C / 752°F (estimated)
Evaporation rate	Not applicable.*
Viscosity:	Not applicable.*
Vapour pressure:	Not applicable.*
Vapour density:	Not applicable.*
Density:	1,2 g/cm ³ (estimated)
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.

9.2 Other information

Bulk density: No information available.

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

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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 to thermal decomposition temperature (see Section 9.1).

Avoid exposure to moisture, direct sunlight and/or heat and accumulation of electrostatic charges.

Avoid dust formation.

10.5 Incompatible materials: Strong oxidizing and reducing agents. Strong acids and strong bases.

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).

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

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.

Test material	Method	Result
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TPU	Possible hazard	Isocyanates may be released during thermal decomposition of the product. Isocyanates may cause skin sensitization and/or respiratory sensitization.
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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: 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

When used and handled according to specifications, the product does not have harmful effects according to our experience and the information provides to us. From a toxicological point of view, the material behaves as the base polymer if there is no dust formation and the operators follow the manipulation instructions of Section 7 and 8.

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

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:

If the material becomes a waste, consider it as special waste. It can be destroyed by incineration in accordance with local, state and federal regulations. For all countries, the disposal methods must be in compliance with national and provincial laws and any municipal or local by-laws.

European Waste Catalogue (EWC) code: 07 02 13 « waste plastic »

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

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provisional EC List Number 936-414-1.

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

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.

REACH Annex XIV (Authorisation): No substance listed, on the SDS publication date.

REACH Annex XVII (Restrictions on use): No substance listed, on the SDS publication date.

United States of America

Toxic Substance Control Act

All substances in this product are listed/exempted in the TSCA inventory.

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. Contact Nanocyl S.A. for details.

SARA 313 EPCRA Toxic Chemical Release Inventory (TRI): None applicable.

SARA Section 311/312 Hazard Categories: None applicable.

Clean Water Act (40CFR122.26):

Plastic pellets are defined by the US EPA under the Clean Water Act (40CFR122.26) as a "significant material" which requires any industrial plant that may expose pellets to storm water to secure a storm water permit. Violations of the rule carry the same penalties as other Clean Water Act violations. Pellets found in storm water runoff are subject to EPA regulations with the potential for substantial fines and penalties.

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.

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
EPCRA	Emergency Planning and Community Right-to-Know Act
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
SARA	Superfund Amendments and Reauthorization Act
SDS	Safety Data Sheet

Safety Data Sheet revision history:

Previous version: 3 November 2016 (V04)

Current version: 25 July 2019 (V05)

Disclaimer:

Nanocyl S.A. provides the information contained herein in good faith and makes no representation as to its comprehensiveness or accuracy. This SDS has been compiled and is solely intended for this product. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material.