

EPOCYL™

CNT epoxy resin concentrates

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

1.1 Product identifier:

Product identifier used on the label: EPOCYL™ 128-05
Other means of identification: Carbon/epoxy mixture
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, for Industrial and professional use only.
Identified Uses: Formulation of preparations; Loading and unloading of substance and mixtures; Use in industrial chemical processes; Use in laboratories; Use in coatings.
Prohibited uses: Not available.

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)

Skin irritation Category 2
Eye irritation Category 2
Skin sensitisation Category 1

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Aquatic Chronic

Category 2

2.1.2 Additional information: None.

2.2 Label elements



* Pictograms:

* Signal word: Warning.

* Hazard statements:

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H411	Toxic to aquatic life with long lasting effects

* Precautionary statements:

P261	Avoid breathing dust/fume/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302 + P352	IF ON SKIN: Wash with plenty of water and soap.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/ attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P391	Collect spillage.
P501	Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : bis-[4-(2,3-epoxipropoxy)phenyl]propane

Supplemental label elements : Not applicable.

2.3 Other hazards: None.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Substances	EC Number / List number	CAS Number	Reach Registration Number	% (wt.)	CLP Classification/ Specific Concentration Limit / M-factor
<i>bis-[4-(2,3-epoxipropoxy)phenyl]propane-BADGE Epoxy Resin</i>	216-823-5 - (Index number: 603-073-00-2)	1675-54-3*	01-2119456619-26	> 80	GHS07 GHS09 H315 H317 H319 H411 Eye Irrit. 2; H319: C ≥ 5 % Skin Irrit. 2; H315: C ≥ 5 %; M=1
<i>Short tangled Multi-walled carbon nanotubes (MWCNTs) obtained by catalytic chemical vapour deposition-Synthetic graphite in tubular shape</i>	- / 936-414-1	-	01-2119879048-26	≤ 20	-

* Previously identified as 4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2,3-epoxypropane, EC number 500-033-5 and CAS number 25068-38-6 (Index number: 603 074 00 8)

For full text of GHS pictograms and Hazard statements: see SECTION 16.

SECTION 4. First aid measures

4.1 Description of first aid measures

After skin contact:

In case of contact with product, remove contaminated clothing. Rinse immediately thoroughly with soap and plenty of water.

In case of contact with heated product, immediately flood the affected area with cold water. Wipe excess material from exposed area. Flush exposed skin with water and follow by washing with soap. Carefully remove clothing; if clothing is stuck to a burn area do not pull it off, but cut around it. Cover burn area with a clean material. Transport to nearest medical facility for additional treatment.

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Eye contact:	If irritation develops and persists, consult a physician. Hold the eyes open and rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Rinse again with water for a sufficiently long period of time (at least 15 minutes). Obtain medical attention if pain, blurred vision, swelling, burning or redness persists.
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:	Rinse out mouth with water. Never give anything to drink or swallow to an unconscious person. Do not induce vomiting without medical advice. 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 also 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:	Material will not burn unless preheated. Cool fire exposed containers with water.
Combustion products:	May form toxic fumes, carbon oxides, nitrogen oxides, sulfur oxides, halogenated compounds, silica, formaldehyde, metal oxides.

5.3 Advice for firefighters

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

Clear fire area of all non-emergency personnel. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Ensure that there are sufficient retaining facilities for media used to extinguish fire. Water used to extinguish fire should not enter drainage systems, soil or stretches of water.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Approach suspected leak areas with caution. Keep unnecessary and unprotected personnel from entering. Equip clean-up crew with adequate protection (see chapter 8).

Special danger of slipping by leaking/spilling product.

Avoid contact with skin, eyes and clothing.

Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator in case of insufficient ventilation.

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 labelled containers for disposal. Dispose as hazardous waste.

Small spills: Clear the spills immediately. Wipe up with absorbent material (eg. cloth, fleece). Damp sweep any residues with soap and hot water. Residuals may be removed with solvent, provided that the safe handling practices of the specific solvent are respected.

Large spills: Soak up inert absorbent (eg sand, polypropylene or polyethylene fiber products, clay,...) and dispose as waste requiring special attention. Wash carefully any residues.

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.

Contact with skin and eyes must be avoided under all circumstances. Handle in accordance with good industrial hygiene and safety procedures. See also Section 8.

Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Launder contaminated clothing before reuse.

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 temperature: 5 - 40°C.

Storage class (Germany): LGK 10

7.3 Specific end use(s):

Please consult Nanocyl S.A. for further information. See also Section 1.

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.

Derived No Effect Levels (DNEL) for BADGE Resin

Downstream user	Exposure route	Exposure duration	Effects	DN(M)EL
Workers	inhalation	short term	systemic	40 mg/m ³
Workers	inhalation	long term	systemic	12,3 mg/m ³
Workers	dermal	short term	systemic	8,3 mg/kg bw
Workers	dermal	long term	systemic	8,3 mg/kg bw
General population	inhalation	short term	systemic	0,75 mg/m ³
General population	inhalation	long term	systemic	0,75 mg/m ³

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General population	dermal	short term	systemic	3,6 mg/kg bw
General population	dermal	long term	systemic	3,6 mg/kg bw
General population	oral	short term	systemic	0,75 mg/kg bw
General population	oral	long term	systemic	0,75 mg/kg bw

Predicted No Effect Levels (PNEC) for BADGE Resin

Compartment	PNEC
Freshwater	3 µg/l
Freshwater sediment	0,5 mg/kg dw
Intermittent release	0,013 mg/l
Marine water	0,3 µg/l
Marine water sediment	0,5 mg/kg dw
Sewage Treatment Plant	10 mg/l
Soil	-
Air	-
Secondary poisoning	-

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:

Measures to prevent aerosol and dust generation:

Avoid aerosol formation in open systems without suitable ventilation and/or extraction. At high temperatures, use explosion-proof machinery, apparatus, ventilation facilities, tools etc.

Organisational measures to prevent exposure: See Section 7. Wash hands and other exposed areas with mild soap and water before eat, drink or smoke and leaving work.

Technical measures to prevent exposure: Provide local exhaust ventilation to keep the air concentrations below the recommended exposure limits. Facilities storing or using this material should be equipped with eyewash station.

8.2.2 Personal protection equipment:

8.2.2.1 Eye and face protection:

Wear safety glasses or chemical goggles.

The selected goggles or glasses must satisfy the European norm standard EN 166.

8.2.2.2 Skin protection:

Hand protection: Wear chemical-resistant gloves according to EN374. Recommended: butyl rubber.

Body protection: Wear protective clothing as required to avoid contact. Choose body protection according to the amount and concentration of the dangerous substance at the work place. When skin contact is possible, protective clothing including gloves, apron, sleeves, boots, head and face protection should be worn. Use PPE that is chemical resistant to the product and prevents skin contact.
Recommended: The selected protective clothing has to satisfy the standard EN 13034, which describes clothing offering limited 8 hours protection against splashes.

8.2.2.3 Respiratory protection:

If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn. Wear a half mask respirator conforming to EN 140. Recommended: type A and P3 filter or better.

8.2.2.4 Thermal hazards:

The product generates flammable vapour when heated up.

8.2.3 Environmental exposure controls:

Collect for disposal.

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

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state/Appearance:	Black viscous liquid, nanomaterial dispersed in resin
Odour/Odour threshold:	Slight odour
pH:	No data available.
Solubility in water:	Mixable
Melting point/freezing point:	No data available.
Initial boiling point and boiling range:	> 200°C (estimated)
Flash point:	> 150°C (estimated)
Decomposition temperature:	> 200°C
Smouldering temperature:	No data available.
Auto-ignition temperature:	245°C at 1013 hPa (estimated)
Evaporation rate	No data available.
Viscosity:	No data available.

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Vapour pressure:	0,32-0,4 hPa at 20°C (estimated)
Vapour density:	No data available.
Relative density:	~1,2 at 25°C (measured)
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: Caustic soda can induce vigorous polymerization at temperatures around 200°C. Reaction with some curing agents may produce considerable heat and possible violent decomposition.

10.4 Conditions to avoid: Avoid exposure to moisture. Avoid mist/vapour/fumes formation. Keep away from heat, sparks, flames and other ignition sources.

10.5 Incompatible materials: Water. Strong oxidizing materials. Strong Lewis or mineral acid and strong mineral and organic bases.

10.6 Hazardous decomposition products: No hazardous decomposition products known at room temperature (see also Section 5.2).

SECTION 11. Toxicological information

No data available on the product itself.

11.1 Toxicity

Acute toxicity:

Test material	Route of exposure	LD50
Resin	Oral	11400 mg/kg
Resin	Dermal	2000 mg/kg
Resin	Inhalation	-
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
Resin	skin (OECD 404)	Irritant
MWCNT	eye	Not irritant
Resin	eye (OECD 405)	Irritant

Respiratory or skin sensitization:

Test material	Route of exposure	LD50
Resin	Dermal (OECD 426)	Sensitizer
Resin	Dermal (OECD 406)	Sensitizer

Germ cell mutagenicity:

Test material	Method	Result
MWCNT	<i>In vitro</i>	Negative
Resin	<i>Weight of evidence</i>	Product induced gene-mutation in Ames/Salmonella tester strains TA1535 and TA100 in multiple studies. Generally, mutagenic activity was greater without liver S9 metabolic activation. Induced gene-mutation in L5178Y mouse lymphoma cells. Induced gene-mutation and chromosome damage in Chinese hamster V79 cells. Induced cell transformation in Syrian hamster BHK cells based on clonal growth in soft agar. Did not induce evidence of chromosome damage in a mouse dominant lethal oral gavage study conducted up to a high dose level of 10 grams/kg and in a mouse micronucleus test conducted up to a high dose of 5,000 mg/kg. Negative in a male mouse spermatocyte cytogenetic assay with treatment for 5 days by oral gavage up to a high dose of 3,000 mg/kg. Did not induce an

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		increase in the increase in the frequency of chromosome damage in a Chinese hamster bone marrow cytogenetic test by oral gavage up to a high dose of 3,300 mg/kg.
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Carcinogenicity:

Test material	Exposure	Species	Result
MWCNT	2-years, intraperitoneal	rat	No carcinogenic response
Resin	2-years, oral (OECD 453)	mouse	No carcinogenic response up to 100 mg/kg bw/day

Reproductive toxicity / Teratogenicity:

Test material	Exposure	Species	Result
Resin	oral (OECD 414)	rat	Maternal tox: 180 mg/kg bw/day (reduced weight gain)
Resin	dermal (OECD 414)	rabbit	Maternal tox: 300 mg/kg bw/day (reduced weight gain)

Summary of evaluation of the CMR properties: -

STOT-single exposure:

Test material	Method	Result
MWCNT	Estimation: 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: Not classified but may be harmful if swallowed and enters airways.

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, semi static	LC50: > 100 mg/l
Resin	Fish, 96h (OECD 203)	LC50: 1,3 mg/L
MWCNT	Daphnia, 48h, static	EC50: > 100 mg/l
Resin	Daphnia, 48h (OECD 202)	EC50: 2,1 mg/l
MWCNT	Algae, 72h	EC50: 134 mg/l
Resin	Algae, 72h	EC50: > 11 mg/l

Chronic toxicity

Test material	Study type	Result
MWCNT	Fish, 10 days, semi static	EC10: 100 mg/l NOEC: 100 mg/l
MWCNT	Daphnia, 21 days	NOEC: > 25 mg/l
Resin	Daphnia, 21 days, semi static (OECD 211)	NOEC: 0,3 mg/l

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

Test material	Study type	Result
Resin	OECD 301B	Not readily biodegradable, 6-12% after 28 days
Resin	OECD 301F	Not readily biodegradable, 5% after 28 days

12.3 Bioaccumulative potential:

Test material	Partition coefficient n-octanol /water (Log Kow)	Bioconcentration factor (BCF)	Result
Resin	2,64 – 3,78	3 - 31	Low potential
MWCNT	No data available	No data available	-

12.4 Mobility in soil: No data available.

12.5 Results of PBT and vPvB assessment: No substances in the product meet the PBT/vPvB

criteria of REACH, annex XIII.

12.6 Other adverse effects: The substances in the product do not have 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.

Suggested European Waste Catalogue (EWC) code:
16 03 05* "organic wastes containing hazardous substances"»

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).

14.1. UN number : UN3082

14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)

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14.3. Transport hazard class(es): 9.

14.4. Packing group: III.

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

SEVESO III: Listed on Annex I, category E2 Hazardous to the Aquatic Environment in Category 2 Chronic

Inventories

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

Canadian Domestic Substance List (DSL) or non-Domestic Substances List (NDSL), Toxic Substance Control Act Inventory (TSCA), 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:

Chemical safety assessments for substances in this mixture have been carried out. This product contains substances still requiring a Chemical Safety Assessment.

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Please contact Nanocyl S.A. for further information.

SECTION 16. Other information

The contents and format of this SDS are in accordance with Regulation (EC) No. 1907/2006 (REACH) and its amendments.

Abbreviations and acronyms:

EC	European Commission
CLP	Classification Labelling and Packaging
GHS	Globally Harmonized System
SDS	Safety Data Sheet

Full-text of GHS phrases and classification:

GHS07		Exclamation mark
GHS08		Health hazard
H315		Causes skin irritation
H317		May cause an allergic skin reaction.
H319		Causes serious eye irritation
H411		Toxic to aquatic life with long lasting effects.

Classification procedure:

Classification according to Regulation (EC) Nr. 1272/2008	Classification procedure
Eye Irrit. Cat. 2	Calculation method.
Skin Irrit. Cat. 2	Calculation method.
Skin sen. Cat 1	Calculation method.
Aquatic Chronic Cat. 2	Calculation method.

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

Safety Data Sheet revision history:

Previous version:	15 March 2017	(V02)
Current version:	21 June 2021	(V03)

EXTENDED SAFETY DATA SHEET

Product:	EPOCYL™ 128-05
Relevant Substance:	2,2-bis[p-(2,3-époxypropoxy)phényl]propane (BADGE Resin)
EC Number:	216-823-5
CAS Number:	1675-54-3
Registration Number:	01-2119456619-26
Date of Generation/Revision:	21/06/2021
ES Template:	None.
Translation:	-
Status:	Data lacking. Please contact Nanocyl S.A. for support.

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