EPOCYL™

CNT epoxy resin concentrates

1. Identification of the product and the company

Trade Name:	EPOCYL™ 128-06
Type of product:	Carbon/epoxy resin mixture
General use:	Manufacturing; industrial process
Company:	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

2. Hazards identification

Classification of the substance or mixture according regulation EC N° 1272/2008 (CLP/GHS)

Hazards classification:

H315: Skin Irritant, Category 2
H317: Skin Sensitizaton, Category 1
H319: Eye Irritant, Category 2
H411: Chronic Aquatic Toxicity, Category 2

Label elements:

* Pictograms: 

* Signal words: Warning

* Hazard statements:
  - H315 Causes skin irritation
  - H317 May cause an allergic skin reaction

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H319	Causes serious eye irritation
H411	Toxic to aquatic life with long lasting effects
EUH205	Contains epoxy constituents. May produce an allergic reaction

* Precautionary statements:

P201	Obtain special instructions before use
P280	Wear protective gloves/protective clothing/eye protection/face protection
P261	Avoid breathing dust/fume/gas/mist/vapours/spray

Other hazards which do not result in classification:

This product contains < 5% of a substance not fully tested for the human health.
This product contains < 5% of a substance not fully tested for the environment.

3. Composition/information on ingredients

Components	EC Nr / List nr	CAS Nr	RRN	% (wt.)	Classification
Epoxy Resin (Bisphenol A epichlorhydrin)	500-033-5	25068-38-6	01-2119456619-26	> 80 %	H317/319/315/411*
Short tangled Multi-walled carbon nanotubes (MWCNTs)	936-414-1	/	01-2119879048-26	< 10 %	/

* Reason for classification: Index number 603-074-00-8 in Annex VI of Regulation (EC) No 1272/2008

4. First aid measures

After skin contact: Wash contaminated skin with soap and water. In case of contact with hot 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.

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 vapours are inhaled, move the person into fresh air, keep warm and allow

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to rest. If breathing is difficult, oxygen may be administered and medical attention should be obtained.

Ingestion: Do not induce vomiting. Rinse out mouth with water. Never give anything by mouth to an unconscious person. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Obtain medical attention.

5. Fire-fighting measures

Suitable extinguishing media: Water fog, Foam, Carbon Dioxide, Dry Chemical.

Unsuitable extinguishing: media: High volume water jet.

Specific hazards: Material will not burn unless preheated. Clear fire area of all non-emergency personnel. Cool fire exposed containers with water. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharge to any waterway, sewer or drains.

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

Combustion products: May form toxic fumes, phenols, carbon monoxide, carbon dioxide, nitrogen oxides, silica, formaldehyde, metal oxides.

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.

6. Accidental release measures

Personal precautions: Keep unnecessary and unprotected personnel from entering. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions: Prevent entry to sewers, rivers and public waters. Construct a dike to prevent spreading. Remove contaminated soil to remove contaminated trace. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to

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the environment if released in large quantities.

Spill procedures: Use absorbent material to collect and dispose as hazardous waste. Place into an appropriate marked container for disposal. Approach suspected leak areas with caution.

7. Handling and storage

Handling: Provide appropriate ventilation of stores and work. Contact with skin and eyes must be avoided under all circumstances. Handle in accordance with good industrial hygiene and safety procedures. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Launder contaminated clothing before reuse.

Storage: 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 between 5-40°C.

8. Exposure controls / Personal protection

Components with workplace parameters:

Provide local ventilation appropriate to the product decomposition risk. Apply technical measures to comply with the occupational exposure limits.

In the framework of the REACH dossier, DNEL's and PNEC's are established by the registrant without an official consultation process, and are not intended to be directly used for setting workplace or general population exposure limits. They are primarily used as input values in running quantitative risk assessment models.

DNEL's (Derived No-Effect Levels')

Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight < 700)

Short term Dermal/Systemic	8.3 mg/kg bw/day	workers
Short term Inhalation/Systemic	12.3 mg/m³	workers
Long term Dermal/Systemic	8.3 mg/ kg bw/day	workers
Long term Inhalation/Systemic	12.3 mg/m³	workers
Short term Dermal/Systemic	3.6 mg/kg bw/day	consumers
Short term Inhalation/Systemic	12.3 mg/m³	consumers

PNEC's (Predicted No-Effect Concentrations')

Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular

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weight < 700)

Fresh water	3 µg/l
Marine	0.3 µg/l
Sewage treatment plant	10 mg/l
Fresh water sediment	0.5 mg/kg dwt
Marine water sediment	0.5 mg/kg dwt
Sediment	0.05 mg/kg dwt
Intermittent releases	0.013 mg/l

Personal protective equipment:

Hand protection:	Wear chemically resistant gloves (tested to EN374). Breakthrough time > 480 minutes. Appropriate glove materials include butyl rubber and nitrile rubber. The selection of specific gloves for a specific application and time of use in a working area should also take into account other factors on the working space and the instructions/specification of the supplier of gloves.
Body protection:	Wear suitable protective clothing as required to avoid contact.
Respiratory protection:	Wear appropriate respirator when ventilation is inadequate or when the product is heated.
Eye protection:	Safety glasses with side-shields (EN166). During splash contact: Wear face shield (EN166).

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 utilizing this material should be equipped with an eyewash facility.

9. Physical and chemical properties

Form and Color:	black viscous liquid, resin
Odor:	nearly odorless
Thermal decomposition:	> 200°C
Flash point:	> 150°C
Viscosity:	not determined
Density:	~1.2 at 25°C
Epoxy value:	not determined
Epoxy equivalent:	not determined
Vapor pressure:	not determined

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

10. Stability and reactivity

Stability:	Stable under normal handling and storage conditions. Hazardous polymerization will not occur under normal conditions of storage and use.
Materials to avoid:	Can react vigorously with strong oxidizing agents, amines, alcohols, strong Lewis or mineral acid, strong mineral and organic bases. Avoid contact with water. Reaction with some curing agents may produce considerable heat and possible violent decomposition.
Conditions to avoid:	Caustic soda (sodium hydroxide) can induce vigorous polymerization at temperatures around 200°C. Keep away from heat, sparks and naked flames.
Hazardous decomposition:	No hazardous decomposition products known at room temperature (see also section 5).

11. Toxicological information

No data available for the product itself.

Toxicological information for the components

Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular weight < 700)

Acute toxicity, oral:	LD50 rat: 30,000 mg/kg No acutely toxic in multiple mouse and rat studies, LD50>2000 mg/kg.
Acute toxicity, dermal:	LD50 rat: >2,000 mg/kg In multiple rabbit cute dermal studies the LD50 was >2,000 mg/kg.
Acute toxicity, inhalation:	No applicable toxicity data. No known significant effects or critical hazards. Due to the very low vapor pressure, saturated atmosphere = 0.008 ppb, meaningful acute inhalation studies could not be conducted.
Skin corrosion/irritation:	In an OECD N° 404 study conducted on the rabbit with a 4hr occlusive exposure scores for erythema and oedema were minimal. Therefore, product is not a skin irritant. In other studies conducted with the rabbit a 4hr occlusive

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exposure was used. Maximum erythema and oedema scores observed under these extreme conditions were 1.5-2 and 1-1.5 respectively.

Serious eye damage/ irritation: the results of an OECD N° 405 GLP study conducted in 2007 reported a mean maximum irritation score of 1.7. Therefore product was not an eye irritant in this study. The results of multiple older non-guideline studies support this finding.

Skin sensitization: In an OECD N° 429 mousse LLNA study the estimated EC3 was a concentration of 5.7% suggesting that product is a moderate skin sensitizer in this test system. In an OECD N° 406 guinea pig maximization study product induced positive dermal reaction in 100% of the test animals at a 50% concentration challenge dose. Therefore, product is an 'Extreme' skin sensitizer under the conditions of this study. Product was also positive for skin sensitization in an OECD N° 406 guinea pig Buehler method study.

Respiratory sensitization: No applicable toxicity data. No known significant effects or critical hazards.

Germ cell mutagenicity: 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 mousse micronucleus test conducted up to a high dose of 5,000 mg/kg. Negative in a male mousse 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 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.

Carcinogenicity: In a rat oral gavage OECD N° 453 study there was no evidence of carcinogenicity up to the high dose level of 100 mg/kg/day. OECD Test Guideline n° 453 dermal exposure studies were conducted on male mice and female rats. No evidence of carcinogenicity was observed in male mice treated up to the high dose of 100 mg/kg/day and female rats exposed up to a high dose level of 1,000 mg/kg/day.

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Reproductive toxicity:	No adverse reproductive effects were observed in an OECD test Guideline N° 416 GLP two-generation rat oral gavage study conducted up to a high dose level of 750 mg/kg/day that resulted in adult body weight decrements.
Developmental/ Teratogenicity:	Product did not induce any evidence of development toxicity in rats and rabbits exposed by oral gavage or in rabbits treated by the dermal route in OECD test Guideline N° 414 GLP studies. The oral gavage studies were conducted up to a high dose level of 180 mg/kg/day that produced maternal toxicity base on decreased body weight gain. The rabbit dermal study was conducted up to maternal toxicity base on decreased body weight gain. The rabbit dermal study was conducted up to a high dose of 300 mg/kg/day that induced maternal toxicity based on reduced body weight gain.
STOT-single exposure:	No applicable toxicity data. No known significant effects or critical hazards.
STOT-repeated exposure:	In a rat OECD test guideline n° 408 sub chronic oral study the NOAEL was 50 mg/kg/day. Significant dose-related evidence of hematotoxicity was observed at doses of 250 & 1000 mg/kg/day. There was a significant increase of blood urea nitrogen at 250 & 1000 mg/kg/day and slight histopathological evidence of kidney evolvement at the high dose of 1000 mg/kg/day. Histological examination identified slight to moderate degeneration of the seminiferous tubules at 1000 mg/kg/day and possible uterine effects at the same dose. The NOAEL for a rat 90-day dermal (5 days/week) study was 100 mg/kg/day due to body weight decrements at 1000 mg/kg/day. No evidence of neurotoxicity was observed in a rat 90-day dermal OECD test guideline N° 411 GLP study conducted up to a high dose level of 1000 mg/kg/day with FOB, motor activity and neurohistopathological assessments.

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 the toxicological point of view, the material behaves as the base resin if there is no dust formation and the operators follow the manipulation instructions of Section 7 and 8.

12. Ecological information

No data available for the product itself.

Ecological information for the components

Reaction product: bisphenol-A-(epichlorhydrin) and epoxy resin (number average molecular

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weight < 700)

Toxicity:	FISH: the acute 96h static exposure LC50 for trout based on the results of OECD N° 203 studies is 1.3 mg/L. DAPHNIA: the acute 48h acute static exposure EC50 value for Daphnia based on the outcome of OECD N° 202 studies is 2.1 mg/L. A NOEC of 0.3 mg/L was observed in a Daphnia 21-day semi-static OECD N° 211 reproduction study. Daphnia survival, growth and reproduction were significantly reduced at concentration of 1 mg/L and higher. ALGAE: the 72h algae LC50 value is > 11 mg/L. The activated sewage sludge respiration inhibition 3h EC50 value based on an EC test method was > 100 mg/L. The growth inhibitory concentration for pseudomonas in an 18h static exposure study was > 42.6 mg/L.
Persistence/ Degradability:	the level of biodegradation in an 'enhanced' OECD 301F study was 5% within the 28 day contact period. Biodegradation reached 6-12% after 28 days of contact in an OECD test guideline N° 301B study. Therefore, BADGE is not readily biodegradable under the conditions of the studies.
Bioaccumulative Potential:	the OASIS CATALOGIC QSAR estimated bioconcentration factor of 3-31 and Log Pow of 3.24@25C suggests low potential to bioaccumulate in aquatic organisms.
Mobility in soil:	The KOCWIN QSAR estimated adsorption/desorption coefficient log Koc = 2.65 suggesting moderated sorption to organic matter and limited soil mobility.

13. Disposal considerations

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.
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.

14. Transport information

ADR/RID:

UN-No:	3082
Class:	9

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Packaging group:	III
Risk No.:	90
ADR/RID-Labels:	9
Proper shipping name:	Environmentally Hazardous Substance, Liquid, N.O.S.
Contains:	Bisphenol A Epoxy Resin

IMDG:

UN-No:	3082
Class:	9
Packaging group:	III
Labels:	9
Proper shipping name:	Environmentally Hazardous Substance, Liquid, N.O.S.
Contains:	Bisphenol A Epoxy Resin

IATA :

UN-No:	3082
Class:	9
Packaging group:	III
Labels:	9
Proper shipping name:	Environmentally Hazardous Substance, Liquid, N.O.S.
Contains:	Bisphenol A Epoxy Resin

15. Regulation information

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

This product contains one or more substances that are not listed on the TSCA inventory of chemical substances and is intended solely for research and development evaluation under the supervision of a technically qualified individual under the terms of the TSCA R&D Exemption (40 CFR § 720.36).

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.

This product contains one or more substances that are not listed on the Canadian Domestic Substance List (DSL) or non-Domestic Substances List (NDSL).

For all substances in this product, a Chemical Safety Assessment is either completed or not applicable.

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16. Other information

The contents and format of this SDS are in accordance with regulation REACH 1907/2006 art.32 and regulation EC N° 1272/2008 (CLP/GHS) and its latest amendments.

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

Previous review date: 26 January 2018 (V3)

Current review date: 25 May 2018 (V4)

Disclaimer:

Nanocyl S.A. provides the information contained herein in good faith and makes no representation as to its comprehensiveness or accuracy. 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.

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