

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

1.1. Product identifier

Product form : Mixture
Product name : TUBALL MATRIX 302
Type of product : Nanoform embedded in a matrix

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Industrial use as additive in polymers, resins and/or coatings

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet ►

Europe:
OCSiAl Europe S.a.r.l.
L-3364, Leudelange,
1, rue de la Poudrerie,
Grand Duchy of
Luxembourg
T +352 27 99 03 73
09.00-17.00 GMT+2
europe@ocsial.com

1.4. Emergency telephone number

EMEA : +44 1865 407333 (English) (Carechem 24)
East/South East Asia : +65 3158 1074 (English, Hindi, Japanese, Korean, Malay, Mandarin) (Carechem 24)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Serious eye damage/eye irritation, Category 2 H319
Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

Causes serious eye irritation.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS07

Signal word (CLP) : Warning
Hazard statements (CLP) : H319 - Causes serious eye irritation.
Precautionary statements (CLP) : P264 - Wash hands thoroughly after handling.
P280 - Wear eye protection, protective gloves, protective clothing.
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.

2.3. Other hazards ►

Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

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according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Alkylene glycol derivative	Trade Secret	70	Not classified
Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylen)bis(benzenesulphonate)	(CAS-No.) 27344-41-8 (EC-No.) 248-421-0 (REACH-No.) 01-2119533064-49	20	Eye Irrit. 2, H319
Single wall carbon nanotubes*	(CAS-No.) Not assigned for EU-REACH (EC-No.) 943-098-8 (REACH-No.) 01-2120130006-75-0000	10	Eye Irrit. 2, H319

*Single wall carbon nanotubes TUBALL™		
Name of (set of) nanoform(s)		Tuball™ - grades 1RW02 / 1RW03 are part of one set of nanoform
Value		-
Number based particle size distribution	d10	1.2 - 1.45 nm
	d50	1.6 - 1.8 nm
	d90	1.9 - 2.2 nm
Shape and aspect ratio of particles		Elongated tubes; length to diameter ratio 2000 – 10000:1
Crystallinity		Amorphous
Surface functionalisation / treatment		No
Process		Chemical vapor deposition (CVD)
Specific surface area		300 – 1500 m²/g
Additional information		G/D range ≥ 40 (RAMAN at 532 nm)

* Single wall carbon nanotubes TUBALL™

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. Get medical attention.
First-aid measures after skin contact	: Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. Wash with plenty of soap and water. Wash skin with plenty of water.
First-aid measures after eye contact	: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: Rinse mouth out with water. Do not induce vomiting. Get medical attention. Call a poison center or a doctor if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: May cause irritation to the respiratory tract.
Symptoms/effects after skin contact	: May cause moderate irritation, including burning sensation, tearing, redness or swelling.
Symptoms/effects after eye contact	: Eye irritation.
Symptoms/effects after ingestion	: Gastrointestinal complaints. Diarrhea.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Powder, Alcohol-resistant foam, Water spray, Carbon dioxide (CO2).
Unsuitable extinguishing media	: Do not use a heavy water stream.

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according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Under fire conditions, hazardous fumes will be present.
Hazardous decomposition products in case of fire : Carbon dioxide. Carbon monoxide.

5.3. Advice for firefighters ►

- Protection during firefighting : Full face mask. Positive pressure self-contained breathing apparatus (SCBA). Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures ►

6.1.1. For non-emergency personnel

- Protective equipment : Wear suitable protective clothing.
Emergency procedures : Ventilate spillage area. Ensure adequate ventilation. Evacuate area. Avoid contact with skin and eyes.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Wear suitable protective clothing, gloves and eye/face protection. In case of fire: Positive pressure self-contained breathing apparatus (SCBA). For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures : Provide adequate ventilation. Evacuate area. Avoid inhalation of vapours.

6.2. Environmental precautions

Avoid release to the environment. Do not allow to enter into surface water or drains. Collect contaminated extinguishing water separately and must not enter the sewage system.

6.3. Methods and material for containment and cleaning up ►

- For containment : Clean spills promptly. Ventilate affected area. Stop leak if safe to do so.
Methods for cleaning up : Mechanically recover the product. Clear up rapidly by scoop or vacuum. Collect in closed container and remove to a safe place for disposal by burning.
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections ►

For disposal of contaminated materials refer to section 13 : "Disposal considerations". For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling ►

- Precautions for safe handling : Ensure good ventilation of the work station. Avoid contact with skin, eyes and clothing. Carry out operations in the open/under local exhaust/ventilation or with respiratory protection. Avoid breathing dust, fume. To prevent thermal burns avoid contact with hot product. Avoid contact with skin and eyes. Wear personal protective equipment.
Hygiene measures : Do not eat, drink or smoke when using this product. Wash contaminated clothing before reuse. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities ►

- Storage conditions : Store in dry, well-ventilated area. Store at ambient temperature. Keep container tightly closed. Protect from sunlight. Store in a well-ventilated place. Keep cool.
Heat and ignition sources : Keep away from open flames, hot surfaces and sources of ignition.
Information on mixed storage : Store away from water (including sewage plant).
Special rules on packaging : Keep container tightly closed.

7.3. Specific end use(s)

No additional information available

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Alkylene glycol derivative

EU - Indicative Occupational Exposure Limit (IOEL)

IOEL TWA	474 mg/m ³
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IOEL TWA [ppm]	150 ppm
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Croatia - Occupational Exposure Limits

GVI (OEL TWA) [1]	474 mg/m ³ ukupno pare i čestice 10 mg/m ³ samo čestice
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GVI (OEL TWA) [2]	150 ppm ukupno pare i čestice
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Regulatory reference	Pravilnik o zaštiti radnika od izloženosti opasnim kemikalijama na radu, graničnim vrijednostima izloženosti i biološkim graničnim vrijednostima (NN 1/2021)
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Norway - Occupational Exposure Limits

Grenseverdi (OEL TWA) [1]	79 mg/m ³
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Grenseverdi (OEL TWA) [2]	25 ppm
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Regulatory reference	FOR-2021-06-28-2248
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Alkylene glycol derivative

DNEL/DMEL (Workers)

Long-term - systemic effects, inhalation	168 mg/m ³
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Long-term - local effects, inhalation	10 mg/m ³
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DNEL/DMEL (General population)

Long-term - systemic effects, inhalation	50 mg/m ³
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Long-term - local effects, inhalation	10 mg/m ³
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PNEC (Water)

PNEC aqua (freshwater)	260 mg/l
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PNEC aqua (marine water)	26 mg/l
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PNEC aqua (intermittent, freshwater)	183 mg/l
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PNEC (Sediment)

PNEC sediment (freshwater)	572 mg/kg dwt
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PNEC sediment (marine water)	57.2 mg/kg dwt
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PNEC (Soil)

PNEC soil	50 mg/kg dwt
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PNEC (Oral)

PNEC oral (secondary poisoning)	1133 mg/kg
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PNEC (STP)

PNEC sewage treatment plant	20000 mg/l
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Single wall carbon nanotubes

DNEL/DMEL (Workers)

Acute - systemic effects, dermal	No hazard identified
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Acute - systemic effects, inhalation	Low hazard (no threshold identified)
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Acute - local effects, dermal	No hazard identified
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Acute - local effects, inhalation	Low hazard (no threshold identified)
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Long-term - systemic effects, dermal	No hazard identified
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Long-term - local effects, dermal	No hazard identified
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Long-term - local effects, inhalation	Low hazard (no threshold identified)
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DNEL/DMEL (General population)

Acute - systemic effects, dermal	No hazard identified
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Acute - systemic effects, inhalation	Low hazard (no threshold identified)
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Acute - systemic effects, oral	No hazard identified
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Acute - local effects, dermal	No hazard identified
Acute - local effects, inhalation	No hazard identified
Long-term - systemic effects, dermal	No hazard identified
Long-term - local effects, dermal	No hazard identified
Long-term - local effects, inhalation	No hazard identified
PNEC (Water)	
PNEC aqua (freshwater)	No hazard identified
PNEC aqua (marine water)	No hazard identified
PNEC (Sediment)	
PNEC sediment (freshwater)	No hazard identified
PNEC sediment (marine water)	No hazard identified
PNEC (Soil)	
PNEC soil	No hazard identified
PNEC (Oral)	
PNEC oral (secondary poisoning)	No potential to cause toxic effects if accumulated (in higher organisms) via the food chain
PNEC (STP)	
PNEC sewage treatment plant	No data available: testing technically not feasible

8.2. Exposure controls

Appropriate engineering controls:

Ensure good ventilation of the work station.

Personal protective equipment:

Gloves. Protective clothing. Safety glasses.

Hand protection:

Wear suitable gloves

Type	Material	Permeation	Thickness (mm)	Penetration	Standard
Disposable gloves, Reusable gloves	Use neoprene or rubber gloves		> 0.18		EN 374

Eye protection:

Chemical goggles or safety glasses. EN 166

Skin and body protection:

Protective clothing (with elasticated cuffs and closed neck). EN 14605

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment. Selection of respiratory protection must be based on the result of the risk assessment

Personal protective equipment symbol(s):



Environmental exposure controls:

Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties ►

Physical state	: Solid
Appearance	: Flakes. Pasty.
Colour	: Black. White inclusions permissible.
Odour	: Odourless.
Odour threshold	: No data available
pH	: No data available

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Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: Not applicable
Boiling point	: No data available
Flash point	: Not applicable
Auto-ignition temperature	: Not applicable
Decomposition temperature	: No data available
Flammability	: Non flammable.
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Density	: 1.03 g/ml
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: No data available
Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: No data available
Explosive properties	: Not explosive.
Oxidising properties	: Non oxidizing.
Explosive limits	: Not applicable

Single wall carbon nanotubes

Particle size	See section 3.2
Particle size distribution	See section 3.2
Particle shape	See section 3.2
Particle aspect ratio	See section 3.2
Particle aggregation state	Bundles of nanotubes
Particle agglomeration state	Single wall carbon nanotubes are embedded in a matrix
Particle specific surface area	See section 3.2
Particle dustiness	1660 mg/kg (DIRM - Single wall carbon nanotubes)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition.

10.5. Incompatible materials

Strong oxidizing agents. Strong bases. Strong acids. Isocyanates.

10.6. Hazardous decomposition products

Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases. Nitrogen oxides. Sulphur oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified.
Acute toxicity (dermal)	: Not classified.
Acute toxicity (inhalation)	: Not classified. Not classified. Not classified.

Alkylene glycol derivative

LD50 oral rat	22500 mg/kg
LD50 dermal rabbit	20800 mg/kg

Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylene)bis(benzenesulphonate) (27344-41-8)

LD50 oral rat	> 2000 mg/kg - OECD 401
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LD50 dermal rat	> 2000 mg/kg - OECD 402
Skin corrosion/irritation	: Not classified.
Serious eye damage/irritation	: Causes serious eye irritation.
Respiratory or skin sensitisation	: Not classified. Not classified.
Germ cell mutagenicity	: Not available
Carcinogenicity	: Not available
Reproductive toxicity	: Not available

Single wall carbon nanotubes	
NOAEL (animal/female, F0/P)	no adverse effects seen at highest dose tested > 1000 mg/kg bw/day - OECD 422
NOAEL (animal, F1)	> 1000 mg/kg bw/day - for adverse effects on prenatal development (conceptus to birth) - OECD 422
NOAEL (animal, F1)	> 1000 mg/kg bw/day - for adverse effects on postnatal development (pup) - OECD 422
STOT-single exposure	: Not available
STOT-repeated exposure	: Not available

Single wall carbon nanotubes	
NOAEL (oral, rat, 90 days)	no adverse effects seen at highest dose tested > 1000 mg/kg bodyweight/day - OECD 422
Aspiration hazard	: Not available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
Hazardous to the aquatic environment, short-term (acute)	: Not classified.
Hazardous to the aquatic environment, long-term (chronic)	: Not classified.

Alkylene glycol derivative	
LC50 fish - 96h	40613 mg/l Oncorhynchus mykiss (Rainbow trout)
EC50 crustacea - 48h	18340 mg/l Ceriodaphnia dubia
EC50 algae - 96h	19000 mg/l Pseudokirchneriella subcapitata
NOEC chronic crustacea - 21 days	13020 mg/l Ceriodaphnia dubia - 7 days
Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylene)bis(benzenesulphonate) (27344-41-8)	
LC50 fish - 96h	10 – 100 mg/l Brachydanio rerio (zebra-fish) - OECD 203 - ISO 7346; 84/499/EEC, C.1
EC50 algae - 72h	10 – 100 mg/l (Growth rate) Scenedesmus subspicatus - OECD 201
NOEC (chronic)	> 1 mg/l (Growth rate) Scenedesmus subspicatus - OECD 201
NOEC chronic crustacea - 21 days	> 1 mg/l Daphnia magna (Water flea) - OECD 211

12.2. Persistence and degradability

Alkylene glycol derivative	
Persistence and degradability	Readily biodegradable.
Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylene)bis(benzenesulphonate) (27344-41-8)	
Persistence and degradability	Readily biodegradable.
Biochemical oxygen demand (BOD)	0 mg O ₂ /g substance - 5 days
Chemical oxygen demand (COD)	1.507 mg O ₂ /g substance
Biodegradation	> 70 % - OECD 301F

12.3. Bioaccumulative potential

Alkylene glycol derivative	
Bioconcentration factor (BCF REACH)	0.09
Partition coefficient n-octanol/water (Log Pow)	-1.07
Disodium 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylene)bis(benzenesulphonate) (27344-41-8)	
Partition coefficient n-octanol/water (Log Pow)	-2.32 - OECD 107

12.4. Mobility in soil

Alkylene glycol derivative	
Surface tension	71.6 mN/m

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according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

12.5. Results of PBT and vPvB assessment

Component	
Alkylen glycol derivative	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
Single wall carbon nanotubes	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	: Dispose of this material and its container at hazardous or special waste collection point.
Waste treatment methods	: Disposal through controlled incineration or authorised waste dump. Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations	: Prevent entry to sewers and public waters.
Product/Packaging disposal recommendations	: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.
Additional information	: Clean up even minor leaks or spills if possible without unnecessary risk.
European List of Waste (LoW) code	: 06 13 99 - wastes not otherwise specified

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.2. UN proper shipping name				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available				

14.6. Special precautions for user

Overland transport

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

Inland waterway transport

Not regulated

Rail transport

Not regulated

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

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according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.2. National regulations

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

Germany

Employment restrictions : Observe restrictions according Act on the Protection of Working Mothers (MuSchG)
Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG)

Water hazard class (WGK) : WGK 1, Slightly hazardous to water (Classification according to AwSV, Annex 1)

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

SZW-lijst van kankerverwekkende stoffen : None of the components are listed

SZW-lijst van mutagene stoffen : None of the components are listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : None of the components are listed

SZW-lijst van reprotoxische stoffen – : None of the components are listed

Vruchtbaarheid

SZW-lijst van reprotoxische stoffen – Ontwikkeling : None of the components are listed

Switzerland

Storage class (LK) : LK 11/13 - Solids

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

For the following substances of this mixture a chemical safety assessment has been carried out

Single wall carbon nanotubes

SECTION 16: Other information

Abbreviations and acronyms:

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
WGK	Water Hazard Class
VOC	Volatile Organic Compounds
OEL	Occupational Exposure Limit
N.O.S.	Not Otherwise Specified
IOELV	Indicative Occupational Exposure Limit Value
EN	European Standard
EC-No.	European Community number
CAS-No.	Chemical Abstract Service number
vPvB	Very Persistent and Very Bioaccumulative
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
STP	Sewage treatment plant
SDS	Safety Data Sheet
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
TLM	Median Tolerance Limit
PNEC	Predicted No-Effect Concentration
PBT	Persistent Bioaccumulative Toxic
OECD	Organisation for Economic Co-operation and Development
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
NOEC	No-Observed Effect Concentration
NOAEL	No-Observed Adverse Effect Level
LD50	Median lethal dose

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NOAEC	No-Observed Adverse Effect Concentration
LOAEL	Lowest Observed Adverse Effect Level
IMDG	International Maritime Dangerous Goods
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DNEL	Derived-No Effect Level
DMEL	Derived Minimal Effect level
BCF	Bioconcentration factor
LC50	Median lethal concentration
ATE	Acute Toxicity Estimate
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA	International Air Transport Association
BLV	Biological limit value
ThOD	Theoretical oxygen demand (ThOD)
ED	Endocrine disrupting properties
Full text of H- and EUH-statements:	
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
H302	Harmful if swallowed.
H319	Causes serious eye irritation.

Revision : All recent revision(s) are noted by a bold triangle pointed to right '►'.

Disclaimer : This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It is the user's responsibility to take mentioned precaution measures and ensure that this information is complete and sufficient for the use of this product.

SDS EU (REACH Annex II) OCSiAl

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