according to Regulation (EC) No. 1907/2006



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

1.1 Product identifier

Trade name : Ti-Pure™ Titanium Dioxide Pigment

SDS-Identcode : 130000146694

REACH Registration Number : 01-2119489379-17-0016

Substance name : Titanium dioxide

Index-No. : 022-006-00-2

EC-No. : 236-675-5

Other means of identification : R-104

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

Use of the Sub-

stance/Mixture

: Colouring agent, Pigment

Recommended restrictions

on use

For industrial use only.

1.3 Details of the supplier of the safety data sheet

Company : Chemours Netherlands B.V.

Baanhoekweg 22

3313 LA Dordrecht Netherlands

Telephone : +31-(0)-78-630-1011

Telefax : +31-78-6163737

E-mail address of person responsible for the SDS

: sds-support@chemours.com

1.4 Emergency telephone number

+(44)-870-8200418 (CHEMTREC - Recommended)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

according to Regulation (EC) No. 1907/2006



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2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Titanium dioxide

Index-No. : 022-006-00-2

EC-No. : 236-675-5

Components

Chemical name	CAS-No.	Concentration (% w/w)
	EC-No.	` ,
Titanium dioxide	13463-67-7	>= 90 - <= 100
	236-675-5	

SECTION 4: First aid measures

4.1 Description of first aid measures

Protection of first-aiders : No special precautions are necessary for first aid responders.

If inhaled : If inhaled, remove to fresh air.

Get medical attention if symptoms occur.

In case of skin contact : Wash with water and soap as a precaution.

Get medical attention if symptoms occur.

In case of eye contact : Flush eyes with water as a precaution.

Get medical attention if irritation develops and persists.

If swallowed, DO NOT induce vomiting.

Get medical attention if symptoms occur. Rinse mouth thoroughly with water.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : irritant effects

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Not applicable

Will not burn

Unsuitable extinguishing

media

Not applicable Will not burn

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-

fighting

Exposure to combustion products may be a hazard to health.

Hazardous combustion prod- :

ucts

No hazardous combustion products are known

5.3 Advice for firefighters

Special protective equipment :

for firefighters

Wear self-contained breathing apparatus for firefighting if nec-

essary. Use personal protective equipment.

Specific extinguishing meth-

ods

Use extinguishing measures that are appropriate to local cir-

cumstances and the surrounding environment.

Use water spray to cool unopened containers.

Remove undamaged containers from fire area if it is safe to do

SO.

Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Follow safe handling advice (see section 7) and personal pro-

tective equipment recommendations (see section 8).

6.2 Environmental precautions

Environmental precautions : Avoid release to the environment.

Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water.

Local authorities should be advised if significant spillages

cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Sweep up or vacuum up spillage and collect in suitable con-

tainer for disposal.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to deter-

mine which regulations are applicable.

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Sections 13 and 15 of this SDS provide information regarding

certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures See Engineering measures under EXPOSURE

CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation Use only with adequate ventilation.

Advice on safe handling Handle in accordance with good industrial hygiene and safety

practice, based on the results of the workplace exposure as-

sessment

Take care to prevent spills, waste and minimize release to the

environment.

If exposure to chemical is likely during typical use, provide eye Hygiene measures

flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contami-

nated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage

areas and containers

Keep in properly labelled containers. Store in accordance with

the particular national regulations.

Advice on common storage No special restrictions on storage with other products.

7.3 Specific end use(s)

Specific use(s) No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form	Control parameters	Basis
		of exposure)		
Titanium dioxide	13463-67-7	TWA (inhalable	10 mg/m3	GB EH40
		dust)	_	
		TWA (Respirable	4 mg/m3	GB EH40
		dust)		

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8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.

Minimize workplace exposure concentrations.

Personal protective equipment

Eye protection : Wear the following personal protective equipment:

Safety glasses

Equipment should conform to BS EN 166

Hand protection

Remarks : Wash hands before breaks and at the end of workday.

Skin and body protection : Skin should be washed after contact.

Respiratory protection : If adequate local exhaust ventilation is not available or expo-

sure assessment demonstrates exposures outside the rec-

ommended guidelines, use respiratory protection. Equipment should conform to BS EN 143

Filter type : Particulates type (P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : crystalline

Colour : white

Odour : odourless

Odour Threshold : No data available

pH : No data available

Melting point/freezing point : 1,843 °C

Initial boiling point and boiling :

range

3,000 °C

Flash point : Not applicable

Evaporation rate : Not applicable

Flammability (solid, gas) : Will not burn

Not expected to form explosive dust-air mixtures.

Upper explosion limit / Upper

flammability limit

No data available

according to Regulation (EC) No. 1907/2006



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Lower explosion limit / Lower : No data available

flammability limit

Vapour pressure Not applicable

Relative vapour density Not applicable

Relative density 3.6 - 4.3

Solubility(ies)

Water solubility insoluble

Partition coefficient: n-

octanol/water

No data available

No data available Auto-ignition temperature

Decomposition temperature The substance or mixture is not classified self-reactive.

Viscosity

Not applicable Viscosity, kinematic

Explosive properties Not explosive

Oxidizing properties The substance or mixture is not classified as oxidizing.

9.2 Other information

Particle size 0.2 - 0.4 µm

> Method: BI-XDC X-ray Disc Centrifuge median mass based hydrodynamic diameter

Particle Size Distribution For the information on the particles percentage with aerody-

namic diameter ≤10 micron, see section 11.1 Information on

toxicological effects - Carcinogenicity - Remarks.

SECTION 10: Stability and reactivity

10.1 Reactivity

Not classified as a reactivity hazard.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions None known.

10.4 Conditions to avoid

Conditions to avoid None known.

10.5 Incompatible materials

Materials to avoid None.

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10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of: Skin contact Ingestion

exposure

Eye contact

Acute toxicity

Not classified based on available information.

Components:

Titanium dioxide:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Method: OECD Test Guideline 425

: LC50 (Rat): > 6.82 mg/l Acute inhalation toxicity

Exposure time: 4 h

Test atmosphere: dust/mist

Assessment: The substance or mixture has no acute inhala-

tion toxicity

Acute dermal toxicity : Acute toxicity estimate (Rat): > 2,000 mg/kg

Method: Expert judgement

Assessment: The substance or mixture has no acute dermal

toxicity

Skin corrosion/irritation

Not classified based on available information.

Components:

Titanium dioxide:

Species Rabbit

Method OECD Test Guideline 404

Result No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

Titanium dioxide:

Species Rabbit

Method **OECD Test Guideline 405**

Result No eye irritation

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Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Components:

Titanium dioxide:

Test Type : Buehler Test Exposure routes : Skin contact Species : Guinea pig

Method : OECD Test Guideline 406

Result : negative

Test Type : Local lymph node assay (LLNA)

Exposure routes : Skin contact

Species : Mouse

Method : OECD Test Guideline 429

Result : negative

Exposure routes : Inhalation Species : Mouse Result : negative

Exposure routes : Inhalation Species : Humans Result : negative

Germ cell mutagenicity

Not classified based on available information.

Components:

Titanium dioxide:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)

Method: OECD Test Guideline 471

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Method: OECD Test Guideline 476

Result: negative

Test Type: Chromosome aberration test in vitro

Method: OECD Test Guideline 473

Result: negative

Test Type: comet assay Method: OPPTS 870.5140

Result: positive

Genotoxicity in vivo : Test Type: In vivo mammalian alkaline comet assay

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Species: Rat

Application Route: intratracheal Method: OECD Test Guideline 489

Result: negative

Test Type: Mammalian erythrocyte micronucleus test (in vivo

cytogenetic assay) Species: Rat

Application Route: Ingestion Method: OECD Test Guideline 474

Result: negative

Test Type: Mutagenicity (in vivo mammalian bone-marrow

cytogenetic test, chromosomal analysis)

Species: Mouse

Application Route: Intraperitoneal injection Method: OECD Test Guideline 475

Result: negative

Test Type: Transgenic rodent germ cell gene mutation assay

Species: Mouse

Application Route: Intravenous injection Method: OECD Test Guideline 488

Result: negative

Germ cell mutagenicity- As-

sessment

Weight of evidence does not support classification as a germ

cell mutagen.

Carcinogenicity

Not classified based on available information.

Product:

Remarks

In lifetime inhalation studies rats were exposed for 2 years to respectively 10, 50 and 250 mg/m3 of respirable TiO2. Slight lung fibrosis was observed at 50 and 250 mg/m3 levels. Microscopic lung tumours were also observed in 13 percent of the rats exposed to 250 mg/m3, an exposure level that caused lung overloading and impairment of rat lungs clearance mechanisms.

In further studies, these tumours were found to occur only under particle overload conditions in a uniquely sensitive species, the rat, and have little or no relevance for humans. The pulmonary inflammatory response to TiO2 particles exposure was also found to be much more severe in rats than in other redent species.

rodent species.

In February 2006, IARC has re-evaluated Titanium dioxide as pertaining to Group 2B: "possibly carcinogenic to humans", based upon inadequate evidence in humans and sufficient evidence in experimental animals for the carcinogenicity of titanium dioxide. IARC evaluation guidelines consider the generation of tumours, in 2 different studies within the same animal species, to be adequate criteria for an assessment of

sufficient evidence.

The conclusions of several epidemiology studies on more than

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> 20000 TiO2 industry workers in Europe and the USA did not suggest a carcinogenic effect of TiO2 dust on the human lung. Mortality from other chronic diseases, including other respiratory diseases, was also not associated with exposure to TiO2 dust.

Based upon all available study results, Chemours scientists conclude that titanium dioxide will not cause lung cancer or chronic respiratory diseases in humans at concentrations experienced in the workplace.

Remarks The Commission Regulation (EU) 2020/217, amending

REGULATION (EC) No 1272/2008, introduces a new harmonized classification for certain forms of TiO2 as a category 2 carcinogen by inhalation which applies from 1 October 2021. To be classified, the TiO₂ must be in powder form and contain 1% or more of particles with aerodynamic diameter ≤ 10 µm. Through a rigorous evaluation of available test methods and available standards, EN 15051-2 (Workplace exposure -Measurement of the dustiness of bulk materials - rotating drum method) was identified as the best available method for complying to the regulation. Data from the testing following EN 15051-2 consistently shows that Ti-Pure™ grades of TiO2 contain < 1% of particles with aerodynamic diameter ≤ 10 µm and therefore do not meet the criteria for classification. The respirable and thoracic dust content of Ti-Pure™ grades fall in the very low or low dustiness categories by the EN 15051-2 method.

Components:

Titanium dioxide:

Species Rat

Application Route inhalation (dust/mist/fume)

Exposure time 2 Years Result negative

Species Rat Application Route Ingestion Exposure time 105 weeks Result negative

Species Mouse Application Route Ingestion Exposure time 103 weeks Result negative

Carcinogenicity - Assess-

Weight of evidence does not support classification as a carment

cinogen

Reproductive toxicity

Not classified based on available information.

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Components:

Titanium dioxide:

Effects on fertility : Test Type: One-generation reproduction toxicity study

Species: Rat

Application Route: Ingestion Method: OECD Test Guideline 443

Result: negative

Effects on foetal develop-

ment

Test Type: Prenatal development toxicity study (teratogenicity)

Species: Rat

Application Route: Ingestion Method: OECD Test Guideline 414

Result: negative

Reproductive toxicity - As-

sessment

Weight of evidence does not support classification for repro-

ductive toxicity

STOT - single exposure

Not classified based on available information.

Components:

Titanium dioxide:

Exposure routes : Skin contact

Assessment : No significant health effects observed in animals at concentra-

tions of 2000 mg/kg bw or less

Exposure routes : Ingestion

Assessment : No significant health effects observed in animals at concentra-

tions of 2000 mg/kg bw or less

Exposure routes : inhalation (dust/mist/fume)

Assessment : No significant health effects observed in animals at concentra-

tions of 5.0 mg/l/4h or less

STOT - repeated exposure

Not classified based on available information.

Components:

Titanium dioxide:

Exposure routes : Ingestion

Assessment : No significant health effects observed in animals at concentra-

tions of 100 mg/kg bw or less.

Exposure routes : inhalation (dust/mist/fume)

Assessment : No significant health effects observed in animals at concentra-

tions of 0.2 mg/l/6h/d or less.

Exposure routes : Ingestion

Assessment : No significant health effects observed in animals at concentra-

tions of 200 mg/kg bw or less.

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Repeated dose toxicity

Components:

Titanium dioxide:

Species : Rat, male and female

 NOAEL
 : 24,000 mg/kg

 LOAEL
 : > 24,000 mg/kg

Application Route : Ingestion Exposure time : 28 Days

Method : OECD Test Guideline 407

Remarks : No significant adverse effects were reported

Species : Rat, male and female

NOAEL : 0.01 mg/l LOAEL : 0.5 mg/l

Application Route : inhalation (dust/mist/fume)

Exposure time : 24 Months

Method : OECD Test Guideline 453

Remarks : No significant adverse effects were reported

Species : Rat, male and female

NOAEL : 962 mg/kg
LOAEL : 962 mg/kg
Application Route : Ingestion
Exposure time : 90 Days

Method : OECD Test Guideline 408

Remarks : No significant adverse effects were reported

Aspiration toxicity

Not classified based on available information.

Components:

Titanium dioxide:

No aspiration toxicity classification

Experience with human exposure

Product:

Inhalation : Target Organs: Respiratory system

Symptoms: respiratory tract irritation

Skin contact : Target Organs: Skin

Symptoms: Contact with dust can cause mechanical irritation

or drying of the skin.

Eye contact : Target Organs: Eyes

Symptoms: Dust contact with the eyes can lead to mechanical

irritation.

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SECTION 12: Ecological information

12.1 Toxicity

Components:

Titanium dioxide:

Toxicity to fish : LC50 (Fish): > 1,000 mg/l

Exposure time: 96 h

Method: OECD Test Guideline 203

LC50 (Marine species): > 10,000 mg/l

Exposure time: 96 h

Method: OECD Test Guideline 203

Toxicity to daphnia and other:

aquatic invertebrates

EC50 (Daphnia sp. (water flea)): > 1,000 mg/l

Exposure time: 48 h

Method: OECD Test Guideline 202

EC50 (No species specified): > 1,000 mg/l

Exposure time: 48 h

Method: OECD Test Guideline 202

Toxicity to algae/aquatic

plants

ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100

mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

EC50 (Skeletonema costatum (marine diatom)): > 10,000 mg/l

Exposure time: 72 h Method: ISO 10253

NOEC (Pseudokirchneriella subcapitata (green algae)): > 100

ma/l

Exposure time: 3 d

Method: OECD Test Guideline 201

NOEC (Skeletonema costatum (marine diatom)): 5,600 mg/l

Exposure time: 3 d Method: ISO 10253

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Components:

Titanium dioxide:

Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)

Bioconcentration factor (BCF): 352

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12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered

to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of

0.1% or higher.

12.6 Other adverse effects

Product:

Endocrine disrupting poten-

tial

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at

levels of 0.1% or higher.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.

According to the European Waste Catalogue, Waste Codes

are not product specific, but application specific.

Waste codes should be assigned by the user, preferably in

discussion with the waste disposal authorities.

Contaminated packaging : Empty containers should be taken to an approved waste han-

dling site for recycling or disposal.

If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

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14.6 Special precautions for user

Not applicable

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

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances,

preparations and articles (Annex XVII)

: Not applicable

REACH - Candidate List of Substances of Very High

Concern for Authorisation (Article 59).

Not applicable

REACH - List of substances subject to authorisation

(Annex XIV)

Not applicable

Regulation (EC) No 1005/2009 on substances that de-

plete the ozone layer

: Not applicable

Regulation (EU) 2019/1021 on persistent organic pollu-

tants (recast)

Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import

of dangerous chemicals

Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

Not applicable

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Other information : Ti-Pure™ and any associated logos are trademarks or copy-

rights of The Chemours Company FC, LLC.

Chemours™ and the Chemours Logo are trademarks of The

Chemours Company.

Before use read Chemours safety information.

For further information contact the local Chemours office or

nominated distributors.

These products may not be directly added to food, pharmaceuticals, cosmetics, or cigarette papers/filters for tobacco

products

Do not use or resell Chemours[™] materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless agreed to by Seller in a written agreement covering such use. For further information,

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please contact your Chemours representative.

An electrostatic charge can potentially build up when pouring or conveying product from plastic bags. Do not use plastic bags in the presence of flammable or explosive vapors. In the manufacture of titanium dioxide, product is packaged at temperatures of approximately 100 to 120°C (212 to 248°F). When pigment is shipped shortly after manufacture, it may stay hot for a very long time depending on ambient temperatures and inventory storage practices. Use caution while handling hot pigment to prevent burns to personnel. Use caution in solvent applications to prevent ignition of solvent.

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of other abbreviations

GB EH40 : UK. EH40 WEL - Workplace Exposure Limits

GB EH40 / TWA : Long-term exposure limit (8-hour TWA reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN -Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS -Emergency Schedule: ENCS - Existing and New Chemical Substances (Japan): ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP -Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL -International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TRGS -Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

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Sources of key data used to compile the Safety Data Sheet

Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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