according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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

1.1 Product identifier

Trade name : CH-80-AL

REACH Registration Number : 01-2119967008-33-0000

Substance name : Cyclohexylidenebis[tert-butyl] peroxide

EC-No. : 221-111-2

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

Use of the Sub-

stance/Mixture

: polymerisation initiators

Recommended restrictions

on use

Exposure Scenario is available as separate attachment., For

further information see eSDS.

1.3 Details of the supplier of the safety data sheet

Company : United Initiators GmbH

Dr.-Gustav-Adolph-Str. 3

82049 Pullach

: +49 / 89 / 74422 - 0 Telephone

E-mail address of person

responsible for the SDS

: contact@united-in.com

#### 1.4 Emergency telephone number

0800 000 7801 (toll-free, access from Germany only) +49 89 220 61012

# **SECTION 2: Hazards identification**

# 2.1 Classification of the substance or mixture

#### Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 3 H226: Flammable liquid and vapour.

Organic peroxides, Type C H242: Heating may cause a fire.

Aspiration hazard, Category 1 H304: May be fatal if swallowed and enters air-

ways.

Long-term (chronic) aquatic hazard, Cat-H410: Very toxic to aquatic life with long lasting

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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egory 1 effects.

#### 2.2 Label elements

#### Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :





Signal word : Danger

Hazard statements : H226 Flammable liquid and vapour.

H242 Heating may cause a fire.

H304 May be fatal if swallowed and enters airways.H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements : Prevention:

P210 Keep away from heat, hot surfaces, sparks, open

flames and other ignition sources. No smoking.

P234 Keep only in original packaging. P273 Avoid release to the environment.

P280 Wear protective gloves/ protective clothing/ eye

protection/ face protection/ hearing protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON

CENTER/ doctor.

P331 Do NOT induce vomiting.

P370 + P378 In case of fire: Use water spray, alcohol-

resistant foam, dry chemical or carbon dioxide to

extinguish.

P391 Collect spillage.

#### **Additional Labelling**

EUH208 Contains tert-butyl hydroperoxide. May produce an allergic reaction.

#### 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.

Ecological information: 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.

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Toxicological information: 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 3: Composition/information on ingredients**

#### 3.1 Substances

Substance name : Cyclohexylidenebis[tert-butyl] peroxide

EC-No. : 221-111-2

Chemical nature : Organic Peroxide

#### Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)	M-Factor, SCL, ATE
Cyclohexylidenebis[tert-butyl] peroxide	3006-86-8 221-111-2	>= 75 - < 80	M-Factor (Chronic aquatic toxicity): 1
2,2,4,6,6- pentamethylheptane	13475-82-6 236-757-0	>= 20 - < 25	
tert-butyl hydroperoxide	75-91-2 200-915-7	>= 0,25 - < 0,75	Acute toxicity estimate  Acute oral toxicity: 560 mg/kg  Acute inhalation toxicity (vapour): 0,83 mg/l  Acute dermal toxicity: 440 mg/kg

## **SECTION 4: First aid measures**

#### 4.1 Description of first aid measures

General advice : Take off contaminated clothing and shoes immediately.

Call a physician immediately.

Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and seek medical

advice.

Move out of dangerous area.

Show this safety data sheet to the doctor in attendance.

Do not leave the victim unattended.

Symptoms of poisoning may appear several hours later. No artificial respiration, mouth-to-mouth or mouth to nose. Use

suitable instruments/apparatus.

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Protection of first-aiders : First Aid responders should pay attention to self-protection

and use the recommended protective clothing

If inhaled : Administer oxygen if breathing is difficult or cyanosis is ob-

served.

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Call a physician or poison control centre immediately.

If unconscious, place in recovery position and seek medical

advice.

Keep respiratory tract clear.

In case of skin contact : If symptoms persist, call a physician.

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing

and shoes.

Wash contaminated clothing before re-use.

If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty

of water and seek medical advice.

Remove contact lenses. Protect unharmed eye.

Keep eye wide open while rinsing.

If eye irritation persists, consult a specialist.

If swallowed : Call a physician immediately.

Contact a poison control center. Rinse mouth thoroughly with water.

Keep respiratory tract clear. Do NOT induce vomiting.

If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : sensitising effects

Risks : May be fatal if swallowed and enters airways.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.

# **SECTION 5: Firefighting measures**

# 5.1 Extinguishing media

Suitable extinguishing media : Water spray jet

Alcohol-resistant foam Carbon dioxide (CO2)

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Dry chemical

Unsuitable extinguishing

media

High volume water jet

# 5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-

fighting

Risk of explosion if heated under confinement.

Possible emission of gaseous decomposition products may

lead to a dangerous pressure build-up.

Avoid confinement.

Contact with incompatible materials or exposure to temperatures exceeding SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which

may auto-ignite.

The product burns violently.

Flash back possible over considerable distance.

Do not allow run-off from fire fighting to enter drains or water

courses.

Vapours may form explosive mixtures with air.

The product will float on water and can be reignited on surface

water.

Cool closed containers exposed to fire with water spray.

#### 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

Do not use a solid water stream as it may scatter and spread

fire.

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

SO.

Use water spray to cool unopened containers.

Further information : Use extinguishing measures that are appropriate to local cir-

cumstances and the surrounding environment. Use a water spray to cool fully closed containers.

Collect contaminated fire extinguishing water separately. This

must not be discharged into drains.

Fire residues and contaminated fire extinguishing water must

be disposed of in accordance with local regulations.

# **SECTION 6: Accidental release measures**

#### 6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Follow safe handling advice and personal protective equip-

ment recommendations.

Beware of vapours accumulating to form explosive concentra-

tions. Vapours can accumulate in low areas.

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Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

Never return spills in original containers for re-use.

Treat recovered material as described in the section "Disposal

considerations".

#### 6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.

Prevent further leakage or spillage if safe to do so.

If the product contaminates rivers and lakes or drains inform

respective authorities.

#### 6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contact with incompatible substances can cause decomposi-

tion at or below SADT. Clear spills immediately.

Suppress (knock down) gases/vapours/mists with a water

spray jet.

To clean the floor and all objects contaminated by this materi-

al, use plenty of water.

Soak up with inert absorbent material. Isolate waste and do not reuse. Non-sparking tools should be used.

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.

#### 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.

Advice on safe handling : Open drum carefully as content may be under pressure.

Protect from contamination.

Do not swallow.

Do not breathe vapours/dust.

Avoid exposure - obtain special instructions before use.

Avoid contact with skin and eyes. Avoid formation of aerosol.

Take precautionary measures against static discharges. Never return any product to the container from which it was

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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originally removed.

Provide sufficient air exchange and/or exhaust in work rooms.

Avoid confinement.

Keep away from heat, hot surfaces, sparks, open flames and

other ignition sources. No smoking.

Smoking, eating and drinking should be prohibited in the ap-

plication area.

Wash thoroughly after handling. For personal protection see section 8.

Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being

used.

Advice on protection against fire and explosion

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from heat and sources of ignition. Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition. Keep away from combustible material. Do not spray on a naked flame or any incandescent material.

Hygiene measures

Avoid contact with skin, eyes and clothing. Keep away from food and drink. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

#### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

Store in original container. Keep containers tightly closed in a cool, well-ventilated place. Store in cool place. Contamination may result in dangerous pressure increases - closed containers may rupture. Observe label precautions. Store in accordance with the particular national regulations. Avoid impurities (e.g. rust, dust, ash), risk of decomposition. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Advice on common storage

Keep away from combustible materials.

Keep away from strong acids, bases, heavy metal salts and

other reducing substances.

Storage class (TRGS 510) 5.2

Recommended storage tem: :

perature

< 30 °C

age stability

Further information on stor- : Stable under recommended storage conditions.

#### 7.3 Specific end use(s)

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Specific use(s) : For further information, refer to the product technical data

sheet.

# **SECTION 8: Exposure controls/personal protection**

# 8.1 Control parameters

# **Occupational Exposure Limits**

Contains no substances with occupational exposure limit values.

# Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value	
Cyclohexyli- denebis[tert-butyl] peroxide	Workers	Inhalation	Long-term systemic effects	5,29 mg/m3	
	Workers	Skin contact	Long-term systemic effects	15 mg/kg bw/day	
tert-butyl hydroperox- ide	Workers	Inhalation	Long-term systemic effects	2,2 mg/m3	
	Remarks:Derived minimal effect level (DMEL)				
	Workers	Inhalation	Acute systemic effects	85,2 mg/m3	
	Remarks:Derived minimal effect level (DMEL)				
	Workers	Inhalation	Long-term local ef- fects	0,58 mg/m3	
	Remarks:Derived minimal effect level (DMEL)				
	Workers	Inhalation	Acute local effects	28,4 mg/m3	
	Remarks:Derived minimal effect level (DMEL)				
	Workers	Skin contact	Long-term systemic effects	0,21 mg/m3	
	Remarks:Derived minimal effect level (DMEL)				

# Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
Cyclohexylidenebis[tert-butyl]	Fresh water	6,45 µg/l
peroxide		
	Marine water	0,645 μg/l
	Sewage treatment plant	2 mg/l
	Fresh water sediment	0,102 mg/kg dry
		weight (d.w.)
	Marine sediment	0,01 mg/kg dry
		weight (d.w.)
	Soil	5,29 mg/kg dry
		weight (d.w.)
tert-butyl hydroperoxide	Fresh water	0,0015 mg/l
	Marine water	0,00015 mg/l
	Fresh water sediment	0,00621 mg/kg
		dry weight (d.w.)

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Marine sediment	0,000621 mg/kg dry weight (d.w.)
Agricultural soil	0,166 mg/kg dry weight (d.w.)
Sewage treatment plant	0,17 mg/l
Secondary poisoning	1,4 mg/kg food

#### 8.2 Exposure controls

## **Engineering measures**

Minimize workplace exposure concentrations.

#### Personal protective equipment

Eye/face protection : Ensure that eyewash stations and safety showers are close

to the workstation location.

Please follow all applicable local/national requirements when selecting protective measures for a specific workplace. Always wear eye protection when the potential for inadvertent

eye contact with the product cannot be excluded.

Tightly fitting safety goggles

Please wear suitable protective goggles. Also wear face pro-

tection if there is a splash hazard.

Equipment should conform to EN 166

Hand protection

Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0.40 mm

Directive : Equipment should conform to EN 374

Material : butyl-rubber
Break through time : 30 min
Glove thickness : 0,47 mm

Directive : Equipment should conform to EN 374

Remarks : The data about break through time/strength of material are

standard values! The exact break through time/strength of material has to be obtained from the producer of the protective glove. Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of

workday.

Skin and body protection : Select appropriate protective clothing based on chemical

resistance data and an assessment of the local exposure

potential.

Additional body garments should be used based upon the

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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task being performed (e.g., sleevelets, apron, gauntlets, dis-

posable suits) to avoid exposed skin surfaces.

Wear as appropriate:

Flame retardant antistatic protective clothing.

Respiratory protection : In the case of dust or aerosol formation use respirator with an

approved filter.

Respirator with combination filter for vapour/particulate (EN

141)

Filter type : ABEK-filter

Protective measures : The type of protective equipment must be selected according

to the concentration and amount of the dangerous substance

at the specific workplace.

## **SECTION 9: Physical and chemical properties**

9.1 Information on basic physical and chemical properties

Physical state : liquid

Colour : colourless

Odour : characteristic

Odour Threshold : not determined

Melting point/ range : -25 °C

Initial boiling point and boiling :

range

Decomposition: Decomposes below the boiling point.

Flammability : Not applicable

Upper explosion limit / Upper

flammability limit

Upper explosion limit

4 %(V)

(for a component of this mixture)

Lower explosion limit / Lower

flammability limit

Lower explosion limit

0,5 %(V)

(for a component of this mixture)

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Flash point : 54 °C

Method: ISO 3679, closed cup

Auto-ignition temperature : not determined

Self-Accelerating decomposi-

tion temperature (SADT)

60 °C

Method: UN-Test H.4

SADT-Self Accelerating Decomposition Temperature. Lowest temperature at which the tested package size will undergo a

self-accelerating decomposition reaction.

pH : substance/mixture is non-soluble (in water)

Viscosity

Viscosity, dynamic : 4,4 mPa.s (20 °C)

Viscosity, kinematic : not determined

Solubility(ies)

Water solubility :  $< 0.001 \text{ g/l} (25 ^{\circ}\text{C})$ 

Method: OECD Test Guideline 105

insoluble

Partition coefficient: n-

octanol/water

log Pow: 7,2 (25 °C)

Method: OECD Test Guideline 117

Vapour pressure : 0,123 hPa (25 °C)

Relative density : not determined

Density : 0,884 g/cm3 (20 °C)

Relative vapour density : not determined

9.2 Other information

Explosives : Not explosive

In use, may form flammable/explosive vapour-air mixture.

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

Organic peroxide

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Flammability (liquids) : Flammable liquid and vapour., Organic peroxide

Self-ignition : The substance or mixture is not classified as pyrophoric.

Self-heating substances : Not applicable

The substance or mixture is not classified as self heating.

Substances and mixtures, which in contact with water, emit flammable gases

The substance or mixture does not emit flammable gases in

contact with water.

Desensitised explosives : Not applicable

Refractive index : 1,4337 at 20 °C

# **SECTION 10: Stability and reactivity**

#### 10.1 Reactivity

Stable under recommended storage conditions. Heating may cause a fire or explosion.

#### 10.2 Chemical stability

Stable under recommended storage conditions.

No decomposition if stored normally.

# 10.3 Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixture with air.

#### 10.4 Conditions to avoid

Conditions to avoid : Protect from contamination.

Contact with incompatible substances can cause decomposi-

tion at or below SADT. Heat, flames and sparks. Avoid confinement.

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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#### 10.5 Incompatible materials

Materials to avoid : Accelerators, strong acids and bases, heavy metals and

heavy metal salts, reducing agents

#### 10.6 Hazardous decomposition products

Irritant, caustic, flammable, noxious/toxic gases and vapours can develop in the case of fire and decomposition

# **SECTION 11: Toxicological information**

# 11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

#### **Acute toxicity**

Not classified due to lack of data.

**Product:** 

Acute oral toxicity : LD50 (Rat, female): 13.342 mg/kg

Method: OECD Test Guideline 401

Assessment: The substance or mixture has no acute oral tox-

icity

Acute inhalation toxicity : Remarks: This information is not available.

Acute toxicity estimate: > 20 mg/l

Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : LD0 (Rat): > 2.000 mg/kg

Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal

toxicity

#### **Components:**

#### Cyclohexylidenebis[tert-butyl] peroxide:

Acute oral toxicity : LD50 (Rat, female): 13.342 mg/kg

Method: OECD Test Guideline 401

Assessment: The substance or mixture has no acute oral tox-

icity

Acute dermal toxicity : LD0 (Rat): > 2.000 mg/kg

Method: OECD Test Guideline 402

Assessment: The substance or mixture has no acute dermal

toxicity

# 2,2,4,6,6-pentamethylheptane:

Acute oral toxicity : LD50 (Rat): > 5.000 mg/kg

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Method: OECD Test Guideline 401

Assessment: The substance or mixture has no acute oral tox-

Remarks: Based on data from similar materials

Acute inhalation toxicity LC50 (Rat, male and female): > 5.000 mg/m3

> Exposure time: 4 h Test atmosphere: vapour

Method: OECD Test Guideline 403

Remarks: No data available

Acute dermal toxicity LD50 Dermal (Rabbit): 3,16 ml/kg

Method: OECD Test Guideline 402

Remarks: Based on data from similar materials

tert-butyl hydroperoxide:

Acute oral toxicity LD50 (Rat): 560 mg/kg

Method: OECD Test Guideline 401

LC50 (Rat): 0,83 mg/l Acute inhalation toxicity

> Exposure time: 4 h Test atmosphere: vapour

Method: OECD Test Guideline 403 Remarks: The value is calculated

Acute dermal toxicity : LD50 (Rabbit): 440 mg/kg

Method: OECD Test Guideline 402

#### Skin corrosion/irritation

Based on available data, the classification criteria are not met.

**Product:** 

**Species** Rabbit

Method **OECD Test Guideline 404** 

Result Mild skin irritation

May cause skin irritation and/or dermatitis. Remarks

#### Components:

# Cyclohexylidenebis[tert-butyl] peroxide:

**Species** Rabbit

Method **OECD Test Guideline 404** 

Result Mild skin irritation

# 2,2,4,6,6-pentamethylheptane:

Result Repeated exposure may cause skin dryness or cracking.

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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#### tert-butyl hydroperoxide:

Species : Rabbit Method : Draize Test

Result : Corrosive, category 1C - where responses occur after expo-

sures between 1 hour and 4 hours and observations up to 14

days.

#### Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

**Product:** 

Species : Rabbit

Method : OECD Test Guideline 405

Result : No eye irritation

Remarks : Vapours may cause irritation to the eyes, respiratory system

and the skin.

#### **Components:**

## Cyclohexylidenebis[tert-butyl] peroxide:

Species : Rabbit

Method : OECD Test Guideline 405

Result : No eye irritation

# 2,2,4,6,6-pentamethylheptane:

Result : No eye irritation

tert-butyl hydroperoxide:

Species : Rabbit

Method : OECD Test Guideline 405
Result : Irreversible effects on the eye

#### Respiratory or skin sensitisation

#### Skin sensitisation

Not classified due to lack of data.

#### Respiratory sensitisation

Not classified due to lack of data.

**Product:** 

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

Method : OECD Test Guideline 406

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Result : negative GLP : yes

Remarks : Causes sensitisation.

## **Components:**

## Cyclohexylidenebis[tert-butyl] peroxide:

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

Method : OECD Test Guideline 406

Result : negative GLP : yes

# tert-butyl hydroperoxide:

Exposure routes : Skin contact Species : Guinea pig

Method : OECD Test Guideline 406

Result : May cause sensitisation by skin contact.

## Germ cell mutagenicity

Not classified due to lack of data.

#### **Product:**

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

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

GLP: yes

Test Type: Mutagenicity (Salmonella typhimurium - reverse

mutation assay)

Test system: Chinese hamster cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

GLP: yes

Test Type: Chromosome aberration test in vitro Test system: human lymphoblastoid cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

GLP: yes

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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#### **Components:**

## Cyclohexylidenebis[tert-butyl] peroxide:

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

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative GLP: yes

Test Type: Mutagenicity (Salmonella typhimurium - reverse

mutation assay)

Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

GLP: yes

Test Type: Chromosome aberration test in vitro

Test system: Human lymphocytes

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

GLP: yes

# 2,2,4,6,6-pentamethylheptane:

Germ cell mutagenicity- As-

sessment

No known effect.

# tert-butyl hydroperoxide:

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

Method: Directive 67/548/EEC, Annex, B.13/14

Result: positive

Test Type: Chromosome aberration test in vitro

Method: OECD Test Guideline 473

Result: positive

Test Type: In vitro mammalian cell gene mutation test

Method: Directive 67/548/EEC, Annex, B.17

Result: positive

Genotoxicity in vivo Test Type: Chromosomal aberration

> Species: Mouse (male and female) Application Route: Intravenous

Method: Directive 67/548/EEC, Annex V, B.12.

Result: negative

Test Type: Rodent dominant lethal test (germ cell) (in vivo)

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Species: Mouse (males)

Application Route: Intraperitoneal

Method: Directive 67/548/EEC, Annex, B.22

Result: positive

Test Type: In vivo mammalian alkaline comet assay

Species: Rat (male)

Application Route: inhalation (vapour) Method: OECD Test Guideline 489

Result: negative

Germ cell mutagenicity- As-

sessment

Positive result(s) from in vivo somatic cell mutagenicity tests supported by positive results from in vitro mutagenicity assays or chemical structure activity relationship to known germ cell

mutagens

# Carcinogenicity

Not classified due to lack of data.

#### **Components:**

#### 2,2,4,6,6-pentamethylheptane:

Carcinogenicity - Assess-

ment

No known effect.

## tert-butyl hydroperoxide:

Species : Rat, male and female Application Route : inhalation (vapour)

NOAEC : 15 mg/l

Method : OECD Test Guideline 451

Result : Suspected of causing cancer if inhaled.

GLP : yes

Carcinogenicity - Assess-

ment

Limited evidence of carcinogenicity in animal studies, Sus-

pected of causing cancer if inhaled.

## Reproductive toxicity

Not classified due to lack of data.

#### **Product:**

Effects on fertility : Test Type: Combined repeated dose toxicity study with the

reproduction/developmental toxicity screening test

Species: Rat, male and female

Application Route: Oral

General Toxicity - Parent: NOAEL: 200 mg/kg bw/day General Toxicity F1: NOAEL: 600 mg/kg bw/day

Fertility: NOAEL: 600 mg/kg bw/day Method: OECD Test Guideline 422

Result: negative

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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GLP: yes

Effects on foetal develop-

ment

Test Type: Combined repeated dose toxicity study with the

reproduction/developmental toxicity screening test

Species: Rat

Application Route: Ingestion

Method: OECD Test Guideline 422

Result: negative

#### **Components:**

## Cyclohexylidenebis[tert-butyl] peroxide:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the

reproduction/developmental toxicity screening test

Species: Rat, male and female

Application Route: Oral

General Toxicity - Parent: NOAEL: 200 mg/kg bw/day General Toxicity F1: NOAEL: 600 mg/kg bw/day

Fertility: NOAEL: 600 mg/kg bw/day Method: OECD Test Guideline 422

Result: negative

GLP: yes

Effects on foetal develop-

ment

Test Type: Combined repeated dose toxicity study with the

reproduction/developmental toxicity screening test

Species: Rat

Application Route: Ingestion Method: OECD Test Guideline 422

Result: negative

#### 2,2,4,6,6-pentamethylheptane:

Reproductive toxicity - As-

sessment

No known effect.

# tert-butyl hydroperoxide:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the

reproduction/developmental toxicity screening test

Species: Rat, male and female

Application Route: Oral

General Toxicity F1: NOAEL: 21 mg/kg body weight

Method: OECD Test Guideline 422

GLP: yes

Effects on foetal develop-

ment

Test Type: Prenatal development toxicity study (teratogenicity)

Species: Rat, female

Application Route: Oral

General Toxicity Maternal: NOAEL: 35 mg/kg body weight Developmental Toxicity: NOAEL: >= 35 mg/kg body weight

Method: OECD Test Guideline 414

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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GLP: yes

#### STOT - single exposure

Not classified due to lack of data.

# **Components:**

#### tert-butyl hydroperoxide:

Exposure routes : Inhalation

Assessment : May cause respiratory irritation.

#### STOT - repeated exposure

Not classified due to lack of data.

## **Components:**

#### tert-butyl hydroperoxide:

Assessment : The substance or mixture is not classified as specific target

organ toxicant, repeated exposure.

Remarks : Not classified due to data which are conclusive although insuf-

ficient for classification.

# Repeated dose toxicity

# **Product:**

Species : Rat, male and female NOAEL : 150 mg/kg bw/day

Application Route : Oral Exposure time : 90

Method : OECD Test Guideline 408

#### **Components:**

# Cyclohexylidenebis[tert-butyl] peroxide:

Species : Rat, male and female NOAEL : 150 mg/kg bw/day

Application Route : Oral Exposure time : 90

Method : OECD Test Guideline 408

#### tert-butyl hydroperoxide:

Species : Rat, male and female NOAEL : 21 mg/kg bw/day

Application Route : Oral

Method : OECD Test Guideline 422

GLP : yes

Species : Rat, male and female

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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NOAEC : 22,2 mg/m<sup>3</sup>

Application Route : inhalation (vapour)

Method : OECD Test Guideline 412

GLP : ves

#### **Aspiration toxicity**

May be fatal if swallowed and enters airways.

#### **Product:**

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

#### **Components:**

#### Cyclohexylidenebis[tert-butyl] peroxide:

The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

#### 2,2,4,6,6-pentamethylheptane:

May be fatal if swallowed and enters airways.

#### tert-butyl hydroperoxide:

Not classified due to data which are conclusive although insufficient for classification.

#### 11.2 Information on other hazards

# **Endocrine disrupting properties**

#### **Product:**

Assessment : The substance/mixture does not contain components consid-

ered 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.

## **Further information**

Product:

Remarks : Solvents may degrease the skin.

# **Components:**

## 2,2,4,6,6-pentamethylheptane:

Remarks : May cause headache and dizziness.

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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# **SECTION 12: Ecological information**

#### 12.1 Toxicity

**Product:** 

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 0,64 mg/l

Exposure time: 96 h Test Type: semi-static test

Method: OECD Test Guideline 203

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and other :

aquatic invertebrates

EC50 (Daphnia magna (Water flea)): > 0,598 mg/l

Exposure time: 48 h Test Type: static test

Method: OECD Test Guideline 202

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to algae/aquatic

plants

ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0,5

mg/l

Exposure time: 72 h

Test Type: Growth inhibition Method: OECD Test Guideline 201

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to fish (Chronic tox-

icity)

NOEC: 0,0645 mg/l Exposure time: 35 d

Species: Danio rerio (zebra fish) Test Type: flow-through test

Method: OECD Test Guideline 210

GLP: yes

Toxicity to daphnia and other : aquatic invertebrates (Chron-

ic toxicity)

NOEC: >= 0,112 mg/l

Species: Daphnia magna (Water flea)

Test Type: semi-static test

Method: OECD Test Guideline 211

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to microorganisms : EC50 : > 20 mg/l

Exposure time: 3 h

Test Type: Respiration inhibition Method: OECD Test Guideline 209

## Components:

# Cyclohexylidenebis[tert-butyl] peroxide:

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 0,64 mg/l

Exposure time: 96 h
Test Type: semi-static test

Method: OECD Test Guideline 203

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and other :

aquatic invertebrates

EC50 (Daphnia magna (Water flea)): > 0,598 mg/l

Exposure time: 48 h Test Type: static test

Method: OECD Test Guideline 202

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to algae/aquatic

plants

ErC50 (Pseudokirchneriella subcapitata (green algae)): > 0,5

mg/l

Exposure time: 72 h
Test Type: Growth inhibition
Method: OECD Test Guideline 201

GLP: yes

Remarks: No toxicity at the limit of solubility

Toxicity to microorganisms : EC50 : > 20 mg/l

Exposure time: 3 h

Test Type: Respiration inhibition Method: OECD Test Guideline 209

Toxicity to fish (Chronic tox-

icity)

NOEC: 0,0645 mg/l

Exposure time: 35 d

Species: Danio rerio (zebra fish) Test Type: flow-through test Method: OECD Test Guideline 210

GLP: yes

Toxicity to daphnia and other : aquatic invertebrates (Chron-

ic toxicity)

NOEC: >= 0.112 mg/l

Species: Daphnia magna (Water flea)

Test Type: semi-static test

Method: OECD Test Guideline 211

GLP: yes

Remarks: No toxicity at the limit of solubility

M-Factor (Chronic aquatic

toxicity)

: 1

Toxicity to soil dwelling or-

ganisms

NOEC:

52,9 milligram per kilogram

Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222

#### 2,2,4,6,6-pentamethylheptane:

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Toxicity to daphnia and other :

aquatic invertebrates

EC50 (Daphnia (water flea)): > 0,04 mg/l

Exposure time: 48 h

Remarks: Information given is based on data obtained from

similar substances.

Toxicity to algae/aquatic

plants

: IC50 (algae): > 0,04 mg/l

Exposure time: 72 h

Remarks: Information given is based on data obtained from

similar substances.

**Ecotoxicology Assessment** 

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : May cause long lasting harmful effects to aquatic life.

tert-butyl hydroperoxide:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 29,61 mg/l

Exposure time: 96 h

Method: OECD Test Guideline 203

Toxicity to daphnia and other :

aquatic invertebrates

EC50 (Daphnia magna (Water flea)): 14,07 mg/l

Exposure time: 48 h

Method: OECD Test Guideline 202

Toxicity to algae/aquatic

plants

EC50 (Pseudokirchneriella subcapitata (green algae)): 1,47

mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 0,22

mg/l

Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (Bacteria): 17 mg/l

Method: OECD Test Guideline 209

**Ecotoxicology Assessment** 

Acute aquatic toxicity : Toxic to aquatic life.

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

## 12.2 Persistence and degradability

**Product:** 

Biodegradability : Inoculum: activated sludge

Concentration: 10 mg/l

Result: Not inherently biodegradable.

Biodegradation: 5 %

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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Exposure time: 28 d

Method: OECD Test Guideline 301B

GLP: yes

#### **Components:**

# Cyclohexylidenebis[tert-butyl] peroxide:

Biodegradability : Inoculum: activated sludge

Concentration: 10 mg/l

Result: Not inherently biodegradable.

Biodegradation: 5 % Exposure time: 28 d

Method: OECD Test Guideline 301B

GLP: yes

## 2,2,4,6,6-pentamethylheptane:

Biodegradability : Result: Not readily biodegradable.

tert-butyl hydroperoxide:

Biodegradability : Result: Not readily biodegradable.

Method: OECD Test Guideline 301B

Result: Not readily biodegradable. Method: OECD Test Guideline 301D

#### 12.3 Bioaccumulative potential

#### **Components:**

# Cyclohexylidenebis[tert-butyl] peroxide:

Partition coefficient: n- : log Pow: 7,2 (25 °C)

octanol/water Method: OECD Test Guideline 117

#### 2,2,4,6,6-pentamethylheptane:

Partition coefficient: n- : log Pow: 5,94 - 6,16 (20 °C) octanol/water : Remarks: The value is calculated

## 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.

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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#### 12.6 Endocrine disrupting properties

#### **Product:**

Assessment : The substance/mixture does not contain components consid-

ered 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.

#### 12.7 Other adverse effects

#### **Product:**

Additional ecological infor-

mation

An environmental hazard cannot be excluded in the event of

unprofessional handling or disposal.

Very toxic to aquatic life with long lasting effects.

#### **SECTION 13: Disposal considerations**

#### 13.1 Waste treatment methods

Product : Dispose of wastes in an approved waste disposal facility.

The product should not be allowed to enter drains, water

courses or the soil.

Do not contaminate ponds, waterways or ditches with chemi-

cal or used container.

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 : Dispose of in accordance with local regulations.

Clean container with water.

Dispose of contents/ container to an approved waste disposal

plant.

Empty remaining contents.

Dispose of as unused product.

Do not re-use empty containers.

Do not burn, or use a cutting torch on, the empty drum.

#### **SECTION 14: Transport information**

#### 14.1 UN number or ID number

**ADN** : UN 3103 **ADR** : UN 3103

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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 RID
 : UN 3103

 IMDG
 : UN 3103

 IATA
 : UN 3103

14.2 UN proper shipping name

**ADN** : ORGANIC PEROXIDE TYPE C, LIQUID

(1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE)

ADR : ORGANIC PEROXIDE TYPE C, LIQUID

(1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE)

RID : ORGANIC PEROXIDE TYPE C, LIQUID

(1,1-DI-(tert-BUTYLPEROXY) CYCLOHEXANE)

IMDG : ORGANIC PEROXIDE TYPE C, LIQUID

(1,1-DI-(tert-BUTYLPEROXY)CYCLOHEXANE)

IATA : Organic peroxide type C, liquid

(1,1-Di-(tert-butylperoxy) cyclohexane)

14.3 Transport hazard class(es)

Class Subsidiary risks

ADN : 5.2
ADR : 5.2
RID : 5.2
IMDG : 5.2

IATA : 5.2 HEAT

14.4 Packing group

ADN

Packing group : Not assigned by regulation

Classification Code : P1 Labels : 5.2

**ADR** 

Packing group : Not assigned by regulation

Classification Code : P1 Labels : 5.2 Tunnel restriction code : (D)

**RID** 

Packing group : Not assigned by regulation

Classification Code : P1 Hazard Identification Number : 539 Labels : 5.2

**IMDG** 

Packing group : Not assigned by regulation

Labels : 5.2

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EmS Code : F-J, S-R

IATA (Cargo)

Packing instruction (cargo :

aircraft)

Packing group : Not assigned by regulation

Labels : Organic Peroxides, Keep Away From Heat

570

IATA (Passenger)

Packing instruction (passen- : 570

ger aircraft)

Packing group : Not assigned by regulation

Labels : Organic Peroxides, Keep Away From Heat

14.5 Environmental hazards

ADN

Environmentally hazardous : yes

**ADR** 

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

**IMDG** 

Marine pollutant : yes

## 14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## 14.7 Maritime transport in bulk according to IMO instruments

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, mixtures and articles (Annex XVII) : Conditions of restriction for the following entries should be considered: Number on list 3

Number on list 40

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Number on list 75: If you intend to use this product as tattoo ink, please

contact your vendor.

REACH - Candidate List of Substances of Very High

Concern for Authorisation (Article 59).

Not applicable

Regulation (EC) on substances that deplete the ozone

layer

: Not applicable

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

tants (recast)

Not applicable

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

of dangerous chemicals

Not applicable

REACH - List of substances subject to authorisation

(Annex XIV)

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.

P6b SELF-REACTIVE SUBSTANCES

AND MIXTURES and ORGANIC

PEROXIDES

E1 ENVIRONMENTAL HAZARDS

Water hazard class (Germa- : WGK 2 obviously hazardous to water

ny) Classification according to AwSV, Annex 1 (5.2)

#### Other regulations:

Gefahrgruppe nach TRGS 741: lb, S+ (German regulatory requirements)

Produkt unterliegt dem Sprengstoffgesetz (SprengG; Stoffgruppe C). (German regulatory requirement)

The product is subject to the supply restrictions of the Ordinance on the Prohibition of Chemicals.

Take note of Law on the protection of mothers at work, in education and in studies (Maternity Protection Act - MuSchG).

# The components of this product are reported in the following inventories:

TCSI (TW) : On the inventory, or in compliance with the inventory

DSL (CA) : All components of this product are on the Canadian DSL

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878



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ENCS (JP) : On the inventory, or in compliance with the inventory

ISHL (JP) : On the inventory, or in compliance with the inventory

PICCS (PH) : On the inventory, or in compliance with the inventory

IECSC (CN) : On the inventory, or in compliance with the inventory

TECI (TH) : On the inventory, or in compliance with the inventory

#### 15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance. For further information see eSDS.

#### **SECTION 16: Other information**

EUH066 : Repeated exposure may cause skin dryness or cracking.

#### Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - 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; TECI -Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA

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- Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

#### **Further information**

Other information : This safety datasheet only contains information relating to

safety and does not replace any product information or prod-

uct specification.

These safety instructions also apply to empty packaging which

may still contain product residues.

The hazards on the label also apply to residues in the con-

tainer.

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 Agen-

cy, http://echa.europa.eu/

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

DE / EN