

SAFETY DATA SHEET

according to GB/T 16483 and GB/T 17519

PERKADOX 16

Version 3.0 Revision Date: 2023/07/26 CN / EN Date of last issue: 2021/06/07
Date of first issue: 2015/01/12

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : PERKADOX 16
:

Manufacturer or supplier's details

Company : Nouryon Functional Chemicals B.V.
Haaksbergweg 88
NL 1101 BZ Amsterdam
Netherlands

Address : Haaksbergweg 88
Amsterdam 1101 BZ

Telephone : +31889840367

Emergency telephone number : 24 hours:+31 57 06 79211, US-CHEMTREC:1-800-424-9300,
CA-CANUTEC:1-613-996-6666, JP: +81 (836) 74 8810, CN: 化
学事故应急咨询电话 : +86 532 8388 9090-:
Nouryon Emergency Response Centre: +31 570 679211
National Registration Centre of Chemicals (NRCC): +86 532
8388 9090

E-mail address : polymer.emeia@nouryon.com

Recommended use of the chemical and restrictions on use

Recommended use : Polymerization initiator

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance : powder
Colour : white
Odour : Faint.

Heating may cause a fire. May cause an allergic skin reaction. Harmful to aquatic life with long lasting effects.

GHS Classification

Organic peroxides : Type C

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Skin sensitisation : Category 1

Short-term (acute) aquatic hazard : Category 3

Long-term (chronic) aquatic hazard : Category 3

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : H242 Heating may cause a fire.
H317 May cause an allergic skin reaction.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P220 Keep/ Store away from clothing/ combustible materials.
P234 Keep only in original container.
P235 Keep cool.
P261 Avoid breathing dust.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.
P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.

Storage:
P410 Protect from sunlight.

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P411 Store at temperatures not exceeding 30°C/ 86°F.
P420 Store away from other materials.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Physical and chemical hazards

Heating may cause a fire.

Health hazards

May cause an allergic skin reaction.

Environmental hazards

Harmful to aquatic life. Harmful to aquatic life with long lasting effects.

Other hazards which do not result in classification

Dust can form an explosive mixture in air.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance
Substance name : bis(4-tert-butylcyclohexyl) peroxydicarbonate
CAS-No. : 15520-11-3
Synonyms : bis(4-tert-butylcyclohexyl) peroxydicarbonate

Components

Chemical name	CAS-No.	Concentration (% w/w)
Di(4-tert-butylcyclohexyl) peroxydicarbonate	15520-11-3	>= 94 -<= 97

4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.

If inhaled : Remove to fresh air.
Keep patient warm and at rest.
Rinse nose and mouth with water.

In case of skin contact : Take off contaminated clothing and shoes immediately.

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		Wash the skin immediately with soap and water. If skin irritation persists, call a physician.
In case of eye contact	:	Rinse with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Obtain medical attention.
Most important symptoms and effects, both acute and delayed	:	The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known. May cause an allergic skin reaction.
Notes to physician	:	Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during firefighting	:	CAUTION: reignition may occur. Supports combustion. Do not use a solid water stream as it may scatter and spread fire. Water spray may be ineffective unless used by experienced firefighters. Do not allow run-off from fire fighting to enter drains or water courses. Risks of ignition followed by flame propagation or secondary explosions shall be prevented by avoiding accumulation of dust, e.g. on floors and ledges. Hazardous decomposition products formed under fire conditions.
Hazardous combustion products	:	Fire will produce smoke containing hazardous combustion products (see section 10).

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- Specific extinguishing methods : Use water spray to cool unopened 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.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment. Wear respiratory protection. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Remove all sources of ignition.
- Environmental precautions : Prevent product from entering drains. Discharge into the environment must be avoided.
- Methods and materials for containment and cleaning up : Keep wetted with water. Confinement must be avoided. Pick up and arrange disposal without creating dust. Collect in plastic container for disposal as hazardous waste. Never return spills in original containers for re-use.
- Prevention of secondary hazards : Evacuate personnel to safe areas. Only qualified personnel equipped with suitable protective equipment may intervene. Prevent unauthorised persons entering the zone.

7. HANDLING AND STORAGE

Handling

- Advice on protection against fire and explosion : Use explosion protected equipment. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. No sparking tools should be used. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps).

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Do not cut or weld on or near this container even when empty.
Keep away from combustible material.

- Advice on safe handling** : For personal protection see section 8.
Avoid formation of respirable particles.
Do not breathe vapours/dust.
Avoid contact with skin.
Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
Smoking, eating and drinking should be prohibited in the application area.
Open drum carefully as content may be under pressure.
Dispose of rinse water in accordance with local and national regulations.
- Avoidance of contact** : Contact with the following incompatible materials will result in hazardous decomposition:
Acids and bases
Iron
Copper
Reducing agents
Heavy metals
Rust
Do not mix with peroxide accelerators, unless under controlled processing.
Use only stainless steel 316, PP, polyethylene or glass-lined equipment.
For queries regarding the suitability of other materials please contact the supplier.
- Storage**
- Conditions for safe storage** : No smoking.
Keep in a dry place.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.
Store at room temperature in the original container.
Keep only in original container.
Store away from other materials.
- Further information on storage stability** : Maximum storage temperature is for quality only.
- No decomposition if stored and applied as directed.

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Maximum storage temperature: : 20 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Dust : 4 mg/m³
Value type (Form of exposure): TWA (Total dust)
Basis: CN OEL

Contains no substances with occupational exposure limit values.

Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Carbon dioxide	124-38-9	PC-TWA	9,000 mg/m ³	CN OEL
		PC-STEL	18,000 mg/m ³	CN OEL
		TWA	5,000 ppm	ACGIH
		STEL	30,000 ppm	ACGIH

Engineering measures : Explosion proof ventilation recommended.
Provide appropriate exhaust ventilation at places where dust is formed.

Personal protective equipment

Respiratory protection : Half mask with a particle filter P2 (EN 143)

Eye/face protection : Tightly fitting safety goggles

Skin and body protection : Protective suit

Hand protection

Material : Neoprene

Material : Nitrile rubber

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
When using do not smoke.

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Wash hands before breaks and at the end of workday.
Wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	powder
Colour	:	white
Odour	:	Faint.
Odour Threshold	:	No data available
pH	:	Weakly acidic
Melting point	:	Decomposes before melting.
Boiling point/boiling range	:	Decomposes below the boiling point.
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Decomposition products may be flammable.
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	< 0.8 hPa (60 °C)
Relative vapour density	:	Not applicable
Relative density	:	1.13 (20 °C)
Bulk density	:	450 - 480 kg/m ³ (20 °C)
Solubility(ies)		

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Water solubility	:	insoluble (20 °C)
Solubility in other solvents	:	Description: Soluble in most organic solvents.
Partition coefficient: n-octanol/water	:	log Pow: 8.34 estimated
Auto-ignition temperature	:	Test method not applicable
Decomposition temperature	:	SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.
Self-Accelerating decomposition temperature (SADT)	:	40 °C
Viscosity		
Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	Not classified as oxidising.
Active Oxygen Content	:	3.8 %
Organic peroxides	:	95 %

10. STABILITY AND REACTIVITY

Reactivity	:	Stable under normal conditions.
Chemical stability	:	Stable under recommended storage conditions.
Possibility of hazardous reactions	:	Dust may form explosive mixture in air.

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Conditions to avoid	:	Confinement must be avoided. Heat, flames and sparks.
Incompatible materials	:	Contact with the following incompatible materials will result in hazardous decomposition: Acids and bases Iron Copper Reducing agents Heavy metals Rust Do not mix with peroxide accelerators, unless under controlled processing. Use only stainless steel 316, PP, polyethylene or glass-lined equipment. For queries regarding the suitability of other materials please contact the supplier.
Hazardous decomposition products	:	No decomposition if stored and applied as directed.
Hazardous decomposition products	:	4-tert-butylcyclohexanol Carbon dioxide
Thermal decomposition	:	SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the SADT. Contact with incompatible substances can cause decomposition below the SADT.
Self-Accelerating decomposition temperature (SADT)	:	40 °C

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

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 toxicity

Skin corrosion/irritation

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Exposure time : 24 h
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Species : Rabbit
Result : No eye irritation
Exposure time : 24 h
Method : OECD Test Guideline 405

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Assessment : May cause sensitisation by skin contact.
Method : OECD Test Guideline 429

Germ cell mutagenicity

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

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Genotoxicity in vitro : Method: OECD Test Guideline 471
Result: negative

Method: Other guidelines
Result: negative

Genotoxicity in vivo : Result: Not mutagenic.

Carcinogenicity

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Remarks : No data available

Reproductive toxicity

Not classified due to lack of data.

STOT - single exposure

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

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

STOT - repeated exposure

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Exposure routes : Ingestion
Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration toxicity

Not classified due to lack of data.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

No aspiration toxicity classification

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Further information

Product:

Remarks : No further data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): 704 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 42 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	: ErC50 (Desmodesmus subspicatus (green algae)): ca. 39 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201
	: NOEC (Desmodesmus subspicatus (green algae)): 17 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201
Toxicity to microorganisms	: NOEC (activated sludge): 20 mg/l Exposure time: 5 d Method: closed serum bottle Remarks: 5 days

Ecotoxicology Assessment

Acute aquatic toxicity	: Harmful to aquatic life.
Chronic aquatic toxicity	: Harmful to aquatic life with long lasting effects.

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Persistence and degradability

Product:

Biodegradability : Result: Not readily biodegradable.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Biodegradability : Result: Not readily biodegradable.
Method: OECD Test Guideline 301B

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Because of the partition coefficient for n-octanol/water (Cf. Section 9), accumulation in living organisms is possible.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Bioaccumulation : Bioconcentration factor (BCF): 2,926

Partition coefficient: n-octanol/water : log Pow: 8.34

Mobility in soil

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

Distribution among environmental compartments : log Koc: 5.08

Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Components:

Di(4-tert-butylcyclohexyl) peroxydicarbonate:

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Results of PBT and vPvB assessment : This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Dispose of contents/container in accordance with local regulation.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not burn, or use a cutting torch on, the empty drum.
Due to the high risk of contamination recycling/recovery is not recommended.
Follow all warnings even after the container is emptied.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number : UN 3114
Proper shipping name : ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED
(Di(4-tert-butylcyclohexyl) peroxydicarbonate, 95%)
Class : 5.2
Packing group : Not assigned by regulation
Labels : 5.2
Environmentally hazardous : no

IATA-DGR

Not permitted for transport

IMDG-Code

UN number : UN 3114
Proper shipping name : ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED
(Di(4-tert-butylcyclohexyl) peroxydicarbonate, 95%)

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Class	: 5.2
Packing group	: Not assigned by regulation
Labels	: 5.2
EmS Code	: F-F, S-R
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

GB 6944/12268

UN number	: UN 3114
Proper shipping name	: ORGANIC PEROXIDE TYPE C, SOLID, TEMPERATURE CONTROLLED (Di(4-tert-butylcyclohexyl) peroxydicarbonate, 95%)
Class	: 5.2
Packing group	: Not assigned by regulation
Labels	: 5.2
Marine pollutant	: no
Remarks	: The control temperature is the maximum temperature at which the formulation can be transported safely during a prolonged period of time.

Special precautions for user

Remarks	: The control temperature is the maximum temperature at which the formulation can be transported safely during a prolonged period of time.
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Further information for transport

Control temperature	: 30 °C
Emergency temperature	: 35 °C

The transport classification(s) provided herein are for informational purposes only. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

15. REGULATORY INFORMATION

National regulatory information

Regulations on Safety Management of Hazardous Chemicals

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Catalogue of Hazardous Chemicals : Listed

Identification of Major Hazard Installations for Hazardous Chemicals (GB 18218)

No. / Code	Chemical name / Category	Threshold quantity
W7.2	Organic peroxides	50 t

Measures on the Environmental Administration of New Chemical Substances Registration

Registration/Notification number : 01-2119966122-42-0001
01-2119966122-42-0003

Downstream users need to comply with the conditions of safe use of the chemical, understand the environmental and health hazard and risk management measures identified on the SDS as well as the local/national regulations concerning the chemical.

Yangtze River Protection Law

This product does not contain any dangerous chemicals prohibited for inland river transport.

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

TCSI	: On the inventory, or in compliance with the inventory
TSCA	: All substances listed as active on the TSCA inventory
AIIC	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
ENCS	: On the inventory, or in compliance with the inventory
ISHL	: On the inventory, or in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
NZIoC	: On the inventory, or in compliance with the inventory
TECI	: Not in compliance with the inventory

16. OTHER INFORMATION

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Further information

Other information : This data sheet contains changes from the previous version in section(s):
 Hazards identification
 Composition/information on ingredients
 Toxicological information

Date format : yyyy/mm/dd

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)

CN OEL : Occupational exposure limits for hazardous agents in the workplace - Chemical hazardous agents.

ACGIH / TWA : 8-hour, time-weighted average

ACGIH / STEL : Short-term exposure limit

CN OEL / TWA : Time weighted average

CN OEL / PC-TWA : Permissible concentration - time weighted average

CN OEL / PC-STEEL : Permissible concentration - short term exposure limit

AIIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution

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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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECl - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Disclaimer

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.

CN / EN

This safety datasheet only contains information relating to safety and does not replace any product information or product specification.