Nouryon

SAFETY DATA SHEET

according to the Globally Harmonized System and US regulation

PERKADOX 16

Version 1 Revision Date 08/17/2018 Print Date 08/28/2020 US / Z8

1. IDENTIFICATION

Product name	:	PERKADOX 16
Product Use Description	:	Specific use(s): Polymerization initiator
Company	:	Nouryon Functional Chemicals B.V. Velperweg 76 Arnhem 6824 BM NL
Telephone	:	+31263664433
Fax	:	
E-mail address	:	polymerchemistry.nl@nouryon.com
Emergency telephone	:	24 hours:+31 57 06 79211, US-CHEMTREC:1-800-424-9300, CA-CANUTEC:1-613-996-6666, JP: +81 (3) 3234 0801, CN: 化学事故应急咨询电话：+86 532 8388 9090

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	powder
Color	white
Odor	Faint.
Hazard Summary	Risk of dust explosion.

GHS Classification

Organic peroxides, Type C
Skin sensitization, Category 1
Acute aquatic toxicity, Category 3
Chronic aquatic toxicity, 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 or fume.
P272 Contaminated work clothing must 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 soap and water.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing 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.
P411 Store at temperatures not exceeding 30°C/ 86°F.
P420 Store away from other materials.
Disposal:
P501 Dispose of contents/container in accordance with local regulation.

Carcinogenicity:

IARC : No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA : No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP : No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Common Name : Organic peroxide
Pure substance/mixture : Substance

Hazardous ingredients

Chemical name	CAS-No.	Classification	Concentration [% W/W]
Di(4-tert-butylcyclohexyl) peroxydicarbonate	15520-11-3	Org. Perox. C; H242 Skin Sens. 1; H317 Aquatic Acute 3; H402 Aquatic Chronic 3; H412	>= 90 - <= 100

Di(4-tert-butylcyclohexyl) peroxydicarbonate, neat

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

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

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

Skin contact : Take off contaminated clothing and shoes immediately.
Wash the skin immediately with soap and water.
If skin irritation persists, call a physician.

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.

Ingestion : Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Obtain medical attention.

Notes to physician

Symptoms : The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Risks : May cause an allergic skin reaction.

Treatment : Treat symptomatically.

5. FIRE-FIGHTING 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 fire fighting / Specific hazards arising from the chemical	:	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.
Combustion products	:	Fire will produce smoke containing hazardous combustion products (see section 10).
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus.
Further information	:	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.

See also Section 9. Physical and chemical properties: Safety data

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Wear respiratory protection. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Remove all sources of ignition.
Emergency measures on accidental release	:	Evacuate personnel to safe areas. Only qualified personnel equipped with suitable protective equipment may intervene. Prevent unauthorized persons entering the zone.
Environmental precautions	:	Prevent product from entering drains. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods for cleaning up / Methods for containment	:	Soak up with inert absorbent material and dispose of as hazardous waste. Keep wetted with water. Confinement must be avoided. Pick up and arrange disposal without creating dust.

Keep in suitable, closed containers for disposal.
Never return spills in original containers for re-use.

Reference to other sections : For disposal considerations see section 13.

For personal protection see section 8.

7. HANDLING AND STORAGE

Handling

Advice on safe handling : For personal protection see section 8.
Avoid formation of respirable particles.
Do not breathe vapors/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.

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

Temperature class : It is recommended to use electrical equipment of temperature group T3. However, autoignition can never be excluded.

Storage

Requirements for storage areas and containers : No smoking.
Keep in a well-ventilated place.
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.

Maximum storage temperature: : 20 °C (68 °F)

Other data : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Ingredients	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Dust		TWA	50 Million particles per cubic foot	2011-07-01	OSHA Z-3	total dust
	Further information	:	a: Based on impinger samples counted by light-field techniques. d: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1. mppcf X 35.3 = million particles per cubic meter = particles per c.c			
Dust		TWA	15 mg/m3	2011-07-01	OSHA Z-3	total dust
	Further information	:	d: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.			
Dust		TWA	5 mg/m3	2011-07-01	OSHA Z-3	respirable fraction
	Further information	:	d: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.			
Dust		TWA	15 Million particles per cubic foot	2011-07-01	OSHA Z-3	respirable fraction
	Further information	:	a: Based on impinger samples counted by light-field techniques. d: All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1. mppcf X 35.3 = million particles per cubic meter = particles per c.c			

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Index
MAC: Maximum Allowable Concentration
NIOSH: National Institute for Occupational Safety and Health
OEL: OEL: Occupational exposure limit.
STEL: Short term exposure limit
TWA: Time Weighted Average

Occupational exposure limits of decomposition products

Decomposition products	CAS-No.	Value	Control parameters	Update	Basis	Form of exposure
Carbon dioxide	124-38-9	TWA	5,000 ppm	2007-01-01	ACGIH	
	Further information	:	asphyxia: Asphyxia			
		STEL	30,000 ppm	2007-01-01	ACGIH	
	Further information	:	asphyxia: Asphyxia			
		TWA	5,000 ppm 9,000 mg/m3	2013-10-08	NIOSH REL	
	Further information	:	Normal constituent of air (about 300 ppm).			
		ST	30,000 ppm 54,000 mg/m3	2013-10-08	NIOSH REL	
	Further information	:	Normal constituent of air (about 300 ppm).			
		TWA	5,000 ppm 9,000 mg/m3	1997-08-04	OSHA Z-1	
	Further information	:	(b): The value in mg/m3 is approximate.			
		TWA	10,000 ppm	1989-01-19	OSHA P0	

			18,000 mg/m3			
	Further information	:	e: Exposures under 10,000 ppm to be cited as de minimus.			
		STEL	30,000 ppm 54,000 mg/m3	1989-01-19	OSHA P0	
		PEL	5,000 ppm 9,000 mg/m3	2014-11-26	CAL PEL	
		STEL	30,000 ppm 54,000 mg/m3	2014-11-26	CAL PEL	

Appropriate engineering controls
Explosion proof ventilation recommended.
Provide appropriate exhaust ventilation at places where dust is formed.

Personal protective equipment

Eye/face protection	:	Tightly fitting safety goggles
Hand protection	:	Glove material: Neoprene
	:	Glove material: Nitrile rubber
Skin and body protection	:	Protective suit
Respiratory protection	:	Half mask with a particle filter P2 (EN 143)
Hygiene measures	:	Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday. Wash contaminated clothing before re-use.

Environmental exposure controls

General advice	:	Prevent product from entering drains. If the product contaminates rivers and lakes or drains inform respective authorities.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	:	powder
Color	:	white
Odor	:	Faint.
Odor Threshold	:	No data available

Safety data

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.
Flammability (liquids)	:	Not applicable
Lower explosion limit	:	No data available
Upper explosion limit	:	No data available
Vapor pressure	:	< 0.8 hPa at 60 °C
Relative vapor density	:	Not applicable
Relative density	:	1.13 at 20 °C
Bulk density	:	450 - 480 kg/m3 at 20 °C
Water solubility	:	at 20 °C insoluble
Solubility in other solvents	:	Soluble in most organic solvents.
Partition coefficient: n-octanol/water	:	log Pow: 8.34 estimated
Autoignition 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, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	Not classified as oxidizing.
Active Oxygen Content	:	3.8 %
Organic peroxides	:	95 %

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

10. STABILITY AND REACTIVITY

Conditions to avoid	:	Confinement must be avoided. Heat, flames and sparks.
Materials to avoid	:	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	:	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.
Reactivity	:	Stable under normal conditions.
Chemical stability	:	Stable under recommended storage conditions.
Hazardous reactions	:	Dust may form explosive mixture in air.
Self-Accelerating decomposition temperature (SADT)	:	40 °C (104 °F)

11. TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION:

Hazard Summary

Acute toxicity	:	Not classified based on available information.
Skin corrosion/irritation	:	Not classified based on available information.
Serious eye damage/eye irritation	:	Not classified based on available information.
Respiratory or skin sensitization	:	Respiratory sensitization: Not classified based on available information. Skin sensitization: May cause an allergic skin reaction.

Germ cell mutagenicity	:	Not classified based on available information.
Carcinogenicity	:	Not classified based on available information.
Reproductive toxicity	:	Not classified based on available information.
STOT-single exposure	:	Not classified based on available information.
STOT-repeated exposure	:	Not classified based on available information.
Aspiration hazard	:	Not classified based on available information.

Potential Health Effects

Inhalation	:	Product dust may be irritating to respiratory system.
Skin	:	Product dust may be irritating to skin. May cause an allergic skin reaction.
Eyes	:	Product dust may be irritating to eyes.
Ingestion	:	May be harmful if swallowed.
Aggravated Medical Condition	:	None known.
Symptoms of Overexposure	:	The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known.

Toxicology Assessment

Further information	:	No further data available.

Carcinogenicity:

IARC	:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Component: Di(4-tert-butylcyclohexyl) peroxydicarbonate

Acute oral toxicity	:	LD50: > 5,000 mg/kg Species: Rat Method: OECD Test Guideline 401 Evident toxicity
Skin irritation	:	Result: No skin irritation Method: OECD Test Guideline 404 Exposure time: 24 h
Eye irritation	:	Species: Rabbit Result: No eye irritation Method: OECD Test Guideline 405 Exposure time: 24 h

Germ cell mutagenicity
Genotoxicity in vitro : Result: negative
Method: OECD Test Guideline 471

Result: negative
Method: Other guidelines

Genotoxicity in vivo : Result: Not mutagenic.

Carcinogenicity : No data available

Target Organ Systemic Toxicant - Repeated exposure : Routes of exposure: Ingestion
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration toxicity : No aspiration toxicity classification

12. ECOLOGICAL INFORMATION

PRODUCT INFORMATION:

Ecotoxicology Assessment
Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

Test result

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

Biodegradability : Result: Not readily biodegradable.

Further information on ecology

Hazardous to the ozone layer
Regulation : 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Component: Di(4-tert-butylcyclohexyl) peroxydicarbonate
Acute aquatic toxicity : Harmful to aquatic life.

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

Component: Di(4-tert-butylcyclohexyl) peroxydicarbonate

Ecotoxicity effects

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

Elimination information (persistence and degradability)

Bioaccumulation	:	Bioconcentration factor (BCF): 2,926
Biodegradability	:	Result: Not readily biodegradable. Method: OECD Test Guideline 301B

13. DISPOSAL CONSIDERATIONS

Product	:	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. Hazardous waste 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

IATA-DGR

UN/ID No.	:	UN 3114
Class	:	5.2 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)
Class	:	5.2
Packing group	:	Not Assigned
Labels	:	5.2
EmS Code	:	F-F, S-R
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.

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

Not applicable for product as supplied.

Further information for transport

Control temperature	:	30 °C (86 °F)
Emergency temperature	:	35 °C (95 °F)

Domestic regulation

49 CFR

UN/ID/NA 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
Labels	:	5.2
ERG Code	:	148
Marine pollutant	:	no
Reportable Quantity	:	This product does not contain an environmentally hazardous substance per 49 CFR 172.101, Appendix A.
Remarks	:	The control temperature is the maximum temperature at which the formulation can be transported safely during a prolonged period of time.

15. REGULATORY INFORMATION

Notification status

DSL	:	YES. All components of this product are on the Canadian DSL
AICS	:	YES. On the inventory, or in compliance with the inventory
NZIoC	:	YES. On the inventory, or in compliance with the inventory
ENCS	:	YES. On the inventory, or in compliance with the inventory
ISHL	:	YES. On the inventory, or in compliance with the inventory

KECI	:	YES. On the inventory, or in compliance with the inventory
PICCS	:	YES. On the inventory, or in compliance with the inventory
IECSC	:	YES. On the inventory, or in compliance with the inventory
TCSI	:	YES. On the inventory, or in compliance with the inventory
TSCA	:	YES. All chemical substances in this product are either listed on the TSCA Inventory or in compliance with a TSCA Inventory exemption.

For explanation of abbreviations, see section 16.

TSCA list

TSCA 5(a)(2)	:	No substances are subject to a Significant New Use Rule.
TSCA 12(b)	:	No substances are subject to TSCA 12(b) export notification requirements.

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards	:	Organic peroxides Respiratory or skin sensitization
SARA 302	:	This material does not contain any components with a section 302 EHS TPQ.
SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals subject to disclosure and listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

Di(4-tert-butylcyclohexyl)	15520-11-3	90 - 100 %

peroxydicarbonate

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California Prop. 65

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Full text of H-Statements

H242	:	Heating may cause a fire.
H317	:	May cause an allergic skin reaction.
H402	:	Harmful to aquatic life.
H412	:	Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
CAL PEL	:	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	:	USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
CAL PEL / STEL	:	Short term exposure limit
CAL PEL / PEL	:	Permissible exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
OSHA Z-3 / TWA	:	8-hour time weighted average

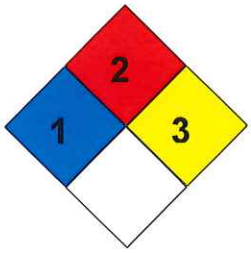
AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute 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 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; 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

Further information

HMIS Classification : Health Hazard: 1
Flammability: 2
Physical hazards: 3

NFPA Classification : Health Hazard: 1
Fire Hazard: 2
Reactivity Hazard: 3



Notification status explanation

REACH	1907/2006 (EU)
DSL	Canadian Domestic Substances List (DSL)
AICS	Australia Inventory of Chemical Substances (AICS)
NZIoC	New Zealand. Inventory of Chemical Substances
ENCS	Japan. ENCS - Existing and New Chemical Substances Inventory
ISHL	Japan. ISHL - Inventory of Chemical Substances
KECI	Korea. Korean Existing Chemicals Inventory (KECI)
PICCS	Philippines Inventory of Chemicals and Chemical Substances (PICCS)
IECSC	China. Inventory of Existing Chemical Substances in China (IECSC)
TCSI	Taiwan Chemical Substance Inventory (TCSI)
TSCA	United States TSCA Inventory

Further information

Revision Date	08/17/2018

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