

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

PERKADOX PF-MT40

Version	Revision Date:	DK / EN	Date of last issue: 12.03.2018
2.0	16.12.2022		Date of first issue: 01.05.2015

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

1.1 Product identifier

Trade name : PERKADOX PF-MT40

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

Use of the Substance/Mixture : Curing agent

1.3 Details of the supplier of the safety data sheet

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

Telephone : +31889840367

E-mail address of person responsible for the SDS : polymer.emeia@nouryon.com

1.4 Emergency telephone number

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
Poison Centre: 82121212

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Organic peroxides, Type E	H242: Heating may cause a fire.
Acute toxicity, Category 4	H302: Harmful if swallowed.
Acute toxicity, Category 4	H332: Harmful if inhaled.
Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.

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Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Germ cell mutagenicity, Category 2	H341: Suspected of causing genetic defects.
Carcinogenicity, Category 2	H351: Suspected of causing cancer.
Specific target organ toxicity - repeated exposure, Category 2	H373: May cause damage to organs through prolonged or repeated exposure.
Long-term (chronic) aquatic hazard, Category 3	H412: Harmful to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms : 

Signal word : Danger

Hazard statements : H242 Heating may cause a fire.
 H302 + H332 Harmful if swallowed or if inhaled.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.
 H341 Suspected of causing genetic defects.
 H351 Suspected of causing cancer.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H412 Harmful 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.
 P260 Do not breathe dust.
 P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.

Response:

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
 P370 + P378 In case of fire: Use water spray, alcohol-

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resistant foam, dry chemical or carbon dioxide to extinguish.

Hazardous components which must be listed on the label:

Dibutyl maleate
tert-Butyl monoperoxymaleate
tert-Butyl hydroperoxide
Maleic acid

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.

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

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Dibutyl maleate	105-76-0 203-328-4	Skin Sens. 1; H317 STOT RE 2; H373	>= 48 - <= 59
tert-Butyl monoperoxymaleate	1931-62-0 217-691-1	Org. Perox. B; H241 Acute Tox. 3; H301 Eye Dam. 1; H318 Acute toxicity estimate Acute oral toxicity: 252 mg/kg	>= 39 - <= 41
tert-Butyl hydroperoxide	75-91-2 200-915-7 617-023-00-2	Flam. Liq. 3; H226 Org. Perox. F; H242 Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 3; H311	>= 0,2 - <= 2,5

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		<p>Skin Corr. 1C; H314 Eye Dam. 1; H318 Skin Sens. 1A; H317 Muta. 2; H341 Carc. 2; H351 STOT SE 3; H335 (Respiratory system) Aquatic Chronic 2; H411</p> <hr/> <p>Acute toxicity estimate</p> <p>Acute oral toxicity: 560 mg/kg Acute inhalation toxicity (vapour): 0,84 mg/l Acute dermal toxicity: 440 mg/kg</p>	
Maleic acid	110-16-7 203-742-5 607-095-00-3	<p>Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317 STOT SE 3; H335 (Respiratory system)</p> <hr/> <p>specific concentration limit Skin Sens. 1; H317 >= 0,1 %</p> <hr/> <p>Acute toxicity estimate</p> <p>Acute oral toxicity: 1.000,1 mg/kg Acute dermal toxicity: 1.000,1 mg/kg</p>	>= 1 - <= 5

For explanation of abbreviations see section 16.

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SECTION 4: First aid measures

4.1 Description of first aid measures

- | | | |
|-------------------------|---|---|
| General advice | : | Immediate medical attention is required.
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance. |
| If inhaled | : | Consult a physician after significant exposure. |
| In case of skin contact | : | Take off contaminated clothing and shoes immediately.
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.
Get medical attention immediately. Continue to rinse during transport.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.
Never give anything by mouth to an unconscious person.
Obtain medical attention. |

4.2 Most important symptoms and effects, both acute and delayed

- | | | |
|----------|---|---|
| Symptoms | : | The symptoms and effects are as expected from the hazards as shown in section 2. No specific product related symptoms are known. |
| Risks | : | Harmful if swallowed or if inhaled.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.
Suspected of causing genetic defects.
Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure. |

4.3 Indication of any immediate medical attention and special treatment needed

- | | | |
|-----------|---|------------------------|
| Treatment | : | Treat symptomatically. |
|-----------|---|------------------------|

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

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.
Hazardous decomposition products formed under fire conditions.

Hazardous combustion products : Fire will produce smoke containing hazardous combustion products (see section 10).

5.3 Advice for firefighters

Special protective equipment for firefighters : 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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Wear respiratory protection.
Ensure adequate ventilation.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Only qualified personnel equipped with suitable protective equipment may intervene.

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Prevent unauthorised persons entering the zone.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Discharge into the environment must be avoided.

6.3 Methods and material for containment and cleaning up

Methods for 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.

6.4 Reference to other sections

For disposal considerations see section 13.
For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : For personal protection see section 8.
Avoid formation of respirable particles.
Do not breathe vapours/dust.
Avoid contact with skin, eyes and clothing.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
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.

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.

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

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Prevent unauthorized access. No smoking. Keep in a well-ventilated place. Electrical installations / working materials must comply with the technological safety standards. Keep only in original container. Store away from other materials.

Further information on storage stability : Maximum storage temperature is for quality only.

Minimum storage temperature: : Avoid temperatures below: -25 °C

Maximum storage temperature: : 25 °C

7.3 Specific end use(s)

Specific use(s) : Consult the technical guidelines for the use of this substance/mixture.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Carbon dioxide	124-38-9	TWA	5.000 ppm 9.000 mg/m3	2006/15/EC
	Further information: Indicative			
		GV	5.000 ppm 9.000 mg/m3	DK OEL
Acetone	67-64-1	TWA	500 ppm 1.210 mg/m3	2000/39/EC
	Further information: Indicative			
		GV	250 ppm 600 mg/m3	DK OEL
	Further information: Guiding list of organic solvents.			
tert-Butanol	75-65-0	L	50 ppm 150 mg/m3	DK OEL
	Further information: Means that the substance can be absorbed through the			

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skin., Guiding list of organic solvents.

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

Substance name	End Use	Exposure routes	Potential health effects	Value
Dibutyl maleate	Consumers	Ingestion	Acute systemic effects	0,5 mg/kg
	Consumers	Ingestion	Long-term systemic effects	0,25 mg/kg
	Workers	Inhalation	Long-term systemic effects	5,87 mg/m ³
	Workers	Skin contact	Long-term systemic effects	0,42 mg/kg
	Workers	Skin contact	Acute systemic effects	58 mg/kg bw/day
Maleic acid	Workers	Skin contact	Acute local effects	0,55 mg/cm ²
	Workers	Skin contact	Long-term systemic effects	3,3 mg/kg bw/day
	Workers	Skin contact	Long-term local effects	0,04 mg/cm ²
	Workers	Skin contact	Long-term systemic effects	83,05 mg/m ³
Hydrogenated castor oil	Consumers	Skin contact	Long-term systemic effects	23,88 mg/kg
	Workers	Skin contact	Long-term systemic effects	47,75 mg/kg
	Workers	Inhalation	Long-term systemic effects	336,75 mg/m ³
	Consumers	Ingestion	Long-term systemic effects	23,88 mg/kg
	Workers	Inhalation	Long-term systemic effects	3,08 mg/m ³
	Workers	Inhalation	Acute systemic effects	10,37 mg/m ³
	Workers	Inhalation	Long-term local effects	3,69 mg/m ³
tert-Butyl hydroperoxide	Workers	Inhalation	Acute local effects	21,34 mg/m ³
	Workers	Dermal	Long-term systemic effects	12,5 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,91 mg/m ³
	Consumers	Inhalation	Acute systemic effects	3,22 mg/m ³
	Consumers	Inhalation	Long-term local effects	0,75 mg/m ³
	Consumers	Inhalation	Acute local effects	12,81 mg/m ³
	Consumers	Dermal	Long-term systemic effects	7,5 mg/kg

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	Consumers	Oral	effects Long-term systemic effects	bw/day 0,26 mg/kg bw/day
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Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
Dibutyl maleate	Fresh water	0,0012 mg/l
	Marine water	0,00012 mg/l
	Intermittent water	0,012 mg/l
	Sewage treatment plant	4,886 mg/l
	Fresh water sediment	0,06 mg/kg dry weight
	Marine sediment	0,006 mg/kg dry weight
	Soil	0,0155 mg/kg dry weight
Maleic acid	Oral	6,33 mg/kg food
	Fresh water	0,0744 mg/l
	Intermittent water	0,744 mg/l
tert-Butyl hydroperoxide	Sewage treatment plant	3,33 mg/l
	Fresh water sediment	0,0624 mg/kg
	Fresh water	0,002 mg/l
	Marine water	0 mg/l
	Intermittent water	0,015 mg/l
	Sewage treatment plant	0,17 mg/l
	Fresh water sediment	0,006 mg/kg dry weight
	Marine sediment	0,001 mg/kg dry weight
	Soil	0,166 mg/kg dry weight
	Secondary Poisoning	1,4 mg/kg food

8.2 Exposure controls

Engineering measures

Explosion proof ventilation recommended.

Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protective equipment

Eye/face protection : Tightly fitting safety goggles

Hand protection

Material : Neoprene

Material : Nitrile rubber

Skin and body protection : Protective suit

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Respiratory protection : Handle in accordance with good industrial hygiene and safety practice.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: paste
Colour	: white
Odour	: Faint.
Odour Threshold	: No data available
Melting point	: No data available
Boiling point/boiling range	: Decomposes below the boiling point.
Flammability	: Decomposition products may be flammable.
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Flash point	: Not applicable
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)	: 55 °C
pH	: substance/mixture is non-soluble (in water)

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Viscosity

Viscosity, dynamic : thixotropic

Viscosity, kinematic : thixotropic

Solubility(ies)

Water solubility : (20 °C)
insoluble

Solubility in other solvents : Description: Soluble in most organic solvents.

Partition coefficient: n-octanol/water : No data available

Vapour pressure : Not applicable

Relative density : 0,85 (20 °C)

Relative vapour density : Not applicable

9.2 Other information

Explosives : Not explosive

Oxidizing properties : Not classified as oxidising.

Evaporation rate : Not applicable

Active Oxygen Content : 3,2 - 3,6 %

Organic peroxides : 40 %

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

Conditions to avoid : A high degree of confinement must be avoided.

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Heat, flames and sparks.

10.5 Incompatible materials

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.

10.6 Hazardous decomposition products

No decomposition if stored and applied as directed.

Hazardous decomposition products : Carbon oxides
Carbon dioxide
Methane
Isobutylene
Acetone
tert-Butanol

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) : 55 °C

SECTION 11: Toxicological information

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

Acute toxicity

Harmful if swallowed or if inhaled.

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Product:

Acute oral toxicity : Acute toxicity estimate: 598,82 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 2.000 mg/kg
Method: Calculation method

Components:

Dibutyl maleate:

Acute oral toxicity : LD50: 3.700 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 (Rabbit): 10.000 mg/kg

tert-Butyl monoperoxymaleate:

Acute oral toxicity : LD50 (Rat): 252 mg/kg

Acute toxicity estimate: 252 mg/kg
Method: Calculation method

tert-Butyl hydroperoxide:

Acute oral toxicity : LD50 (Rat, male and female): 560 mg/kg

Acute toxicity estimate: 560 mg/kg
Method: Calculation method

Acute inhalation toxicity : LC50 (Rat, male and female): 1,85 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

LC50 (Rat, male): 0,84 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
GLP: yes

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Acute toxicity estimate: 0,84 mg/l
 Test atmosphere: vapour
 Method: Calculation method

Acute dermal toxicity : LD50 (Rabbit, male and female): 440 mg/kg
 Method: OECD Test Guideline 402
 GLP: yes

Acute toxicity estimate: 440 mg/kg
 Method: Calculation method

Maleic acid:

Acute oral toxicity : LD50 (Rat): > 1.000 mg/kg

Acute toxicity estimate: 1.000,1 mg/kg
 Method: Calculation method

Acute dermal toxicity : LD50 (Rabbit): > 1.000 mg/kg

Acute toxicity estimate: 1.000,1 mg/kg
 Method: Calculation method

Skin corrosion/irritation

Causes skin irritation.

Components:

Dibutyl maleate:

Result : No skin irritation

tert-Butyl monoperoxymaleate:

Result : No skin irritation

tert-Butyl hydroperoxide:

Species : Rabbit
 Result : Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days.

Maleic acid:

Species : Rabbit
 Method : OECD Test Guideline 404
 Result : Irritating to skin.
 Remarks : Information taken from reference works and the literature.

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Serious eye damage/eye irritation

Causes serious eye damage.

Components:

Dibutyl maleate:

Result : No eye irritation

tert-Butyl monoperoxymaleate:

Result : Risk of serious damage to eyes.

tert-Butyl hydroperoxide:

Species : Rabbit
Result : Risk of serious damage to eyes.

Maleic acid:

Result : Irritating to eyes.

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Components:

Dibutyl maleate:

Assessment : May cause sensitisation by skin contact.

tert-Butyl hydroperoxide:

Test Type : Maximisation Test
Species : Guinea pig
Method : OECD Test Guideline 406
Result : The product is a skin sensitiser, sub-category 1A.
GLP : yes

Maleic acid:

Test Type : Maximisation Test
Method : OECD Test Guideline 406
Result : May cause sensitisation by skin contact.
GLP : yes

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Remarks : Information taken from reference works and the literature.

Germ cell mutagenicity

Suspected of causing genetic defects.

Components:

Dibutyl maleate:

Genotoxicity in vitro : Test Type: Ames test
Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Method: OECD Test Guideline 474
Result: negative

tert-Butyl hydroperoxide:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
GLP: yes

Test Type: In vitro gene mutation study in mammalian cells
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: Regulation (EC) No. 440/2008, Annex, B.17
Result: positive
GLP: yes

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: Metabolic activation
Method: Regulation (EC) No. 440/2008, Annex, B.13/14
(Ames test)
Result: positive
GLP: yes

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse (male and female)
Application Route: Intravenous
Method: Regulation (EC) No. 440/2008, Annex, B.12
Result: negative
GLP: yes

Test Type: dominant lethal test
Species: Mouse (male)

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Application Route: Intraperitoneal
 Method: Regulation (EC) No. 440/2008, Annex, B.22
 Result: positive
 GLP: no

Test Type: In vivo mammalian alkaline comet assay
 Species: Rat (male)
 Application Route: Inhalation
 Method: OECD Test Guideline 489
 Result: negative
 GLP: yes

Germ cell mutagenicity-
 Assessment : In vitro tests showed mutagenic effects which were not observed with in vivo test.

Maleic acid:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
 Metabolic activation: with and without metabolic activation
 Method: OECD Test Guideline 476
 Result: negative
 Remarks: Information taken from reference works and the literature.

Carcinogenicity

Suspected of causing cancer.

Components:

tert-Butyl hydroperoxide:

Species : Rat, male and female
 Application Route : inhalation (vapour)
 Method : OECD Test Guideline 451
 GLP : yes

Carcinogenicity -
 Assessment : Limited evidence of carcinogenicity in animal studies

Reproductive toxicity

Not classified based on available information.

Components:

tert-Butyl hydroperoxide:

Effects on foetal
 development : Species: Rat
 Strain: wistar
 Application Route: Oral
 General Toxicity Maternal: NOAEL: 35 mg/kg bw/day

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Method: OECD Test Guideline 414
GLP: yes

STOT - single exposure

Not classified based on available information.

Components:

Dibutyl maleate:

Exposure routes : Inhalation
Target Organs : Respiratory system
Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

tert-Butyl hydroperoxide:

Assessment : May cause respiratory irritation.

Maleic acid:

Exposure routes : Inhalation
Target Organs : Lungs
Assessment : May cause respiratory irritation.

STOT - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Components:

Dibutyl maleate:

Exposure routes : Ingestion
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Repeated dose toxicity

Components:

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
NOAEL : 22,2 mg/m³
Application Route : Inhalation

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Test atmosphere : vapour
 Method : OECD Test Guideline 412
 GLP : yes

Species : Rat, male and female
 NOAEC : 22,2 mg/m³
 Application Route : Inhalation
 Test atmosphere : vapour
 Method : OECD Test Guideline 413
 GLP : yes

Aspiration toxicity

Not classified based on available information.

Components:

Dibutyl maleate:

No aspiration toxicity classification

tert-Butyl monoperoxymaleate:

No aspiration toxicity classification

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : 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.

Further information

Product:

Remarks : No further data available.

SECTION 12: Ecological information

12.1 Toxicity

Components:

Dibutyl maleate:

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- Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 1,2 mg/l
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 21 mg/l
Exposure time: 48 h
- Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): 6,2 mg/l
Exposure time: 72 h
Test Type: Growth inhibition
Method: OECD Test Guideline 201
- NOEC (Desmodesmus subspicatus (green algae)): 4,2 mg/l
Exposure time: 72 h
Test Type: Growth inhibition
Method: OECD Test Guideline 201
- Toxicity to microorganisms : EC10 (activated sludge): 80,2 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Method: Domestic OECD Guideline 209

Ecotoxicology Assessment

- Acute aquatic toxicity : Toxic to aquatic life.

tert-Butyl hydroperoxide:

- Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 29,61 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203
GLP: yes
- Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 14,07 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
GLP: yes
- Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 1,47 mg/l
Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes
- NOEC (Pseudokirchneriella subcapitata (green algae)): 0,22 mg/l
Exposure time: 72 h

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Test Type: static test
 Method: OECD Test Guideline 201
 GLP: yes

Maleic acid:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 42,81 mg/l
 Exposure time: 48 h
 Method: OECD Test Guideline 202
 GLP: yes
 Remarks: Information taken from reference works and the literature.

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 74,35 mg/l
 Exposure time: 72 h
 Method: OECD Test Guideline 201
 Remarks: Information taken from reference works and the literature.

12.2 Persistence and degradability

Components:

Dibutyl maleate:

Biodegradability : Result: Readily biodegradable.

tert-Butyl hydroperoxide:

Biodegradability : Test Type: Ready biodegradability
 Inoculum: activated sludge, non-adapted
 Result: Not readily biodegradable.
 Biodegradation: 0 %
 Exposure time: 28 d
 Method: OECD Test Guideline 301B
 GLP: yes

Maleic acid:

Biodegradability : Result: Readily biodegradable.
 Method: OECD Test Guideline 301B
 GLP: yes
 Remarks: Information taken from reference works and the literature.

Biochemical Oxygen Demand (BOD) : Remarks: No data available

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12.3 Bioaccumulative potential

Components:

Dibutyl maleate:

Partition coefficient: n-octanol/water : log Pow: 3,38

Maleic acid:

Bioaccumulation : Remarks: No data available

12.4 Mobility in soil

Components:

Maleic acid:

Mobility : Remarks: 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.

Components:

Maleic acid:

Assessment : This substance is not considered to be a PBT (Persistent, Bioaccumulation, Toxic). This substance is not considered to be vPvB (very Persistent nor very Bioaccumulating)

12.6 Endocrine disrupting properties

Product:

Assessment : 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.

12.7 Other adverse effects

Product:

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

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.

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.

Waste, residues, etc. must be collected, stored and disposed of in tightly closed container labeled: "Contains a substance that is covered by the Danish health and safety regulation in terms of cancer risk."

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.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	: UN 3108
RID	: UN 3108
IMDG	: UN 3108
IATA	: UN 3108

14.2 UN proper shipping name

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ADR	:	ORGANIC PEROXIDE TYPE E, SOLID (tert-Butyl monoperoxymaleate)
RID	:	ORGANIC PEROXIDE TYPE E, SOLID (tert-Butyl monoperoxymaleate)
IMDG	:	ORGANIC PEROXIDE TYPE E, SOLID (tert-Butyl monoperoxymaleate, Dibutyl maleate)
IATA	:	Organic peroxide type E, solid (tert-Butyl monoperoxymaleate)

14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADR	: 5.2	
RID	: 5.2	
IMDG	: 5.2	
IATA	: 5.2	HEAT

14.4 Packing group

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
EmS Code	: F-J, S-R
IATA (Cargo)	
Packing instruction (cargo aircraft)	: 570
Packing group	: Not assigned by regulation
Labels	: Organic Peroxides, Keep Away From Heat
IATA (Passenger)	
Packing instruction (passenger aircraft)	: 570
Packing group	: Not assigned by regulation
Labels	: Organic Peroxides, Keep Away From Heat

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14.5 Environmental hazards

ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes

IATA (Passenger)

Environmentally hazardous : yes

IATA (Cargo)

Environmentally hazardous : yes

14.6 Special precautions for user

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.

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) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

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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

Other regulations:

The substance/mixture is subject to the provisions of BEK nr. 1795 of 18/12/2015 (as amended) "Executive order on Measures to Protect Workers from the Risks related to Exposure to Carcinogenic Substances and Materials at Work". The work with this substance/mixture may pose a cancer risk.

: tert-Butyl hydroperoxide

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	:	Not in compliance with the inventory
DSL	:	This product contains the following components listed on the Canadian NDSL. All other components are on the Canadian DSL. tert-Butyl monoperoxymaleate
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	:	Not in compliance with the inventory
TECI	:	Not in compliance with the inventory

15.2 Chemical safety assessment

Product information	:	No information available.
tert-Butyl hydroperoxide	:	A Chemical Safety Assessment has been carried out for this substance.

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Maleic acid : No information available.

SECTION 16: Other information

Full text of H-Statements

H226	: Flammable liquid and vapour.
H241	: Heating may cause a fire or explosion.
H242	: Heating may cause a fire.
H301	: Toxic if swallowed.
H302	: Harmful if swallowed.
H311	: Toxic in contact with skin.
H312	: Harmful in contact with skin.
H314	: Causes severe skin burns and eye damage.
H315	: Causes skin irritation.
H317	: May cause an allergic skin reaction.
H318	: Causes serious eye damage.
H319	: Causes serious eye irritation.
H330	: Fatal if inhaled.
H335	: May cause respiratory irritation.
H341	: Suspected of causing genetic defects.
H351	: Suspected of causing cancer.
H373	: May cause damage to organs through prolonged or repeated exposure if swallowed.
H411	: Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Carc.	: Carcinogenicity
Eye Dam.	: Serious eye damage
Eye Irrit.	: Eye irritation
Flam. Liq.	: Flammable liquids
Muta.	: Germ cell mutagenicity
Org. Perox.	: Organic peroxides
Skin Corr.	: Skin corrosion
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation
STOT RE	: Specific target organ toxicity - repeated exposure
STOT SE	: Specific target organ toxicity - single exposure
2000/39/EC	: Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
2006/15/EC	: Europe. Indicative occupational exposure limit values
DK OEL	: Denmark. Occupational Exposure Limits
2000/39/EC / TWA	: Limit Value - eight hours
2006/15/EC / TWA	: Limit Value - eight hours
DK OEL / GV	: Long term exposure limit

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DK OEL / L : Ceiling

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIIC - 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 - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

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

Classification of the mixture:

Org. Perox. E	H242
Acute Tox. 4	H302
Acute Tox. 4	H332

Classification procedure:

Based on product data or assessment
Calculation method
Calculation method

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Skin Irrit. 2	H315	Calculation method
Eye Dam. 1	H318	Calculation method
Skin Sens. 1	H317	Calculation method
Muta. 2	H341	Calculation method
Carc. 2	H351	Calculation method
STOT RE 2	H373	Calculation method
Aquatic Chronic 3	H412	Calculation method

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