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

1.1 Product identifier

Trade name	:	TMCH-HA-M1
Unique Formula Identifier (UFI)	:	JUS9-D0G3-S00S-UG0H

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

Use of the Substance/Mixture	:	polymerisation initiators, Hardener

1.3 Details of the supplier of the safety data sheet

Company	:	United Initiators GmbH Dr.-Gustav-Adolph-Str. 3 82049 Pullach
Telephone	:	+49 / 89 / 74422 – 0
E-mail address of person responsible for the SDS	:	contact@united-in.com

1.4 Emergency telephone number

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

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids, Category 3	H226: Flammable liquid and vapour.
Organic peroxides, Type C	H242: Heating may cause a fire.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Reproductive toxicity, Category 1B	H360F: May damage fertility.
Aspiration hazard, Category 1	H304: May be fatal if swallowed and enters airways.
Short-term (acute) aquatic hazard, Category 1	H400: Very toxic to aquatic life.

Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :
H226 Flammable liquid and vapour.
H242 Heating may cause a fire.
H304 May be fatal if swallowed and enters airways.
H317 May cause an allergic skin reaction.
H360F May damage fertility.
H410 Very toxic to aquatic life with long lasting effects.

Supplemental Hazard Statements : EUH066 Repeated exposure may cause skin dryness or cracking.

Precautionary statements :

Prevention:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 Keep/Store away from clothing/ strong acids, bases, heavy metal salts and other reducing substances /combustible materials.
P233 Keep container tightly closed.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P331 Do NOT induce vomiting.
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:

P403 + P235 Store in a well-ventilated place. Keep cool.
P411 Store at temperatures not exceeding 20 °C.

Disposal:

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

Hazardous components which must be listed on the label:
2,2,4,6,6-pentamethylheptane (CAS-No. 13475-82-6)
tert-Butyl 2-ethylperoxyhexanoate (CAS-No. 3006-82-4)

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

Chemical nature : Organic Peroxide
Liquid mixture

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide	6731-36-8 229-782-3 01-2119735694-30-0002	Org. Perox. B; H241 Aquatic Chronic 4; H413	>= 35 - < 40
2,2,4,6,6-pentamethylheptane	13475-82-6 236-757-0 01-2119490725-29	Flam. Liq. 3; H226 Asp. Tox. 1; H304 Aquatic Chronic 4; H413 EUH066	>= 35 - < 40
tert-Butyl 2-ethylperoxyhexanoate	3006-82-4 221-110-7 01-2119498310-40-	Org. Perox. C; H242 Skin Sens. 1; H317 Repr. 1B; H360F	>= 25 - < 30

	0000	Aquatic Acute 1; H400 Aquatic Chronic 2; H411 M-Factor (Acute aquatic toxicity): 1	

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.
Symptoms of poisoning may appear several hours later.
No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus.
Call a physician immediately.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing

If inhaled : Call a physician or poison control centre immediately.
If unconscious, place in recovery position and seek medical advice.
Keep respiratory tract clear.
If breathed in, move person into fresh air.

In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Wash contaminated clothing before re-use.
If on skin, rinse well with water.
If on clothes, remove clothes.
If symptoms persist, call a physician.

In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Call a physician immediately.
Contact a poison control center.

4.2 Most important symptoms and effects, both acute and delayed

Risks : May be fatal if swallowed and enters airways.
May cause an allergic skin reaction.
May damage fertility.
Repeated exposure may cause skin dryness or cracking.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray jet
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Contact with incompatible materials or exposure to temperatures exceeding SADT may result in a self-accelerating decomposition reaction with release of flammable vapors which may auto-ignite.
The product burns violently.
Flash back possible over considerable distance.
Vapours may form explosive mixtures with air.
Cool closed containers exposed to fire with water spray.

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

Specific extinguishing methods : Do not use a solid water stream as it may scatter and spread fire.
Remove undamaged containers from fire area if it is safe to do so.
Use water spray to cool unopened containers.

Further information : 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.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Ensure adequate ventilation.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Follow safe handling advice and personal protective equipment recommendations.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Never return spills in original containers for re-use.
Treat recovered material as described in the section "Disposal considerations".

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Contact with incompatible substances can cause decomposition at or below SADT.
Clear spills immediately.
Suppress (knock down) gases/vapours/mists with a water spray jet.
To clean the floor and all objects contaminated by this material, use plenty of water.
Soak up with inert absorbent material.
Isolate waste and do not reuse.
Non-sparking tools should be used.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Advice on safe handling	:	Do not swallow. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. Avoid formation of aerosol. Take precautionary measures against static discharges. Never return any product to the container from which it was originally removed. Provide sufficient air exchange and/or exhaust in work rooms. Avoid confinement. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Smoking, eating and drinking should be prohibited in the application area. Wash thoroughly after handling. For personal protection see section 8. Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Protect from contamination.
Advice on protection against fire and explosion	:	Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from heat and sources of ignition. Use only explosion-proof equipment. Keep away from combustible material.
Hygiene measures	:	Keep away from food and drink. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Avoid impurities (e.g. rust, dust, ash), risk of decomposition. Electrical installations / working materials must comply with the technological safety standards. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in original container. Keep containers tightly closed in a cool, well-ventilated place. Store in accordance with the particular national regulations.
Advice on common storage	:	Keep away from strong acids, bases, heavy metal salts and other reducing substances.

Storage class (TRGS 510)	:	5.2
Recommended storage temperature	:	< 20 °C
Further information on storage stability	:	No decomposition if stored normally.

7.3 Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

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

Substance name	End Use	Exposure routes	Potential health effects	Value
di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide	Workers	Inhalation	Long-term systemic effects	1,4 mg/m3
	Workers	Skin contact	Long-term systemic effects	2 mg/kg bw/day
tert-Butyl 2-ethylperoxyhexanoate	Workers	Inhalation	Long-term systemic effects	9,8 mg/m3
	Workers	Skin contact	Long-term systemic effects	5,6 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	1,74 mg/m3
	Consumers	Oral	Long-term systemic effects	1 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide	Fresh water sediment	0,102 mg/kg dry weight (d.w.)
	Marine sediment	0,01 mg/kg dry weight (d.w.)
	Sewage treatment plant	100 mg/l
	Soil	5,29 mg/kg dry weight (d.w.)
tert-Butyl 2-ethylperoxyhexanoate	Fresh water	0,002 mg/l

	Marine water	0 mg/l
	Sewage treatment plant	0,64 mg/l
	Fresh water sediment	0,622 mg/kg dry weight (d.w.)
	Marine sediment	0,062 mg/kg dry weight (d.w.)

8.2 Exposure controls

Engineering measures

Minimize workplace exposure concentrations.

Personal protective equipment

Eye/face protection : Tightly fitting safety goggles
Please wear suitable protective goggles. Also wear face protection if there is a splash hazard.
Ensure that eyewash stations and safety showers are close to the workstation location.
Please follow all applicable local/national requirements when selecting protective measures for a specific workplace.

Equipment should conform to EN 166

Hand protection

Material : butyl-rubber
Break through time : < 30 min
Glove thickness : 0,47 mm
Directive : Equipment should conform to EN 374

Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0,40 mm
Directive : Equipment should conform to EN 374

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

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, dis-

		posable suits) to avoid exposed skin surfaces. Wear as appropriate: Flame retardant antistatic protective clothing.
Respiratory protection	:	In the case of dust or aerosol formation use respirator with an approved filter. Respirator with combination filter for vapour/particulate (EN 141)
Filter type	:	ABEK-filter
Protective measures	:	The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Colour	:	colourless
Odour	:	musty
Odour Threshold	:	not determined
Melting point/range	:	< -25 °C
Boiling point/boiling range	:	Decomposition: Decomposes below the boiling point.
Flammability	:	Not applicable
Upper explosion limit / Upper flammability limit	:	Upper explosion limit 4 %(V) (for a component of this mixture)
Lower explosion limit / Lower flammability limit	:	Lower explosion limit 0,5 %(V) (for a component of this mixture)
Flash point	:	42 °C Method: ISO 3679, closed cup
Auto-ignition temperature	:	not determined
Self-Accelerating decomposition temperature (SADT)	:	55 °C Method: UN-Test H.4 SADT-Self Accelerating Decomposition Temperature. Lowest

		temperature at which the tested package size will undergo a self-accelerating decomposition reaction.
pH	:	No data available
Viscosity		
Viscosity, dynamic	:	3 mPa.s (20 °C)
Viscosity, kinematic	:	not determined
Solubility(ies)		
Water solubility	:	No data available
Solubility in other solvents	:	Solvent: Alcohol Description: completely miscible
Partition coefficient: n-octanol/water	:	Not applicable
Vapour pressure	:	not determined
Relative density	:	not determined
Density	:	0,84 g/cm3 (20 °C)
Relative vapour density	:	not determined

9.2 Other information

Explosives	:	Not explosive In use, may form flammable/explosive vapour-air mixture.
Oxidizing properties	:	The substance or mixture is not classified as oxidizing. Organic peroxide
Flammability (liquids)	:	Flammable liquid and vapour., Organic peroxide
Self-ignition	:	The substance or mixture is not classified as pyrophoric.
Self-heating substances	:	The substance or mixture is not classified as self heating.
Substances and mixtures, which in contact with water, emit flammable gases	:	The substance or mixture does not emit flammable gases in contact with water.
Desensitised explosives	:	Not applicable
Evaporation rate	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid : Protect from contamination.
Contact with incompatible substances can cause decomposition at or below SADT.
Heat, flames and sparks.
Avoid confinement.

10.5 Incompatible materials

Materials to avoid : Accelerators, strong acids and bases, heavy metals and heavy metal salts, reducing agents

10.6 Hazardous decomposition products

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

SECTION 11: Toxicological information

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

Acute toxicity

Not classified based on available information.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5,6 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity	:	LD50 (Rat): > 2.000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

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

Acute oral toxicity	:	LD50 (Rat): > 5.000 mg/kg Method: OECD Test Guideline 401 Assessment: The substance or mixture has no acute oral toxicity Remarks: Based on data from similar materials
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	LD50 Dermal (Rabbit): > 5.000 mg/kg Method: OECD Test Guideline 402

tert-Butyl 2-ethylperoxyhexanoate:

Acute oral toxicity	:	LD50 (Rat): >= 10.000 mg/kg Method: OECD Test Guideline 401 Assessment: The substance or mixture has no acute oral toxicity Remarks: No mortality observed at this dose.
Acute inhalation toxicity	:	LC50 (Rat): > 42,2 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): 16.820 mg/kg Method: OECD Test Guideline 402

Skin corrosion/irritation

Repeated exposure may cause skin dryness or cracking.

Product:

Remarks	:	May cause skin irritation in susceptible persons.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

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

Result	:	Repeated exposure may cause skin dryness or cracking.

tert-Butyl 2-ethylperoxyhexanoate:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Product:

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

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	No eye irritation

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

Result	:	No eye irritation

tert-Butyl 2-ethylperoxyhexanoate:

Species	:	Rabbit
Method	:	OECD Test Guideline 405
Result	:	No eye irritation

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified based on available information.

Product:

Remarks	:	Causes sensitisation.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

tert-Butyl 2-ethylperoxyhexanoate:

Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	May cause sensitisation by skin contact.

Germ cell mutagenicity

Not classified based on available information.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Genotoxicity in vitro	:	Test Type: Chromosome aberration test in vitro Method: OECD Test Guideline 473 Result: negative Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: negative Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: negative
Genotoxicity in vivo	:	Remarks: No data available

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

Germ cell mutagenicity- Assessment	:	No known effect.

tert-Butyl 2-ethylperoxyhexanoate:

Genotoxicity in vitro	:	Test Type: Bacterial reverse mutation assay (AMES) Method: OECD Test Guideline 471 Result: positive Test Type: In vitro mammalian cell gene mutation test Method: OECD Test Guideline 476 Result: positive
Genotoxicity in vivo	:	Species: Mouse Application Route: Ingestion Method: OECD Test Guideline 474 Result: negative

Carcinogenicity

Not classified based on available information.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Species	:	Mouse
Application Route	:	Oral
Result	:	negative

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

Carcinogenicity - Assessment	:	No known effect.

tert-Butyl 2-ethylperoxyhexanoate:

Remarks	:	This information is not available.

Reproductive toxicity

May damage fertility.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Effects on fertility	:	Remarks: No data available
Effects on foetal development	:	Species: Rat Application Route: oral (gavage) General Toxicity Maternal: NOAEL: 1.000 mg/kg body weight Method: OECD Test Guideline 414

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

Reproductive toxicity - Assessment	:	No known effect.

tert-Butyl 2-ethylperoxyhexanoate:

Effects on fertility	:	Test Type: Reproduction/Developmental toxicity screening test Species: Rat Application Route: Oral General Toxicity - Parent: NOEL: 300 mg/kg body weight Method: OECD Test Guideline 421 Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Oral General Toxicity - Parent: NOAEL: 300 mg/kg body weight General Toxicity F1: NOAEL: 300 mg/kg body weight Fertility: NOAEL Mating/Fertility: 100 mg/kg body weight Early Embryonic Development: NOAEL F2: 300 mg/kg body weight

		Method: OECD Test Guideline 443 GLP: yes
Effects on foetal development	:	Species: Rabbit Application Route: Oral General Toxicity Maternal: NOAEL: 30 mg/kg body weight Developmental Toxicity: NOAEL: 100 mg/kg body weight Method: OECD Test Guideline 414 Species: Rat Application Route: Oral General Toxicity Maternal: NOEL: 400 mg/kg body weight Developmental Toxicity: NOEL: 400 mg/kg body weight Method: OECD Test Guideline 414
Reproductive toxicity - Assessment	:	Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

Not classified based on available information.

Components:

tert-Butyl 2-ethylperoxyhexanoate:

Remarks	:	No data available

STOT - repeated exposure

Not classified based on available information.

Components:

tert-Butyl 2-ethylperoxyhexanoate:

Remarks	:	No data available

Repeated dose toxicity

Components:

tert-Butyl 2-ethylperoxyhexanoate:

Species	:	Rat, male
NOAEL	:	316 mg/kg
Exposure time	:	28 d
Method	:	OECD Test Guideline 407
Species	:	Rat, female
NOAEL	:	100 mg/kg
Exposure time	:	28 d
Method	:	OECD Test Guideline 407

Species	:	Rat
NOAEL	:	450 mg/kg
Method	:	OECD Test Guideline 408

Aspiration toxicity

May be fatal if swallowed and enters airways.

Components:

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

May be fatal if swallowed and enters airways.

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	:	Solvents may degrease the skin.

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Remarks	:	No data available

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

Remarks	:	May cause headache and dizziness.

SECTION 12: Ecological information

12.1 Toxicity

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 0,043 mg/l Exposure time: 96 h Method: OECD Test Guideline 203

		Remarks: No toxicity at the limit of solubility
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 1 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: No toxicity at the limit of solubility
Toxicity to algae/aquatic plants	:	EC10 (Pseudokirchneriella subcapitata (green algae)): 0,11 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: No toxicity at the limit of solubility
Toxicity to microorganisms	:	EC50 (Bacteria): > 1.000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,0128 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211 Remarks: No toxicity at the limit of solubility

Ecotoxicology Assessment

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

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

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia (water flea)): > 0,04 mg/l Exposure time: 48 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae/aquatic plants	:	IC50 (algae): > 0,04 mg/l Exposure time: 72 h Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

Acute aquatic toxicity	:	This product has no known ecotoxicological effects.
Chronic aquatic toxicity	:	May cause long lasting harmful effects to aquatic life.

tert-Butyl 2-ethylperoxyhexanoate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 8,66 mg/l Exposure time: 96 h Method: OECD Test Guideline 203

		NOEC (Poecilia reticulata (guppy)): 2,10 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 7,5 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Raphidocelis subcapitata (freshwater green alga)): 0,44 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201 GLP: yes NOEC (Raphidocelis subcapitata (freshwater green alga)): 0,018 mg/l Exposure time: 72 h Test Type: Growth inhibition Method: OECD Test Guideline 201 GLP: yes
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 : 64 mg/l Exposure time: 0,5 h Method: OECD Test Guideline 209
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,45 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211 LOEC: 0,87 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211

Ecotoxicology Assessment

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

12.2 Persistence and degradability

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Biodegradability : Result: Biodegradable
Method: OECD Test Guideline 301D

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

Biodegradability : Result: Not readily biodegradable.

tert-Butyl 2-ethylperoxyhexanoate:

Biodegradability : Result: rapidly biodegradable
Biodegradation: 65 %
Related to: Theoretical oxygen demand
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes
Remarks: According to the results of tests of biodegradability this product is considered as being readily biodegradable.

12.3 Bioaccumulative potential

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Bioaccumulation : Bioconcentration factor (BCF): 443

Partition coefficient: n-octanol/water : log Pow: 6,53

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

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

tert-Butyl 2-ethylperoxyhexanoate:

Bioaccumulation : Bioconcentration factor (BCF): 202,4
Method: QSAR

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

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

12.6 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:

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

Components:

di-tert-butyl 3,3,5-trimethylcyclohexylidene diperoxide:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
May cause long lasting harmful effects to aquatic life.

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.
Dispose of wastes in an approved waste disposal facility.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.
Dispose of in accordance with local regulations.

SECTION 14: Transport information

14.1 UN number or ID number

ADR : UN 3113

IMDG : UN 3113

14.2 UN proper shipping name

ADR	:	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED (1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYLCYCLOHEXANE, tert-BUTYL PEROXY-2-ETHYLHEXANOATE)
IMDG	:	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED (1,1-DI-(tert-BUTYLPEROXY)-3,3,5-TRIMETHYLCYCLOHEXANE, tert-BUTYL PEROXY-2-ETHYLHEXANOATE)

14.3 Transport hazard class(es)

		Class	Subsidiary risks
ADR	:	5.2	
IMDG	:	5.2	

14.4 Packing group

ADR

Packing group	:	Not assigned by regulation
Classification Code	:	P2
Labels	:	5.2
Tunnel restriction code	:	(D)

IMDG

Packing group	:	Not assigned by regulation
Labels	:	5.2
EmS Code	:	F-F, S-R

14.5 Environmental hazards

ADR

Environmentally hazardous	:	yes

IMDG

Marine pollutant	:	yes

14.6 Special precautions for user

Additional advice

Temperature controlled transport.:

Control temperature	:	20 °C
Emergency temperature	:	25 °C

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

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3
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

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

		Quantity 1	Quantity 2
P6b	SELF-REACTIVE SUBSTANCES AND MIXTURES and ORGANIC PEROXIDES	50 t	200 t
E1	ENVIRONMENTAL HAZARDS	100 t	200 t

Water hazard class (Germany)	:	WGK 3 highly hazardous to water Classification according to AwSV, Annex 1 (5.2)

Other regulations:

Gefahrgruppe nach DGUV 13 Vorschrift 13 (bisher BGV B4): II (German regulatory requirements)

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

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

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

DSL (CA)	:	All components of this product are on the Canadian DSL
KECI (KR)	:	On the inventory, or in compliance with the inventory
PICCS (PH)	:	On the inventory, or in compliance with the inventory
IECSC (CN)	:	On the inventory, or in compliance with the inventory
TCSI (TW)	:	On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

This information is not available.

SECTION 16: Other information

Further information

Other information	:	This safety datasheet only contains information relating to safety and does not replace any product information or product specification. These safety instructions also apply to empty packaging which may still contain product residues.
Sources of key data used to compile the Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/

Classification of the mixture:		**Classification procedure:**
Flam. Liq. 3	H226	Based on product data or assessment
Org. Perox. C	H242	Based on product data or assessment
Skin Sens. 1	H317	Calculation method
Repr. 1B	H360F	Calculation method
Asp. Tox. 1	H304	Calculation method

Aquatic Acute 1	H400	Calculation method
Aquatic Chronic 2	H411	Calculation method

Full text of H-Statements

H226	:	Flammable liquid and vapour.
H241	:	Heating may cause a fire or explosion.
H242	:	Heating may cause a fire.
H304	:	May be fatal if swallowed and enters airways.
H317	:	May cause an allergic skin reaction.
H360F	:	May damage fertility.
H400	:	Very toxic to aquatic life.
H411	:	Toxic to aquatic life with long lasting effects.
H413	:	May cause long lasting harmful effects to aquatic life.
EUH066	:	Repeated exposure may cause skin dryness or cracking.

Full text of other abbreviations

Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Asp. Tox.	:	Aspiration hazard
Flam. Liq.	:	Flammable liquids
Org. Perox.	:	Organic peroxides
Repr.	:	Reproductive toxicity
Skin Sens.	:	Skin sensitisation

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

tative) 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

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.

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