1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Identification of the product

Substance name:
REACH Registration Name: Tert-Butyl 2-ethylperoxyhexanoate
REACH Registration Number: 01-2119498310-40-0002
EC Nr: 221-110-7
CAS-No.: 3006-82-4

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

Use of the Substance/Mixture :

Sector of use :	Product category :
Use as polymerisation initiator/curing agent **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites**, SU12:** Manufacture of plastics products, including compounding and conversion	

1.3. Details of the supplier of the safety data sheet

Supplier	Arkema ADDITIFS FONCTIONNELS 420 rue d'Estienne d'Orves 92705 Colombes Cedex, France Téléphone : +33 (0)1 49 00 80 80 Télécopie : +33 (0)1 49 00 83 96 http://www.arkema.com
E-mail address	pars-drp-fds@arkema.com
E-mail address : Exposure scenario	arkema.peroxides-reach-uses@arkema.com

1.4. Emergency telephone number

+33 1 49 00 77 77
European emergency phone number : 112

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (Regulation (EC) No 1272/2008):
Organic peroxides, C, H242
Skin sensitization, 1, H317
Acute aquatic toxicity, 1, H400
Chronic aquatic toxicity, 1, H410
M-Factor: Acute = 1
Chronic = 1

Classification (Directive 67/548/EEC):

E; R 2
O; R 7
Xi; ; R43
N; R50/53

Additional information:
For the full text of the R, H, EUH-phrases mentioned in this Section, see Section 16.

2.2. Label elements

Label elements (REGULATION (EC) No 1272/2008):

Hazardous components which must be listed on the label:

CAS-No. : 3006-82-4 Tert-Butyl 2-ethylperoxyhexanoate

Hazard pictograms:

Signal word: **Danger**

Hazard statements:
H242 : Heating may cause a fire.
H317 : May cause an allergic skin reaction.
H410 : Very toxic to aquatic life with long lasting effects.

Precautionary statements:
Prevention:
P210 : Keep away from open flames/hot surfaces. - No smoking.
P261 : Avoid breathing gas/mist/vapours/spray.
P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.
P273 : Avoid release to the environment.
Response:
P302 + P352 : IF ON SKIN: Wash with plenty of soap and water.
Storage:
P411 : Store at temperatures not exceeding 20 °C
P420 : Store away from other materials.

2.3. Other hazards

Potential health effects:
Skin contact: May cause sensitization by skin contact.
Eye contact: Slightly irritating to eyes.

Environmental Effects:
Toxic to fish. Toxic to daphnia. Very toxic to algae. Inherently biodegradable. Bioaccumulable

Physical and chemical hazards:
Risk of explosion by shock, friction, fire or other sources of ignition. Contact with combustible material may cause fire. Thermal decomposition giving flammable and toxic products.
Decomposition products: See chapter 10

Other:
Results of PBT and vPvB assessment : According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Chemical name of the substance[1]: TERT-BUTYL 2-ETHYLPEROXYHEXANOATE

Chemical Name[1]	EC-No.	CAS-No.	Concentration	Classification Directive 67/548/EEC	Classification Regulation (EC) No 1272/2008
Tert-Butyl 2-ethylperoxyhexanoate	221-110-7	3006-82-4	99 %	E; R 2 O; R 7 Xi; R43 N; R50/53	Org. Perox. C; H242 Skin Sens. 1; H317 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor Acute = 1 M-Factor Chronic = 1

[1]: See chapter 14 for Proper Shipping Name

4. FIRST AID MEASURES

4.1. & 4.2. Description of necessary first-aid measures & Most important symptoms/effects, acute and delayed:

General advice:
Take off immediately all contaminated clothing. Risk of ignition. In case of splashes, remove contaminated clothing and plunge it into water immediately.

Inhalation:
Inhalation of vapours/mists : Move to fresh air. Oxygen or artificial respiration if needed. In case of persistent problems : Consult a physician.

Skin contact:
Wash immediately, abundantly and thoroughly with soap and water.

Eye contact:
Wash immediately, abundantly and thoroughly with water. If irritation persists, consult an ophthalmologist.

Ingestion:
In case of problems : Consult a doctor.

Protection of first-aiders:
In case of insufficient ventilation, wear suitable respiratory equipment. Protective suit.

4.3.Indication of immediate medical attention and special treatment needed, if necessary : No data available.

5. FIREFIGHTING MEASURES

5.1.Extinguishing media

Suitable extinguishing media: Water spray, After cooling : Dry powder

5.2. Special hazards arising from the substance or mixture:

Risk of explosion by shock, friction, fire or other sources of ignition.
The product burns violently (protect people from possible projections).
Contact with combustible material may cause fire.
Through thermal decomposition, formation of very reactive free radicals.
Thermal decomposition giving flammable and toxic products :
Tertiobutanol, 2-Ethylhexanol, Carbon oxides (by combustion)

5.3. Advice for firefighters:

Specific methods:
Fight fire from a distance (more than 15 m). Cool containers / tanks with water spray. In case of fire nearby, remove exposed containers.

Special protective actions for fire-fighters:
Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Evacuate non-essential staff and those not equipped with individual protection apparatus. Prohibit all sources of sparks and ignition - Do not smoke. Prohibit contact with skin and eyes and inhalation of vapours. Use personal protective equipment. In case of insufficient ventilation, wear suitable respiratory equipment.

6.2. Environmental precautions:

Do not release into the environment. Do not let product enter drains. Do not allow material to contaminate ground water system. Do not contaminate surface water.

6.3. Methods and materials for containment and cleaning up:

Methods for cleaning up:
After cleaning, flush away traces with water. Recover waste water for processing later.

Recovery:
Never return spills in original containers for re-use. Shovel into suitable container for disposal. Small quantities : Soak up with inert absorbent material (Vermiculite, Clean sand). Do not confine. No sparking tools should be used.

Elimination: See chapter 13

6.4. Reference to other sections: None.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling:

Technical measures/Precautions:
Storage and handling precautions applicable to products: Organic peroxides. Liquid. Sensitizing. Dangerous for the environment.
Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths. Provide self-contained breathing apparatus nearby (for emergency intervention). Provide water supplies near the point of use. Provide fire-blanket nearby. Provide electrical earthing of equipment.

Safe handling advice:
Strictly limit the quantities of product in the work area to those which are absolutely necessary for the work in hand. Great cleanliness in work areas is a necessary and important factor for safety. Handle and open container with care (risk of overpressurization in containers). Prohibit all sources of sparks and ignition - Do not smoke. Protect from contamination. Never return any product to the container from which it was originally removed (risk of decomposition). Never mix peroxides directly with accelerators (risk of explosion). Add each component separately to the resin. In case of insufficient ventilation, wear suitable respiratory equipment.

Hygiene measures:
Take off immediately all contaminated clothing. Prohibit contact with skin and eyes and inhalation of vapours. When using do not eat, drink or smoke.
Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities:

Store in well insulated area (peroxide area) away from other substances. Storage buildings must be built and equipped so as not to exceed the maximum proscribed temperature limit. Use non-combustible construction materials. Keep tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not smoke. Store in original container. Use only very clean containers and equipment free from traces of impurities. Never return unused material to storage receptacle. Do not reuse empty packaging to store other products. Protect the containers from any impacts. Provide earthing and safe electrical equipment. Provide a catch-tank in a bunded area. Provide impermeable floor. Consult ARKEMA before storage design.

Storage period: < 6 Months, Storage temperature: < 20 °C

Incompatible products:
Strong oxidizing agents, Powerful reducers, Strong acids, strong bases, Amines, Sulphur compounds, heavy metal compounds, heavy metals, rust, Ash, dusts (risk of self-accelerating exothermic decomposition)

Packaging material:
Recommended: Stainless steel, High density polyethylene (HDPE), Polytetrafluoroethylene (PTFE)
To be avoided: Ordinary metals (ordinary steel), copper, rubber (natural or synthetic), Glass - Stoneware (risk of contents spurting or spraying out if container ruptures due to overpressurization)

7.3. Specific end uses: None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure Limit Values Not relevant

Derived No Effect Level (DNEL):

End Use	Inhalation	Ingestion	Skin contact
Workers	2,92 mg/m3 (LT, SE)		1,66 mg/kg bw/day (LT, SE)
Consumers	0,63 mg/m3 (LT, SE)	0,42 mg/kg bw/day (LT, SE)	0,84 mg/kg bw/day (LT, SE)

LE : Local effects, **SE** : Systemic effects, **LT** : Long term, **ST** : Short term

Predicted No Effect Concentration (PNEC):

Compartment:	Value:
Fresh water	0,44 µg/l
Water (Intermittent release)	4,4 µg/l
Marine water	0,044 µg/l
Fresh water sediment	0,145 mg/kg dw
Marine sediment	0,0145 mg/kg dw
Effects on waste water treatment plants	0,64 mg/l
Soil	0,03 mg/kg dw

Oral (Secondary Poisoning)	6,67 mg/kg

8.2. Exposure controls:

General protective measures: Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment:

Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment.
In the case of hazardous fumes, wear self contained breathing apparatus.
Hand protection: Gloves (PVC, neoprene, nitrile rubber)
Eye/face protection: Safety glasses/goggles and face-mask (during discharge)
Skin and body protection: Protective suit

Environmental exposure controls: See chapter 6

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:
Physical state (20°C): liquid
Colour: colourless
Odour: slight, ester-like
Olfactory threshold: No data available.
pH: No data available.
Melting point/range : -67,3 °C
Boiling point/boiling range : Not applicable (decomposes on heating)
Flash point: closed cup: 78 °C The flashpoint of this product is greater than the Self Acceleration Decomposition Temperature (SADT).(ISO 3679)
Evaporation rate: No data available.
Flammability (solid, gas):
Flammability: not applicable
Vapour pressure: 0,02 hPa , at 20 °C
Vapour density: No data available.
Density: 896 kg/m3 , at 20 °C
Water solubility: 46,3 mg/l at 20 °C
Partition coefficient: n-octanol/water: log Kow : 4,79 , at 20 °C (OECD Test Guideline 117)
Autoignition temperature: Not relevant
Decomposition temperature: No data available.
Self-Accelerating decomposition temperature (SADT): 35 °C (OPPSD (USA))
Viscosity, dynamic: 3,7 mPa.s , at 20 °C
Explosive properties:
Explosivity: Risk of explosion by shock, friction, fire or other sources of ignition.
Oxidizing properties: Organic peroxide

9.2. Other data:

Solubility in other solvents: Soluble in most organic solvents
pKA: -4,84 (calculated)
Molecular Weight: 216,31 g/mol
Active oxygen content: 7,3 %

10. STABILITY AND REACTIVITY

10.1. & 10.2. Reactivity & Chemical stability:
The product is stable under normal handling and storage conditions.

10.3. Possibility of hazardous reactions:
Risk of explosion by shock, friction, fire or other sources of ignition.

10.4. Conditions to avoid:

Temperatures above 20 °C
(risk of self-accelerating exothermic decomposition)
Keep away from heat and sources of ignition.

10.5. Incompatible materials to avoid:
Strong oxidizing agents, Powerful reducers, Strong acids, strong bases, Sulphur compounds, heavy metal compounds, heavy metals, rust, Ash, dusts (risk of self-accelerating exothermic decomposition)
Follow conditions of use with : accelerators (amines, metallic salts).

10.6. Hazardous decomposition products:
Through thermal decomposition, formation of very reactive free radicals.
Thermal decomposition giving flammable and toxic products :
Tertiobutanol, 2-Ethylhexanol, Carbon oxides (by combustion)

Half-life of peroxide in solvent:
Benzene (0,2 Mol/l):
10 h (at 73 °C)
1 h (at 92 °C)
1 min (at 132 °C)
n-Dodecane (0,2 Mol/l):
10 h (at 77 °C)
1 h (at 94 °C)
1 min (at 129 °C)
n-decane (0,2 Mol/l):
10 h (at 78 °C)
1 h (at 97 °C)
1 min (at 137 °C)

11. TOXICOLOGICAL INFORMATION

Data on this material and/or a similar material are summarized below.

11.1. Information on toxicological effects:

Acute toxicity:

Inhalation:	**Slightly harmful by inhalation**
• In animals :	LC50/4 h/rat: 42,2 mg/l (Method: OECD Test Guideline 403) (Aerosol)
Ingestion:	**Slightly harmful by ingestion**
• In animals :	No mortality/rat: 10.000 mg/kg (Method: OECD Test Guideline 401)
Dermal:	**Slightly harmful in contact with skin**
• In animals :	LD50/rabbit: 16.818 mg/kg (Method: OECD Test Guideline 402)

Local effects (Corrosion / Irritation / Serious eye damage):

Skin contact:	**Slightly or not irritating to skin**
• In animals :	Mild skin irritation (OECD Test Guideline 404, rabbit)
Eye contact:	**Slightly irritating to eyes**
• In animals :	Mild eye irritation (OECD Test Guideline 405, rabbit)

Respiratory or skin sensitization:

Inhalation:	No data available.
Skin contact:	**Skin sensitizer**
• In animals :	Sensitizing effects by skin contact. (Method : OECD Test Guideline 406 Buehler Test, guinea pig)

CMR effects :

Mutagenicity: **Based on the available information, it is not possible to conclude on the hasard potential of this mixture.**

In vitro

Ames test in vitro: Inactive (Method: OECD Test Guideline 471)
In vitro gene mutations test on mammalian cells: Active (Method: OECD Test Guideline 476)

In vivo

Micronucleus test in vivo mouse: Inactive (Method: OECD Test Guideline 474)

Carcinogenicity:

No data available.

Reproductive toxicity:

Fertility: **Absence of toxic effects on fertility**
• In animals : Absence of toxic effects on fertility, NOAEL: 300 mg/kg/d
NOAEL (Parent): 300 mg/kd/d (Method: OECD Test Guideline 421, rat, By oral route)

Foetal development: **There is no data available for this product.**
No data available.

Specific target organ toxicity :
Single exposure :

Inhalation:
No data available.

Repeated exposure: **The substance or mixture is not classified as specific target organ toxicant, repeated exposure.**
• In animals : By oral route: Target organs: At high dose :, Haematological system, NOAEL= 100 mg/kg/d (Method: OECD Test Guideline 407, rat, 4 Weeks)

Aspiration hazard: No data available.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Fish: **Toxic to fish.**
LC50, 96 h (Poecilia reticulata) : = 8,6 mg/l (Method: OECD Test Guideline 203)

Aquatic invertebrates: **Toxic to daphnia.**
EC50, 48 h (Daphnia magna (Water flea)) : = 7,5 mg/l (Method: OECD Test Guideline 202)

Aquatic plants: **Very toxic to algae.**
ErC50, 72 h (Pseudokirchneriella subcapitata (green algae)) : = 0,4394 mg/l (Method: OECD Test Guideline 201)

Microorganisms:
EC50, 30 min (Activated sludge) : = 64 mg/l (Method: OECD Test Guideline 209, Respiration inhibition)

Aquatic toxicity / Long term toxicity:
Aquatic plants:
NOEC, 72 h (Pseudokirchneriella subcapitata (green algae)) : = 0,018 mg/l (Method: OECD Test Guideline 201, growth rate)

M-Factor:
Acute = 1
Chronic = 1

12.2. Persistence and degradability :

Stability in water:
Half-life: 86 h at 15 °C and pH 7
Method: OECD Test Guideline 111
Half-life: 67 h at 25 °C and pH 7
Method: OECD Test Guideline 111

Biodegradation (In water): **Inherently biodegradable.**
55 % after 28 d (Method: OECD Test Guideline 301 D)

12.3. Bioaccumulative potential :

Bioaccumulation: **Bioaccumulable**
Partition coefficient: n-octanol/water: log Kow : 4,79 , at 20 °C (Method: OECD Test Guideline 117)

12.4. Mobility in soil - Distribution among environmental compartments:

Absorption / desorption:
In soils and sediments: log Koc: 3,08 (Method: calculated)

12.5. Results of PBT and vPvB assessment :

According to REACH regulation, annex XIII, the substance does not meet PBT and vPvB criteria.

12.6. Other adverse effects: None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment:

Disposal of product: Do not dispose of waste into sewer. Eliminate the product by incineration after dilution in a suitable flammable solvent (in accordance with local and national regulations). Amount of active oxygen must be below 1%. Consult ARKEMA.
Can be disposed of as waste water, when in compliance with local regulations.

Disposal of packaging: Do not release into the environment. Drain off the drums and recover as much product as possible. Destroy packaging by incineration at an approved waste disposal site (in accordance with local and national regulations).

14. TRANSPORT INFORMATION

Regulation	UN number	Proper shipping name	Class	Label	PG	Environmentally hazardous	Other information
ADR	3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED(Tert-BUTYL PEROXY-2-ETHYLHEXANOATE)	5.2	5.2		yes	
RID							**Not permitted for transport**
IATA Cargo							**Not permitted for transport**
IATA Passenger							**Not permitted for transport**
IMDG	3113	ORGANIC PEROXIDE TYPE C, LIQUID, TEMPERATURE CONTROLLED (Tert-BUTYL PEROXY-2-ETHYLHEXANOATE)	5.2	5.2		Marine pollutant	EmS Number: F-F, S-R Mark: MP

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

15. REGULATORY INFORMATION

Safety data sheets: according to Regulation (EC) No. 1907/2006

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

15.2. Chemical Safety Assessment:
A Chemical Safety Assessment has been carried out for this substance.

INVENTORIES:

EINECS:	Conforms to
TSCA:	Conforms to
AICS:	Conforms to
DSL:	All components of this product are on the Canadian DSL list.
ENCS (JP):	Conforms to
KECI (KR):	Conforms to
PICCS (PH):	Conforms to
IECSC (CN):	Conforms to
NZIOC:	HSNO Approved

16. OTHER INFORMATION

Full text of R, H, EUH-phrases referred to under sections 2 and 3

R 2	Risk of explosion by shock, friction, fire or other sources of ignition.
R 7	May cause fire.
R43	May cause sensitization by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
H242	Heating may cause a fire.
H317	May cause an allergic skin reaction.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Bibliography	ARKEMA brochure : Safe Handling of Organic Peroxides Cahiers et notes documentaires INRS - N°186 - 1erT2002 : "Les peroxydes et leur utilisation"
Further information	This product must be handled only by personnel well informed of safety conditions. When used in formulations, contact us for labelling.

Update:

Safety datasheet sections which have been updated:		Type:
1	REACH Registration Number	Additions
2	Classification and labelling, Most important hazards	Revisions
3	Classification and labelling	Revisions
8	Derived No Effect Level (DNEL), Predicted No Effect Concentration (PNEC)	Revisions
11	Repeated dose toxicity, Germ cell mutagenicity, Foetal development	Additions, Revisions, Deletions
12	Long term toxicity, Aquatic plants, Stability in water, PBT assessment	Additions, Revisions

Thesaurus:
NOAEL : No Observed Adverse Effect Level (NOAEL)
LOAEL : Lowest Observed Adverse Effect Level (LOAEL)
bw : Body weight
food : oral feed
dw : Dry weight
vPvB : very Persistent and very Bioaccumulative
PBT : Persistent, Bioaccumulative and Toxic

This information applies to the PRODUCT AS SUCH and conforming to specifications of ARKEMA. In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive. It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product. It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.

NB: In this document the numerical separator of the thousands is the "." (point), the decimal separator is "," (comma).