

## GPS Safety Summary

**Substance Name:**

**Tert-amyl hydroperoxide**

### 1. General Statement

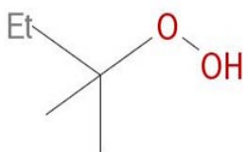
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Tert-amyl hydroperoxide is primarily used as a polymerisation initiator. The substance is used at the industrial stage and is not sold to general public.

### 2. Chemical Identity

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<b>Name:</b>	tert-amyl hydroperoxide, tert-pentyl hydroperoxide
<b>Brand names:</b>	Luperox® TAH85
<b>Chemical name (IUPAC):</b>	1,1-dimethylpropyl hydroperoxide
<b>CAS number(s):</b>	3425-61-4
<b>EC number:</b>	222-321-7
<b>Molecular formula:</b>	C <sub>5</sub> H <sub>12</sub> O <sub>2</sub>
<b>Structure:</b>	



### 3. Use and applications

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The substance is primarily used as a radical initiator to induce polymerisation (free radical polymerisation process) for the manufacture of plastic (acrylic resins).

### 4. Physical / Chemical properties

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Organic peroxides are thermally unstable substances or mixtures, which can undergo exothermic self-accelerating decomposition.

Property	Value
Physical state	Liquid at 20°C and 1013 hPa
Colour	Colourless
Odour	Aromatic
Molecular weight	104.15 g/mol
Density	0.9 at 20°C
Vapour pressure	4.32 kPa at 25°C
Freezing range	[-20°C; -4.6°C]

Boiling point	Not relevant, the substance decomposes before boiling
Flash point	36.5°C at 1013 hPa
Self-Accelerating Decomposition Temperature (SADT)	>58°C
Explosive / oxidizing properties	Not applicable – The substance is an organic peroxide type E
Water solubility	63.25 g/L at 20°C
Octanol-water partition coefficient (LogKow)	2.9 at 20°C

## 5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Harmful following oral exposure. Toxic following dermal contact and inhalation exposure.
Irritation / corrosion Skin / eye	Corrosive to skin and eyes
Sensitisation	Based on data available on similar substances, may cause skin allergic reaction
Toxicity after repeated exposure	Repeated exposures by inhalation did not induce significant toxicity
Genotoxicity / Mutagenicity	Based on the available data, it is not possible to conclude on genotoxic potential
Carcinogenicity	No data available
Reproductive / Developmental Toxicity	No effects were observed on fertility and foetal development in treated laboratory rats.

## 6. Environmental Effects

Tert-amyl hydroperoxide was demonstrated to be toxic towards daphnia and algae but because its log Kow is low, the substance is not bioaccumulable and thus is neither PBT nor vP/vB.

Effect Assessment	Result
Aquatic Toxicity	Toxic to daphnia and algae

Fate and behaviour	Result
Biodegradation	Not readily biodegradable
Bioaccumulation potential	No potential to bioaccumulate
PBT / vPvB conclusion	Not considered as PBT nor vPvB

## 7. Exposure

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### 7.1 Human health

The manufacture of organic peroxide is a closed process that occurs behind anti-deflagration walls, which minimizes worker exposure during the production process. However, workers can be exposed during loading/unloading operations, mixing, sampling or maintenance operations. The primary routes of industrial/professional exposure of the substance are skin contact and inhalation. Based on the risk assessment, risk is controlled when activities are carried out under conditions recommended in the extended safety data sheet (chapter 8 and exposure scenarios)

In addition, the general population is not expected to be exposed to this organic peroxide by inhalation, dermal or oral exposure, as the product does not remain in the plastic products.

### 7.2 Environment

Releases of organic peroxides into the environment are to be expected during production, processing (formulation) and industrial uses mainly via wastewater and lesser amounts via emissions of vapour (due to its physical state and its vapour pressure).

Potential release during production is treated by on-site and off-site risk management measures.

The substance is used for production of polymers, which can either be dry or wet processes. In case of wet processes, releases to water have to be directed to a wastewater treatment plant.

The substance is used in small quantities in polymer production, and is almost totally consumed during the process. Therefore the release to environment is very low and, in spite of the environmental hazard profile of the substance, the use is considered safe for the environment (this was confirmed by a quantitative risk assessment performed in the framework of REACH regulation)

## 8. Risk Management recommendations

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Human health measures	
Eye/Face protection	Safety glasses/goggles Face-mask during the discharge
Skin protection	Protective suit
Hand protection	Gloves: PVC, neoprene (suitable gloves tested according to EN374)
Respiratory protection	Suitable respiratory equipment in case of insufficient ventilation
Organizational measures	Ensure workers are duly trained to minimize exposure
Engineering control	Provide sufficient air exchange and/or exhaust ventilation in work area

Environmental measures
Can be discharged in waste water, when in compliance with local regulations. Do not spread sludge on natural soils. 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%.

## Storage and handling

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. Never weigh out in the storage room. Handle and open container carefully (risk of overpressurization in containers). Eliminate all sources of ignition, and do not generate flames or sparks. Take precautionary measures against static discharges. Apply earthing when transferring from one container to another. Confinement must be avoided. Use explosion protected equipment.

Use non-sparking tools in areas where explosive vapor/air mixtures may occur. Keep product and emptied container away from heat and sources of ignition. Do not cut or weld on or near this container even when empty. Keep away from incompatible materials such as: strong oxidizing agents, powerful reducers, acids, bases, amines, transition metal salts, sulphur compounds, rust, ash, dusts (risk of self-accelerating exothermic decomposition)

Never return any product to the container from which it was originally removed (risk of decomposition).

Avoid temperatures above 30 °C. Storage buildings must be built and equipped so as not to exceed the maximum proscribed temperature limit.

## 9. Regulatory Information / Classification and Labelling

### 9.1 Regulatory Information

This substance has been registered under:

- EU Regulation EC 1907/2006 (REACH)

As organic peroxides are sensitive substances (as they are liable to exothermic decomposition), the carriage of tert-amyl hydroperoxide is strongly regulated, under the rules and conditions of class 5.2 of UN Recommendations on the Transport of Dangerous Goods regulation.






%	Form	UN Number	Classification	OP Category
<88%	liquid	UN 3107	OP Type E, Liquid, No temperature control	Type E: the mixture, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement

### 9.2 Classification and labelling

Under GHS substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and safety data sheets. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

#### **Classification and labelling according to Regulation (EC) n° 1272/2008:**

Classification
– Flammable Liquid; Category 3
– Organic peroxide; type E
– Acute Toxicity - oral; Category 4
– Acute Toxicity - dermal; Category 3
– Acute Toxicity - inhalation; Category 3

<ul style="list-style-type: none"> <li>– Skin Corrosive; Category 1B</li> <li>– Eye Damage; Category 1</li> <li>– Skin sensitisation; Category 1</li> <li>– Chronic aquatic toxicity; Category 2</li> </ul>	
<b>Labelling</b>	
<b>Hazard pictogram(s)</b>	
– GHS02: Flame	
– GHS05: Corrosion	
– GHS06: Skull and crossbones	
– GHS08: Health hazard	
– GHS09: Environment	
<b>Signal word</b>	
– Danger	
<b>Hazard statement(s)</b>	
<ul style="list-style-type: none"> <li>– H226: Flammable liquid and vapours.</li> <li>– H242: Heating may cause a fire.</li> <li>– H302: Harmful if swallowed.</li> <li>– H311: Toxic in contact with skin.</li> <li>– H331: Toxic if inhaled.</li> <li>– H314: Causes severe skin burns and eye damage.</li> <li>– H317: May cause an allergic skin reaction.</li> <li>– H411: Toxic to aquatic life with long lasting effects.</li> </ul>	
<b>Additional classification</b>	
<p>In case the product contains more than 1% of di-tert-amyl peroxide (CAS: 10508-09-5) as an impurity, the additional classification applies:</p> <ul style="list-style-type: none"> <li>– Germ cell mutagenicity; Category 2; Suspected of causing genetic defects.</li> </ul>	

**Classification and labelling according to GHS:**

<b>Classification</b>
<ul style="list-style-type: none"> <li>– Flammable Liquid; Category 3</li> <li>– Organic peroxide; type E</li> <li>– Acute Toxicity - oral; Category 4</li> <li>– Acute Toxicity - dermal; Category 3</li> <li>– Acute Toxicity - inhalation; Category 3</li> </ul>

- Skin Corrosive; Category 1B
- Eye Damage; Category 1
- Skin sensitisation; Category 1
- Chronic aquatic toxicity; Category 2
- Acute aquatic toxicity; Category 2

### Labelling

#### Hazard pictogram(s)

– GHS02: Flame



– GHS05: Corrosion



– GHS06: Skull and crossbones



– GHS08: Health hazard



– GHS09: Environment



#### Signal word

– Danger

#### Hazard statement(s)

- H226: Flammable liquid and vapours.
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- Germ cell mutagenicity; Category 2; Suspected of causing genetic defects.

## 10. Contact Information within Company

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For further information on this substance or product safety summary in general, please contact:

- [arkema.peroxides-reach-uses@arkema.com](mailto:arkema.peroxides-reach-uses@arkema.com)
- ICCA portal where the GPS Safety Summary is posted:  
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

## 11. Date of Issues / Revision

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- Date of issue: 2014/10/31
- Date of revision:

## 12. Disclaimer

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The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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