

GPS Safety Summary

Substance Name:

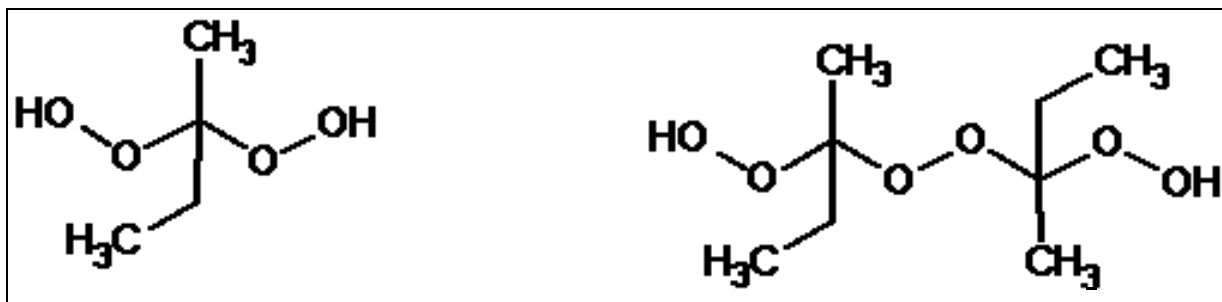
Methyl Ethyl Ketone Peroxide

1. General Statement

Methyl ethyl ketone peroxide is an organic peroxide commercially available as a 40% to 60% solution.

2. Chemical Identity

Name:	2-Butanone, peroxide
Brand names of mixtures:	Luperox® K1S, Luperox® K10, Luperox® K18, Luperox® K1G, Luperox® K12G
Chemical name (IUPAC):	Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane
CAS number(s):	1338-23-4
List number:	700-954-4
Molecular formula (optional):	Mixture of C ₄ H ₁₀ O ₄ and C ₈ H ₁₈ O ₆
Structure (optional):	



3. Use and applications

Methyl ethyl ketone peroxide is an unstable organic peroxide used in the manufacture of unsaturated polyester resins.

4. Physical / Chemical properties

Methyl ethyl ketone peroxide (MEKP) is a mixture of isomers (monomer and dimer) and is marketed exclusively with various stabilizing agents that cannot be totally separated due to the explosive properties of the substance.

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	Ketone-like
Molecular weight	122 to 210 g/mol
Density	1.02 at 20°C
Vapour pressure	1.84 x 10 ⁻³ to 0.736 hPa at 25°C (estimation for the pure isomers without their solvent)
Freezing point	-10°C to -5.5°C at 1013 hPa (estimation for the pure isomers without their solvent)
Flash point – flammability	42 to 82°C (depending on the grade)
Self-Accelerating Decomposition Temperature (SADT)	>50°C
Self-ignition temperature	The substance decomposes under test conditions
Explosive / oxidizing properties	Not applicable. The substance is an organic peroxide of type D.
Water solubility	6.53 g/L at 20°C
Octanol-water partition coefficient (Log K _{ow})	0.3 – 2.04 at 20°C

5. Health Effects

Exposure to MEKP should be avoided regarding the corrosive properties of the substance.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	MEKP, in solution with stabilizing agents, is harmful if swallowed, practically not harmful following acute dermal and inhalation exposures Inhalation of high concentrations of MEKP may induce lung damages
Irritation / corrosion Skin / eye/ respiratory tract	Corrosive to the skin and eyes and irritating for the respiratory tract
Sensitisation	Does not cause allergic reaction
Toxicity after repeated exposure Oral / inhalation / dermal	Does not cause significant target organ toxicity after oral repeated exposure
Genotoxicity / Mutagenicity	Not considered as genotoxic
Carcinogenicity	No data available.
Reproductive / Developmental Toxicology	Not suspected to cause adverse effects on the reproduction

6. Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic organisms

Fate and behaviour	Result
(Bio)degradation potential	Readily biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered to be PBT* or vPvB**

*: Persistent, Bioaccumulative and Toxic (PBT)

** : very Persistent and very Bioaccumulative (vPvB)

7. Exposure

7.1 Human health

The manufacture of Methyl ethyl ketone 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 to MEKP 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). Given the corrosive properties of the substance, special attention should be paid to avoid skin and eye contact.

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

7.2 Environment

Releases of Methyl ethyl ketone peroxide into the environment are to be expected during production, processing (formulation) and industrial uses mainly via wastewater and via emissions of vapour.

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

The substance is used in low quantity in polymer production, and is almost totally consumed during the process therefore the release to environment is very low during the final use of the substance.

8. Risk Management recommendations

Human health measures	
Eye/Face protection	Safety glasses/goggles and face-mask (during discharge)
Skin protection	Protective suit.
Hand protection	Gloves (PVC, neoprene, nitrile rubber)

Respiratory protection	Suitable respiratory equipment in case of insufficient ventilation. In the case of hazardous fumes, wear self contained breathing apparatus.
Organizational measures	Ensure workers are duly trained to minimize exposure.
Engineering control	Provide sufficient air exchange and/or exhaust ventilation in work rooms.
Environmental measures	
Do not release into the environment. Do not let product enter drains. 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 with care (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. Protect from contamination. 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). Store in accordance with local/national regulations. Store in well insulated area (peroxide area) away from other substances. Use non-combustible construction materials. Provide earthing and safe electrical equipment. Keep tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition, and direct sunlight. 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. Keep container upright to prevent leakage. Provide a catch-tank in a bunded area. Provide impermeable floor.	

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 this substance is strongly regulated, under the rules and conditions of class 5.2 of UN Recommendations on the Transport of Dangerous Goods regulation.


Concentration of diluent type A%	UN Number	Classification	OP Category
≥48%	UN 3101	OP Type B, liquid, no temperature control	Type B: any organic peroxide possessing explosive properties and which, as packaged, neither detonates nor deflagrates rapidly, but is liable to undergo a thermal explosion in that package
≥55%	UN 3105	OP Type D, liquid, no temperature control	Type D : any organic peroxide which in laboratory testing: (i) detonates partially, does not deflagrate rapidly and shows no violent effect when heated under confinement; or (ii) does not detonate at all, deflagrates slowly and shows no violent effect when heated under confinement; or (iii) does not detonate or deflagrate at all and shows a medium effect when heated under confinement
≥60%	UN 3107	OP Type E, liquid, no temperature control	Type E : any organic peroxide which, in laboratory testing, neither detonates nor deflagrates at all and shows low or no effect when heated under confinement shall be defined as organic peroxide

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 the eSDS. 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	
<ul style="list-style-type: none"> – Organic Peroxide; Type D – Acute toxicity (oral); Category 4 – Skin corrosive; Category 1B – Eye damage; Category 1 	
Signal word	
– Danger	
Pictogram	
– GHS02: flame	
– GHS05: corrosion	

— GHS07: exclamation mark	
Labelling hazard statements	
<ul style="list-style-type: none"> — H242 : Heating may cause a fire — H302 : Harmful if swallowed — H314 : Causes severe skin burns and eye damage 	

Classification and labelling according to GHS:

Classification	
<ul style="list-style-type: none"> — Organic Peroxide; Type D — Acute toxicity (oral); Category 4 — Skin corrosive; Category 1B — Eye damage; Category 1 — Acute toxicity (dermal); Category 5 — Aquatic acute toxicity; Category 2 	
Signal word	
— Danger	
Pictogram	
— GHS02: flame	
— GHS05: corrosion	
— GHS07: exclamation mark	
Labelling hazard statements	
<ul style="list-style-type: none"> — H242 : Heating may cause a fire — H302 : Harmful if swallowed — H314 : Causes severe skin burns and eye damage — H313 : May be harmful in contact with skin — H401 : Toxic to aquatic life 	

10. Contact Information within Company

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

- 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/>

GPS Safety Summary

Arkema – Functional Additives – MEKP – Methyl ethyl ketone peroxide – GPS – 2017-09-30 – V0

11. Date of Issues / Revision

- Date of issue: 2014/09/30
- Date of revision:

12. Disclaimer

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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