SAFETY DATA SHEET
accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)

Product: **LUPEROX® K1S E** Page: 1 / 14

SDS No.: 005526-001 (Version 4.0) Date 26.10.2017 (*Cancel and replace* : 11.10.2017)

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

1.1. Identification of the product

Identification of the mixture: LUPEROX® K1S E

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

Use of the Substance/Mixture :

Sector of use :	Product category :
Formulation of organic peroxides **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites	**PC32:** Polymer preparations and compounds
Formulation of organic peroxides **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites	**PC32:** Polymer preparations and compounds
Use of organic peroxide as polymerisation initiator, cross-linking agent **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites	**PC32:** Polymer preparations and compounds
Formulation of the substance **SU 10:** Formulation	
Polymers processing (industrial) **SU3:** Industrial Manufacturing (all)	
Industrial use in chemical synthesis or processes and formulation **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites**, SU4:** Manufacture of food products**, SU 8,9:** Manufacture of bulk, large scale substances (including petroleum products); manufacture of fine chemicals**, SU 10:** Formulation**, SU11:** Manufacture of rubber products**, SU12:** Manufacture of plastics products, including compounding and conversion**, SU14:** Manufacture of basic metals, including alloys**, SU15:** Manufacture of fabricated metal products, except machinery and equipment**, SU16:** Manufacture of computer, electronic and optical products, electrical equipment**, SU17:** General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment	
Loading and unloading oprerations, distribution covering all identified uses **SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites**, SU4:** Manufacture of food products**, SU6a:** Manufacture of wood and wood products**, SU 8,9:** Manufacture of bulk, large scale substances (including petroleum products); manufacture of fine chemicals**, SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)**, SU11:** Manufacture of rubber products**, SU12:** Manufacture of plastics products, including compounding and conversion**, SU14:** Manufacture of basic metals, including alloys**, SU15:** Manufacture of fabricated metal products, except machinery and equipment**, SU16:** Manufacture of computer, electronic and optical products, electrical equipment**, SU17:** General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment**, SU 21:** Consumer uses: Private households (= general public = consumers)**, SU 22:** Professional uses: Public domain (administration, education, entertainment, services, craftsmen)	

1.3. Details of the supplier of the safety data sheet

Supplier	ARKEMA Organic peroxides 420 rue d'Estienne d'Orves 92705 Colombes, FRANCE Telephone: + 33 (0)1 49 00 80 80 Telefax: + 33 (0)1 49 00 83 96 E-mail address: pars-drp-fds@arkema.com http://www.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
UK: National Chemical Emergency Centre Tel: 01865 407 333

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008):
Flammable liquid, 3, H226
Organic peroxides, D, H242
Oral: Acute toxicity, 4, H302
Inhalation: Acute toxicity, 4, H332
Skin corrosion, 1B, H314
Serious eye damage, 1, H318
Specific target organ toxicity - single exposure, 3, Respiratory system, H335

Additional information:
For the full text of the 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:
Reaction mass of butane-2,2-diyl dihydroperoxide and dioxydibutane-2,2-diyl dihydroperoxide
4-hydroxy-4-methylpentan-2-one; diacetone alcohol
hydrogen peroxide solution

Hazard pictograms:

Signal word: **Danger**

Hazard statements:
H226 : Flammable liquid and vapour.
H242 : Heating may cause a fire.
H302 + H332 : Harmful if swallowed or if inhaled
H314 : Causes severe skin burns and eye damage.
H335 : May cause respiratory irritation.

Precautionary statements:
Prevention:
P210 : Keep away from heat. - No smoking.
P234 : Keep only in original container.
P261 : Avoid breathing gas/mist/vapours/spray.
P273 : Avoid release to the environment.
P280 : Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P330 + P331 : IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 : IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 : Call a POISON CENTER or doctor/ physician if you feel unwell.
Storage:
P403 + P235 : Store in a well-ventilated place. Keep cool.

2.3. Other hazards

Potential health effects:
Inhalation: At high vapour/fog concentrations : Possible irritation of respiratory system

Environmental Effects:
Harmful to fish. Harmful to daphnia. Toxic to algae.

Physical and chemical hazards:
Flammable liquid Heating may cause a 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, this mixture contains no substance meeting PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

Chemical nature of the mixture[1]:
Organic peroxide Preparation based on :

Components :

Chemical name[1] & REACH Registration Number[2]	EC-No.	CAS-No.	Concentration	Classification REGULATION (EC) No 1272/2008
Dimethyl phthalate (01-2119437229-36)	205-011-6	131-11-3	37 - 47 %	

Hazardous components (accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)) :

Chemical name[1] & REACH Registration Number[2]	EC-No.	CAS-No.	Concentration	Classification REGULATION (EC) No 1272/2008
Reaction mass of butane-2,2-diyl dihydroperoxide and dioxydibutane-2,2-diyl dihydroperoxide (01-2119514691-43)	700-954-4		27 - 37 %	Org. Perox. D; H242 Acute Tox. 4 (Oral); H302 Acute Tox. 4 (Inhalation); H332 Skin Corr. 1B; H314 Eye Dam. 1; H318
4-Hydroxy-4-methylpentan-2-one (01-2119473975-21) (N° ANNEX: 603-016-00-1)	204-626-7	123-42-2	9 - 14 %	Eye Irrit. 2; H319 STOT SE 3; H335
Tributylamine	203-058-7	102-82-9	0,1 - 0,5 %	Acute Tox. 1 (Inhalation); H330 Acute Tox. 2 (Dermal); H310 Acute Tox. 4 (Oral); H302 Skin Irrit. 2; H315

Hazardous impurities :

Chemical name[1]	EC-No.	CAS-No.	Concentration	Classification REGULATION (EC) No 1272/2008
Hydrogen peroxide (N° ANNEX: 008-003-00-9)	231-765-0	7722-84-1	1 - 4 %	Ox. Liq.1; H271 Acute Tox.4 (Oral); H302 Acute Tox.4 (Inhalation); H332 Skin Corr.1A; H314 Eye Dam.1; H318 STOT SE3; H335 Aquatic Chronic3; H412
Butanone (N° ANNEX: 606-002-00-3)	201-159-0	78-93-3	1 - 6 %	Flam. Liq.2; H225 Eye Irrit.2; H319 STOT SE3; H336 EUH066

[1]: See chapter 14 for Proper Shipping Name
[2] :See the text of the regulation for applicable exceptions or provisions : The transition time according to REACH Regulation, Article 23, is still not expired.

4. FIRST AID MEASURES

4.1. Description of necessary first-aid measures:

General advice:
Under the shower: Take off immediately all contaminated clothing. including shoes. 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. Keep under medical surveillance. In case of problems : Hospitalise.

Skin contact:
Wash immediately, abundantly and thoroughly with water. Consult a doctor quickly. In case of extensive burns, hospitalize.

Eye contact:

Wash open eyes immediately, abundantly and thoroughly for at least 15 minutes. Remove contact lenses. Consult an ophthalmologist immediately.

Ingestion:
Do not induce vomiting, rinse mouth and lips with plenty of water if the subject is conscious, then hospitalize.

Protection of first-aiders:
For any intervention, wear appropriate breathing apparatus. Protective suit

4.2. Most important symptoms/effects, acute and delayed: No data available.

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, Foam, powder, Carbon dioxide (CO2)

5.2. Special hazards arising from the substance or mixture:
Flammable liquid, Heating may cause a fire.
The product burns violently (protect people from possible projections).
Through thermal decomposition, formation of very reactive free radicals.
Thermal decomposition giving flammable and toxic products :
Ethane - Methane - Ethylene, Carbon oxides

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, remove exposed containers. Prohibit all sources of sparks and ignition - Do not smoke. Do not allow run-off from fire fighting to enter drains or water courses.

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.

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.
For small leaks : Soak up with inert absorbent material. Do not use vermiculite.
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. Flammable. Corrosive. Harmful. Provide appropriate exhaust ventilation at machinery. Provide showers, eye-baths. Provide water supplies near the point of use. Provide self-contained breathing apparatus nearby. 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.Handling of this product must be in accordance with HSE Guidance Note CS21 The Storage and Handling of Organic Peroxides and with ARKEMA brochure Safe Handling of Organic PeroxidesHandling of this product must be in accordance with HSE Guidance Note CS21 The Storage and Handling of Organic Peroxides and with ARKEMA brochure Safe Handling of Organic Peroxides

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. Keep/Store away from clothing/ combustible materials. 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. Provide earthing and safe electrical equipment. Provide a catch-tank in a bunded area. Provide impermeable floor. Consult ARKEMA before storage design.

Storage of this product must be in accordance with HSE Guidance Note CS21 The Storage and Handling of Organic Peroxides.

Storage of this product must be in accordance with HSE Guidance Note CS21 The Storage and Handling of Organic Peroxides.
Storage period: < 6 Months, Storage temperature: < 30 °C (to maintain the technical properties of the product).
Storage temperature: > -10 °C (to prevent crystallization).

Store between: -10 °C to 30 °C

Incompatible products:
Strong oxidizing agents Powerful reducers Acids Bases Amines transition metal salts Sulphur compounds Rust, ash, dusts (risk of self-accelerating exothermic decomposition)

Packaging material:
Recommended: High density polyethylene (HDPE), Polytetrafluoroethylene (PTFE), Stainless steel
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 use(s): None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters:

Exposure Limit Values

Dimethyl phthalate

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	12 2011	STEL	–	10	–
EH40 WEL	12 2011	TWA	–	5	–
ACGIH (US)	02 2012	TWA	–	5	–

Reaction mass of butane-2,2-diyl dihydroperoxide and dioxydibutane-2,2-diyl dihydroperoxide

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	12 2011	STEL	0,2	1,5	–
ACGIH (US)	02 2012	Ceiling	0,2	–	–

4-Hydroxy-4-methylpentan-2-one

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	12 2011	STEL	75	362	–
EH40 WEL	12 2011	TWA	50	241	–
ACGIH (US)	02 2012	TWA	50	–	–

Butanone

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	12 2011	SKIN	–	–	Can be absorbed through the skin.
EH40 WEL	12 2011	TWA	200	600	–
EH40 WEL	12 2011	STEL	300	899	–
EU ELV	12 2009	TWA	200	600	Indicative value
EU ELV	12 2009	STEL	300	900	Indicative value
ACGIH (US)	02 2012	TWA	200	–	–
ACGIH (US)	02 2012	STEL	300	–	–

Hydrogen peroxide

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	12 2011	STEL	2	2,8	–
EH40 WEL	12 2011	TWA	1	1,4	–
ACGIH (US)	02 2012	TWA	1	–	–

Biological occupational exposure limits

Substance name	CAS-No.	Control parameters	Sampling time	Update

Derived No Effect Level (DNEL): REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :

End Use	Inhalation	Ingestion	Skin contact
Workers	5,288 mg/m3 (LT, SE) 15,864 mg/m3 (ST, SE)		3 mg/kg bw/day (LT, SE)
Consumers	1,125 mg/m3 (LT, SE)	0,75 mg/kg bw/day (LT, SE)	1,5 mg/kg bw/day (LT, SE)

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

Derived No Effect Level (DNEL): 4-HYDROXY-4-METHYLPENTAN-2-ONE :

End Use	Inhalation	Ingestion	Skin contact
Workers	240 mg/m3 (ST, LE) 66,4 mg/m3 (LT, SE, LE)		9,4 mg/kg bw/day (LT, SE)
Consumers	120 mg/m3 (ST, LE) 11,8 mg/m3 (LT, SE, LE)	3,4 mg/kg bw/day (LT, SE)	3,4 mg/kg bw/day (LT, SE)

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

Derived No Effect Level (DNEL): HYDROGEN PEROXIDE :

End Use	Inhalation	Ingestion	Skin contact
Workers	3 mg/m3 (LE, ST) 1,4 mg/m3 (LE, LT)		
Consumers	1,93 mg/m3 (LE, ST) 0,21 mg/m3 (LE, LT)		

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

Predicted No Effect Concentration: REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :

Compartment:	Value:
Fresh water	0,0056 mg/l
Marine water	0,00056 mg/l
Water (Intermittent release)	0,056 mg/l
Effects on waste water treatment plants	1,2 mg/l
Fresh water sediment	0,0876 mg/kg dw
Marine sediment	0,00876 mg/kg dw
Soil	0,0142 mg/kg dw

Predicted No Effect Concentration: 4-HYDROXY-4-METHYLPENTAN-2-ONE :

Compartment:	Value:
Fresh water	2 mg/l
Marine water	0,2 mg/l
Water (Intermittent release)	1 mg/l
Effects on waste water treatment plants	10 mg/l
Fresh water sediment	9,06 mg/kg dw
Marine sediment	0,91 mg/kg dw
Soil	0,63 mg/kg dw

Predicted No Effect Concentration: HYDROGEN PEROXIDE :

Compartment:	Value:
Fresh water	0,013 mg/l
Marine water	0,013 mg/l
Water (Intermittent release)	0,014 mg/l
Effects on waste water treatment plants	4,66 mg/l
Fresh water sediment	0,047 mg/kg dw
Marine sediment	0,047 mg/kg dw
Soil	0,002 mg/kg dw

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: pungent

Olfactory threshold: No data available.

pH:	Through analogy with a comparable product : pH 4,7
Crystallization temperature :	Through analogy with a comparable product :
Crystallization temperature :	< -20 °C
Boiling point/boiling range :	Decomposes on heating.
Flash point:	closed cup: 55 °C (ISO 3679)
Evaporation rate:	No data available.
Flammability (solid, gas):	
Flammability:	Temperatures at or above the SADT can result in the release of hazardous decomposition products which are flammable and may autoignite.
Vapour pressure:	Through analogy with a comparable product : 20 hPa , at 20 °C
Vapour density:	No data available.
Density:	1,128 kg/m3 , at 20 °C
Water solubility:	DIMETHYL PHTHALATE : 4,000 mg/l at 25 °C (measured) REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE : 6.530 mg/l at 20 °C (OECD Test Guideline 105) 4-HYDROXY-4-METHYLPENTAN-2-ONE : completely miscible
Partition coefficient: n-octanol/water:	DIMETHYL PHTHALATE : log Kow : 1,54 , at 25 °C, Slightly bioaccumulable. (OECD Test Guideline 107) REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE : log Kow : < 0,3 (OECD Test Guideline 117) 4-HYDROXY-4-METHYLPENTAN-2-ONE : log Kow : -0,09, Slightly bioaccumulable. (calculated) HYDROGEN PEROXIDE : log Kow : -1,57 , at 20 °C, Slightly bioaccumulable. (calculated)
Auto-ignition temperature:	Not applicable (decomposes on heating)
Decomposition temperature:	No data available.
Self-Accelerating decomposition temperature (SADT) :	62 °C in packaging of 25 kg
Viscosity, dynamic:	16 mPa.s , at 20 °C
Explosive properties:	
Explosivity:	The substance or mixture is an organic peroxide classified as type D.
Oxidizing properties:	Organic peroxide

9.2. Other data:

Active oxygen content:	9,2 %

10. STABILITY AND REACTIVITY

10.1. Reactivity: No data available.

10.2. Chemical stability:
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions:
Organic peroxides. At high temperature : risk of violent reaction (decomposition)

10.4. Conditions to avoid:
Temperatures below -10 °C
(Risk of precipitation)
Temperatures above 30 °C
(to maintain the technical properties of the product). Keep away from heat and sources of ignition (risk of exothermic decomposition).

10.5. Incompatible materials to avoid:
Strong oxidizing agents, Powerful reducers, Acids, Bases, Amines, transition metal salts, Sulphur compounds, 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 :
Ethane - Methane - Ethylene, Carbon oxides

11. TOXICOLOGICAL INFORMATION

All available and relevant data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

11.1. Information on toxicological effects:

Acute toxicity:

Inhalation: **From its composition, it must be considered as: Harmful if inhaled.**
Inhalation of vapours due to thermal decomposition:, Risk of irritation of respiratory system, Toxic effects cannot be excluded

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
May be considered as comparable to a similar product for which experimental results are:

METHYL ISOBUTYL KETONE PEROXIDE :
• In animals : LC50/4 h/Rat: 1,5 mg/l (Method: OECD Test Guideline 403, Aerosol) (In solution in diisobutyl phthalate, 60 %) (Aerosol)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
• In man : At high vapour/mist concentrations
headache, Central nervous system depression, Dizziness, Difficulty in breathing
• In animals : No mortality/4 h/Rat: 7,6 mg/l (Method: OECD Test Guideline 403) (vapour saturated atmosphere)

Ingestion: **From its composition, it must be considered as: Harmful if swallowed.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In man : Liver damage, Difficulty in breathing, Abdominal pain, Causes severe digestive tract burns.
At high concentrations, Lethal cases reported in man
• In animals : LD50/Rat: 1,017 g/kg (Method: OECD Test Guideline 401) (In solution in Dimethyl phthalate, 35 - 39 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
• In animals : LD50/Rat: 3.2 ml/kg (Method: OECD Test Guideline 401)

Dermal: **According to its composition : May be harmful in contact with skin.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In animals : LD50/Rabbit: 4 g/kg (Method: OECD Test Guideline 402) (In solution in Dimethyl phthalate, 35 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
• In animals : No mortality/Rat: 2 ml/kg (Method: OECD Test Guideline 402), No specific toxic effects
LD50/Rabbit: 13,75 g/kg

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

Skin contact: **According to its composition : Causes severe skin burns and eye damage.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In animals : Corrosive to skin (after occlusive contact, Rabbit, Exposure time: 4 h)
(In solution in Dimethyl phthalate, 33 %)

Eye contact: **According to its composition : Causes serious eye damage.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In man : May cause irreversible eye damage.
• In animals : Severe eye irritation (OECD Test Guideline 405, Rabbit)
(In solution in Dimethyl phthalate, 40 - 60 %)

Respiratory or skin sensitisation:

Inhalation: No data available.

Skin contact: **Not a skin sensitizer**
• In animals : No skin allergy was observed (Method: OECD Test Guideline 406 Guinea pig maximization test)
(tested with its impurities, 40 %)

CMR effects :

Mutagenicity: **contains no ingredient considered as genotoxic**

Carcinogenicity: No data available.

Reproductive toxicity:

Fertility: **Based on the available data, the substance is not suspected of having reprotoxic potential.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In animals : Reproductive/Developmental Effects Screening Assay: Absence of toxic effects on fertility, Effects on newborn, Side effects due to maternal toxicity.
NOAEL (Parental toxicity): = 50 mg/kg bw/day
NOAEL (Fertility): = 75 mg/kg bw/day
NOAEL (Developmental Toxicity): = 50 mg/kg bw/day
(Method: OECD Test Guideline 421, Rat, By oral route) (Dissolved in 2,2,4-trimethyl-1,3-pentanediol-diisobutyrate / Diacetone alcohol, 32 %)

DIMETHYL PHTHALATE :
• In animals : Two-generation study: Absence of toxic effects on fertility, At high dose :, Effects on postnatal development
NOAEL (Parental toxicity): > 1 g/kg
NOAEL (Fertility): > 1 g/kg
NOAEL (Developmental Toxicity): 0,3 g/kg
(Method: OECD Test Guideline 416, Rat, By diet) ((Results obtained on a similar product).)

Foetal development: **Based on the available data, the substance is not suspected of having developmental toxicity potential.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In animals : Exposure during pregnancy: No effects on foetal development
NOAEL (Developmental Toxicity): > 200 mg/kg bw/day
NOAEL (Maternal Toxicity): 65 mg/kg bw/day
(Method: OECD Test Guideline 414, Rat, By oral route) (Dissolved in 2,2,4-trimethyl-1,3-pentanediol-diisobutyrate / Diacetone alcohol, 31 %)

DIMETHYL PHTHALATE :
• In animals : Exposure during pregnancy: Absence of toxic effects for foetal development
NOAEL (Developmental Toxicity): 3,57 g/kg
NOAEL (Maternal Toxicity): 0,84 g/kg
(Method: OECD Test Guideline 414, Rat, By diet)

Specific target organ toxicity :
Single exposure :

Inhalation: **According to its composition : May cause respiratory irritation.**

4-HYDROXY-4-METHYLPENTAN-2-ONE :
• In man : Irritating to nose, throat and respiratory system (100 ppm, 0,48 mg/l)

Repeated exposure: **The substance or mixture is not classified as specific target organ toxicant, repeated exposure.**

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
• In animals : By oral route: No specific toxic effects
NOAEL= > 150mg/kg bw/day (Method: OECD Test Guideline 408, Rat, 3 months) (Dissolved in 2,2,4-trimethyl-1,3-pentanediol-diisobutyrate / Diacetone alcohol, 31 %)

DIMETHYL PHTHALATE :
• In animals : By diet: decreased growth rate, Target organs: Target organs at high doses:, Kidney, NOAEL= 1g/kg bw/d (Rat, 24 Months)
By diet: decreased growth rate, NOAEL= 770mg/kg bw/day (Method: OECD Test Guideline 408, Rat, 3 months) ((Results obtained on a similar product).)

Aspiration hazard:
Not applicable

12. ECOLOGICAL INFORMATION

Ecotoxicology Assessment: All available and relevant data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

Acute aquatic toxicity : Toxic to aquatic life.

12.1. Acute toxicity :

Fish: **From its composition, it must be considered as: Harmful to fish.**

DIMETHYL PHTHALATE :
LC50, 96 h (Pimephales promelas (fathead minnow)) : 39 mg/l (Method: US EPA)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
LC50, 96 h (Poecilia reticulata) : 44,2 mg/l (Method: OECD Test Guideline 203, Test substance: In solution in Dimethyl phthalate)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
LC50, 96 h (Oryzias latipes) : > 100 mg/l (Method: OECD Test Guideline 203)

HYDROGEN PEROXIDE :
LC50, 96 h (Pimephales promelas (fathead minnow)) : 16,4 mg/l (Method: US EPA)

Aquatic invertebrates: **From its composition, it must be considered as: Harmful to daphnia.**

DIMETHYL PHTHALATE :
EC50, 48 h (Daphnia magna (Water flea)) : > 52 mg/l (Method: US EPA)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
EC50, 48 h (Daphnia magna (Water flea)) : 39 mg/l (Method: OECD Test Guideline 202, Test substance: In solution in Dimethyl phthalate)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
EC50, 48 h (Daphnia magna (Water flea)) : > 1.000 mg/l (Method: OECD Test Guideline 202)

HYDROGEN PEROXIDE :
LC50, 48 h (Daphnia pulex (Water flea)) : 2,4 mg/l (Method: US EPA)

Aquatic plants: **From its composition, it must be considered as: Toxic to algae.**

DIMETHYL PHTHALATE :
ErC50, 72 h (Desmodesmus subspicatus (green algae)) : 259,76 mg/l (Method: Standard : DIN 38412 - Part 9)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
ErC50, 72 h (Raphidocelis subcapitata) : 5,6 mg/l (Method: OECD Test Guideline 201, Test substance: In solution in Dimethyl phthalate)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
ErC50, 72 h (Pseudokirchneriella subcapitata (microalgae)) : > 1.000 mg/l (Method: OECD Test Guideline 201)

HYDROGEN PEROXIDE :
ErC50, 72 h (Skeletonema costatum (marine diatom)) : 1,38 mg/l Marine environment

Microorganisms:

DIMETHYL PHTHALATE :
EC20, 30 min (Activated sludge) : ca. 400 mg/l (Method: Standard : ISO 8192, Respiration inhibition)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
EC10, 30 min (Activated sludge) : 12 mg/l (Method: OECD Test Guideline 209, Test substance: In solution in Dimethyl phthalate)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
EC50, 3 h (Activated sludge) : > 1.000 mg/l (Method: OECD Test Guideline 209, Respiration inhibition)

HYDROGEN PEROXIDE :
EC50, 0,5 h (Activated sludge) : 466 mg/l (Method: OECD Test Guideline 209, Respiration inhibition)

Aquatic toxicity / Long term toxicity:

Fish:

DIMETHYL PHTHALATE :
NOEC, 102 d (Oncorhynchus mykiss (rainbow trout)) : 11 mg/l (Method: US EPA)

Aquatic invertebrates:

DIMETHYL PHTHALATE :
NOEC r, 21 d (Daphnia magna (Water flea)) : 9,6 mg/l (Method: OECD Test Guideline 211)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
NOEC r, 21 d (Daphnia magna (Water flea)) : 100 mg/l (Method: OECD Test Guideline 211)

HYDROGEN PEROXIDE :
NOEC, 21 d (Daphnia magna (Water flea)) : 0,63 mg/l (Reproduction inhibition)

Aquatic plants:

DIMETHYL PHTHALATE :
ErC10, 72 h (Desmodesmus subspicatus (green algae)) : 193,09 mg/l

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
ErC10, 72 h (Raphidocelis subcapitata) : 2,1 mg/l (Method: OECD Test Guideline 201)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
NOEC r, 72 h (Pseudokirchneriella subcapitata (microalgae)) : 1000 mg/l (Method: OECD Test Guideline 201)

HYDROGEN PEROXIDE :
NOEC r, 72 h (Skeletonema costatum) : 0,63 mg/l Marine environment

Non aquatic toxicity / Acute toxicity :

Toxicity to soil dwelling organisms:

DIMETHYL PHTHALATE :
LC50, 14 d (Eisenia fetida) : 3.160 mg/kg (Soil dw) (Method: artificial soil test, mortality)

12.2. Persistence and degradability :

Biodegradation (In water): **All the products and/or main components quoted in section 3 and/or analogue substances/metabolites are readily biodegradable.**

DIMETHYL PHTHALATE :
Readily biodegradable: 91 % after 11 d (Method: OECD Test Guideline 301 E)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
Readily biodegradable:
87 % after 28 d (Method: OECD Test Guideline 301D)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
Readily biodegradable: 98,51 % after 28 d (Method: OECD Test Guideline 301 A)

HYDROGEN PEROXIDE :
Readily biodegradable: 99 % after 30 min

12.3. Bioaccumulative potential :

Bioaccumulation: **None of the product and /or main component quoted in section 3 and/or analogue substance/metabolite is expected to bioaccumulate.**

DIMETHYL PHTHALATE :
Partition coefficient: n-octanol/water: log Kow : 1,54 , at 25 °C, Slightly bioaccumulable. (Method: OECD Test Guideline 107)

REACTION MASS OF BUTANE-2,2-DIYL DIHYDROPEROXIDE AND DIOXYDIBUTANE-2,2-DIYL DIHYDROPEROXIDE :
Partition coefficient: n-octanol/water: log Kow : < 0,3 (Method: OECD Test Guideline 117)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
Partition coefficient: n-octanol/water: log Kow : -0,09, Slightly bioaccumulable. (Method: calculated)

HYDROGEN PEROXIDE :
Partition coefficient: n-octanol/water: log Kow : -1,57 , at 20 °C, Slightly bioaccumulable. (Method: calculated)

DIMETHYL PHTHALATE :
Bioconcentration factor (BCF): 57 (21 d, Method: OECD Test Guideline 305, Lepomis macrochirus (Bluegill sunfish)

12.4. Mobility in soil - Distribution among environmental compartments:

Vapor pressure: Through analogy with a comparable product :,
20 hPa, 20 °C

Absorption / desorption:
DIMETHYL PHTHALATE :
log Koc: 1,5 (Method: calculated)
4-HYDROXY-4-METHYLPENTAN-2-ONE :

12.5. Results of PBT and vPvB assessment :
According to REACH regulation, annex XIII, this mixture contains no substance meeting 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. Destroy packaging by incineration at an approved waste disposal site (in accordance with local and national regulations).

14. TRANSPORT INFORMATION

Regulation	14.1. UN number	14.2.UN proper shipping name	14.3.Class*	Label	14.4. PG*	14.5. Environmental hazards	14.6. Special precautions for user
ADR	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2(8)		no	
ADN							**Not permitted for transport**
RID	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2(8)		no	
IATA Cargo							**Not permitted for transport**
IATA Passenger							**Not permitted for transport**
IMDG	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2(8)		no	EmS Number: F-J, S-R

*Description: 14.3. Transport hazard class(es)
14.4. Packing group

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

15. REGULATORY INFORMATION

Safety data sheets: accordance with Annex II of Regulation (EC) No 1907/2006 and its amendment(s)

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

Additional regulations (European Union) :
The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 1996, Statutory Instruments number 192 of 1996. — Applies

Hazardous Waste Regulations 2005 — Applies
The Control of substances Hazardous to Health Regulations 2002 (as ammended) — Banned and/or restricted
UK REGULATION — Chip3: Chemical (Hazard Information and Packaging for Supply) Regulations 2002
Material storage : — Hazard group: 1
Organic peroxide

Major Accident Hazard Legislation — Self-reactive substances and mixtures, Type C, D, E or F or organic peroxides, Type C, D, E, or F P6B

Major Accident Hazard Legislation — Flammable liquids Category 2 or 3 where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards; P5b

15.2. Chemical safety assessment:
Chemical Safety Assessments have been carried out for these substances. (Reaction mass of butane-2,2-diyl dihydroperoxide and dioxydibutane-2,2-diyl dihydroperoxide) (4-Hydroxy-4-methylpentan-2-one) (Hydrogen peroxide)

INVENTORIES:

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

16. OTHER INFORMATION

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

EUH066	Repeated exposure may cause skin dryness or cracking.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H242	Heating may cause a fire.
H271	May cause fire or explosion; strong oxidizer.
H302	Harmful if swallowed.
H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H412	Harmful 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	Product name	Revisions
2	Classification and labelling	Revisions
3	Hazardous components	Revisions
5	Suitable extinguishing media	Additions
8	Exposure Limit Values, Derived No Effect Level (DNEL)	Additions, Revisions
11	11. TOXICOLOGICAL INFORMATION	Revisions
12	12. ECOLOGICAL INFORMATION	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).