

MATERIALS SAFETY DATA SHEET



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

UNDERTAKING Identification of the mixture: Bullet Roof GRP Hardener

Use of the Substance/Mixture : UP hardener (unsaturated polyesters)

Company/Undertaking Identification:

Supplier
Bullet Building Products Ltd
Barbot Hall Industrial Estate
Mangham Road,
Rotherham, S61 4RJ

E-mail address
sales@bulletbp.co.uk

Tel: 01274 752643

2. HAZARDS IDENTIFICATION

Classification (Regulation (EC) No 1272/2008):

The transition time according to the Regulation N°1272/2008 is still not expired.

Classification according to EU Directives 1999/45/EC :

O; R 7
C; R34
R22

Additional information:

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

Label elements (D. 1999/45/EC amended by D. 2006/8/CE):

Hazard pictograms:



O Oxidising



C Corrosive

R-phrase(s):

R 7 May cause fire.
R22 Harmful if swallowed.
R34 Causes burns.

S-phrase(s):

S 3/7 Keep container tightly closed in a cool place.
S14 Keep away from reducing agents (e.g. amines), acids, alkalis and heavy metal compounds
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Hazardous components which must be listed on the label:

methylethylketone peroxide

Other hazards:

Potential health effects:

Inhalation: At high vapour/fog concentrations: headache Central nervous system depression Dizziness Difficulty in breathing

Ingestion: Liver damage Difficulty in breathing Abdominal pain Causes severe digestive tract burns.

Environmental Effects:

Toxic to aquatic flora. Harmful to aquatic fauna. Readily biodegradable. Practically not bioaccumulable

Physical and chemical hazards:

Flammable liquid (when hot) 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, this mixture contains no substance meeting PBT and vPvB criteria.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature of the mixture¹:

Preparation based on : water

Chemical Name ¹ & REACH Registration Number ²	EC-No.	CAS-No.	Concentration	Classification Directive 67/548/EEC	Classification Regulation (EC) No 1272/2008
Dimethyl phthalate (01-2119437229-36)	205-011-6	131-11-3	40 - 45%	–	

Hazardous components (according to Regulation (EC) No. 1907/2006) :

Chemical Name ¹ & REACH Registration Number ²	EC-No.	CAS-No.	Concentration	Classification Directive 67/548/EEC	Classification Regulation (EC) No 1272/2008
methylethylketone peroxide	215-661-2	1338-23-4	25 - 45%	O; R 7 Xn; R22 C; R34	Org. Perox. D; H242 Acute Tox. 4 (Oral); H302 Skin Corr. 1B; H314 Eye Dam. 1; H318
4-Hydroxy-4-methylpentan-2-one (01-2119473975-21)	204-626-7	123-42-2	5 - 10%	Xi; R36/37	Flam. Liq. 3; H226 Eye Irrit. 2; H319 STOT SE 3 (Inhalation); H335
Hydrogen peroxide (01-2119485845-22)	231-765-0	7722-84-1	1 - 5%	C; R35 Xn; R20/22 O; R 8 R 5	Ox. Liq. 1; H271 Acute Tox. 4 (Oral); H302 Acute Tox. 4 (Inhalation); H332 Skin Corr. 1A; H314 Eye Dam. 1; H318 STOT SE 3 (Inhalation); H335

Hazardous impurities :

Chemical Name ¹	EC-No.	CAS-No.	Concentration	Classification Directive 67/548/EEC	Classification Regulation (EC) No 1272/2008
Butanone	201-159-0	78-93-3	1 - 5%	F; R11 Xi; R36 R66 R67	Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336 EUH066
Tributylamine	203-058-7	102-82-9	0,1 - 1%	T; R23/24 R22 Xi; R38	Acute Tox. 1 (Inhalation); H330 Acute Tox. 2 (Dermal); H310 Acute Tox. 4 (Oral); H302 Skin Irrit. 2; H315

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.

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

4. FIRST AID MEASURES

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

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. 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

5. FIREFIGHTING MEASURES

Extinguishing media:

Suitable extinguishing media: Water spray
After cooling: Dry powder, Carbon dioxide (CO₂)

Special hazards arising from the substance or mixture:

Flammable liquid (when hot), 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:

Methane, Ethane, Ethylene, Carbon oxides

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.

Special protective actions for fire-fighters:

Wear self-contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

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

Environmental precautions:

Do not release into the environment. Do not let product enter drains.

Methods and materials for containment and cleaning up:**Methods for cleaning up:**

Never return spills in original containers for re-use.

Recovery:

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

7. HANDLING AND STORAGE

Precautions for safe handling:**Technical measures/Precautions:**

Storage and handling precautions applicable to products: Organic Peroxides Liquid. Flammable (when hot). 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.

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.

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. Keep tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Do not smoke. Use non-combustible construction 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.

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

Incompatible products:

Strong oxidizing agents, Powerful reducers, Strong acids, strong bases, Amines, Acetone, Sulphur compounds, heavy metal compounds, heavy metals, 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)

Specific use(s) (End Use): None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS:

Exposure Limit Values

Dimethyl phthalate

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	2007	STEL	–	10	–
EH40 WEL	2007	TWA	–	5	–
ACGIH (US)	2007	TWA	–	5	–

methylethylketone peroxide

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	2007	STEL	0,2	1,5	–
ACGIH (US)	2007	Ceiling	0,2	–	–

4-Hydroxy-4-methylpentan-2-one

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	2007	STEL	75	362	–
EH40 WEL	2007	TWA	50	241	–
ACGIH (US)	2007	TWA	50	–	–

Butanone

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	2007	TWA	200	600	–
EH40 WEL	2007	SKIN	–	–	Can be absorbed through the skin.
EH40 WEL	2007	STEL	300	899	–
EU ELV	12 2009	STEL	300	900	Indicative
EU ELV	12 2009	TWA	200	600	Indicative
ACGIH (US)	2007	TWA	200	–	–
ACGIH (US)	2007	STEL	300	–	–

Hydrogen peroxide

Source	Date	Value type	Value (ppm)	Value (mg/m3)	Remarks
EH40 WEL	2007	STEL	2	2,8	–
EH40 WEL	2007	TWA	1	1,4	–
ACGIH (US)	2007	TWA	1	–	–

Derived No Effect Level (DNEL): DIMETHYL PHTHALATE :

End Use	Inhalation	Ingestion	Skin contact
Workers	294 mg/m3 (LT, SE)		100 mg/kg bw/day (LT, SE)
Consumers	87 mg/m3 (LT, SE)	25 mg/kg bw/day (LT, SE)	60 mg/kg bw/day (LT, SE)

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

Derived No Effect Level (DNEL):METHYLETHYLKETONE PEROXIDE :

The transition time according to REACH Regulation, Article 23, is still not expired.

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/m ³ (LE, ST) 1,4 mg/m ³ (LE, LT)		
Consumers	1,93 mg/m ³ (LE, ST) 0,21 mg/m ³ (LE, LT)		

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

Predicted No Effect Concentration (PNEC): DIMETHYL PHTHALATE :

Compartment:	Value:
Fresh water	0,192 mg/l
Marine sediment	0,0192 mg/l
Water (Intermittent release)	0,39 mg/l
Effects on waste water treatment plants	4 mg/l
Fresh water sediment	1403 mg/kg
Soil	3,16 mg/kg

Predicted No Effect Concentration (PNEC): METHYLETHYLKETONE PEROXIDE :

The transition time according to REACH Regulation, Article 23, is still not expired.

Predicted No Effect Concentration (PNEC): 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	82 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 (PNEC): HYDROGEN PEROXIDE :

Compartment:	Value:
Fresh water	0,0126 mg/l
Marine water	0,0126 mg/l
Water (Intermittent release)	0,0138 mg/l
Effects on waste water treatment plants	4,66 mg/l

EXPOSURE CONTROLS:

General protective measures: Ensure sufficient air exchange and/or exhaust in work areas

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: Acid resistant gloves (PVC, neoprene)
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

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: 60 °C (Standard ISO-DIN 3680 (Seta Flash))
Evaporation rate:	No data available.
<u>Flammability (solid, gas):</u>	
Lower flammable limit :	not applicable
Vapour pressure:	Through analogy with a comparable product: 20 hPa , at 20 °C
Vapour density:	No data available.
Density:	1,128 kg/m ³ , at 20 °C
Water solubility :	DIMETHYL PHTHALATE : 4,800 mg/l at 25 °C METHYLETHYLKETONE PEROXIDE : 6,53 g/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 (OECD Test Guideline 107) METHYLETHYLKETONE PEROXIDE : log Kow : < 0,3 (OECD Test Guideline 117) 4-HYDROXY-4-METHYLPENTAN-2-ONE : log Kow : = -0,09 HYDROGEN PEROXIDE : log Kow : -1,57 (calculated)
Autoignition temperature:	No data available.
Decomposition temperature:	No data available.
Self-Accelerating decomposition temperature (SADT):	65 °C in packaging of 25 kg
Viscosity, dynamic:	16 mPa.s , at 20 °C
<u>Explosive properties:</u>	
Explosivity:	The substance or mixture is an organic peroxide classified as type D.
Oxidizing properties:	Organic peroxide
<u>Other data:</u>	
Henry constant :	DIMETHYL PHTHALATE : 23E-03 Pa.m ³ /mol , at 25 °C HYDROGEN PEROXIDE : 750E-06 Pa.m ³ /mol (Concentration: 70%) 9,2 %
Active oxygen content:	

10. STABILITY AND REACTIVITY

Reactivity & Chemical stability:

The product is stable under normal handling and storage conditions.

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).

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), Acetone, Possible formation of :explosive compounds or those sensitive to impact

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

Toxicological information:

Acute toxicity:

Inhalation: According to its composition, can be considered as : Slightly harmful by inhalation

DIMETHYL PHTHALATE :

- In animals : No mortality/6 h/rat: 10,4 mg/l (vapour)

METHYLETHYLKETONE PEROXIDE :

- In animals : LC50/4 h/rat: Active ingredient 17 mg/l (Method: OECD Test Guideline 403) (In solution in Dimethyl phthalate, 40 %) (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)

HYDROGEN PEROXIDE :

- In man: At high vapour/fog concentrations :
Risk of pulmonary oedema, Delayed effects possible
- In animals : At high vapour/fog concentrations :, Maximum concentration technically possible
LC50/4 h/rat: > 0,17 mg/l (Method: OECD Test Guideline 403) (50 %)

TRIBUTYLAMINE :

- In animals : LC50/4 h/rat: 0,5 mg/l (Method: OECD Test Guideline 403)lung effects (vapour)

BUTANONE :

- In man : headache, Nausea, Cardiovascular problems, confusion, Possible loss of consciousness, Convulsions
- In animals : LC50/4 h/rat: 34,5 mg/l (11700 ppm) (vapour)

Ingestion: According to its composition, can be considered as : Harmful by ingestion.

DIMETHYL PHTHALATE :

- In animals : LD50/rat: 8.200 mg/kg (6.9 ml/kg)

METHYLETHYLKETONE PEROXIDE :

- 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 mg/kg (Method: OECD Test Guideline 401) (In solution in Dimethyl phthalate, 40 - 60 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

- In animals : LD50/rat: 3.002 mg/kg (Method: OECD Test Guideline 401)

HYDROGEN PEROXIDE :

- In man : Risk of burns to the mouth, oesophagus and stomach, Through rapid liberation of oxygen :, Risk of stomach dilation and haemorrhage, can cause severe lesions, Risk of mortality
- In animals : (as aqueous solution)
LD50/rat: 801 mg/kg (Method: OECD Test Guideline 401) (70 %)

TRIBUTYLAMINE :

- In animals : LD50/rat: 420 mg/kg

BUTANONE :

- In man : The effects of ingesting a large dose can include :, Metabolic problems, Difficulty in breathing, Loss of consciousness
- In animals : LD50/rat: 2.800 - 5.600 mg/kg

Dermal: According to its composition, can be considered as : Slightly harmful in contact with skin

DIMETHYL PHTHALATE :

- In animals : LD50/rabbit: > 11.900 mg/kg (10 ml/kg)

METHYLETHYLKETONE PEROXIDE :

- In animals : LD50/rabbit: 4.000 mg/kg (Method: OECD Test Guideline 402) (In solution in Dimethyl phthalate, 60 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

- In animals : No mortality/rat: 1.875 mg/kg (Method: OECD Test Guideline 402)
LD50/rabbit: 13.750 mg/kg

HYDROGEN PEROXIDE :

- In animals : (as aqueous solution)
No mortality/rabbit: 6.500 mg/kg (Method: OECD Test Guideline 402) (70 %)

TRIBUTYLAMINE :

- In animals : LD50/rabbit: 190 mg/kg (100 %)
LD50/rat: > 2.000 mg/kg (In solution in water)

BUTANONE :

- In animals : LD50/rabbit: 5 - 13 g/kg

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

Skin contact: According to its composition : Causes burns.

DIMETHYL PHTHALATE :

- In animals : No skin irritation (after occlusive contact, rabbit, Exposure time: 24 h)

METHYLETHYLKETONE PEROXIDE :

- In animals : Corrosive to skin (after occlusive contact, rabbit, Exposure time: 24 h)
(In solution in Dimethyl phthalate, 30 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

- In man : Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.

- In animals : Mild skin irritation (after occlusive contact, rabbit, Exposure time: 24 h)

HYDROGEN PEROXIDE :

- In man : Effects of skin contacts may include: Discolouration, Erythema, Oedema
- In animals : (as aqueous solution) Corrosive to skin (After semi-occlusive contact, rabbit, Exposure time: 3 min)
(50 - 70 %)
Corrosive to skin (rabbit)

Eye contact:**According to its composition : Risk of serious damage to eyes.****DIMETHYL PHTHALATE :**

- In animals : Mild eye irritation (OECD Test Guideline 405, rabbit)

METHYLETHYLKETONE PEROXIDE :

- In man : May cause irreversible eye damage.
- In animals : Severe eye irritation (OECD Test Guideline 405, rabbit)
(In solution in Dimethyl phthalate, 40 - 60 %)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

- In man : Mild eye irritation (Exposure to vapours)
(0,48 mg/l)

- In animals : Eye irritation (OECD Test Guideline 405, rabbit)

HYDROGEN PEROXIDE :

- In man : May cause irreversible eye damage.
- In animals : Severe eye irritation (rabbit)
(In solution in water, 35 %)
Corrosive to eyes (rabbit)

Respiratory or skin sensitization:**Inhalation:**

No data available.

Skin contact:**According to its composition, can be considered as : Not a skin sensitizer****DIMETHYL PHTHALATE :**

- In animals : (Results obtained on a similar product). No skin allergy was observed (Method : Buehler Test, guinea pig)

- In man : Negative epicutaneous tests reported in man

METHYLETHYLKETONE PEROXIDE :

- In man : Some cases of cutaneous sensitization reported

- In animals : Not a skin sensitizer (Method : OECD Test Guideline 406 Guinea pig maximization test, guinea pig)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

- In animals : No skin allergy was observed (Method : OECD Test Guideline 406 Guinea pig maximization test)

HYDROGEN PEROXIDE :

- In animals : Not a skin sensitizer (guinea pig)

BUTANONE :

- In man : Not a skin sensitizer

- In animals : Not a skin sensitizer (Method : OECD Test Guideline 406 Buehler method, guinea pig)

CMR effects :**Mutagenicity:****According to its composition : According to available experimental data: Overall not genotoxic**

In vitro

DIMETHYL PHTHALATE :	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 vitro test for chromosomal abnormalities on CHO cells: Inactive (Method: OECD Test Guideline 473)
METHYLETHYLKETONE PEROXIDE :	Ames test in vitro: Inactive (Method: OECD Test Guideline 471) In vitro test for chromosomal abnormalities on CHO cells: Inactive (Method: OECD Test Guideline 473) In vitro gene mutations test on mammalian cells: Inactive (Method: OECD Test Guideline 473)
4-HYDROXY-4-METHYLPENTAN-2-ONE :	Ames test in vitro: Inactive (Method: OECD Test Guideline 471) Tests for chromosome aberrations in vitro on mammalian cells: Inactive (Method: OECD Test Guideline 473) In vitro gene mutations test on mammalian cells: Inactive (Method: OECD Test Guideline 476)
HYDROGEN PEROXIDE :	Genotoxic
TRIBUTYLAMINE :	Ames test in vitro: Inactive (Method: OECD Test Guideline 471) In vitro gene mutations test on mammalian cells: Inactive (Method: OECD Test Guideline 476)
BUTANONE :	Ames test in vitro: Inactive (Method: OECD Test Guideline 471) Tests for chromosome aberrations in vitro on mammalian cells: Inactive (Method: OECD Test Guideline 473) In vitro gene mutations test on mammalian cells: Inactive (Method: OECD Test Guideline 476)

In vivo

DIMETHYL PHTHALATE :	In vivo micronucleus test: Inactive (Method: OECD Test Guideline 474)
METHYLETHYLKETONE PEROXIDE :	No data available.
4-HYDROXY-4-METHYLPENTAN-2-ONE :	In vivo micronucleus test: Inactive (Method: OECD Test Guideline 474)
HYDROGEN PEROXIDE :	Not genotoxic
TRIBUTYLAMINE :	Micronucleus test in vivo mouse: Inactive (Method: OECD Test Guideline 474)
BUTANONE :	Micronucleus test in vivo mouse: Inactive (Method: OECD Test Guideline 474)

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

DIMETHYL PHTHALATE :	
• In animals :	Absence of carcinogenic effects (mouse, dermal route)
METHYLETHYLKETONE PEROXIDE :	No data available.
4-HYDROXY-4-METHYLPENTAN-2-ONE :	May be considered as comparable to a similar product for which experimental results are:
4-METHYLPENTAN-2-ONE :	The tumour-inducing effects on the liver and lungs observed at high doses in rats and mice are specific to these animal species and are considered as unsuitable for extrapolation to man
• In animals :	At high doses : Liver tumours (mouse) - Kidney tumours (rat) (rat, mouse, 2 years, By inhalation) No Observed Adverse Effect Level (NOAEL) (1,84 mg/l)
HYDROGEN PEROXIDE :	Experimental effects have been observed in animals at much higher doses than those which people come into contact with during normal use conditions. Following repeated force-feeding with the product, stomach tumours have been found in rats due to local irritation of the gastric mucous membrane
TRIBUTYLAMINE :	No data available.
BUTANONE :	No data available.

Reproductive toxicity:

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

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

METHYLETHYLKETONE PEROXIDE :
• In animals :
Reproduction Test: No toxicity to reproduction
NOAEL (Parent): = 75 mg/kg
NOAEL (F1): = 50 mg/kg (Method: OECD Test Guideline 421, rat, By oral route)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
• In animals :
At high dose :, Toxic effects on fertility., Effects on offspring, Side effects due to maternal toxicity.
NOAEL (Parent): 30 - 100 mg/kg
NOAEL (F1): 300 mg/kg (Method: OECD Test Guideline 422, rat, By oral route)
May be considered as comparable to a similar product for which experimental results are:

4-METHYLPENTAN-2-ONE :
• In animals :
Multiple generation reproduction test (Method: OECD Test Guideline 416, rat, By inhalation)

Absence of toxic effects on fertility
At high dose :, Effects on offspring
NOAEL (Parent): 4,1 mg/l
NOAEL (F1): 4,1 mg/l

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

TRIBUTYLAMINE :
No data available.

BUTANONE :
No data available.

Foetal development: **Based on the available information, it is not possible to conclude on the hazard potential of this mixture.**

DIMETHYL PHTHALATE :
• In animals :
Exposure during pregnancy: Absence of toxic effects for foetal development, NOAEL: 3.570 mg/kg
Maternal concentration without effect: 840 mg/kg (Method: OECD Test Guideline 414, rat, By diet)

METHYLETHYLKETONE PEROXIDE :
No data available.

4-HYDROXY-4-METHYLPENTAN-2-ONE :
May be considered as comparable to a similar product for which experimental results are:

4-METHYLPENTAN-2-ONE :
• In animals :
Exposure during pregnancy (Method: OECD Test Guideline 414, rat, mouse, By inhalation)

Toxic effects for foetal development at toxic maternal doses
No teratogenic effects
NOAEL: 4,1 mg/l
Maternal concentration without effect: 4,1 mg/l

HYDROGEN PEROXIDE :
Based on the available data, the substance is not suspected of having developmental toxicity potential.

TRIBUTYLAMINE :
• In animals :
Exposure during pregnancy: Absence of toxic effects for fetal development, NOAEL: 135 mg/kg
Maternal concentration without effect: 45 mg/kg (Method: OECD Test Guideline 414, rat, By oral route)

BUTANONE :
• In animals :
Absence of congenital malformations and embryotoxic effects in rats at non-toxic doses for the mothers (Method: OECD Test Guideline 414, rat, By inhalation)

Specific target organ toxicity :**Single exposure :****Inhalation:**

DIMETHYL PHTHALATE :

No data available.

METHYLETHYLKETONE PEROXIDE :

No data available.

4-HYDROXY-4-METHYLPENTAN-2-ONE :

• In man : Irritating to nose, throat and respiratory system (100 ppm, 0,48 mg/l)

HYDROGEN PEROXIDE :

• In man : At high vapour/fog concentrations :
Irritating to respiratory system.

BUTANONE :

• In man : Olfactory threshold: approx. 5,4 ppm
Irritating to respiratory system. (> 200 ppm)**Repeated exposure:****The substance or mixture is not classified as specific target organ toxicant, repeated exposure.**

DIMETHYL PHTHALATE :

According to limited available data

By diet: Target organs: Target organs at high doses:, Kidney, NOAEL= 1000mg/kg bw/day (rat, 24 Months)

METHYLETHYLKETONE PEROXIDE :

• In animals : No specific toxic effects
NOAEL= 65 mg/kg (Method: OECD Test Guideline 407, rat)

4-HYDROXY-4-METHYLPENTAN-2-ONE :

• In animals : By oral route: No toxic effect directly extrapolated to humans
Target organs: Liver, Kidney, NOAEL= 30 - 100mg/kg bw/day (rat, 6 Weeks)• In animals : By inhalation: No toxic effect directly extrapolated to humans
Target organs: Liver, Kidney, NOAEL= 1,041 mg/l (rat, 6 Weeks)
Through analogy with a comparable product :

HYDROGEN PEROXIDE :

• In animals : By oral route: Irritation of the gastric mucosa, NOAEL= 26 mg/kg/d (rat, 3 months) (drinking water)

inhalation: Irritation of upper respiratory system, Irritating to nose, Local effects due to an irritant effect, LOAEL= 0,0029 mg/l (Method: OECD Test Guideline 407, rat, Repeated)

BUTANONE :

• In animals : By inhalation: Liver disorders, NOAEL= 2500 ppm (Method: OECD Test Guideline 413, rat, 3 Months)

Aspiration hazard:

No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicology Assessment:

According to its composition: Harmful to fish. Harmful to daphnia. Toxic to algae.

Acute toxicity**Fish:****According to its composition : Harmful to fish.**

DIMETHYL PHTHALATE :

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

METHYLETHYLKETONE PEROXIDE :

LC50, 96 h (Poecilia reticulata) : 44,2 mg/l (Method: OECD Test Guideline 203)

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: No information available., pH: 6,6 - 7,2, Test substance: Active ingredient)

TRIBUTYLAMINE :

LC50, 28 d (Danio rerio (zebra fish)) : > 10 mg/l
NOEC, 28 d (Danio rerio (zebra fish)) : = 0,315 mg/l**Aquatic invertebrates:****According to its composition : Harmful to daphnia.**

DIMETHYL PHTHALATE :

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

METHYLETHYLKETONE PEROXIDE :
EC50, 48 h (Daphnia magna (Water flea)) : = 39 mg/l (Method: OECD Test Guideline 202)

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

HYDROGEN PEROXIDE :
EC(L)50, 48 h (Daphnia pulex (Water flea)) : = 2,4 mg/l (Method: No information available., pH: 7, Immobilization, Test substance: Active ingredient)

TRIBUTYLAMINE :
EC50, 48 h (Daphnia) : = 8 mg/l (Method: OECD Test Guideline 202)

Aquatic plants: **According to its composition : Toxic to algae.**

DIMETHYL PHTHALATE :
EC r50, 72 h (Desmodesmus subspicatus (green algae)) : 259,76 mg/l (Method: Standard : DIN 38412 - Part 9)

METHYLETHYLKETONE PEROXIDE :
NOEC, 72 h (Pseudokirchneriella subcapitata) : = 2,1 mg/l (Method: OECD Test Guideline 201)
EC r50, 72 h (Pseudokirchneriella subcapitata) : = 5,6 mg/l (Method: OECD Test Guideline 201)

4-HYDROXY-4-METHYLPENTAN-2-ONE :
EC r50, 72 h (Pseudokirchneriella subcapitata) : > 1.000 mg/l (Method: OECD Test Guideline 201, Growth inhibition)
NOEC, 72 h (Pseudokirchneriella subcapitata) : 1.000 mg/l (Method: OECD Test Guideline 201, Growth inhibition)

HYDROGEN PEROXIDE :
ErC50, 72 h (Skeletonema costatum) : 1,38 mg/l (pH: 8,1 - 9,0, growth rate, Test substance: Active ingredient)
NOEC, 72 h : = 0,63 mg/l

TRIBUTYLAMINE :
EC10, 72 h (Desmodesmus subspicatus (green algae)) : = 1,4 mg/l (Method: Standard : DIN 38412 - Part 9, Biomass)

Microorganisms:

DIMETHYL PHTHALATE :
EC20, 30 min (Activated sludge) : ca. 400 mg/l (Method: OECD Test Guideline 209)

METHYLETHYLKETONE PEROXIDE :
EC10, 30 min (Activated sludge) : = 12 mg/l
EC50, 30 min (Activated sludge) : = 48 mg/l

4-HYDROXY-4-METHYLPENTAN-2-ONE :
Toxicity threshold, 16 h (Pseudomonas putida) : = 825 mg/l Growth inhibition

HYDROGEN PEROXIDE :
EC50, 0,5 h (Activated sludge) : 466 mg/l (Method: OECD Test Guideline 209, pH: 7,8, Respiration inhibition, Respiration inhibition of activated sludge, Test substance: Active ingredient)
EC50, 3 h : > 1.000 mg/l

Aquatic toxicity / Long term toxicity:

Fish:

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

Aquatic invertebrates:

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

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

HYDROGEN PEROXIDE :
NOEC, 21 d (Daphnia magna (Water flea)) : = 0,63 mg/l (pH: 7,5 - 8,0, Test substance: Active ingredient)
Lowest observed effect concentration : = 1,25 mg/l

Non aquatic toxicity / Acute toxicity :

Earth dwelling non-mammal species:

DIMETHYL PHTHALATE :
LC50, 14 d (Eisenia fetida) : 3.160 mg/kg (Method: artificial soil test) Soil dw
NOEC, 56 d (Eisenia fetida) : 47.200 mg/kg

Persistence and degradability :

Biodegradation (In water):	According to its composition : Readily biodegradable
DIMETHYL PHTHALATE :	91 % after 11 d (Method: OECD Test Guideline 301 E)
METHYLETHYLKETONE PEROXIDE :	87 % after 28 d (Method: OECD guideline 301D (Closed bottle test))
4-HYDROXY-4-METHYLPENTAN-2-ONE :	98,51 % after 28 d (Method: OECD Test Guideline 301 A)
HYDROGEN PEROXIDE :	Decomposition : few minutes to 24 h, Depends on the amount of mineral compounds and microorganisms Chemical oxygen demand 99 % after 0,02 d

Bioaccumulative potential :

Bioaccumulation:	According to its composition : Practically not bioaccumulable
DIMETHYL PHTHALATE :	Partition coefficient: n-octanol/water: log Kow : 1,54 (Method: OECD Test Guideline 107)
METHYLETHYLKETONE PEROXIDE :	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
HYDROGEN PEROXIDE :	Partition coefficient: n-octanol/water: log Kow : -1,57 (Method: calculated)
DIMETHYL PHTHALATE :	Bioconcentration factor (BCF): 57 (Method: OECD Test Guideline 305, Lepomis macrochirus (Bluegill sunfish))

Mobility in soil - Distribution among environmental compartments:

Henry constant:	
DIMETHYL PHTHALATE :	23E-03 Pa.m ³ /mol, 25 °C,
HYDROGEN PEROXIDE :	750E-06 Pa.m ³ /mol, (Concentration: 70%),

Absorption / desorption:	
DIMETHYL PHTHALATE :	log Koc: 1,57
4-HYDROXY-4-METHYLPENTAN-2-ONE :	In soils and sediments: Slight adsorption , log Koc: 0,52, Koc: 3,32 (Method: estimation)

Results of PBT and vPvB assessment :

According to REACH regulation, annex XIII, this mixture contains no substance meeting PBT and vPvB criteria.

13. DISPOSAL CONSIDERATIONS

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 Principal Building Products Ltd.
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	UN number	Proper shipping name	Class	Label	PG	Environmentally hazardous	Other information
ADR	3105	ORGANIC PEROXIDE TYPE D, LIQUID(METHYL ETHYL KETONE PEROXIDE)	5.2	5.2		no	
ADN	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2		no	
RID	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2		no	
IATA Cargo	3105	Organic peroxide type D, liquid (Methyl ethyl ketone peroxide)	5.2	5.2 + 74F		no	
IATA Passenger	3105	Organic peroxide type D, liquid (Methyl ethyl ketone peroxide)	5.2	5.2 + 74F		no	
IMDG	3105	ORGANIC PEROXIDE TYPE D, LIQUID (METHYL ETHYL KETONE PEROXIDE)	5.2	5.2		no	EmS Number: F-J, S-R

15. REGULATORY INFORMATION

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

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

Additional regulations (European Union) :

Hazardous Waste Regulations 2005

The Control of substances Hazardous to Health Regulations 2002 (as amended)

Applies

Banned and/or restricted

Listed in:

EU. Regulation 273/2004, Drug Precursors, Category 3: butanone; ethyl methyl ketone Number 2914-12-00

UK REGULATION

Material storage :

Chip3: Chemical (Hazard Information and Packaging for Supply) Regulations 2002

Hazard group: 1

Organic peroxide

Major Accident Hazard Legislation

Oxidising 3

Chemical Safety Assessment:

The transition time according to REACH Regulation, Article 23, is still not expired.

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:	Conforms to

16. OTHER INFORMATION

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

R 5	Heating may cause an explosion.
R 7	May cause fire.
R 8	Contact with combustible material may cause fire.
R11	Highly flammable.
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R23/24	Toxic by inhalation and in contact with skin.
R34	Causes burns.
R35	Causes severe burns.
R36	Irritating to eyes.
R36/37	Irritating to eyes and respiratory system.

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H242	Heating may cause a fire.
H271	May cause fire or explosion; strong oxidiser.
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.

Further information This product must be handled only by personnel well informed of safety conditions.
When used in formulations, contact us for labelling.

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 Principal Building Products Ltd. 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).
