GRP WINTER CATALYST

SECTION 1

Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Chemical Name: Methyl ethyl ketone peroxide 35% w/w - Phthalate Free plasticizers mixture, in Alifatic Solvents 2-Butanone peroxide 35% w/w - Phthalate Free plasticizers mixture.

Commercial name: FIX-R GRP Winter Catalyst

Approved chemical name and/or synonyms: 2-Butanone peroxide, Ethyl methyl ketone peroxide, MEK peroxide, Methyl ethyl ketone hydroperoxide.

Reach Substance IUPAC: Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane.

REACH Registration Number: 01-2119514691-43-0005

C.A.S. Registry Number: 1338-23-4 Formula $C_4H_{10}O_4$ Formula $C_8H_{18}O_6$

EINECS Number: 700-954-4 IUPAC Name Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane

Intended use: For Industrial/Professional Use - Curing of Unsaturated Polyester Resins - Reaction Initiator - UP hardener (unsaturated polyesters), Chemical hardener, polymerization initiator. Uses in Coatings: Industrial/Professional Use. Use according to Reach: Manufacturing MEKP. Formulation MEKP solutions. Industrial Use of MEKP. Professional use of MEKP. Production. Use as an intermediate of systhesis (SCC). Uses have been ifentified according REACH and are included into the Annex of this SDS.

1.2. Relevant identified uses of the substance or mixture and uses advised against: Description / Use

1.3. Details of the supplier of the safety data sheet

FIX-R, Harding Way, St Ives, Cambridgeshire PE27 3YJ

Tel: 01480 466 777 Fax: 01480 290 133 Email: info@fix-r.co.uk www.fix-r.co.uk

1.4. Emergency telephone numbers:

NHS Tel: 111

SECTION 2

Products Hazards Identification

2.1. Classification of the substance or mixture

Classification
Hazard Symbols
Directive 1999/45/CE
Directive 67/548/CE


O - Oxidizing


C - Corrosive


Xn - Harmful

Risk-phrases	:	R7, R22, R34, R52/53. For other information see section 15.
Principal risk	:	It may cause fire. Harmful if swallowed. Causes burns. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Risk of decomposition in contact with incompatible substances, impurities, metals, alkalis, reducing agents. Danger of decomposition if exposed to heat. Flammable liquid (when hot).
Secondary risk	:	Contact with combustible material may cause fire. Thermal decomposition giving flammable and toxic products.

Classification according to Regulation (EC) No. 1272/2008

Organic Peroxide	D	H242
Acute toxicity, Oral	4	H302
Skin Corrosion/Irritation	1B	H314
Eye Damage/Eye Irritation	1	H318
Acquatic Chronic Toxicity	3	H412

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard pictograms (CLP)

Signal word	:	Danger
Signal word/Hazard statement(s) GHS	:	H242: Heating may cause a fire. H302: Harmful if swallowed. H314: Causes severe skin burns and eye damage. H412: Harmful to aquatic life with long-lasting effects.
H- Code Hazard statements		
P- Code Precautionary statements		P202: Do not handle until all safety precautions have been read and understood. P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P220: Keep/Store away from clothing, strong acids, bases, heavy metal salts and other reducing substances/combustible materials. P234: Keep only in original container. P261: Avoid breathing dust, fume, gas, mist, vapours, spray P262: Do not get in eyes, on skin, or on clothing. P264: Wash with water and soap thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection. P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. P333+P313: If skin irritation or a rash occurs: Get medical advice/attention. P360: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. P403+P235: Store in a well ventilated place. Keep cool. Protect from sunlight. P411+P235: Store at temperatures not exceeding 30°C. Store in a well-ventilated place. Keep cool. P420: Do not mix with peroxide-accelerators or reducing agents. P501: Dispose of contents and container according to local regulation. Dispose of contents/ container to an approved waste disposal plant.
Hazardous components	:	Product contains: 2-Butanone, peroxide, hydrogen peroxide solution. Flammable liquid (when hot). Contact with combustible material may cause fire. Thermal decomposition giving flammable and toxic products. The product can decompose can rapidly decompose if heated or mixed with other incompatible chemical compounds. Do not mix directly with amines, oxidizing agents, acids and alkalis especially in concentrated form, liquid oxygen, nitric acid, ozone, mineral acids.
Other Dangers	:	Do not mix with peroxide accelerators. Store in a cool place away from heat or direct sunlight. May ignite combustible materials. Decomposition products: See chapter 10. Major adverse effects: see sections 9 to 12.
Results of PBT and vPvB assessment	:	This substance/mixture does not meet the PBT criteria of REACH, annex XIII. This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3

Composition/Information on Ingredients

This product is to be considered as a preparation in conformance to EC directives.

3.1. Substance/Mixture

Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane.

METHYL ETHYL KETONE PEROXIDE - 2 BUTANONE PEROXIDE — **30 - 40%w/w**

CAS N. 1338-23-4	UN N. 3105	EINECS (CE) 700-954-4			Index No --
Symbol(s): O, Oxidizing; C, Corrosive; Xn, Harmful		Risk-phrase(s): R7, R22, R34.			Directive 67/548/EEC (DSD)
Symbol(s): 		Organic Peroxide	B	H241	Reg. (EC) No. 1272/2008 (CLP) Reach Registration Number 01- 2119514691-43-0005
		Acute Toxicity Oral	4	H302	
		Skin Corrosion	1B	H314	
		Eye Damage/Irritat	1	H318	

2, 2, 4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE — **30 - 50%w/w**

CAS N. 6846-50-0	UN N. --	EINECS (CE) 229-934-9			Index No --
Symbol(s): No dangerous		Risk-phrase(s): No dangerous			Directive 67/548/EEC (DSD)
Symbol(s): No GHS Symbols		Aquatic Chronic Tox	3	H412	Reg. (EC) No. 1272/2008 (CLP) Reach Registration Number 01- 2119451093-47-XXXX

DIACETONEALCOHOL - 4-HYDROXY-4-METHYLPENTAN-2-ONE — **10 - 20%w/w**

CAS N. 123-42-2	UN N. 1148	EINECS (CE) 204-626-7			Index No n.d
Symbol(s): Xi, Irritant		Risk-phrase(s): R36.			Directive 67/548/EEC (DSD)
Symbol(s): 		Flammable Liquid	2	H226	Reg. (EC) No. 1272/2008 (CLP) Reach Registration Number 01- 2119473975-21-XXXX
		Eye Irritation	2	H319	
		STOT SE	3	H335	
		Eye Irritation 02; H319: C ≥ 10%			

2 BUTANONE - ETHYL METHYL KETONE — **01 - 05%w/w**

CAS N. 78-93-3	UN N. 1193	EINECS (CE) 201-159-0			Index No 606-002-00-3
Symbol(s): F, Highly flammable; Xi, Irritant		Risk-phrase(s): R11, R36, R66, R67.			Directive 67/548/EEC (DSD)
Symbol(s): 		Flammable Liquid	2	H225	Reg. (EC) No. 1272/2008 (CLP) Reach Registration Number 01- 2119457290-43-XXXX
		Eye Irritation/Corros	2	H319	
		STOT SE	3	H336	
		EUH066			

HYDROGEN PEROXIDE — **01 - 05%w/w**

CAS N. 7722-84-1	UN N. 2015	EINECS (CE) 231-765-0			Index No 008-003-00-9
Symbol(s): C, Corrosive; O, Oxidizing.		Risk-phrase(s): R5, R8, R20/22, R35.			Directive 67/548/EEC (DSD)
Symbol(s): 		Oxidising Liquid	1	H271	Reg. (EC) No. 1272/2008 (CLP) Reach Registration Number 01- 2119485845-22-XXXX
		Acute Tox. Ingestion	4	H302	
		Skin Corrosion	1A	H314	
		Acute Tox. Inhalat.	4	H332	
		Aquatic Chronic Tox.	3	H412	
		STOT SE C ≥ 35%	3A	H335	

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section. For the full text of the R phrases mentioned in this Section, see Section 16. For the full text of hazard (H) phrases mentioned in this Section, see Section 16. For more detailed information on health effects and symptoms refer to section 11.

SECTION 4

First Aid Measures

In case of incident or if you feel unwell, seek medical advice (Show the label where possible). Take off immediately all contaminated clothing. including shoes. Risk of ignition. In case of splashes, remove contaminated clothing and plunge it into water immediately. 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.

Routes of exposure:

4.1. Description of first aid measures

Most important symptoms and effects	:	Skin contact: Corrosive to skin. Eye contact: Corrosive to eyes. Ingestion: Liver damage Difficulty in breathing Abdominal pain Causes severe digestive tract burns.
Following inhalation	:	Take the injured person away from the contaminated area. If the injured person shows any signs of breathing-insufficiency, give artificial respiration by means of a self-expanding balloon mask (AMBU). Immediately take the injured person to the nearest first-aid post.
Following skin contact	:	Remove the accidentally contaminated clothes immediately, wash any affected skin area with plenty of lukewarm water and soap. Should there be persistent skin reddening or irritation, take the injured person to the nearest first-aid post for burns treatment.
Following eye contact	:	Wash immediately with plenty of running keeping the eyelid always far from the eye. Immediately take the injured person to an oculist. Hold the eyelids apart during the flushing to ensure rinsing the entire surface of the eye and lids with water. Do not treat injured eyes with any ointments or oils.
Following ingestion	:	Do not induce vomiting. Get medical attention immediately by calling a physician or a poison control centre. Rinse mouth with water and immediately take him to the nearest first-aid post. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs, the patient should lie on their left side while vomiting to reduce the risk of aspiration. If swallowed, do not induce vomiting. Give drink plenty of water to the patient. The ingestion of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the digestive tract, with hemorrhage and fluid loss. His inspiration during induced vomiting can result in severe lung damage.
First Aid - Tips	:	

4.2. Principal symptoms and effects, both acute and delayed.

Inhalation	:	Irritating to respiratory system. At high vapour/fog concentrations: headache Central nervous system depression Dizziness Difficulty in breathing.
Ingestion	:	Harmful if swallowed. May cause burns to mouth, throat and stomach. Liver damage Difficulty in breathing Abdominal pain Causes severe digestive tract burns.
Skin contact	:	Corrosive to skin.
Eye Contact	:	Corrosive to eyes.

4.3. Principal symptoms and effects of Overexposure.

Inhalation	:	Irritating to respiratory system. At high vapour/fog concentrations: headache Central nervous system depression Dizziness Difficulty in breathing.
Ingestion	:	Harmful if swallowed. May cause burns to mouth, throat and stomach. Liver damage Difficulty in breathing Abdominal pain Causes severe digestive tract burns.
Skin contact	:	Corrosive to skin.
Eye Contact	:	Corrosive to eyes.

4.4. Indication of the possible necessity to immediately consult a physician and of special treatments

Notes to physician: Treat symptomatically. In the case where large quantities have been ingested or inhaled, contact a poison control centre immediately. Persons with pre-existing skin, eye, or respiratory disease may be at increased risk from the irritant properties of this material. The Inspiration during induced vomiting can cause severe lung damage. People with diseases of the skin, eyes or pre-existing respiratory may run a greater risk in respect of the irritant or allergic properties of this material. Contact a Poison Control Centre for more information on treatment. Attending physician should treat exposed patients symptomatically.

For more detailed information on health effects and symptoms, see Section 11.

SECTION 5

Fire-fighting Measures

5.1. Extinguishing media

Suitable Extinguishing Media: : Water Spray, alcohol resistant foam, powder, CO_2. Fight larger fires with Water Spray or alcohol resistant foam. Always use water as an extinguisher, preferably broken up, keeping windward and at a safe distance. Cool down both the containers which have been involved in the fire and the surrounding area. Do not start cleaning the area or salvaging the goods before the whole area has completely cooled down. In case of product decomposition, this is detectable by the formation of fumes and by containers overheating, cool down with water.

Unsuitable Extinguishing Media : Halones, Water with full jet.

5.2. Special hazards

Special hazards from the 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. Do not breathe fumes/vapors. If not properly cooled the fire can easily resume. Decomposition may occur under effect of heating. The heat of the fire may decompose peroxides near the area. If involved in a fire, it will support combustion. Vapours may form explosive mixtures with air. In case of fire and/or explosion do not breathe fumes. In case of fire of if heated a pressure increase into the container will occur, that situation can cause them to burst. The Main Hazardous decomposition/combustion products: CO_2, Carbon monoxide, Mixture of aliphatic and aromatic hydrocarbon solvents, Methane, Ethane, Ethylene. Exposure to products of combustion or decomposition can cause adverse health effects. Formation of toxic products through combustion..

5.3. Advice for firefighters

Fire-fighters must wear fire resistant protective equipment. Wear approved respirator and protective gloves (see section 8): Wear full protective fire fighting equipment. Protective measures to be adopted: Remove containers from fire area if this is possible without risk, or cool because the substance is exposed to thermal radiation or directly involved can give rise to toxic fumes. The damaged containers should be handled only by trained personnel authorized. Proceed to extinguish fire at a safe distance from the containers, using hoses or systems with automatic fire extinguishing nozzles positioned above the containers. Proceed to collect water off. Use full face mask and air breathing apparatus (EN 317), will complete flame retardant (EN 469), flame retardant gloves (EN 659) Boots for Firefighter (HO A29 - A30).

5.4 Other information

Extinguish a small fire with powder or carbon dioxide then apply water to prevent re-ignition. Cool closed containers with water. Water used to extinguish a fire should not be allowed to enter the drainage system or water courses. After a fire, ventilate thoroughly the area and soak with water, clean the walls and metallic surfaces. Cool closed containers with water, keeping windward and at a safe distance.

Fire and explosion hazard

CAUTION: reignition may occur. Decomposition under effect of heating (See also Section Hazardous decomposition products). If involved in a fire, it will support combustion. Vapours may form explosive mixtures with air. In case of fire and/or explosion do not breathe fumes.

SECTION 6

Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency workers: Remove from the affected area people not involved in the emergency. Alerting inside emergency workers or firefighters. In case of an immediate action is needed to refer to the guidelines/instructions for emergency workers. 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.

For emergency workers: Wear an appropriate Personal Protective Equipment: Breathing apparatus with air reserve or full-face gas mask with filter. Wear suitable protective clothing (Acid Proof). Keep product and emptied container away from heat and sources of ignition. Ensure adequate ventilation. Avoid coming into contact with the substance or handling containers without adequate protection. Use water spray to reduce vapours or to redirect the movement of the cloud. Segregate the area until complete dispersion of the substance. Avoid contact with ignition sources. Avoid direct contact with the product and do not breathe fumes or vapours. Use the personal protective equipment described in paragraph 8.

6.2. Environmental precautions

Do not contaminate water with the material. Do not contaminate surface water. Do not allow to enter sewers/surface or ground water. If the product contaminates rivers and lakes or drains inform respective authorities in accordance with local laws. Do not let product enter drains. In case of large spillage the environmental authority should be informed. Soak up with absorbent material (e. g. Vermiculit) and dispose of in accordance with government regulations. Large quantities should be diluted with suitable desensitation agent to a concentration below 10% before disposal. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). See section 8.

6.3. Methods and material for containment and cleaning up

Stop leakage if possible. Contain and collect spillage with non-combustible absorbent materials, eg sand, earth, vermiculite, diatomaceous earth and dispose of the product in a container for disposal according to local regulations (see section 13). Eliminate all sources of ignition, and do not generate flames or sparks. Collect the spilled material and absorbent non-combustible (perlite, vermiculite, or sand) in opened and cleaned containers polyethylene and/or polyethylene. Keep contents moist. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. The waste should NOT be confined. Flush surroundings with large amounts of water and soap. After collection, aerate and wash the affected area with water, neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide, before granting access. Large amounts must be diluted with appropriate agents before being sent to disposal. Follow the recommendations in paragraph 13.

6.4. Reference to other sections

For emergency contact information, see Section 1. See Section 8 for information on personal protective equipment and section 13 for waste disposal. See Sections 07, 08, 11, 12 and 13.

SECTION 7

Handling and Storage

7.1. Precautions for safe handling

Technical measures/Precautions
Safe handling advice

Apply the legislation regarding the Industrial Hygiene/Safety job. During the operation use the individual protective devices. See section 8. 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. Do not allow operators to use naked flames, to produce sparks or to smoke inside the rooms where the product is handled and stored. Avoid contact with the products. Do not breathe fumes/ vapours. Avoid loss and/or disperses. Keep container tightly sealed. Keep away from dirt, rust, impurities, chemicals in particular concentrated acids, alkalis and accelerators (e.g. heavy metal compounds and amines) reducing substances, metals, flammable materials, nonferrous heavy metal, aluminium, zinc, those can cause the decomposition of the product. See Section 10. The containers used to collect and pour out the product are to be kept scrupulously clean. Avoid peroxide refilling into its original container. Avoid: Direct contact with skin and eyes, inhalation of vapors and fumes. Handle containers carefully. Include the use of local exhaust ventilation systems. Do not reuse empty container before they have been subjected to cleaning. 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 over pressurization 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. Before performing transfer operations ensure that the new tank does not contain residues of incompatible substances. Do not eat, drink or smoke in the workplace areas. See also Section 8 for recommended personal protective equipment. See Paragraph 10.

7.2. Conditions for safe storage, including any incompatibilities

Restricting access to unauthorized persons. Pay attention to the special requirements of local authorities for handling dangerous goods. Keep the product:

✓ In accordance with local/national regulations;
✓ Away from food, drink and animal feeding stuffs;
✓ Away from sources of ignition (steam lines, naked flames, sparks, direct sunlight, etc.);
✓ Away from flammable materials, and incompatible substances,
✓ Only in the original container. Keep container upright to prevent leakage.
✓ In a dry well ventilated place, into closed, labelled original container.

Absolutely Incompatible Materials: Iron, Copper, Brass, Bronze, Aluminium, Zinc, Strong bases, oxidizing agents, powdered metals, strong oxidizing agents, metals, iron, copper, amines, strong acids, reducing agents, heavy metals, organic materials, alcohols, permanganates, such as potassium permanganate, Nickel, Brass, iron and iron salts, strong reducing agents, soluble phosphates and carbonates, hydroxides. Strong oxidizing agents, Powerful reducers, Strong acids, Bases,

Amines, Acetone, Metallic salts, Sulphur compounds, heavy metal compounds (risk of self-accelerating exothermic decomposition). The Suitable materials which can bear the contact with peroxides, and which are consequently suitable for the construction of peroxides containers, dispensers, etc., are glass or ceramic, polyethylene, High density polyethylene (HDPE), Polytetrafluoroethylene (PTFE), Stainless steel, AISI 304 or 316 stainless steel, the latter before use must be suitably pickled and passivated. 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)
In order to keep the product characteristics unaltered for a long time, store in a cool, well ventilated position.
Recommended storage Temperature: < 30°C.

7.3. Specific end use(s)
Apart from the uses described in section 1.2 no other specific uses are covered.

SECTION 8

Exposure Controls/Personal Protection

Additional information about design of technical facilities: No further data; see item 7.

8.1. Limit value for exposure to single components. Ingredients with limit values that require monitoring at the workplace:

Occupational exposure limits			TWA	STEL
2 BUTANONE PEROXIDE	WEL - GB	STEL	--	0.2 ppm - 1.5 mg/m³
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	ACGIH	TLV -TWA	--	--
DIACETONE ALCOHOL	ACGIH	TWA	50 ppm - 241 mg/m³	
2 BUTANONE	ACGIH (US)	TWA - STEL	200 ppm 8h - 600 mg/m³	300 ppm st - 900 mg/m³
HYDROGEN PEROXIDE	ACGIH	OEL - TWA	1.0 ppm - 1.4 mg/m³	2.8 mg/m³, 2 ppm
Biological limit values				
2 BUTANONE PEROXIDE	No biological limit value for exposure			
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	No biological limit value for exposure			
DIACETONE ALCOHOL	No biological limit value for exposure			
2 BUTANONE	IBE () 2 mg/l MEK - urine at end of shift			
HYDROGEN PEROXIDE	No biological limit value for exposure			

TLV- Threshold Limit value; TWA - Time Weighted Average; STEL - Short Term Exposure Limit; ACGH - American Conference of Governmental Industrial Hygienists. OEL(EU): Occupational Exposure Limit (EU). The information in this section contains generic advice and guidance. Refer to the list of Identified Uses in Section 1 for specific information available in the given scenario or exposure scenarios.

Control exposure parameters

2 BUTANONE PEROXIDE - Reaction Mass - Derived no Effect Level (DNEL)

	Inhalation - Via - Route	**Oral - Via - Route**	**Dermal - Via - Route**
Workers	1.90 mg/m³ (LT, SE)	Qualitative Evaluation	1.08 mg/Kg bw/day (LT, SE)
Consumers	0.41 mg/m³ (LT, SE)	0.27 mg/Kg bw/day (LT, SE)	0.54 mg/Kg bw/day (LT, SE)

2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE – Substance - Derived no Effect Level (DNEL)

	Inhalation - Via - Route	**Oral - Via - Route**	**Dermal - Via - Route**
Workers	110 mg/m³ (LT, SE)	--	31.2 mg/Kg bw/day (LT, SE)
Consumers	32.6 mg/m³ (LT, SE)	18.8 mg/Kg bw/day (LT, SE)	18.8 mg/Kg bw/day (LT, SE)

DIACETONE ALCOHOL - Derived no Effect Level (DNEL)

	Inhalation - Via - Route	**Oral - Via - Route**	**Dermal - Via - Route**
Workers	240 mg/m³ (ST, LE)	Qualitative Evaluation	9.4 mg/Kg bw/day (LT, SE)
	66.4 mg/m³ (LT, SE, LE)		
	120 mg/m³ (ST, LE)		
Consumers	11.8 mg/m³ (LT, SE, LE)	3.4 mg/Kg bw/day (LT, SE)	3.4 mg/Kg bw/day (LT, SE)

2 BUTANONE - Derived no Effect Level (DNEL)

	Inhalation - Via - Route	Oral - Via - Route	Dermal - Via - Route
Workers	600 mg/m³ (LT, SE)	--	1161 mg/Kg bw/day (LT, SE)
Consumers	106 mg/m³ (LT, SE)	31 mg/Kg bw/day (LT, SE)	412 mg/Kg bw/day (LT, SE)

HYDROGEN PEROXIDE - Derived no Effect Level (DNEL)

	Inhalation - Via - Route	Oral - Via - Route	Dermal - Via - Route
Workers	3 mg/m³ (LE, ST)	Unlikely	Qualitative Evaluation
	1.4 mg/m³ (LE, ST)		
	1.93 mg/m³ (LE, ST)	Qualitative Evaluation	Qualitative Evaluation
Consumers	0.21 mg/m³ (LE, LT)		

LE: Local Effects. **SE:** Systemic Effects. **LT:** Long Term. **ST:** Short term.

* DNEL has been calculated on the basis of toxicological information provided. Conservatives assessment factors were used. Qualitative assessment carried out on the basis ** OC and RMM. *** Qualitative assessment performed is based on OC and RMM (for the risk to the eyes). **** The substance does not meet the criteria to be classified for dermal systemic effects. G.p.: General population.

PNECs - Predicted No Effect Concentration

	2 BUTANONE PEROXIDE
PNEC fresh water (mg/l)	5.6 E-03 mg/l
PNEC sediment fresh water (mg/Kg)	6.18 E-03 mg/Kg wwt (MEKP Monomer) 1.90 E-02 mg/Kg wwt (MEKP Dimer)
PNEC marine water (mg/l)	5.6 E-04 mg/l
PNEC sediment marine (mg/Kg)	6.18 E-04 mg/Kg wwt (MEKP Monomer) 1.90 E-03 mg/Kg wwt (MEKP Dimer)
Intermittent releases to water	05.6 E-02 mg/l
PNEC Sewage Treatment Plant (mg/l):	PNEC STP = 1.2 mg/l
PNEC soil (mg/Kg):	2.95 E-02 mg/Kg wwt (MEKP Monomer) 1.26 E-02 mg/Kg wwt (MEKP Dimer)

PNECs - Predicted No Effect Concentration

	2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	DIACETONE ALCOHOL
PNEC fresh water (mg/l)	0.014 mg/l	2 mg/l
PNEC sediment fresh water (mg/Kg)	1.15 mg/Kg wwt	9.06 mg/Kg dw
PNEC marine water (mg/l)	0.014 mg/l	0.2 mg/l
PNEC sediment marine (mg/Kg)	1.15 mg/Kg wwt	0.91 mg/Kg dw
Intermittent releases to water	0.014 mg/l	1 mg/l
PNEC Sewage Treatment Plant (mg/l):	3 mg/l mg/Kg	82 mg/l
PNEC soil (mg/Kg):	0.926	0.63 mg/Kg dw

PNECs - Predicted No Effect Concentration

	2 BUTANONE	HYDROGEN PEROXIDE
PNEC fresh water (mg/l)	55.8 mg/l	0.0126 mg/l
PNEC sediment fresh water (mg/Kg)	284.7 mg/Kg (dry wt)	0.47 mg/Kg
PNEC marine water (mg/l)	55.8 mg/l	0.0126 mg/l
PNEC sediment marine (mg/Kg)	284.7 mg/Kg (dry wt)	0.47 mg/Kg
Intermittent releases to water	55.8 mg/l	0.0138 mg/l
PNEC Sewage Treatment Plant (mg/l):	709 mg/l	4.66 mg/l
PNEC soil (mg/Kg):	22.5 mg/Kg	0.0023 mg/Kg dw

8.2. Professional Exposure controls

Technical Measures	:	Use in closed processes (for example transfer in closed circuit). Ensure sufficient air exchange and/or exhaust in work areas. The working area shall be provided with suitable ventilation system in order to keep the product concentration rate in the air at a low level. It must be ensured a good local ventilation and a good system of air supply. If these measures are not sufficient to maintain concentrations of vapours below the exposure limit, it is necessary to make use of appropriate respiratory protection of the respiratory tract. Emergency-shower and facilities for rinsing eyes must be accessible. Launder clothes before reuse.

Personal Protective equipment

Respiratory protection (EN 141, EN 143, 14387)	:	In case of insufficient ventilation, wear suitable respiratory equipment: filters for gases / vapors EN 143. Avoid inhalation of vapours. Use only in well-ventilated areas. Use suitable respiratory protective device in case of insufficient ventilation. Use self breathing system or masks with organic vapour filter, type “A” during the emergency. Check Exposure scenarios if they are available. Use suitable respiratory device when it exceed exposure limit and when insufficiently ventilated equipment (respirator with Filter A): European Cartridges Draeger multipurpose type (A2B2E2K1P2) Combination 3M Cartridge / Filter: 60922, 60923 or 60926, 3M multipurpose type (ABEK2P3), 3M Acid Gas (AG) 6002, Organic Vapor / Acid gas (OV / AG) 6003, Multigas (MG / V) 6006. Filter ABEK recommended.
Hand protection (EN 374)	:	Gloves with adequate chemical resistance tested to EN374 and with specific activity training. Skin Protection Effectiveness: 95%. Material: butyl rubber , neoprene, Nitrile Rubber, glove thickness : 0.5 mm Breakthrough time: > = 8 h (90% protection). Avoid direct skin contact with the product. Identify potential areas for indirect skin contact. Wear suitable gloves (EN374) if hand contact with substance is likely. Remove impurities/spills as soon as they arise. Rinse off any skin contamination immediately. Carry out a basic training of staff so that exposure is minimized and you can report any skin problems. Check status before using. Avoid contact with eyes and skin and wear suitable protective gloves when handling and check their condition before use. Gloves should be replaced immediately if there is a noticeable degradation phenomena. Remarks: After contact clean skin carefully.
Eye/Face protection (EN 166)	:	Avoid contact with the eyes and skin. Wear eye/face protection during manipulation. Install emergency eye sources close to the Area of Use.
Skin/Body protection (EN 14605)	:	Protective clothing, safety apron. Suitable protective footwear. Remove contaminated clothing and wash before re-use.
Hygienic measures	:	Remove and wash contaminated clothing before reuse. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.
Environmental exposure controls	:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, you will need to run the fume scrubbers, filters or engineering modifications to the process equipment to reduce emissions to acceptable levels. Use preferably pumping techniques to deposit or download. Avoid subsoil penetration. Do not contaminate surface water. If the product contaminates rivers and lakes or drains inform respective authorities in accordance with local laws. Do not let product enter drains.

SECTION 9

Physical and Chemical Properties

9.1. General information

CHARACTERISTIC	UNIT OF MEASURE	DECLARED VALUE
Appearance - at 20°C e 1013 hPa	-	Liquid, clear
Colour	-	Colourless
Odour	-	Distinctive - Keton Like
Substance	-	Organic

CHARACTERISTIC	UNIT OF MEASURE	DECLARED VALUE
pH (in aqueous solution) - EPA OPPTS 830.7000	-	Slightly Acid - < 5
Melting point/freezing point - EPIWIN (v. 4.00)	°C	- 10°C - +5.5°C at 1013 hPa
Melting point/freezing point - Promox	°C	- 25°C at 1013 hPa
Boiling point/range	°C	Not determined - Decomposes at 60°C
Relative density UNI EN ISO 12185:1999 a 20°C	d 20/20	1.011 - 1.015 (SSC 2010 Promox P200TX)
Vapour Pressure - EPIWIN (v. 4.00)	METHYL ETHYL KETONE PEROXIDE 4-HYDROXY-4-METHYLPENTANE-2-ONE 1-ISOPROPYL-2,2-DIMETHYLTRI-METHYLENE DIISOBUTYRATE	73.6 Pa at 25°C 0.97 mmHg, at 20°C < 1.5 pa (25°C)
Partition coefficient OECD 117 LogKow/LogPow	METHYL ETHYL KETONE PEROXIDE 1-ISOPROPYL-2,2-DIMETHYL TRI-METHYLENE DIISOBUTYRATE 4-HYDROXY -4-METHYLPEN-TANE-2-ONE HYDROGEN PEROXIDE	log Kow : < 0.3 (OCDE 117) log Kow : 4.49 (calculated) log Kow : - 0.09 log Kow : -1.57 at 20°C
Solubility in water - EU method A.6 - OECD 105	METHYL ETHYL KETONE PEROXIDE 1-ISOPROPYL-2,2-DIMETHYL TRI-METHYLENE DIISOBUTYRATE 4-HYDROXY -4-METHYLPEN-TANE-2-ONE	6.530 mg/l at 20°C 0.0009 - 0.0130 g/l Completely miscible
Solubility in Organic Solvents - CIPAC MT 181	g/l HEXANE METHANOL	Soluble in most organic solvents < 10 g/l > 500 g/l
Surface tension EU Method A.5.	mN/m	Not determined
Flash Point - Penski-Martens closed cup EN ISO 2719	°C	> 55°C at 1013 hPa
Flash Point - Cleveland open cup ASTM D92	°C	> 75°C at 1013 hPa
AutoFlammability EU Method A.15	°C	Non Applicable
Flammability - in Contact with Water	°C	Negative
Flammability - Pirofosforic Properties	°C	Not determined
Self-ignition temperature	°C	Non Applicable
Explosive properties - EU Method A.14	The substance or mixture is an organic peroxide classified as type D.	
Oxidizing properties/Comburent	--	Organic peroxide
Dissociation Costant - SPARC pKa 20°C	METHYL ETHYL KETONE PEROXIDE 4-HYDROXY-4-METHYLPENTANE-2-ONE HYDROGEN PEROXIDE	11.38 14.57 11.62 - pKa

CHARACTERISTIC	UNIT OF MEASURE	DECLARED VALUE
Viscosity at 20°C OECD GuideLine 114	mPa·s	13.1 (Dinamic)
Viscosity at 20°C UNI EN ISO 3104:2000 a 20°C	mm^2/s	11 - 15 (SSC 2010 - Promox P200TX)
Henry's Law Costant at 25°C	Pa m^3/mole DIMETHYL PHTHALA TE HYDROGEN PEROXIDE	0,217 23E-03 Pa.m^3/mol, at 25°C 750E-06 Pa.m^3/mol, at 20°C
Stability into Organic Solvents		Stable in his formulation agents
VOC Content (VOC)	% w/w	NA

CHARACTERISTIC	UNIT OF MEASURE	DECLARED VALUE
SADT (Self Accelerated Decomposition Temperature)	°C	> 65°C
Active oxygen content	%	9.0 - 9.3
Peroxide content	%	32 - 37%
Miscibility with Solvents	-	See chapter 10

SECTION 10

Stability and Reactivity

10.1. Reactivity

The product is stable under normal handling and storage conditions. **This product can react quickly and violently** when mixed with incompatible chemicals or heated. Avoid contact with rust, iron and Copper. Contact with incompatible materials such as acids, alkalies, heavy metals and reducing agents will result in hazardous decomposition.

10.2. Stability

The product is stable under normal storage conditions for at least six months from the date of production. No decomposition if used and stored according to specifications. To maintain quality store in original closed container below: 30°C. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the following temperature: 60°C (SADT). Contact with incompatible substances can cause decomposition at or below the SADT value.

10.3. Possibility of hazardous reactions

The product is stable under normal storage and use conditions, in this case hazardous reactions will not occur. In case of decomposition is observed increase of temperature and emission of fumes. The oxygen that develops during the decomposition, in the event of fire, may contribute to the combustion of flammable substances. The product can decompose rapidly when mixed with incompatible chemicals or heated. Do not mix directly with metallic salts, accelerators, acids and alkalis especially in concentrated form, reducing products and organic/flammable substances.

10.4. Conditions to avoid

Temperatures below -10°C - Temperatures above 30°C.

10.5. Materials to avoid

Avoid temperatures below - 6°C. It can rapidly decompose if heated or mixed with other incompatible chemical compounds. It is therefore necessary to avoid the product coming into contact with all kinds of metallic salts; acids and alkalis, especially if in a concentrated form; any reducers and all organic and flammable compounds. 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. Do not mix with peroxide accelerators. Avoid contact with rust, iron and Metals. Store in a well ventilated place away from sources of heat and direct sunlight. Use, only, compatible materials listed at point 7.

10.6. Hazardous decomposition products

Hazardous decomposition products: CO_2, Carbon monoxide, Mixture of aliphatic and aromatic hydrocarbon solvents (Ethane - Methane - Ethylene).

SECTION 11

Toxicological Information

11.1. Information on toxicological effects

Toxicological data on the preparation as such available. The following data are applicable to the ingredient(s) listed below.

METHYL ETHYL KETONE PEROXIDE - 2 BUTANONE PEROXIDE - DIMETHYL PHTHALATE SOLUTION

Acute Toxicity - Oral	LD50 Oral (letal dose - rat)	1017 mg/Kg bw
Acute Toxicity - Dermal	LD50 Skin (letal dose - rat)	> 4000 mg/Kg (OCDE 402)
Acute Toxicity - Inhalation	LC50 Inhalation (letal dose - rat)	Active ingredient 17 mg/l 4h (OCDE 403)
Skin Irritation	(rabbit)	Corrosive to skin (after occlusive contact, rabbit, Exposure time: 24 h)
Eye Irritation	(rabbit)	May cause irreversible eye damage. Severe eye irritation (OECD 405, rabbit)

Sensitization (Skin/Respiratory) : Not a skin sensitizer (Method : OECD 406 Guinea pig maximization test, guinea pig)

Genotoxicity in vitro/vivo (Ames test) : Ames test in vitro: Inactive (Method: OECD 471). In vitro test for chromosomal abnormalities on CHO cells: Inactive (Method: OECD 473). In vitro gene mutations test on mammalian cells: Inactive (Method: OECD 473).

Chronic toxicity / Carcinogenicity : No data available.

Reproductive Toxicity : 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).

(STOT) – Single exposure : No data available.

(STOT) – Repeated exposure

Aspiration Toxicity : No specific toxic effects. NOAEL= 65 mg/Kg (Method: OECD 407, rat)

Aspiration Toxicity : No data available.

Potential Acute Health Effects:

Inhalation : At high vapors or fog concentrations: headache, Central nervous system depression Dizziness Difficulty in breathing.

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

Skin Contact : Corrosive to skin.

Contact with eyes : May cause irreversible eye damage. Severe eye irritation.

Signs and Symptoms of Exposure

Inhalation : headache, Central nervous system depression Dizziness Difficulty in breathing.

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

Skin Contact : pain or irritation, blush, possible formation bladders. Corrosive to skin.

Contact with eyes : May cause irreversible eye damage. Severe eye irritation.

2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE

Acute Toxicity - Oral	LD50 (rat)	> 2000 mg/Kg bw
Acute Toxicity - Oral	LD50 (rat)	6400 mg/Kg bw
Acute Toxicity - Inhalation	LD50 (rat)	> 5.3 mg/l - 6h
Acute Toxicity - Dermal	LD50 (Guinea pig)	> 18900 mg/Kg bw
Skin Irritation	(Rabbit)	Not Irritant
Eye Irritation	(Guinea pig)	Slightly Irritant
Sensitization (Skin/Respiratory)	(Guinea pig)	Not a skin sensitizer
Genotoxicity in vitro/vivo (Ames test)	OECD 476 (In vitro Mammalian Cell Gene Mutation Test): Negative.EU Method B.13/14 (Mutagenicity - Reverse Mutation Test Using Bacteria): Negative.In vitro mammalian chromosome aberration test: Negative.	
Chronic toxicity / Carcinogenicity	No data Available.	
Reproductive Toxicity	NOAEL : 276 mg/Kg bw/day Males and NOAEL : 359 mg/Kg bw/day females (Method : OECD 421, rat, Food). OECD (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test) : P/F1 M/F : 750 mg/Kg bw/day.	
(STOT) - Single exposure	No data Available.	

(STOT) - Repeated exposure	Oral: kidney disorders, Target Organs : Kidney, NOAEL = 150 mg/Kg (Method : OECD 408, rat, male, 3 months). No effects reported . NOAEL = 750 mg/Kg (rat, female, 3 months).
Aspiration Toxicity	No data Available.
Other toxicological information	No known significant effects or critical hazards to health.

Potential Acute Health Effects

Inhalation : No data Available.
Ingestion : No data Available.
Skin Contact : No data Available.
Contact with eyes : No data Available.

Signs and Symptoms of Exposure

Inhalation : No data Available.
Ingestion : No data Available.
Skin Contact : No data Available.
Contact with eyes : No data Available.

4-HYDROXY-4-METHYLPENTAN-2-ONE

Acute Toxicity - Oral	LD50 Oral (letal dose - rat)	3.000 mg/Kg (Method: OECD 401)
Acute Toxicity - Dermal	LD50 Skin (letal dose - rabbit)	13.63 g/Kg b.w
Acute Toxicity - Inhalation	LC0 Inhalation (letal dose - rat)	No mortality/8 h/rat: 7.23 g/m^3
Skin Irritation	(rabbit)	Irritating
Eye Irritation	(rabbit)	Mildly irritating
Sensitization (Skin/Respiratory)	No Sensitization is possible	
Genotoxicity in vitro/vivo (Ames test)	Ames test: negative. Chromosomal aberration test (OECD 471): negative. There are experimental indications about the mutagenicity in vitro.	
Chronic toxicity / Carcinogenicity	Negative	
Reproductive Toxicity	NOAEL (Parent): 30 to 100 mg/Kg. NOAEL (F1): 300 mg/Kg (Method: OECD 422, Rat, Oral)	
(STOT) - Single exposure	Irritating to nose, throat and respiratory system 100 ppm – 0.48 mg/l By oral route: No toxic effect directly extrapolated to humans	
(STOT) - Repeated exposure	Target organs: Liver, Kidney, NOAEL= 30 - 100 mg/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)	
Aspiration Toxicity	No data	

Potential Acute Health Effects

Inhalation : At high vapour/mist concentrations headache, Central nervous system depression, Dizziness, Difficulty in breathing.
Ingestion : No data.
Skin Contact : Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.
Eye Contact : Mild eye irritation.

Signs and Symptoms of Exposure

Inhalation : Headache, Central nervous system depression, Dizziness, Difficulty in breathing. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness.
Ingestion : stomach pains.
Skin Contact : Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product.
Eye Contact : Mild eye irritation.

2-BUTANONE

Acute Toxicity - Oral	LD50 Oral (letal dose - rat)	> 2800 mg/Kg b.w.
Acute Toxicity - Dermal	LD50 Skin (letal dose - rabbit)	> 5000 mg/Kg b.w.
Acute Toxicity - Inhalation	LC0 Inhalation (letal dose - rat)	LC50/4 h/rat: 34.5 mg/l
Skin Irritation	(rabbit)	Mildly irritating
Eye Irritation	(rabbit)	Irritant
Sensitization (Skin/Respiratory)	Not a skin sensitizer (Method: OECD 406 Buehler method, guinea pig)	
Genotoxicity in vitro/vivo (Ames test)	Ames test in vitro: Inactive (Method: OECD 471). Tests for chromosome aberrations in vitro on mammalian cells: Inactive (Method: OECD 473). In vitro gene mutations test on mammalian cells: Inactive (Method: OECD 476). Micronucleus test in vivo mouse: Inactive (Method: OECD 474).	
Chronic toxicity / Carcinogenicity	Negative	
Reproductive Toxicity	No data available.	
(STOT) - Single exposure	Olfactory threshold: ap. 5.4 ppm. In man: Irritating to respiratory system. (> 200 ppm)	
(STOT) - Repeated exposure	By inhalation: Liver disorders, NOAEL= 2500 ppm (Method: OECD 413, rat, 3 Months)	
Aspiration Toxicity	No data available.	

Potential Acute Health Effects

Inhalation : AMEK is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. High concentrations (above 200 ppm) in the air can cause eye and lung irritation, may cause drowsiness and dizziness, and may cause central nervous system (CNS) depression.

Ingestion : The effects of ingesting a large dose can include: Metabolic problems, Difficulty in breathing, Loss of consciousness.

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

Eye Contact : Irritant and cause of lesions of the ocular tissues. MEK may increase the neurotoxicity of compounds such as n-hexane and methyl n-butyl ketone.

Signs and Symptoms of Exposure

Inhalation : Headache, Central nervous system depression, Dizziness, Difficulty in breathing. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. MEK is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. High concentrations (above 200 ppm) in the air can cause eye and lung irritation, may cause drowsiness and dizziness, and may cause central nervous system (CNS) depression.

Ingestion : MEK is generally recognized to have low acute and chronic toxicity if ingested and/or breathed. The effects of ingesting a large dose can include: Metabolic problems, Difficulty in breathing, Loss of consciousness.

Skin Contact : Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product

Eye Contact : Irritant and cause of lesions of the ocular tissues. If accidentally swallowed, small amounts of liquid may be aspirated into the lungs during ingestion or from vomiting, this may cause severe lung inflammation and lung edema (an accumulation of fluid in the lungs). This is a medical emergency which must be immediately and properly treated.

HYDROGEN PEROXIDE – ACQUEOUS STABILIZED SOLUTION

Acute Toxicity - Oral	LD50 – Lethal Dose Rat	> 694 mg/Kg bw (HP70%) – OECD TG401
Acute Toxicity - Dermal	LD50 – Lethal Dose Rabbit	> 6500 mg/Kg bw (HP70%) – OECD 402
Acute Toxicity - Inhalation	CL50 – Lethal Dose Rat	> 0.17 mg/l 4h (HP50%) – USA EPA
Skin Irritation	(Rat)	Extremely Corrosive, causes burns, irritation
Eye Irritation	(Rabbit)	Risk of serious damage to eyes
Sensitization (Skin/Respiratory)		Not a skin sensitizer (guinea pig)
Repeated dose Toxicity	Oral - Rat	100 ppm 26 and 37 mg/Kg/day - OECD TG 408
Genotoxicity in vitro/vivo (Ames test)	Genotoxic in vitro. Not Genotoxic in Vivo.	

Chronic toxicity / Carcinogenicity	Substance not carcinogenic according MAK, IARC, ACGIH.
Reproductive Toxicity	Based on the available data, the substance is not suspected of having Reproductive Toxicity potential.
(STOT) - Single exposure	Non data available.
(STOT) - Repeated exposure	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).
Aspiration Toxicity	It is not expected aspiration hazard.
Other toxicological information	No known significant effects or critical hazards to health.

Potential Acute Health Effects

Inhalation : Irritating to the respiratory tract and which can cause inflammation and pulmonary edema, especially if inhaled in aerosol form. Risk of pulmonary oedema, Delayed effects possible.

Ingestion : 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. Causes burns to mouth, throat and stomach burns to mucous membranes of the mouth, oesophagus and stomach.

Contact with skin : Effects of skin contacts may include:, Discolouration, Erythema, Oedema.

Eye Contact : May cause irreversible eye damage. Severe eye irritation.

Signs and Symptoms of Exposure

Inhalation : Respiratory tract irritation, cough, dizziness, and sore throat. Inflammation and pulmonary edema, especially if inhaled in aerosol form.

Ingestion : stomach aches, damage to organs. Causes burns to mouth, throat and stomach burns to mucous membranes of the mouth, oesophagus and stomach.

Contact with skin : Effects of skin contacts may include: Discolouration, Erythema, Oedema

Eye Contact : irreversible damage. Severe eye irritation.

For more information on the hazardous components to health, see step 2 and 8. Not Applicable Added indication when a chemical / Physics / Toxicology is not adequate to the chemical nature of the substance. Added indication not available when a chemical / Physics / Toxicology has not been determined experimentally, or when the data in the literature do not provide information on the substance / mixture tested. The EC Regulation 1907/2006 and EC 453/2010 Reach establish that the information entered in this section must be in line with those provided in the registration dossier to ECHA.

SECTION 12

Ecological Information

Use this product appropriately, according the good working practices, and avoid product dispersion in the environment (see also section 6,7,13,14 e 15). Environmental Effects: Readily biodegradable. Potentially bioaccumulable. Toxic to algae. Harmful to aquatic fauna. The available EcoToxicity data about single components of the preparation, are as follows:

METHYL ETHYL KETONE PEROXIDE - 2 BUTANONE PEROXIDE - DIMETHYL PHTHALATE SOLUTION

12.1.

Acute toxicity EC50 bacteria	48 mg/l - EC10, 30 min (Activated sludge) : = 12 mg/l
Acute toxicity EC50 Algae (Pseudokirchneriella 72h)	5.6 mg/l
Acute toxicity EC50 crustaceans (Daphnia magna 48h)	39 mg/l
Acute toxicity LC50 fish (poecilia reticolata 96h)	44.2 mg/l

12.2.

Persistence and degradation — 87% after 28 d (Method: OECD 301D (Closed bottle test))

12.3.

Bioaccumulation potential — Partition coefficient: n-octanol/water: log Kow : < 0.3 (OECD 117)

12.4.

Mobility in soil — Soil Possibile absorption - Half Life 12h

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 information — No Data Available.

2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE

12.1.

Acute toxicity EC50 bacteria (pseudomonas putida 16h)	--
Acute toxicity CE50 Algae (Selenastrum capricornutum)	> 7.49 mg/l No effect up to the limit of solubility
Acute toxicity EC50 crustaceans (Daphnia magna 48h)	> 1.46 mg/l - NOEC: 1.46 mg/l
Acute toxicity EC50 crustaceans	> 1.55 mg/l - NOEC: 1.55 mg/l
Acute toxicity LC50 fish (Ciprinide Acqua Dolce 96h)	> 6.00 mg/l - NOEC: 1.55 mg/l
Acute toxicity LC50 Platelminta	> 1.55 mg/l - NOEC: 1.55 mg/l
Acute toxicity LC50 Mollusc (Planorbis)	> 1.55 mg/l - NOEC: 1.55 mg/l

12.2.

Persistence and degradation — The criterion of the time interval of 10 days is not satisfied. Aerobic: 70.73% after 28 d (Method: OECD 301 B)

12.3.

Bioaccumulation potential — Partition coefficient: n-octanol / water log Kow: = 4.04 to 4.91. Low potential Bioaccumulation: 1.95. The Bioaccumulation potential of this product in the environment is very low.

12.4.

Mobility in soil — Soil Possibile absorption - 2.69 - 3.60 (QSAR)

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 information — No Data Available.

DIACETON ALCOHOL - 4-HYDROXY-4-METHYLPENTAN-2-ONE

12.1.

Acute toxicity EC50 bacteria (Pseudomonas putida)	825 mg/l Growth inhibition 16h
Acute toxicity EC50 Algae (Pseudokirchneriella 72h)	> 1000 mg/l (Method: OECD 201)
Acute toxicity EC50 crustaceans (Daphnia magna 48h)	> 1000 mg/l (Method: OECD 202)
Acute toxicity LC50 fish (Oryzias latipes 96h)	> 100 mg/l (Method: OECD 203)
Aquatic toxicity / Long term toxicity:	NOEC, 21 d (Daphnia magna (Water flea)) : >= 100 mg/l (OECD Test 211, Growth inhibition/Reproduction inhibition)

12.2.

Persistence and degradation — Readily biodegradable (98.51% 28 days OECD TG 301 D)

12.3.

Bioaccumulation potential — Log Kow 0.09 Not potentially bioaccumulative

12.4.

Mobility in soil — Soil Slight adsorption, log Koc: = 0.52

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 information — No Data Available.

2-BUTANONE - METHYL ETHYL KETONE

12.1.

Acute toxicity EC50 Bacteria (Pseudomonas putida)	16-hour toxicity threshold = 1150 mg/l EC50
Acute toxicity EC50 Algae (Pseudokirchneriella subcapitata)	> 2000 mg/l 96h
Acute toxicity EC50 Crustaceans (Daphnia magna 48h)	EC50 = 5091 mg/l (48 hours) - LC50 = 8890 mg/l (24 hours);
Acute toxicity LC50 Fish (Pimephales promelas, 96h)	3200 mg/l (96 hours)
Acute toxicity LC50 Fish (Lepomis macrochirus (Bluegill)	LC50 = 5640 mg/l (24 hours); LC50 = 5640 mg/l (48 hours)

12.2.

Persistence and degradation — Readily biodegradable (Aerobic Degradation)

12.3.

Bioaccumulation potential — Log Pow = 0.29 at 25°C - Calculated (BCF): 1.0 and 3.0

12.4.
Mobility in soil — Soil adsorption coefficient of 1.53

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 information — No Data Available.

HYDROGEN PEROXIDE AQUEOUS SOLUTION

12.1.

Acute toxicity CE50 Static test Activated sludge (bacteria)	466 mg/l - 30 min (HP100%)
Acute toxicity ErC50, 72 h (Skeletonema costatum)	1.38 mg/l (growth rate) Marine environment
NOEC Static Test Skeletonema costatum (Algae)	0.63 mg/l - 72 h (HP100%)
NOEC Crustaceans (Daphnia magna 48h)	0.63 mg/l - 21 d (HP100%) LOEC : = 1.25 mg/l
NOEC Flow-through test with Daphnia magna (Crustaceans)	0.63 mg/l - 21 d (HP100%)
Acute toxicity LC50 fishes (Pimephales promelas)	16.4 mg/l - 96 h (HP100%) (US EPA, pH: 6.6 - 7.2)

12.2.
Persistence and degradation — Readily Biodegradable (28 Days – OECD TG 301 E).

12.3.
Bioaccumulation potential — Not bioaccumulative - Rapid degradation n-octanol/water: log Kow : = -1.57 , at 20°C (Method: calculated)

12.4.
Mobility in soil — Soil Decomposes - Half-life 24h 12h - 750E-06 $Pa.m^3/mol$, (Concentration: 70%).

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 information — No Data Available.

Results of PBT and vPvB assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. Other information: No Data available.

SECTION 13

Disposal Considerations

For safety measures about handling of excess and residuals see section 7 and 8. It is advisable to dispose the product and the packaging in strict observance with the local rules.

13.1. Waste treatment methods

Product - Packaging disposal : Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.

Due to the high risk of contamination recycling/recovery is not recommended. Waste must be handled and disposed of as provided by local and national regulations. Do not discharge into drains and/or into the environment; This material must be disposed of as hazardous waste into an authorized waste collection site. Directive 94/62/EC, D.L. 22/1997, Act 152/2006. Please contact your hazardous waste disposers to assign the right EWC-(European waste catalog)- number. After diluting with a suitable desentisation agent to 1% of active oxygen, the solution must be supplied to a special treatment (e.g. thermal utilization) under observance of all official regulations. 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).

The empty containers must be disposed of as hazardous waste in strict observance with the local and national rules. 94/62/CE Directive, D.L. 22/1997, DLgs. 152/2006.

Waste treatment-relevant information : It is advisable to dispose of the product by combustion in authorized structure. Before starting the combustion procedure, it is recommended to dilute the peroxide with adequate plasticizers. If the product is correctly ignite, it decomposes itself in carbon dioxide and water. Please contact your hazardous waste disposers. For further advice contact Promox S.p.A. Due to the high risk of contamination recycling/recovery is not recommended. After diluting with a suitable desentisation agent to 10%, the solution must be supplied to a special treatment (e. g. thermal utilization) under observance of all official regulations. Send, the waste, to authorized plants or to incineration under controlled conditions. For the manipulation and the provisions in case of accidental dispersion of the waste, the indications are worth in general furnished to the sections 6 and 7. Cautions and specific actions must be valued in relationship to the composition of the waste. Work according to the in force local and national regulations. Please contact your hazardous waste disposers to assign the right EWC-(European waste catalog)-number.

Further Information : For handling and measures in case of accidental spillage of waste, apply in general to the information provided in sections 6 and 7. Cautions and specific actions should be assessed in relation to the composition of the waste. Operate according to local and national regulations. For higher volumes, users can make direct contact with Promox.

SECTION 14

Transport Information

		ADR/RID	ADN/ADNR	IMDG	IATA
14.1.	**UN number**	UN 3105	UN 3105	UN 3105	UN 3105
14.2.	**UN proper shipping name**	UN 3105, ORGANIC PEROXIDE TYPE D, LIQUID. (METHYLETHYLKETONE PEROXIDE, 5.2, P1, (D)).		UN 3105, ORGANIC PEROXIDE TYPE D, LIQUID. (METHYLETHYLKETONE PEROXIDE, 5.2, P1).	
14.3.	**Transport hazard class(es)**	5.2 	5.2 	5.2 	5.2 + 74F 
	Classification Code	P1	P1	--	--
14.4.	**Packing group**	No	No	II	II
14.5.	**Environmental hazards**	No	No	--	--
	Marine pollutant	--	--	None	None
14.6.	**Special precautions for user**	Warning: Organic peroxides		Warning: Organic peroxides	
	Subsidiary risks	--		--	
	EMS Code	EmS: F-J, S-R			
	ADR/RID Hazard No	Haz. Id. Number ----			
	Tunnel Code	Tunnel Code: D	Tunnel Code: D	--	--
14.7.	**Transport in bulk according to Annex II of MARPOL73/78 - IBC Code**	Non applicable		Unapplicable	
	Additional Infomation	--	--	--	--

Special precautions for user: see chapter 6, 7 and 8.

SECTION 15

Regulatory Information

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

Relevant national provisions:

D.Lg.vo 334/99

Unless local restriction the product is submitted to the requirements for storage facilities above 50 tons. Seveso Substance. MethylEthyl Ketone Peroxide: Major Accident Hazard Legislation Oxidising Category 3.

D.Lg.vo 81/08

Italy: Legislative Decree 81/2008 (Law on protection of health and safety in the workplace), as amended and Directive 2009/161/EU - chemical risk assessment within the meaning of Title IX Italy: Product subject to D . lgs. September 21 2005 n. 238 (Annex A).

Water hazard class (WGK - Germany) - Water hazard class (German Regulation)

Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage. Must not reach sewage water or drainage ditch undiluted or unneutralized.

EU. Regulation 273/2004, Drug Precursors

Butanone; ethyl methyl ketone Number 2914-12-00.

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

Material storage: Hazard group: 1 - Organic peroxide.

BGV B4 Organische Peroxide - Gefahrengruppe nach § 3 BGV B4:
(bisher VBG 58) - vom 1 October 1993 1/ Fassung 1 January 1997. (German regulatory requirements).

BG-Merkblatt M001 beachten (German regulatory requirements).
Produkt unterliegt nicht dem Sprengstoffgesetz (SprengG). (German regulatory requirements).

Dir 92/85/EEC on the safety and health at work of pregnant workers.

Dir 94/33/EC on the protection of young people at work.

Störfallverordnung Anhang I (German regulatory requirements).

Restrictions relating to the product or contained substances according Annex XVII to EC Regulation 1907/2006

Negative.

Substances of very high concern (SVHC) according to REACH, Article 57

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Candidate List Substances according to REACH, Article 56

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Substances subject to REACH Annex XIV Authorization

This substance/mixture contains no components subject to Authorization Reach process.

European Inventory of Existing Commercial Chemical Substances (EINECS)

All components Included.

Status of Carcinogicity

Not recognized as carcinogen by the IARC, NTP, and OSHA.

Norms and legislation on health and environment associated to the mixture.

- ✓ Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances, and following changes.
- ✓ Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances.
- ✓ Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work (fourteenth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC), and following changes. 3 D.Lgs.334/1999 and following changes.
- ✓ Directive 1999/45/CE of the European parliament and of the council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the ember States relating to the classification, packaging and labelling of dangerous preparations, and following changes.
- ✓ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, and following changes.
- ✓ Regulation (EC) No 1907/2006 - Annex XIV - List of substances subject to authorization. Substances of very high concern (SVHC) according to REACH, Article 57.
- ✓ Regulation (EC) No 1907/2006 - Annex XII - Restrictions in the manufacture, placing on the market and use of certain dangerous substances, preparations and articles;

✓ Legislative decree 9 April 2008, n. 81, "Implementation of article 1 of law 3 August 2007, n. 123, in matter of protection of the health and the security on the working places", and following changes.
✓ Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006, and following changes.
✓ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives;
✓ Regulation (EC) No 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific Regulation progress.
✓ Directive 2009/161/EU of 17 December 2009 establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC.

15.2. Chemical Safety Report

For the reaction mass Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane was performed a risk assessment (CSA). The CSA is documented in the Chemical Safety Report (Chemical Safety Report - CSR) and the final ES shall also be provided along the supply chain through the extended SDS.

SECTION 16

Other information

Chemical Name	Directive 67/548/EEC [DSD]	Directive (CE) No 1907/2006
2 BUTANONE PEROXIDE (CAS 1338-23-4)	**R2, R7, R22, R34.** Risk of explosion by shock, friction, fire or other sources of ignition. May cause fire. Harmful if swallowed. Causes burns.	**H241, H302, H314, H318.** Heating may cause a fire or explosion. Harmful if swallowed. Causes severe skin burns and eye damage. Causes serious eye damage.
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE (CAS 6846-50-0)	Not dangerous	**H412.** Harmful to aquatic life with long lasting effects.
DIACETONE ALCOHOL (CAS 123-42-2)	**R36.** Irritating to eyes.	**H226, H319, H335.** Flammable liquid and vapour. Causes serious eye irritation. May cause respiratory irritation.
2 BUTANONE (CAS 78-93-3)	**R11, R36, R66, R67.** Highly flammable. Irritating to eyes. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.	**H225, H319, H336. EUH 066.** Highly flammable liquid and vapour. Causes serious eye irritation. May cause drowsiness or dizziness. Repeated exposure may cause skin dryness or cracking.
HYDROGEN PEROXIDE (CAS 7722-84-1)	**R11, R36, R66, R67.** Heating may cause an explosion. Contact with combustible material may cause fire. Harmful if swallowed, in contact with skin and if swallowed. Causes severe burns.	**H271, H302, H314, H332, H335, H412.** May cause fire or explosion; strong oxidizer. Harmful if swallowed. Causes severe skin burns and eye damage. Harmful if inhaled. May cause respiratory irritation. Harmful to aquatic life with long lasting effects.

REACH REGULATION: This MSDS has been written on 01.04.2015 on the base of how much decided by the Regulation n. 1907/2006 of the 18 December 2006 (REACH) and according to Regulation (EC) N°. 1272/2008. Safety data sheets: according to Regulation (EC) No. 1907/2006. The aim of REACH is to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. This safety data sheet has been completely updated in compliance to Regulation (EC) No. 1907/2006 and the Regulation (EC) 453/2010/EU. Promox registered MethylEthylKetone Peroxide (CAS 1338-23-4) as Reaction mass of butane-2,2-diyl dihydroperoxide and di-sec-butylhexaoxidane and obtained this registration number: 01-2119514691-43-0005.

Bibliographical references: IUCLID Data set; NIOSH, The Registry of Toxic Effects. ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities. Reach Registration Dossier reference Number 01-2119514691-43-0005. ACGIH - Threshold Limit Values - 2010 edition.

Classification procedure

The classification of the mixture is in general based on calculation methods using substance data, as required by Regulation (EC) No 1272/2008. If for certain classifications data on the mixture is available or for example bridging principles or weight of evidence can be used for classification, this will be indicated in the relevant sections of the Safety Data Sheet. See section 9 for physical chemical properties, section 11 for toxicological information and section 12 for ecological information.

Acronyms

ADN: Accord européen relative au transport international des marchandises dangereuses par voies de navigation intérieures (The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways). **ADR:** Accord européen relative au transport international des marchandises dangereuses par route. The European Agreement concerning the International Carriage of Dangerous Goods by Road. **ASTM:** American Society for Testing and Materials (ASTM). **ACGIH:** American Conference of Governmental Industrial Hygienists**; BCF: BioConcentration Factor.** BOD: Biochemical Oxygen Demand. **BCF:** Bioconcentration factor: A Bioconcentration factor (L/Kg) can either be expressed as the ratio of the concentration of a substance in an organism to the concentration in water once a steady state has been achieved (static BCF), or, on a non-equillibrium basis, as the quotient of the uptake and depuration rate constants (dynamic BCF). Static and dynamic BCFs can be equally used for regulatory purposes. The parameter gives an indication of the accumulation potential of a substance.B86. **Bw:** Body weight / Bw, b.w. CAS: Chemical Abstracts Service (division of the American Chemical Society) **CL50:** Lethal Concentration 50% **CLP:** Classification, Labelling and Packaging; **COD:** Chemical Oxygen Demand. **CSR:** Chemical Safety Report; **CMR:** Carcinogenic, mutagenic or toxic to reproduction. **CSA:** Chemical Safety Assessment. **DL 50:** Lethal Dose 50%. **DMEL:** Derived Minimum Effect Level **DNEL:** Derived no effect level; **DT50:** Period required for 50 percent dissipation (define method of estimation). **DT50lab:** Period required for 50 percent dissipation, under laboratory conditions (define method of estimation). **DT90:** Period required for 90 percent dissipation (define method of estimation). **DT90field:** Period required for 90 percent dissipation under field conditions (define method of estimation). **EC(0/50/100):** Effective Concentration 0/50/100. **EINECS:** European Inventory of Existing Commercial Chemical Substances. **ESR:** Existing Substances Regulation. EU: European Union. **EUSES:** European Union System for the Evaluation of Substances. **GHS:** "Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations. **GLP:** Good Laboratory Practice. **IC50:** Median immobilisation concentration or median inhibitory concentration 1. **IARC:** International Agency for Research on Cancer; **IATA:** International Air Transport Association; **ICAO:** International Civil Aviation Organization; **IC50:** Inhibitor Concentration 50%; **Code IMDG:** International Maritime Dangerous Goods code; **LCLo:** Lethal Concentration Low. LD (0/50/100): Lethal Dose 0/50/100; **LOEC:** Lowest Observed Effect Concentration. **L(E)C50 :** Lethal concentration, median. **LOAEL:** Lowest Observed Adverse Effect Level. **LOEC:** Lowest Observed Effect Concentration. **LOEL:** Lowest Observed Effect Level. **Lowest Observed Adverse Effect Concentration (LOAEC):** The Lowest Observed Adverse Effect Concentration is the lowest tested concentration at which there are statistically significant increases in frequency or severity of adverse effects between the exposed population and an appropriate control group. **Lowest Observed Adverse Effect Level (LOAEL):** The Lowest Observed Adverse Effect Level is the lowest tested dose or exposure level at which there are statistically significant increases in frequency or severity of adverse effects between the exposed population and an appropriate control group. **Lowest Observed Effect Concentration (LOEC):** The Lowest Observed Effect Concentration is the lowest tested concentration at which, in a study, a statistically significant effect is observed in the exposed population compared with an appropriate control group. **Lowest Observed Effect Level (LOEL):** The Lowest Observed Effect Level is the lowest tested dose or exposure level at which, in a study, a statistically significant effect is observed in the exposed population compared with an appropriate control group. **N.A.:** No applicable. **N.D.:** Not Available. **NOEC:** No Observed Effect Concentration. NOEL: No Observed Effect Level. **No Observed Adverse Effect Concentration (NOAEC):** The No Observed Adverse Effect Concentration is the highest tested concentration at which there are no statistically significant increases in the frequency or severity of adverse effects between the exposed population and an appropriate control group, some effects may be produced at this level, but they are not considered adverse or precursors of adverse effects. **No Observed Adverse Effect Level (NOAEL):** The No Observed Adverse Effect Level is the highest tested dose or exposure level at which there are no statistically significant increases in the frequency or severity of adverse effects between the exposed population and an appropriate control group, some effects may be produced at this level, but they are not considered adverse or precursors of adverse effects. **No Observed Effect Concentration (NOEC):** The No Observed Effect Concentration is the highest tested concentration at which, in a study, no statistically significant effect is observed in the exposed population compared with an appropriate control group. **No Observed Effect Level (NOEL):** The No Observed Effect Level is the hightst tested tested dose or exposure level at which, in a study, no statistically significant effect is observed in the exposed population compared with an appropriate control group. **NOAEL:** No observed adverse effect level. **NOEC**: No observed effect concentration. **NOEL:** No observed effect level. **PBT:** Persistent, bioaccumulative and toxic. **PNOS:** Particulates not Otherwise Specified **PNEC:** Predicted no effect concentration; **RID:** Règlement concernent le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the Intl Transport of Dangerous Goods by Rail); **STEL:** short term exposure limit; **STOT SE:** Specific target organ toxicity – single exposure. **STOT RE:** Specific target organ toxicity – repeated exposure; **ThOD:** Theoretical Oxygen Demand. **TLV:** threshold limit value; **TWA:** Time Weighted Average; UE: European Union; **vPvB:** Very persistent very bioaccumulative.

This information applies to the Product as Such and conforming to specifications of Promox Spa. 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. These information's given are designed only as a guidance for safe use, storage, transport and disposal of the product in the most correct and secure. It is not possible to ensure that these instructions are sufficient and / or valid in all cases, some data are still under review, their character is for informational purposes only, do not constitute a guarantee for any specific product features and shall not establish any contractual legal relationship. The references to legislative, regulatory and codes should not be considered as exhaustive. For any further information, users may directly contact the Promox Regulatory Affairs Office and/or Promox Technical Service.

The present Safety Data Sheet has been revised in all of its sections and Conforms to EC Regulation 1272/2008 and EU Regulation 453/2010. The present edition replaces any previous edition. Changes effected in comparison to the previous edition: Introduction criterions and changes in conformity to the EC Regulation 1907/2006 - 1272/2008 and following changes.