

Safety Data Sheet

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name Puli Jet Plus 2.0

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

Intended use Disinfectant cleaner for dental aspirators (class IIa medical device)

1.3. Details of the supplier of the safety data sheet

Name Magnolia Srl
Full address Via Natta 6/A
District and Country 43122 Parma
Italy
Tel. +390521607604

e-mail address of the competent person
responsible for the Safety Data Sheet

info.magnolia@cattani.it

1.4. Emergency telephone number

For urgent inquiries refer to

IRELAND: National Poisons Information Centre (NPIC): +353 1 8092166
MALTA: Medicines & poisons info Office 112
UK: National Health Service (NHS) (999 emergency call; 111 non-emergency call)
Emergency Action: In the event of a medical enquiry involving this product, please contact your doctor or local hospital accident and emergency department

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in (EC) Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety data sheet that complies with the provisions of (EU) Regulation 2015/830. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Physical-chemical hazards: this product is not classified as a physical or chemical hazard.

Health hazards: this product causes severe skin burns and eye damage and may cause an allergic skin reaction.

Environmental hazards: this product is toxic to aquatic life with long lasting effects.

Hazard classification and indication:

Skin corrosion, category 1A	H314	Causes severe skin burns and eye damage.
Serious eye damage, category 1	H318	Causes serious eye damage.
Skin sensitization, category 1B	H317	May cause an allergic skin reaction.
Hazardous to the aquatic environment, chronic toxicity, category 2	H411	Toxic to aquatic life with long lasting effects.

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words: Danger

Hazard statements:

H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements:

P260 Do not breathe vapours.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection and face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or 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.
P310 Immediately call a POISON CENTER or a doctor.

Contains: Sodium hydroxide
 Chlorocresol
 tetrasodium ethylene diamine tetraacetate
 Poly(oxy-1,2-ethanediol)-phenyl-hydroxy phosphate
 Citral

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	Concentration %	Classification 1272/2008 (CLP)	Specific concentration limits 1272/2008 (CLP)
Chlorocresol CAS 59-50-7	10 - 16	Acute Tox. 4 H302, Skin Corr. 1C H314, Eye Dam. 1 H318, STOT SE 3 H335, Skin Sens. 1B H317, Aquatic Acute 1 H400 M=1, Aquatic Chronic 3 H412	<i>Not applicable</i>

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EC 200-431-6

INDEX 604-014-00-3

Reg. no. 01-2119938953-25-XXXX

1-methoxy-2-propanol

CAS 107-98-2

10 - 12

Flam. Liq. 3 H226, STOT SE 3 H336

Not applicable

EC 203-539-1

INDEX 603-064-00-3

Reg. no. 01-2119457435-35-XXXX

Sodium hydroxide

CAS 1310-73-2

3,17 - 5,17

Met. Corr. 1 H290, Skin Corr. 1A H314, Eye Dam. 1 H318

*Eye Irrit. 2; H319: 0,5 % ≤ C < 2 %
Skin Corr. 1A; H314: C ≥ 5 %
Skin Corr. 1B; H314: 2 % ≤ C < 5 %
Skin Irrit. 2; H315: 0,5 % ≤ C < 2 %*

EC 215-185-5

INDEX 011-002-00-6

Reg. no. 01-2119457892-27-XXXX

**tetrasodium ethylene diamine
tetraacetate**

CAS 64-02-8

2,74 - 4,74

Acute Tox. 4 H302, Acute Tox. 4 H332, STOT RE 2 H373, Eye Dam. 1 H318

Not applicable

EC 200-573-9

INDEX 607-428-00-2

Reg. no. 01-2119486762-27-XXXX

propan-2-ol

CAS 67-63-0

1,88 - 3,88

Flam. Liq. 2 H225, Eye Irrit. 2 H319, STOT SE 3 H336

Not applicable

EC 200-661-7

INDEX 603-117-00-0

Reg. no. 01-2119457558-25-XXXX

biphenyl-2-ol

CAS 90-43-7

1,5 - 3,5

Eye Irrit. 2 H319, Skin Irrit. 2 H315, STOT SE 3 H335, Aquatic Acute 1 H400 M=1, Aquatic Chronic 1 H410 M=1

Not applicable

EC 201-993-5

INDEX 604-020-00-6

Reg. no. 01-2119511183-53-XXXX

3-butoxypropan-2-ol

CAS 5131-66-8

1 - 3

Eye Irrit. 2 H319, Skin Irrit. 2 H315

Not applicable

EC 225-878-4

INDEX 603-052-00-8

**Poly(oxy-1,2-ethanediol)-phenyl-
hydroxy phosphate**

CAS 39464-70-5

0,35 - 1,35

Eye Dam. 1 H318

Not applicable

EC 609-691-9

INDEX -

Citral

CAS 5392-40-5

0,11 - 0,31

Eye Irrit. 2 H319, Skin Irrit. 2 H315, Skin Sens. 1 H317

Not applicable

EC 226-394-6

INDEX 605-019-00-3

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Reg. no. 01-2119462829-23-XXXX

phosphoric acid

CAS 7664-38-2

0,05 - 0,15

Skin Corr. 1B H314, Eye Dam. 1 H318,
Classification note according to Annex VI to
the CLP Regulation: B*Eye Irrit. 2; H319: 10 % ≤ C < 25 % Skin
Corr. 1B; H314: C ≥ 25 % Skin Irrit. 2;
H315: 10 % ≤ C < 25 %*

EC 231-633-2

INDEX 015-011-00-6

Reg. no. 01 -2119485924-24-XXXX

The full wording of hazard (H) statements is given in section 16 of the sheet.

SECTION 4. First aid measures**4.1. Description of first aid measures**

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 30-60 minutes, opening the eyelids fully. Get medical advice.

SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Get medical advice.

INGESTION: Have the subject drink as much water as possible. Get medical advice. Do not induce vomiting unless explicitly authorised by a doctor.

INHALATION: Get medical advice immediately. Remove victim to fresh air, away from the accident scene. If the subject stops breathing, administer artificial respiration. Take suitable precautions for rescue workers.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

1-methoxy-2-propanol

Acute dose-related effects:

Skin: irritation

Nervous system: depression

Eyes: irritation

Upper respiratory tract: irritation

Chronic effects:

no data on chronic effects are currently available

Sodium hydroxide

Acute dose-related effects:

Skin: irritation, necrosis

Eyes: irritation, corneal damage

Lungs: irritation, bronchospasm

Digestive tract: if ingested, abdominal colic, nausea, vomit, hematemesis, melena.

Chronic effects:

Skin: irritation

Lungs: irritation

Phosphoric acid

Acute dose-related effects:

Skin: irritation, burn, corrosion

Eyes: irritation, keratitis, corneal damage

Oral cavity:

Nose: irritation

Upper respiratory tract: irritation

Lungs: irritation

Chronic effects:

no data on chronic effects are currently available

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Get medical advice.

SECTION 5. Firefighting measures**5.1. Extinguishing media**SUITABLE EXTINGUISHING EQUIPMENT

Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.

UNSUITABLE EXTINGUISHING EQUIPMENT

Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixtureHAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE

Overpressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products (COx, NOx, chlorates, POx).

5.3. Advice for firefightersGENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**For non-emergency personnel

Alert the staff responsible for handling these emergencies. Move away from the accident area if you do not have the personal protective equipment listed in Section 8.

For emergency responders

Remove all staff not adequately equipped to deal with the emergency.

Wear appropriate personal protective equipment referred to in section 8 of the safety data sheet to prevent contamination of the skin, eyes and personal clothing. Stop the leak if there is no danger.

Make the area affected by the accident accessible to workers only after adequate remediation has taken place. Ventilate the premises affected by the accident.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Collect the leaked product into a suitable container. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material (e.g. vermiculite, diatomaceous earth, sand, fossil flour, zeolites, activated carbon, aluminum / silica).

Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Ensure that there is an adequate earthing system for the equipment and personnel. Avoid contact with eyes and skin. Do not breathe powders, vapours or mists. Do not eat, drink or smoke during use. Wash hands after use. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store in a ventilated and dry place, far away from sources of ignition. Keep containers well sealed. Keep the product in clearly labelled containers. Avoid overheating. Avoid violent blows. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

No specific end uses are intended other than the relevant uses set out in Section 1.2 of this safety data sheet.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Regulatory References:

DEU	Deutschland	TRGS 900 (Fassung 07.06.2018) - Liste der Arbeitsplatzgrenzwerte und Kurzzeitwerte
FRA	France	Valeurs limites d'exposition professionnelle aux agents chimiques en France. ED 984 - INRS
ITA	Italia	Directive (UE) 2017/164
EU	OEL EU	Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2019

Chlorocresol

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,015	mg/l
Normal value in marine water	0,002	mg/l
Normal value for fresh water sediment	13,981	mg/kg/d
Normal value for marine water sediment	13,981	mg/kg/d
Normal value for water, intermittent release	0,015	mg/l
Normal value of STP microorganisms	2,286	mg/l
Normal value for the terrestrial compartment	6,399	mg/kg/d

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Chronic systemic	Effects on workers		
	Acute local	Acute systemic	Chronic local		Acute local	Acute systemic	Chronic local
Oral				0,892 mg/kg bw/d			

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Oral				25 mg/kg bw/d		
Inhalation	1,2 mg/m3	0,6 mg/m3			3 mg/m3	1,5 mg/m3

propan-2-ol
Threshold Limit Value

Type	Country	TWA/8h		STEL/15min		
		mg/m3	ppm	mg/m3	ppm	
MAK	DEU	500	200	1000	400	average value: 15 mins
VLEP	FRA			980	400	

Predicted no-effect concentration - PNEC

Normal value in fresh water		140,9	mg/l
Normal value in marine water		140,9	mg/l
Normal value for fresh water sediment		552	mg/kg/d
Normal value for marine water sediment		552	mg/kg/d
Normal value of STP microorganisms		2251	mg/l
Normal value for the food chain (secondary poisoning)		160	mg/kg
Normal value for the terrestrial compartment		28	mg/kg/d

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Chronic systemic	Effects on workers			Chronic systemic
	Acute local	Acute systemic	Chronic local		Acute local	Acute systemic	Chronic local	
Oral				26 mg/kg/d				
Inhalation				89 mg/m3				500 mg/m3
Skin				319 mg/kg bw/d				888 mg/kg bw/d

biphenyl-2-ol
Predicted no-effect concentration - PNEC

Normal value in fresh water		0,001	mg/l
Normal value in marine water		0	mg/l
Normal value for fresh water sediment		0,128	mg/kg/d
Normal value for marine water sediment		0,013	mg/kg/d
Normal value for water, intermittent release		0,027	mg/l
Normal value of STP microorganisms		0,56	mg/l
Normal value for the food chain (secondary poisoning)		1,87	mg/kg
Normal value for the terrestrial compartment		2,5	mg/kg/d

Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Chronic systemic	Effects on workers			Chronic systemic
	Acute local	Acute systemic	Chronic local		Acute local	Acute systemic	Chronic local	
Oral				0,4 mg/kg bw/d				
Inhalation				1,2 mg/m3				19,25 mg/m3
Skin				0,4 mg/kg bw/d				21,84 mg/kg bw/d

3-butoxypropan-2-ol

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	systemic	systemic	systemic
Inhalation	0,73 mg/m3		2,92 mg/m3

Legend:

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

1-methoxy-2-propanol

Critical Effects: Upper Respiratory Tract and eye irritation

Sampling method:

http://amcaw.ifa.dguv.de/substance/methoden/012-Methoxypropan-2-ol_2016.pdf.

Sodium hydroxide

Sampling method:

http://amcaw.ifa.dguv.de/substance/methoden/045-sodium_hydroxide_2016.pdf

Citral

Critical Effects: effects on body weight, Upper Respiratory Tract irritation, eye damage

Phosphoric acid

Critical Effects: Upper Respiratory Tract, eye and skin irritation

Sampling method:

http://amcaw.ifa.dguv.de/substance/methoden/094-phosphoric_acid_2016.pdf.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

HAND PROTECTION

Protect hands with category III work gloves, class A, L, G (fluorinated rubber or equivalent) (see standard EN 374).

The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.

The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.

SKIN PROTECTION

Wear category III professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing. Evaluate the possibility to provide antistatic clothing if the work environment presents an explosion hazard.

EYE PROTECTION

Wear a hood visor or protective visor combined with airtight goggles (see standard EN 166). Provide an emergency shower with face and eye wash station.

RESPIRATORY PROTECTION

If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, use a mask with a type A.B.E.K. filter whose class (1, 2 or 3) must be chosen according to the limit of use concentration. (see standard EN 14387). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.

Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.

If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus (in compliance with standard EN 137) or external air-intake breathing apparatus (in compliance with standard EN 138). For a correct choice of respiratory protection device, see standard EN 529.

ENVIRONMENTAL EXPOSURE CONTROLS

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

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SECTION 9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

Appearance	liquid	
Colour	Not available	
Odour	Not available	
Odour threshold	Not available	
pH	10,9	
Melting point / freezing point	Not available	
Initial boiling point	> 35 °C	
Boiling range	Not available	
Flash point	80 °C	
Evaporation rate	Not available	
Flammability (solid, gas)	Not available	(the product is liquid)
Lower inflammability limit	Not available	
Upper inflammability limit	Not available	
Lower explosive limit	Not available	
Upper explosive limit	Not available	
Vapour pressure	Not available	(the product is a mixture)
Vapour density	Not available	(the product is a mixture)
Relative density	Not available	
Solubility	Not available	
Partition coefficient: n-octanol/water	Not available	
Auto-ignition temperature	Not available	
Decomposition temperature	Not available	
Viscosity	Not available	
Explosive properties	Not applicable	(absence of chemical groups associated with explosive properties pursuant to the provisions of Annex I, Part 2, chap. 2.1.4.3 of reg. (EC) 1272/2008 - CLP).
Oxidising properties	Not applicable	(absence of requirements related to the presence of atoms and / or chemical bonds associated with oxidizing properties in the molecules of the components in accordance with the provisions of Annex I, Part 2, 2.13.4 of reg. (EC) 1272/2008 - CLP).

9.2. Other information

Information not available

SECTION 10. Stability and reactivity**10.1. Reactivity**

There are no particular risks of reaction with other substances in normal conditions of use.

1-methoxy-2-propanol

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It oxidizes slowly on contact with air.

Sodium hydroxide

Contact with metals develops flammable hydrogen gas.

Phosphoric acid

Decomposes at temperatures above 200°C/392°F.

The substance decomposes on contact with alcohols, aldehydes, cyanides, ketones, phenols, esters, sulphides and halogenated organic compounds, producing toxic fumes. It attacks and corrodes several metals (in particular iron, zinc and aluminum) with development of hydrogen and flammable and explosive gas. It is a stronger acid than oxalic, silicic, and boric acid but less strong than nitric acid, sulfuric acid, hydrochloric acid and chromic acid.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

1-methoxy-2-propanol

Stable under normal conditions.

Sodium hydroxide

Quickly absorbs carbon dioxide and water from the air.

Phosphoric acid

Hygroscopic. The substance polymerizes violently under the influence of azo compounds and epoxides.

10.3. Possibility of hazardous reactions

The product is stable in normal conditions of use and storage.

1-methoxy-2-propanol

At temperatures > 38 ° C it may form explosive vapor / air mixtures. Forms explosive peroxides.

Sodium hydroxide

The potential to cause corrosion increases at T > 60 ° C. Use suitable containers at high temperatures.

Phosphoric acid

Risk of explosion on contact with: nitromethane. May react dangerously with: alkalis, sodium borohydride. NEVER add water to this substance; for solutions or dilutions always add it slowly to the water.

10.4. Conditions to avoid

None in particular.

1-methoxy-2-propanol

Avoid contact with air.

Sodium hydroxide

Avoid exposure to: air, moisture, sources of heat.

Phosphoric acid

Ignition sources.

Under the action of heat, starting from 213 ° C, the phosphoric acid loses water and turns into pyrophosphoric acid (H₄P₂O₇).

10.5. Incompatible materials**1-methoxy-2-propanol**

Oxidizing substances, strong acids and alkaline metals.

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Sodium hydroxide

Strong acids, ammonia, zinc, lead, aluminium, water, flammable liquids.

Phosphoric acid

Metals, strong alkalis, aldehydes, organic sulphides, peroxides.

10.6. Hazardous decomposition products

In the event of thermal decomposition or fire, gases and vapours that are potentially dangerous to health may be released.

Sodium hydroxide

Decomposes on heating, developing toxic fumes including sodium oxide.

Phosphoric acid

By thermal decomposition, may develop: phosphoryl oxides.

SECTION 11. Toxicological information**11.1. Information on toxicological effects**

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.

It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

ACUTE TOXICITY

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

SKIN CORROSION / IRRITATION

Based on the available data and the classification criteria set out in table 3.2.3 of Annex I of Reg. (EC) 1272/2008 and as amended, the product is classified as **Skin Corr. 1A; H314**.

SERIOUS EYE DAMAGE / IRRITATION

Based on the available data and the classification criteria set out in table 3.3.3 of Annex I of Reg. (EC) 1272/2008 and as amended, the product is classified as **Eye Dam. 1; H318**

RESPIRATORY OR SKIN SENSITISATION

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is classified as **Skin Sens 1B; H317**.

GERM CELL MUTAGENICITY

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

CARCINOGENICITY

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

Puli Jet Plus 2.0REPRODUCTIVE TOXICITY

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

STOT - SINGLE EXPOSURE

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

STOT - REPEATED EXPOSURE

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

ASPIRATION HAZARD

Based on the available data and the classification criteria of Annex I, Part 3 of Reg. (EC) 1272/2008 and as amended, the product is not classified for this hazard class.

The toxicological data referring to the substances contained in the mixture are shown below:

Sodium hydroxideMetabolism, kinetics, mechanism of action and other information

On contact with human skin, at non-irritating concentrations, the passage of the ions is mild and absorption hard.

ACUTE TOXICITY

Rabbit DL50 (oral)= 325 mg/kg
Rabbit DL50 (dermal): 1350 mg/kg
Rat CL50-4 ore (inhalation): not available

SKIN CORROSION / IRRITATION

The substance causes chemical burns the severity of which is a function of the concentration of the solution and of the importance of contamination and the duration of contact. Depending on the depth of the damage it is observed hot and painful erythema, blisters and necrosis. Evolution can be complicated by infections, aesthetic or functional sequelae.

RESPIRATORY TRACT CORROSION

Data not available.

SERIOUS EYE DAMAGE / IRRITATION

The substance causes chemical burns the severity of which is a function of the concentration of the solution.

REPRODUCTIVE TOXICITY

- Adverse effects on sexual function and fertility:
No data are available. The substance has no systemic toxicity and effects on reproduction do not seem plausible under normal conditions of use.
- Adverse developmental effects:
No data are available. The substance has no systemic toxicity and effects on reproduction do not seem plausible under normal conditions of use.
- Effects on breastfeeding or through breastfeeding:
Data not available.

STOT - SINGLE EXPOSURE

Inhalation of vapours or aerosols immediately causes: rhinorrhea, sneezing, burning sensation of the nose and throat, cough, dyspnoea and chest pain. Laryngeal edema or bronchospasm are complications.

At the end of the exposure, the symptoms may regress, but pulmonary edema may delay and occur within 48 hours.

The substance is corrosive and the ingestion of a concentrated solution of sodium hydroxide causes pain in the oral cavity, retrosternal pain and pain at

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the epigastric region associated with burr and frequent vomiting with traces of blood, esophagic or gastric perforation.

STOT - REPEATED EXPOSURE

Following occupational exposure via inhalation, a case of severe obstructive disease with cough, dyspnoea and tachypnea after 20 years of exposure has been reported in the literature. Long-term dermal exposure can cause dermatitis.

ASPIRATION HAZARD

Data not available.

Possible routes of exposure

In a professional environment the main routes of exposure are inhalation and skin or eye contact. At the ocular level there is immediate pain, tearing and conjunctival hyperemia. Sequelae can occur such as: conjunctival adhesions, corneal opacities, cataracts, glaucoma and even blindness.

RESPIRATORY SENSITISATION

Inhalation of the substance can cause Brooks syndrome (irritant induced asthma).

SKIN SENSITISATION

A study on volunteers has shown that sodium hydroxide is not a skin sensitizer. Furthermore this substance is widely used and no case of sensitization has been reported.

GERM CELL MUTAGENICITY

In vitro and in vivo studies indicate that sodium hydroxide is not genotoxic.

CARCINOGENICITY

A dated study (1976) on workers with chronic exposure to caustic soda did not observe any relationship between neoplasms and duration or intensity of exposure.

Immediate, delayed and chronic effects from short and long term exposure

Inhalation of vapours or aerosols immediately causes: runny nose, sneezing, sensation of nasal and pharyngeal burning, cough, dyspnoea and chest pain. Laryngeal edema or bronchospasm are complications.

At the end of the exposure, the symptoms may regress, but pulmonary edema may delay and occur within 48 hours.

Superinfections re other complications. Bronchial hypersecretion and desquamation of the bronchial mucosa in case of extensive lesions are responsible for truncular obstructions and atelectasis.

Pulmonary sequelae can be: asthma (in particular reactive airway dysfunction syndrome or Brooks syndrome), bronchial stenosis, bronchiectasis, pulmonary fibrosis.

The ingestion of concentrated solutions is followed by buccal, retrosternal and epigastric pain associated with hypersialorrhea and bloody vomiting. Metabolic acidosis, hyperleukocytosis, hemolysis and hypernatremia occur.

Complications are: esophageal or gastric perforation, digestive hemorrhage, fistulas, breathing difficulty (sign of laryngeal edema or inhalation pneumopathy or esotracheal fistula), shock, disseminated intravascular coagulation.

Long-term evolution can lead to digestive stenosis, especially esophageal. There is also a risk of cancerization of cicatricial lesions of the digestive tract.

Skin or eye contamination involves local chemical burns the severity of which depends on the concentration of the solution, the importance of contamination and the duration of contact.

At the skin level, depending on the depth of the damage, hot and painful erythema, blisters and necrosis are observed. Evolution can be complicated by infections, aesthetic or functional sequelae.

At the ocular level there is immediate pain, tearing and conjunctival hyperemia. Sequelae can occur such as: conjunctival adhesions, corneal opacities, cataracts, glaucoma and also blindness.

Long-term dermal exposure can cause dermatitis.

Phosphoric acidMetabolism, kinetics, mechanism of action and other information

Phosphoric acid can enter the body by inhalation of its aerosols and by ingestion. It releases phosphate ions which are eliminated in the urine.

Phosphoric acid particles are hygroscopic and tend to increase in volume when passing through the respiratory tract. They contain 90% humidity in the trachea and 99% in the lungs. The phosphoric acid in contact with the humidity of the gastrointestinal tract is transformed into phosphate ions.

Absorption and, in limited quantities, reabsorption in the gastrointestinal tract are influenced by several factors. Transport to the blood is an active

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phenomenon that is stimulated by vitamin D. In adult men, about 2/3 of the quantity ingested is absorbed and eliminated through urine. In the child the absorbed quantity is not completely eliminated, consequently the plasma rate remains higher than that of an adult. (INRS, 2011)

ACUTE TOXICITY

Rat DL50 (oral): 1530 mg/kg (INRS, 2011)
Rabbit DL50 (dermal): 2740 mg/kg (INRS, 2011)
Rat CL50-4 ore (inhalation): > 213 mg/m³ (INRS, 2011)

SKIN CORROSION / IRRITATION

The substance has corrosive action. Severity depends on concentration of the solution, quantity and duration of contact. May cause yellowish discolouration of the skin. Depending on the damage, hot and painful erythema, blisters or necrosis are observed. Evolution can be complicated with infections, aesthetic or functional sequelae. On rabbit skin, phosphoric acid induces irritation starting from a concentration of 75% for a contact of 4 hours; 80% of the irritation is severe, and 85% of it is corrosive (necrosis) (INRS, 2011).

RESPIRATORY TRACT CORROSION

Vapours and aerosols are corrosive. The severity of the injury is related to the concentration of the solution, the quantity and duration of the contact. The combustion fumes of a mixture containing 95% of red phosphorus are composed of a high concentration of phosphoric acid and a small amount of diphosphoric acid. An exposure of rats to these fumes for 1 hour induces slight deformation of the epiglottis (at 3150 mg / m³), edema of the larynx (at 5400 mg / m³) and tracheal and laryngeal lesions (at 8500 mg / m³). An exposure for 4 hours at 1500 mg / m³ causes severe edema of the larynx and in some places hemorrhagic. Rabbits exposed to these fumes for 30 minutes present epithelial necrosis of the alveoli and partially reversible inflammation of the larynx in 14 days (INRS, 2011).

SERIOUS EYE DAMAGE / IRRITATION

The substance has corrosive action. Severity is related to the concentration of the solution, the quantity and duration of contact. The symptoms are: immediate pain, tearing, conjunctival hyperemia and often blepharospasm. Possible sequelae are: conjunctival adhesions, corneal opacities, cataracts, glaucoma and also blindness. In humans, ocular instillation of a drop of pH 2.5 buffered phosphoric acid solution causes only slight itching without injury. A drop of the same buffered solution at pH 3.4 is perfectly tolerated (INRS, 2011). In the rabbit eye, a 10-17% solution is slightly irritating, while direct contact with the pure substance (119 mg) induces serious effects (burns) (INRS, 2011).

RESPIRATORY SENSITISATION

Inhalation of substance can cause Brooks syndrome (irritant-induced asthma) (INRS, 2011).

SKIN SENSITISATION

Phosphoric acid did not show sensitizing power on guinea pig (INRS, 2011).

GERM CELL MUTAGENICITY

In vitro, negative results obtained in the Ames assay, with or without metabolic activation. In vivo a gene recombination assay on Drosophila gave negative results. A rat dominant lethal assay showed an increase in females who exhibited resorption after mating with males exposed to the lowest concentration. (INRS, 2011)

CARCINOGENICITY

In a recent evaluation, the data showed an association between exposure to strong inorganic acid mists and laryngeal cancer in humans while they were limited in establishing a causal association with bronchial cancer.

A positive association between exposure to strong inorganic acid mists and lung cancer has also been observed in humans (IARC, 2012; INRS, 2011).
- The International Agency for Research on Cancer (IARC) allocates strong inorganic acid mists in group 1 (confirmed human carcinogen) based on evidence of sufficient carcinogenicity in humans (laryngeal cancer and positive association between exposure inorganic strong acid mists and lung cancer) (IARC, 2012).

REPRODUCTIVE TOXICITY

- Adverse effects on sexual function and fertility: Data not available.
- Adverse developmental effects: No human data are available. No change on growth or reproduction was observed in rats (in a 3-generation study) who received diets containing 0.4 and 0.75% phosphoric acid (INRS, 2011). In rats, phosphoric acid is foetotoxic in case of exposure to high concentrations by inhalation (INRS, 2011).

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- Effects on breastfeeding or through breastfeeding: Data not available.

STOT - SINGLE EXPOSURE

In humans, exposure by inhalation to vapours or aerosols immediately causes signs of irritation to the respiratory tract: runny nose, sneezing, a burning sensation of the nose and throat, cough, dyspnoea and chest pain. The prognosis can be poor if laryngeal edema or bronchospasm occurs.

When the exposure stops, the symptoms generally regress but, pulmonary edema can delay and occur within 48 hours.

Bacterial infections are the most frequent complications. Bronchial hypersecretion and flaking of the bronchial mucosa, in the presence of extensive lesions, are responsible for bronchial obstructions and atelectasis (INRS, 2011).

The ingestion of a concentrated solution of substance causes pain in the mouth, retrosternal and epigastric, associated with hypersialorrhea and frequently bloody vomiting. Metabolic acidosis, hyperleukocytosis and hemolysis occur. Short-term complications are esophageal or gastric perforation, digestive bleeding, fistulas (esotracheal or aorto-esophageal), respiratory distress (for laryngeal edema, inhalation pneumopathy or esotracheal fistula), shock and disseminated intravascular coagulation (INRS, 2011).

STOT - REPEATED EXPOSURE

No human data are available after chronic exposure to the substance. In humans, the ingestion of phosphates can cause electrolyte imbalance in the body which can interfere with the function of a variety of organ systems. In particular, high phosphate consumption can influence the distribution of calcium in the body and in some cases can produce calcification of soft tissues and affect bone formation.

Kidney damage, soft tissue and bone calcification were the main results found in laboratory animals fed repeatedly with phosphates (BIBRA, 1993).

The toxicity of phosphoric acid after repeated inhalation is similar to that of acid aerosols; the effect is due to the direct irritating action of the H⁺ ion and depends not only on the concentration, but also on the size of the particles and the duration of the exposure. In rats exposed to aerosols (0.49-0.65 µm aerosol particles) of combustion products of a mixture containing red phosphorus consisting of 71 to 79% of phosphoric acid, for 2.25 hours / day, 4 days / week for 13 weeks, lethality was observed starting from a concentration of 750 mg / m³ with effects on the respiratory tract and in particular on the terminal bronchioles. Rats exposed to white phosphorus combustion products, 15 minutes / day, 5 days / week for 13 weeks, die at high concentrations (589 to 1161 mg / m³) due to laryngeal or tracheal edema (INRS, 2011).

ASPIRATION HAZARD

Data not available.

Possible routes of exposure

The main potential routes of exposure are expected to be skin contact and inhalation in workers exposed to the production and use of the substance.

Immediate, delayed and chronic effects from short and long term exposure

Inhalation exposure to vapours or aerosols immediately causes signs of irritation of the respiratory tract: runny nose, sneezing, nasal and pharyngeal burning sensation, cough, dyspnoea and chest pain. The prognosis can be poor if laryngeal edema or bronchospasm occurs. At the end of the exposure there is usually a remission of the symptoms, but delayed pulmonary edema can occur within 48 hours. Complications are bacterial superinfections.

Hypersecretion and desquamation of the bronchial mucosa, in the presence of extensive lesions, are responsible for bronchial obstructions and atelectasis. Other possible sequelae are: bronchial stenosis, bronchiectasis, pulmonary fibrosis.

The ingestion of a concentrated solution of substance causes pain in the mouth, retrosternal and epigastric, associated with hypersialorrhea and frequently bloody vomiting. Metabolic acidosis, hyperleukocytosis and hemolysis occur. Short-term complications are esophageal or gastric perforation, digestive hemorrhages, fistulas (esotracheal or aorto-esophageal), breathing difficulties (for laryngeal edema, inhalation pneumopathy or esotracheal fistula), shock and disseminated intravascular coagulation. In the long term evolution digestive stenosis, in particular esophageal, can occur.

There is also a risk of cancering the digestive tract lesions. No data are available for chronic exposures to the substance.

Interactive effects

Data not available

1-methoxy-2-propanol**Metabolism, kinetics, mechanism of action and other information**

The substance is well absorbed by the inhalation route, by the oral route and by the skin route. It is distributed mainly in the liver where it is metabolized in propylene-glycol PG and eliminated both via the route respiratory in the form of CO₂ either unchanged, conjugated or metabolised by the urinary tract.

ACUTE TOXICITY

Rat DL50 (oral): 4000 mg/kg

Rabbit DL50 (dermal): 13000 mg/kg

Rat CL50-4 ore (inhalatory): 15000 ppm

Puli Jet Plus 2.0SKIN CORROSION / IRRITATION

At high concentrations it can have irritating power (IPCS, 1997).

RESPIRATORY TRACT CORROSION

No data available.

SERIOUS EYE DAMAGE / IRRITATION

The substance and the vapor in high concentrations are irritating to the eyes (IPCS, 1997).

RESPIRATORY SENSITISATION

No data available.

SKIN SENSITISATION

It showed no sensitizing power.

GERM CELL MUTAGENICITY

The tests performed, in vitro and in vivo, gave negative results.

CARCINOGENICITY

Two-year inhaled studies in rats and mice (Spencer PJ et al., 2002) indicate that the substance is not a potential carcinogen for humans (INRS, 2010; OECD, 2001).

REPRODUCTIVE TOXICITY

-Adverse effects on sexual function and fertility:

The substance is not considered toxic.

- Adverse developmental effects:

The substance is not considered toxic.

- Effects on breastfeeding or through breastfeeding:

Data not available.

STOT - SINGLE EXPOSURE

High concentrations can cause sedative action. The substance, in high concentrations, has irritating power for the respiratory system (IPCS, 1997).

STOT - REPEATED EXPOSURE

Data not available.

ASPIRATION HAZARD

Data not available.

Possible routes of exposure

The main potential routes of exposure are expected to be skin contact and inhalation in workers exposed to the production and use of the substance. Potential exposure of the general population can occur through the ingestion of food or water contaminated, by ambient air and by contact with products containing the substance.

Immediate, delayed and chronic effects from short and long term exposure

The substance and its vapors (at high concentrations) are irritating to eyes, skin and respiratory tract (IPCS, 1997). Exposure to very high concentrations can lead to CNS depression (IPCS, 1997). Inhalation of vapors has low toxicity as even low concentrations are intolerable for man. Exposures at 250 ppm for 1-7 hours cause eye, nose and throat irritation; in some cases it causes headache, sometimes nausea. The primary response to exposure to high inhaled concentrations (1000 ppm) is a sedative action. Repeated exposures that could cause effects are very unpleasant (irritation to the eyes and

the apparatus respiratory, in some subjects there was nausea). Repeated or prolonged exposure degrades the skin and can cause dryness and cracking (IPCS, 1997).

Interactive effects

No data available.

1-methoxy-2-propanol

LD50 (Oral) 3739 mg/kg Rat
LD50 (Dermal) > 2000 mg/kg Rat
LC50 (Inhalation) > 7000 ppm/6h Rat

Sodium hydroxide

LD50 (Oral) 325 mg/kg bw Rabbit

3-butoxypropan-2-ol

LD50 (Oral) 3300 mg/kg Rat
LD50 (Dermal) > 2000 mg/kg Rat

Citral

LD50 (Oral) 6800 mg/kg Rat
LD50 (Dermal) > 2000 mg/kg Rat

Chlorocresol

LD50 (Oral) 1830 mg/kg rat
LC50 (Inhalation) > 2,86 mg/l/4h rat

tetrasodium ethylene diamine tetraacetate

LD50 (Oral) 1780 mg/kg Rat

propan-2-ol

LD50 (Oral) 5,84 mg/kg Rat
LD50 (Dermal) 16,4 mg/kg Rabbit

phosphoric acid

LD50 (Oral) 2600 mg/kg rat
LD50 (Dermal) 2740 mg/kg rabbit
LC50 (Inhalation) > 0,85 mg/l/1h rat

biphenyl-2-ol

LD50 (Oral) 2733 mg/kg Rat
LD50 (Dermal) > 2000 mg/kg rabbit
LC50 (Inhalation) > 36 mg/l/4h Rat

1-methoxy-2-propanol

Rat DL50 (oral): 4000 mg/kg
rabbit DL50 (dermal): 13000 mg/kg
rat CL50-4 ore (inhalation): 15000 ppm.

SECTION 12. Ecological information

12.1. Toxicity

This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it has negative effects on the aquatic environment.

1-methoxy-2-propanol

Short-term effects

Fish (*Leuciscus idus*) CL50-96 hours: 6812 mg / l (geometric mean) [Guideline DIN 38412]; NOEC: 4640 mg / l (EU, 2006; OECD, 2001).
Aquatic invertebrates (*Daphnia magna*) CE50-48 hours: > 500 mg / l (EU, 2006; Verschueren, 2009).
Algae (*Selenastrum capricornutum*) EC50-96 hours: > 1000 mg / l (EU, 2006).

At a concentration of 46 g / l the substance slightly inhibits the spore germination of the fungus *Cladosporium*.

Long-term effects

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Fish: long-term studies are not available (EU, 2006).
Aquatic invertebrates: long-term studies are not available (EU, 2006).
Algae: no long-term studies are available (EU, 2006).

Sodium hydroxide

LC50 - for Fish < 180 mg/l/96h *Gambusia affinis*
EC50 - for Aquatic invertebrates 40,4 mg/l/48h *Ceriodaphnia* sp.

3-butoxypropan-2-ol

LC50 - for Fish 560 mg/l/96h *Poecilia reticulata*
EC50 - for Crustacea > 1000 mg/l/48h *Daphnia magna*

Citral

LC50 - for Fish 6,78 mg/l/96h *Leuciscus idus*
EC50 - for Aquatic invertebrates 6,8 mg/l/48h *Daphnia magna*
EC50 - for Algae / Aquatic Plants 103,8 mg/l/72h *Desmodesmus subspicatus*

Chlorocresol

LC50 - for Fish 0,917 mg/l/96h *Oncorhynchus mykiss*
EC50 - for Aquatic invertebrates 2,29 mg/l/48h *Daphnia magna*
Chronic NOEC for Fish 0,15 mg/l *Oncorhynchus mykiss*
Chronic NOEC for Aquatic invertebrates 0,32 mg/l *Daphnia magna*

tetrasodium ethylene diamine tetraacetate

LC50 - for Fish 24 mg/l/96h *Lepomis macrochirus*

propan-2-ol

LC50 - for Fish 10000 mg/l/96h *Pimephales promelas*

phosphoric acid

EC50 - for Aquatic invertebrates > 100 mg/l/48h *Daphnia magna*
EC50 - for Algae / Aquatic Plants > 100 mg/l/72h *Desmodesmus subspicatus*

12.2. Persistence and degradability**1-methoxy-2-propanol**

It is expected to biodegrade.

Sodium hydroxide

The high solubility in water and the low vapour pressure indicate that sodium hydroxide will be found mainly in the aquatic environment. The substance is present in the environment as sodium ions and hydroxyl ions, this implies that it does not adsorb on particulate matter or on surfaces and does not accumulate in living tissues.

Atmospheric emissions of sodium hydroxide are rapidly neutralized by carbon dioxide or other acids and salts (e.g. sodium carbonate).

phosphoric acid

Degradability: information not available

12.3. Bioaccumulative potential

Puli Jet Plus 2.0**1-methoxy-2-propanol**

Bioconcentration is not significant.

Sodium hydroxide

Not relevant.

BCF Not applicable

Partition coefficient n-octanol / water see sect. 9.1

12.4. Mobility in soil**1-methoxy-2-propanol**

Significant ground absorption is not to be expected.

Sodium hydroxide

Given the high mobility in the soil and the high solubility, it can melt following rains and infiltrate the soil. No significant emissions are expected in the terrestrial environment during normal use of the substance, any small emissions will be neutralized by the buffer capacity of the soil.

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects

Information not available

SECTION 13. Disposal considerations**13.1. Waste treatment methods**

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

CONTAMINATED PACKAGING

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The transport must be carried out by vehicles equipped and / or authorized to transport dangerous goods according to the provisions of the current edition of the A.D.R. and the applicable national provisions. Transport must be carried out in the original packaging and, in any case, in packaging that is made up of materials that cannot be attacked by its contents and which are not likely to generate dangerous reactions with it. Employees for loading and unloading dangerous goods must have received appropriate training on the risks presented by the preparation and on any procedures to be adopted in the event of emergency situations.

14.1. UN Number

ADR/ADN/RID: 1760

IMDG: 1760

IATA: 1760

14.2. UN proper shipping name

ADR/ADN/RID: CORROSIVE LIQUID, N.O.S. (sodium hydroxide, biphenyl-2-ol)

IMDG: CORROSIVE LIQUID, N.O.S. (sodium hydroxide, biphenyl-2-ol)

IATA: CORROSIVE LIQUID, N.O.S. (sodium hydroxide, biphenyl-2-ol)

14.3. Transport hazard class(es)

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ADR/ADN/RID: 8
 IMDG: 8
 IATA: 8

14.4. Packing group

ADR/ADN/RID: II
 IMDG: II
 IATA: II

14.5. Environmental hazards

ADR/ADN/RID: YES
 IMDG: YES
 Marine Pollutant: NO
 IATA: YES

14.6. Special precautions for user

ADR/ADN/RID
 Classification code: C9
 Transport category: 2
 Hazard identification No: 80
 Labels: 8 + environmentally hazardous
 Special provisions: 274
 Limited quantity: 1 L
 Excepted quantity: E2
 Tunnel restriction code: (E)



IMDG
 Labels: 8 + environmentally hazardous
 Special provisions: 274
 Limited quantity: 1 L
 Excepted quantity: E2
 EmS: F-A, S-B
 Stowage and segregation Category B
 Segregation SW2



IATA
 Labels: Corrosive



Excepted quantity: E2
 Packing instruction: Cargo: 855 Passenger: 851 Limited Quantity: Y840
 Max net Qty/Pkg: 30 L 1 L 0.5 L
 Special provisions: A3 - A803

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk must comply with Annex II of MARPOL 73/78 and the IBC Code where applicable.

SECTION 15. Regulatory information

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

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Seveso Category - Directive 2012/18/EC: E2

Biocidal Product Regulation (Reg. (UE) 528/2012): not applicable

Detergents Regulation (Reg. (CE) 648/2004): not applicable

Dir. 2004/42/CE - VOC: not applicable

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

Product

Point 3 - 40

Substances in Candidate List (Art. 59 REACH)

On the basis of available data, the product does not contain any SVHC in percentage greater than 0,1%.

Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

15.2. Chemical safety assessment

A chemical safety assessment has been performed for the following contained substances

Chlorocresol

1-methoxy-2-propanol

Sodium hydroxide

tetrasodium ethylene diamine tetraacetate

propan-2-ol

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biphenyl-2-ol

phosphoric acid

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Liq. 2	Flammable liquid, category 2
Flam. Liq. 3	Flammable liquid, category 3
Met. Corr. 1	Substance or mixture corrosive to metals, category 1
Acute Tox. 4	Acute toxicity, category 4
STOT RE 2	Specific target organ toxicity - repeated exposure, category 2
Skin Corr. 1A	Skin corrosion, category 1A
Skin Corr. 1B	Skin corrosion, category 1B
Skin Corr. 1C	Skin corrosion, category 1C
Eye Dam. 1	Serious eye damage, category 1
Eye Irrit. 2	Eye irritation, category 2
Skin Irrit. 2	Skin irritation, category 2
STOT SE 3	Specific target organ toxicity - single exposure, category 3
Skin Sens. 1	Skin sensitization, category 1
Skin Sens. 1B	Skin sensitization, category 1B
Aquatic Acute 1	Hazardous to the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic toxicity, category 1
Aquatic Chronic 2	Hazardous to the aquatic environment, chronic toxicity, category 2
Aquatic Chronic 3	Hazardous to the aquatic environment, chronic toxicity, category 3
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H290	May be corrosive to metals.
H302	Harmful if swallowed.
H332	Harmful if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H335	May cause respiratory irritation.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

LEGEND:

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- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

CALCULATION METHODS

Chemical-physical hazards: the hazard was derived from the classification criteria of the CLP Regulation Annex I Part 2 and s.m.i.

Health hazards have been assessed using the calculation method envisaged by Reg. (CE) 1272/2008 (CLP) and subsequent amendments. for the classification of mixtures when data exist on all the components of the mixture or on some of them:

Acute Tox: application of criteria Table 3.1.1. Annex I Part 3 of the CLP Regulation and subsequent amendments

Skin Corr. 1A / 1B / 1C H314: application of the additivity formula criteria Table 3.2.3 Annex I Part 3 of the CLP Regulation

Skin Irrit 2 H315: application of additive formula criteria Table 3.2.3 Annex I Part 3 of the CLP Regulation

Eye Dam 1 H318: application of the additive formula criteria Table 3.3.3 Annex I Part 3 of the CLP Regulation

Eye Irrit. 2 H319: application of the formula of additivity criteria Table 3.3.3 Annex I Part 3 of the CLP Regulation

Eye Irrit. 2 H319: table 3.3.3 of Annex I, Part 3 of Reg. (EC) 1272/2008 (CLP) and subsequent amendments

Skin Sens 1A / 1B / 1C H317 Table 3.4.5 of Annex I, Part 3 of Reg. (CE) 1272/2008 (CLP) and subsequent amendments

Resp Sens 1A / 1B / 1C H334 Table 3.4.5 of Annex I, Part 3 of Reg. (CE) 1272/2008 (CLP) and subsequent amendments

Muta. 1A / 1B, 2 H340 - H341: table 3.5.2 Annex I Part 3 of the CLP Regulation and subsequent amendments

Carc 1A / 1B, 2 H350 - H351: table 3.6.2 Annex I Part 3 of the CLP Regulation and subsequent amendments

Repr 1A / 1B, 2 H360 - H361: table 3.7.2 Annex I Part 3 of the CLP Regulation and subsequent amendments

STOT SE 1, 2 H370 - 371: application of the calculation methods - table 3.8.3 of Annex I, Part 3 of Reg. (CE) 1272/2008 (CLP) and subsequent amendments

STOT SE 3 H336: chap. 3.8.3.4.5 of Annex I, Part 3 of Reg. (CE) 1272/2008 (CLP) and subsequent amendments

STOT RE 1, 2 H372 - H373: table 3.9.4 Annex I Part 3 of the CLP Regulation and subsequent amendments

Asp Tox 1 H304: application of the criteria 3.10 Annex I Part 3 of the CLP Regulation and subsequent amendments

Environmental hazards have been assessed using the calculation method provided for by Reg. (CE) 1272/2008 (CLP) and subsequent amendments for the classification of mixtures when data exist on all the components of the mixture or on some of them:

toxicity to the aquatic environment acute effects: table 4.1.1 of Annex I, Part 4 of Reg. (EC) 1272/2008 (CLP) and subsequent amendments;

toxicity to the aquatic environment chronic effects: table 4.1.2 of Annex I, Part 4 of Reg. (EC) 1272/2008 (CLP) and subsequent amendments

Note B:

Some substances (acids, bases, etc.) are placed on the market in aqueous solutions at various concentrations and, therefore, these solutions require different classification and labelling since the hazards vary at different concentrations.

In Part 3 entries with Note B have a general designation of the following type: 'nitric acid ... %'.

In this case the supplier must state the percentage concentration of the solution on the label. Unless otherwise stated, it is assumed that the percentage concentration is calculated on a weight/weight basis.

Puli Jet Plus 2.0**GENERAL BIBLIOGRAPHY**

1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
 2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
 3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
 4. Regulation (EU) 2015/830 of the European Parliament
 5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
 6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
 7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
 8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
 9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
 10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
 11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
 12. Regulation (EU) 2016/1179 (IX Atp. CLP)
 13. Regulation (EU) 2017/776 (X Atp. CLP)
 14. Regulation (EU) 2018/669 (XI Atp. CLP)
 15. Regulation (EU) 2018/1480 (XIII Atp. CLP)
 16. Regulation (EU) 2019/521 (XII Atp. CLP)
- The Merck Index. - 10th Edition
 - Handling Chemical Safety
 - INRS - Fiche Toxicologique (toxicological sheet)
 - Patty - Industrial Hygiene and Toxicology
 - N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
 - IFA GESTIS website
 - ECHA website
 - Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

First version of the document.