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VIRKON™ S
SAFETY of 1% Solutions

Executive summary

Virkon™ S is intended to be used at concentrations of 1% or less in most situations, at which dilution rate the product is considered to be low hazard and safe for the intended uses as any hazards associated with the powder are diluted by a factor of at least 100X. 1% concentration (or lower) solutions of Virkon™ S are therefore not classified as hazardous according to the European system for hazard classification[1].
This document is intended to support your risk assessment and as a general guide on safe use of Virkon™ S working solutions (1% concentration or lower). As exposure potential varies greatly between users, use areas and application methods, individual risk assessments will need to be conducted that are specific to your conditions of use and in accordance with the relevant national or regional legislation. Always follow the instructions of your risk assessment when using the product.
This document is not intended as a safety data sheet as per the meaning within 1907/2006 (REACH).

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1. IDENTIFICATION OF THE PRODUCT AND SUPPLIER

Product name: Virkon™ S (1% dilution in water)
Supplier: Hugh Crane Cleaning Equipment Ltd
South Walsham Road, Acle
Norwich NR13 3ES
Tel: +44 (0) 1493 750 072

2. HAZARD CLASSIFICATION

All information refers to diluted solutions of Virkon™ S at a concentration of 1% or lower in water, unless specified otherwise, and is made in accordance with European Regulation (EC) No 1272 /2008 on classification, labelling and packaging of substances and mixtures[1].

Hazard pictograms: None (not classified as dangerous)
Signal word: None
Hazard statements: None
Precautionary statements: None

3. BASIS FOR HAZARD CLASSIFICATION

According to the European Regulation on classification, labelling and packaging of substances and mixtures (1272/2008 – CLP), 1% solutions of Virkon™ S are not classified as dangerous. The justification for this is summarised below.
Calculation methods referred to below are those described in the abovementioned CLP regulation.

3.1. Toxicological profile

Endpoint	Result	Justification
Skin irritation	Not irritating	Calculation method
Eye irritation	Not irritating	Calculation method and independent test data following OECD Test Guideline 405 (eye irritation)
Skin Sensitisation	Not sensitising	Calculation method and independent test data following OECD Test Guideline 406 (skin sensitisation)
Acute oral toxicity	Not harmful	Independent test data according to OECD 401 for Virkon™ S **powder** demonstrating that the product has a low toxicity and therefore not harmful. Dilution to 1% will reduce the toxicity proportionally, to the extent that it is considered to be of very low toxicity.
Acute Dermal Toxicity	Not Harmful	Independent test data for Virkon™ S **powder** demonstrating that the product has a low toxicity and therefore not harmful. Dilution to 1% will reduce the toxicity proportionally, to the extent that it is considered to be of very low toxicity
Acute Inhalation Toxicity	Not Harmful	Calculation Method.

3.2. Specific Health Effects

Endpoint	Result	Justification
Carcinogenicity	Negative	Formulation does not include any substances classified as carcinogenic within the meaning of EC/1272/2008
Mutagenicity	Negative	Formulation does not include any substances classified as mutagenic within the meaning of EC/1272 /2008
Toxicity for Reproduction	Negative	Formulation does not include any substances classified as teratogenic within the meaning of EC/1272 /2008

3.3. Physical and Chemical Effects

Endpoint	Result	Justification
Flammability	Negative	Formulation does not include any substances classified as flammable within the meaning of EC/1272/2008
Oxidising	Negative	Testing on Virkon™ S POWDER according to method A17 of CD 92/69/EEC demonstrating that the product is not oxidising.

3.4. Ecological Effects

Endpoint	Result	Justification
Aquatic Toxicity	Not harmful	Testing on Virkon™ S POWDER demonstrates an aquatic toxicity within the range 1 – 100 mg/L. Taking the lowest concentration (daphnia) of 1 – 10 mg/L and account for the dilution of 100X for the 1% solution, this equates to a toxicity within the range of 100 – 1000 mg/L and is therefore not considered harmful,
Degradability	Not persistent	Calculation method.

4. FIRST AID ADVICE

4.1. Human Exposure

Whilst the solutions will not cause skin/mucous membrane irritation and eye damage/irritation within the meaning of European Regulations on hazard classification, contact with eyes may cause discomfort and skin contact may lead to mild skin irritation in some cases and with sufficient contact. Therefore, where contact with skin or eyes is expected, skin coverings and eye protection are recommended.
When facing spray mists and aerosols of the diluted product, respiratory protection may also be required, depending on the extent of potential exposure.

4.2. First aid advice

Route of Exposure	Potential Symptoms	Response
Inhalation	Mild irritation, coughing	If irritation or discomfort occurs following inhalation, remove from exposure. Use PPE and/or ventilation
Ingestion	Upset stomach, nausea	Ingestion of the solution is unexpected as a route of exposure. In case of ingestion, give small quantities of water to drink. Stop of if the person feels sick. Seek medical attention
Skin Contact	Mild irritation, reddening	In case of irritation flush skin with plenty of water
Eye Contact	Irritation, watering, reddening, discomfort	Flush with water. If irritation persists, seek medical attention

5. FIRE-FIGHTING MEASURES

As an aqueous solution without any physical or chemical properties of concern to firefighting (e.g. flammability, oxidisation), contact of 1% Virkon™ S solutions will suppress any fire that it comes in contact with.

6. STORAGE

Store unused solutions out of direct sunlight in loosely sealed containers. Prevent from contamination which could lead to a reduction in activity of the solution.
Prevent from contact with strong alkalis.
Do not leave in application equipment after use. Rinse thoroughly.

7. PERSONAL PROTECTION

Below is a guide on typical personal protective equipment (PPE) for common tasks involving solutions of Virkon™ S at a concentration of 1% or less. Selection of appropriate PPE will depend on many factors, many of which are specific to your operation and area of use. As a result, the required PPE must be defined by your own risk assessment.

7.1. Manual spraying, large areas

Task: Application of Virkon™ S 1% solutions by low-pressure spraying to surfaces and equipment in LARGE livestock facilities using pressure washers and other hand-held equipment.

7.2. Manual spraying, high ventilation

Task: Application of Virkon™ S 1% solutions by low-pressure spraying to surfaces and equipment in well ventilated areas.

7.3. heavy spraying, large area

Task: Application of Virkon™ S 1% solutions by low-pressure spraying to surfaces and equipment in LARGE livestock facilities using vehicle mounted equipment. Open cab. Low/moderate ventilation.

7.4. Fogging/fine misting applications

Task: Application of Virkon™ S solutions by high-pressure spraying. Very fine droplet sizes (1-50 µm) and heavy misting/fogging. Normally within enclosed areas.

8. STABILITY AND REACTIVITY

The product is considered to be stable at normal temperature ranges within which it is used.
Avoid contact with alkalis, acids, halides and metal salts.

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9. DISPOSAL CONSIDERATIONS

Virkon™ S solutions may generally be disposed of via drains leading to a foul sewer but not via drains leading to surface waters. Disposal to foul sewer is typically subject to discharge consent with the appropriate local authority and normally requires prior approval and control of the volumes discharged.
Always seek guidance from your local authority prior to discharge.
Note: Virkon™ S is generally considered to be of low risk to municipal sewage treatment facilities and data can be provided in support of any discharge consent procedures.
In general, the risk will often be negligible if relatively low volumes e.g. a few litres of solution is disposed of periodically into slurry or sewage in most cases, but each individual instance will also depend on other factors, such as the local authority guidelines, the volumes employed, the frequency of disposal and the capacity of the treatment plant.
As a result, disposal should be made according to your site's risk assessment.
Data can be supplied upon request to support any discharge consent applications.

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References:

1. European Union Regulation (EC) No 1272 /2008 on classification, labelling and packaging of substances and mixtures

Safety Data Sheet to follow.

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SAFETY DATA SHEET

According to Regulation (EC) No, 19707/2006

VIRKON™ S

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

Product Name: Virkon™ S
Product Code: 57747484
MSDS No.: 103000008259
Supplier: Hugh Crane Cleaning Equipment Ltd
South Walsham Road, Acle
Norwich, NR13 3ES
Telephone: 01493 750072 Fax 01493 751854
Emergency Telephone: 0870 190 6777 National Chemical Emergency Centre.

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against
Use of the Substance/Mixture: Disinfectants

2. HAZARDS IDENTIFICATION

Classification Of The Substance Or Mixture
Classification according to Regulation (EC) No 1272/2008
Classification:

Skin Irritation Category 2.	H315	Causes skin irritation
Serious Eye Damage Category 1	H318	Causes serious eye damage.
Chronic aquatic toxicity, Category 3	H412	Harmful to aquatic life with long lasting effects.

Label Elements
Labelling (Regulation [EC] No 1272/2008)
Hazard Pictograms:

Signal Word: Danger
Hazard Statements:
H315 Causes skin irritation.
H318 Causes serious eye damage.
H412 Harmful to aquatic life with long lasting effects

Precautionary Statements
Prevention:
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/eye protection/face protection.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of water.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if pre-sent and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 + P364 Take off contaminated clothing and wash it before reuse.

Disposal: P501 Dispose of contents/ container to an approved waste disposal plant.

Hazardous components which must be listed on the label:
pentapotassium bis(peroxymonosulphate) bis(sulphate)
Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts
potassium hydrogensulphate
dipotassium disulphate

Additional Labelling: Contains dipotassium peroxodisulphate, Dipentene. May produce an allergic reaction.

Other hazards: 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.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures

Product/Ingredient Name	CAS No	EC No	Index No	REACH Reg .No	Classification (EC 1272/2008) (CLP)	Concentration (% w/w)
Pentapotassium bis (peroxymonosulphate) bis (Sulphate)	70693-62-8	274-778-7		01-2119485567-22	Acute Tox 4 H302 Skin Corr 1B H314 Eye Dam 1 H318 Aquatic Chronic 3 H412	>=30 - <50

Product/Ingredient Name	CAS No	EC No	Index No	REACH Reg .No	Classification (EC 1272/2008) (CLP)	Concentration (% w/w)
Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts	68411-30-3	270-115-0		01-2119489428-22	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 Aquatic Chronic 3; H412	>=10 - <20
Malic Acid	6915-15-7	230-022-8		01-2119906954-31	Eye Irrit 2 H319	>=1 - <10
Sulphamidic Acid	5329-14-6	226-218-8	016-026-00-0	01-2119488633-28	Skin Irrit 2 H319 Skin Irrit 2 H315 Aquatic Chronic 3 H412	>=2.5 - <10
Potassium Hydrogensulphate	7646-93-7	231-594-1	016-056-00-4		Skin Corr 1b H314 Eye Dam 1 H318 STOT SE 3 H335 Respiratory system	>=1 - <3
Dipotassium disulphate	7790-62-7	232-216-8			Acute Tox 3 H331 Skin Corr 1a H314 Eye Dam 1 H318	>=1 - <3
Sodium toluenesulfonate	12068-03-0	235-088-1			Skin Irrit 2 H315 Eye Irrit 2 H319	>=1 - <10
Dipotassium peroxodisulphate	7727-21-1	231-781-8	016-061-00-1	01-2119495676-19	Ox Sol 3 H272 Acute Tox 4 H302 Skin Irrit 2 H315 Eye Irrit 2 H319 Resp. Sens 1 H334 Skin Sens 1 H317 STOT SE H335 Respiratory system	>=0.1 - <1
Dipentene **Aquatic Acute, M=1** **Aquatic Chronic, M=1**	138-86-3	205-341-0	601-029-00-7		Flam Liq 3 H226 Skin Irrit 2 H315 Eye Irrit 2 H319 Skin Sens 1 H317 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	>=0.1 - <0.25

See Section 16 for the full text of the H statements and explanation of abbreviations above.

4. FIRST AID MEASURES

Description of First Aid Measures

General advice: Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.

Inhalation: If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

Skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

Eye contact: Small amounts splashed into eyes can cause irreversible tis-sue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Continue rinsing eyes during transport to hospital. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist

If Swallowed: Keep respiratory tract clear. Do NOT induce vomiting. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

Most important symptoms and effects, both acute and delayed

None known.

Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable extinguishing media: In case of fire, use water spray (fog), foam or dry chemical.
Unsuitable Extinguishing Media: Carbon (CO_2). High volume water jet.

Specific Hazards Arising from the Substance or Mixture

Specific hazards during fire-fighting: Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous Combustion Products: Sulphur oxides. Metal oxides. Carbon dioxide (CO_2). Carbon monoxide. Nitrogen oxides (NOx). Halogenated compounds.

Advice for Fire Fighters

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus for fire fighting if necessary.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, Protective Eqpt & Emergency Procedures

Personal Precautions: Use personal protective equipment. Avoid dust formation. Avoid breathing dust.

Environmental Precautions

Environmental precautions: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains, inform relevant authorities.

Methods And Materials For Containment And Cleaning Up

Methods for Cleaning Up: Neutralise with chalk, alkali solution or ammonia. Keep in suitable, closed containers for disposal.

Reference to Other Sections

References: See Section 8 for personal protection. See Section 13 for disposal considerations.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Advice on safe handling: Protect from moisture. Avoid formation of respirable particles. Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion: Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

Conditions for Safe Storage Including any Incompatibilities

Requirements for storage areas and containers: Protect from moisture. Combustible substances. Strong bases
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully re-sealed and kept upright to prevent leakage. Electrical installations / working materials must comply with the technological safety standards

Advice on common storage: Do not store near acids.

Recommended storage temperature: < 50 °C

Further information on storage stability: Keep in a dry place. No decomposition if stored and applied as directed.

Specific End Use(s)

Specific Uses: No data available.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters: Contains no substances with occupational exposure limit values.

Exposure Controls

Engineering Measures: This information is not available.

Personal Protective Equipment

Eye Protection: Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand Protection

Material: Butyl rubber – IIR

Wearing Time: <60 min

Remarks: The suitability for a specific workplace should be discussed with the producers of the protective gloves. After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations

Skin and body protection: Wear suitable protective clothing. Dust impervious protective suit. Choose body protection according to the amount and concentration of the dangerous substance at the work place

Respiratory protection: In the case of dust or aerosol formation use respirator with an approved filter

Filter type: Recommended Filter type: ABEK-P2-filter

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance: Powder

Colour: Pink.
Odour: Pleasant, sweet.
Odour Threshold: No data available. Not determined.
pH: 2.35 – 2.65 (conc. 1%).
Melting/Freezing Point: No data available. Biocides Authorisation not required.
Boiling Point/Boiling Range: No data available. Biocides Authorisation not required.
Flash point: Not applicable. Solid.
Evaporation rate: No data available. Biocides Authorisation not required.
Flammability (Solid, Gas): The product is not flammable.
Burning Number: Not applicable.
Upper Explosion/Flammability Limit: Not applicable. Solid.
Lower Explosion/Flammability Limit: Not applicable. Solid.
Vapour Pressure: No data available. Biocides Authorisation not required.
Relative Vapour Density: Not applicable. Solid.
Relative Density: 1.07.
Density: 1.07 g/cm^3 (20ºC)
Solubility in water: 65 g/l
Partition Coefficient n-octanol/water: Not applicable. Preparation.
Ignition Temperature: Not applicable. Solid.
Decomposition Temperature: >50ºC
Viscosity, Dynamic: Not applicable. Solid.
Viscosity, Kinematic: Not applicable. Solid.
Explosive properties: Not explosive.
Oxidising Properties: The substance or mixture is not classified as oxidising.
Method: Regulation [EC] No 440/2008, Annex A.17
Other Information: No data available.

10. STABILITY AND REACTIVITY

Reactivity: No decomposition if stored and applied as directed.
Chemical Stability: No decomposition if stored and applied as directed.
Possibility of Hazardous reactions: No decomposition if stored and applied as directed. Dust may form explosive mixture in air.
Conditions to avoid: Exposure to moisture.
Incompatible Materials: Incompatible with acids. Combustible substances. Oxidising agents. Strong bases. Brass. Cyanides. Copper, Halogenated compounds. Metal salt
Hazardous decomposition Products: Oxygen. Chlorine, Sulphur oxides, hypochlorites.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

ACUTE TOXICITY

PRODUCT

Acute Oral Toxicity:	LD50 (rat, male and female): 4123 mg/kg	
	Method:	OECD Test Guideline 401
	GLP:	Yes
Acute Inhalation Toxicity:	LC50 (rat)	3.7 mg/l
	Exposure Time:	4 hrs
	Test Atmosphere:	Dust/mist
	Method:	OECD Test Guideline 403
	Assessment:	The substance or mixture has no acute inhalation toxicity.
	Remarks:	The particle size measurements of the product indicate that it is not respirable and therefore not bioavailable by the inhalation route
Acute Dermal Toxicity:	LD50 (rat)	5000 mg/kg
	Remarks:	Extrapolation according to Regulation (EC No 440/2008)

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate

Acute Oral Toxicity:	LD50 (rat, male and female): 500 mg/kg	
	Method:	OECD Test Guideline 423
Acute Inhalation Toxicity:	LC50 (rat, male):	>5 mg/l
	Exposure Time:	4 hrs
	Test Atmosphere:	Dust/mist
	Method:	OECD Test Guideline 403
	Assessment:	The substance or mixture has no acute inhalation toxicity.
	Remarks:	Highest producible concentration.

Acute Dermal Toxicity: LD50 (rat, male and female: >5000 mg/kg
Method: OECD Test Guideline 402
Remarks: Extrapolation according to Regulation (EC No 440/2008)

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts

Acute Oral Toxicity: LD50 (rat, male and female): 1080 mg/kg
Method: OECD Test Guideline 401
GLP: No

Acute Dermal Toxicity: LD50 (rat, male and female): >5000 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Assessment: The substance or mixture has no acute dermal toxicity.
Remarks: Dosage caused no mortality.

Malic Acid

Acute Oral Toxicity: LD50 (rat, male and female): 3500 mg/kg
Method: OECD Test Guideline 401
GLP: no

Acute Inhalation Toxicity: LC50 (rat, male and female): >1306 mg/l
Exposure Time: 4 hrs
Test Atmosphere: Dust/mist
Method: OECD Test Guideline 403
Remarks: Highest producible concentration.

Acute Dermal Toxicity: LD50 (Rabbit, female): >5000 mg/kg
Method: OECD Test Guideline 401
GLP: no

Sulphamidic Acid

Acute Oral Toxicity: LD50 (Rat, female): 2,065 mg/kg
Method: OECD Test Guideline 401
GLP: Yes

Acute Dermal Toxicity: LD50 (rat, male and female): >2,000 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Assessment: The substance or mixture has no acute dermal toxicity.
Remarks: Extrapolation according to Regulation (EC No 440/2008)

Potassium Hydrogensulphate

Acute Oral Toxicity: LD50 (rat): 2340 mg/kg

Dipotassium disulphate

Acute Oral Toxicity: LD50 (rat, male): 2140 mg/kg
Method: OECD Test Guideline 401
Remarks: Test results on an analogous product.

Acute Inhalation Toxicity: Assessment: Corrosive to the respiratory tract.
The component/mixture is toxic after short term inhalation.

Sodium toluenesulfonate

Acute Oral Toxicity: LD50 (rat): 6500 mg/kg

Acute Dermal Toxicity: LD50 (rabbit): >2000 mg/kg

Dipotassium peroxodisulphate

Acute Oral Toxicity: LD50 (rat): 700 mg/kg

Acute Inhalation Toxicity: LC50 (rat,): >2.95 mg/l
Exposure Time: 4 hrs
Test Atmosphere: Dust/mist
Remarks: Highest producible concentration.

Acute Dermal Toxicity: LD50 (rabbit): >10,000 mg/kg

Dipentene

Acute Oral Toxicity: LD50 (rat): 5300 mg/kg
Acute Dermal Toxicity: LD50 (rat): >5,000 mg/kg

SKIN CORROSION/IRRITATION

PRODUCT

Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate
Species: Rabbit
Method: OECD Test Guideline 404
Result: Causes burns.

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.
GLP: No

Malic Acid
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Sulphamidic Acid
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

Potassium Hydrogensulphate
Assessment: Causes burns.

Dipotassium disulphate
Assessment: Causes severe burns.

Sodium toluenesulfonate
Species: Rabbit
Result: Irritating to skin.

Dipotassium peroxodisulphate
Species: Rabbit
Method: OECD Test Guideline 404
Result: Irritating to skin.

Dipentene
Assessment: Irritating to skin.

SERIOUS EYE DAMAGE / EYE IRRITATION

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate
Species: Rabbit
Method: OECD Test Guideline 405
Result: Risk of serious damage to eyes.

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts
Species: Rabbit
Method: OECD Test Guideline 405
Result: Risk of serious damage to eyes.
GLP: Yes

Malic Acid
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritating to eyes.

Sulphamidic Acid
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritating to eyes.

Dipotassium disulphate
Assessment: Risk of serious damage to eyes.

Sodium toluenesulfonate
Species: Rabbit
Result: Irritating to eyes.

Dipotassium peroxodisulphate
Result: Irritating to eyes.

Dipentene
Species: Rabbit
Result: Irritating to eyes.

RESPIRATORY OR SKIN SENSITISATION

PRODUCT

Exposure Route: Skin contact.
Species: Guinea Pig
Method: OECD Test Guideline 406
Remarks: Did not cause sensitisation on laboratory animals.

Exposure Route: Inhalation.
Species: Mammal – species unspecified
Method: Expert judgement
Remarks: Does not cause respiratory sensitisation.

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate
Exposure Route: Skin contact.
Species: Guinea Pig
Method: OECD Test Guideline 406
Remarks: Did not cause skin sensitisation

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts
Test Type: Maximisation test.
Exposure Route: Skin contact.
Species: Guinea Pig
Method: OECD Test Guideline 406
Remarks: Did not cause sensitisation on laboratory animals.
GLP: Yes

Malic Acid
Exposure Route: Skin contact.
Species: Guinea Pig
Method: OECD Test Guideline 406
Remarks: Did not cause sensitisation on laboratory animals.
GLP: yes

Sulphamidic Acid
Result: Did not cause sensitisation on laboratory animals.

Sodium toluenesulfonate
Exposure Route: Skin contact.
Species: Guinea Pig
Method: OECD Test Guideline 406
Remarks: Did not cause sensitisation on laboratory animals.

Dipotassium peroxodisulphate
Exposure Route: Inhalation.
Species: Mammal – species unspecified
Result: May cause sensitisation by inhalation.

Exposure Route: Skin contact.
Species: Mouse
Method: OECD Test Guideline 429
Remarks: May cause sensitisation by skin contact.

Dipentene
Test Type: Maximisation test.
Exposure Route: Dermal
Species: Guinea pig
Remarks: May cause sensitisation by skin contact.

GERM CELL MUTAGENICITY

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate

Genotoxicity in Vitro:	Test system:	Mammalian-Animal
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 476
	Result:	positive
	GLP:	yes
	Test system:	Bacteria
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 471
	Result:	negative
	GLP:	yes
	Test system:	Mammalian-Human
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 473
	Result:	positive
	GLP:	
Genotoxicity in Vivo:	Species:	Mammalian-Animal
	Application Route:	Oral
	Method:	OECD Test Guideline 474
	Result:	negative

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts

Genotoxicity in Vitro:	Test type:	Ames test
	Test system:	Salmonella typhimurium
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 471
	Result:	negative
	GLP:	yes
	Test type:	Chromosome aberration test in vitro
	Test system:	Chinese hamster ovary cells
	Metabolic activation:	without metabolic activation
	Method:	OECD Test Guideline 473
	Result:	negative
	GLP:	yes
	Test type:	Chromosome aberration test in vitro
	Test system:	Chinese hamster ovary cells
	Metabolic activation:	with metabolic activation
	Method:	OECD Test Guideline 473
	Result:	positive
	GLP:	yes
	Test type:	In vitro mammalian cell gene mutation test
	Test system:	Chinese hamster ovary cells
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 473
	Result:	negative
	GLP:	yes
Genotoxicity in Vivo:	Test type:	Cytogenetic assay
	Species:	Mouse (male)
	Cell Type:	Bone marrow
	Application Route:	Oral
	Result:	negative
	GLP:	No
	Test type:	Dominant lethal test
	Species:	Mouse (male)
	Application Route:	Oral
	Result:	negative
	GLP:	No

Malic Acid

Genotoxicity in Vivo:	Remarks:	Not mutagenic in a standard battery of genetic toxicological tests.

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Sulphamidic Acid

Genotoxicity in Vitro:	Test system:	Mammalian-Human
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 487
	Result:	negative
	GLP:	yes
	Test system:	Mammalian-Animal
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 476
	Result:	negative
	Test system:	Bacteria
	Metabolic activation:	with and without metabolic activation
	Method:	OECD Test Guideline 471
	Result:	negative

Sodium toluenesulfonate

Genotoxicity in Vitro:	Remarks:	No mutagenic effect.

Dipotassium peroxodisulphate

Genotoxicity in Vitro:	Remarks:	Not mutagenic in a standard battery of genetic toxicological tests.

REPRODUCTIVE TOXICITY

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate

Effects on Foetal Development:	Remarks:	No teratogenic or foetotoxic effects were found at all dose levels tested.

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts

Effects on Fertility:	Test Type:	Three generation study,
	Species:	Rat, male and female.
	Application Route:	Oral.
	Dose:	0-14-70-350 milligram per kilogram.
	General Toxicity:	Parent: NOAEL 35 mg/kg bodyweight.
		F1: NOAEL 350 mg/kg bodyweight.
		F2: NOAEL 350 mg/kg bodyweight.
	Fertility:	NOAEL: 350 mg/kg bodyweight.
	Result:	Animal testing did not show any effects on fertility.
	GLP:	No
	Remarks:	Test results on an analogous product.
Effects on Foetal Development:	Species:	Rat (female)
	Application Route:	Oral
	General Toxicity Maternal:	NOAEL 300 mg/kg bodyweight.
	Teratogenicity:	NOAEL 300 mg/kg bodyweight.
	Result:	No teratogenic effects.
	GLP:	No
	Remarks:	Test results on an analogous product.

Malic Acid

Effects on Foetal Development:	Remarks:	No known significant effects or critical hazards.

STOT – SINGLE EXPOSURE

COMPONENTS

Potassium hydrogensulphate

Assessment:	May cause respiratory irritation.

Dipotassium peroxodisulphate

Assessment:	May cause respiratory irritation.

REPEATED DOSE TOXICITY

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate

Species:	Rat, male and female
LOAEL:	>1000 mg/kg
Application Route:	Oral

Exposure Time: 28 days
Number of exposures: 7 days/week
Method: OECD Test Guideline 407.
Remarks: Subacute toxicity.

Species: Rat, male and female
LOAEL: 600 mg/kg
Application Route: Oral
Exposure Time: 90 days
Number of exposures: 7 days/week
Method: OECD Test Guideline 408.
Remarks: Sub-chronic toxicity.

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts
Species: Rat, male and female
NOAEL: 85 mg/kg
LOAEL: 145 mg/kg
Application Route: Oral
Exposure Time: 36 weeks
Number of Exposures: Daily
GLP: No
Remarks: Sub-chronic toxicity.

Malic Acid
Remarks: No known significant effects or critical hazards.

Sodium toluenesulfonate
Species: Rat
NOAEL: 114 mg/kg
Application Route: Oral
Exposure Time: 91 days
Method: OECD Test Guideline 408
Remarks: Sub-chronic toxicity.

FURTHER INFORMATION
PRODUCT
Remarks: No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

PRODUCT
Toxicity to Fish: LC50 (Salmo salar [Atlantic Salmon]) 24.6 mg/l
Exposure Time: 96 hrs
Method: Regulation (EC) No. 440/2008, Annex C1
Remarks: Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Dapnia Magna [Water flea]): 6.5 mg/l
Exposure Time: 48 hrs
Method: OECD Test Guideline 202
Remarks: Fresh water.

Toxicity to Algae: NOEC (Desmodesmus subcapitatus [green algae]): 6.25 mg/l
Exposure Time: 72 hrs
Method: OECD Test Guideline 201
Remarks: Fresh water.

COMPONENTS
Pentapotassium bis (peroxymonosulphate) bis (Sulphate)
Toxicity to Fish: LC50 (Oncorhynchus mykiss [Rainbow Trout]) 53 mg/l
Exposure Time: 96 hrs
Method: OECD Test Guideline 203
GLP: yes
Remarks: Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Dapnia Magna [Water flea]): 3.5 mg/l
Exposure Time: 48 hrs
Method: OECD Test Guideline 202
GLP: yes
Remarks: Fresh water.

Toxicity to Algae: EC50 (Pseudokirchneriella subcapitata [microalgae]): >1 mg/l

Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

NOEC (Pseudokirchneriella subcapitata [microalgae]): 0.5 mg/l

Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

Benzenesulfonic acid, C10-13-alkyl derivs., sodium salts

Toxicity to Fish: LC50 (Pimephales Promelas) [Fathead minnow] : 2.88 mg/l

Exposure Time:	96 hrs
Analytical Monitoring:	Yes
Method:	OECD Test Guideline 203
GLP:	No
Remarks:	Fresh Water

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): 2.9 mg/l

Exposure Time:	48 hrs
Analytical Monitoring:	Yes
Method:	OECD Test Guideline 202
GLP:	yes
Remarks:	Fresh water.

Toxicity to Algae: EC50 (Pseudokirchneriella subcapitata [green algae]): 235 mg/l

Exposure Time:	72 hrs
Analytical Monitoring:	No
Method:	OECD Test Guideline 201
GLP:	No
Remarks:	Fresh Water

EC10 (Pseudokirchneriella subcapitata [green algae]): 13.1 mg/l

Exposure Time:	72 hrs
Analytical Monitoring:	No
Method:	OECD Test Guideline 201
GLP:	No
Remarks:	Fresh Water

Toxicity to Fish (Chronic Toxicity) NOEC: 0.23 mg/l

Exposure Time:	72 days
Species:	Oncorhynchus myksiss [rainbow trout]
Analytical Monitoring:	Yes
Method:	OECD Test Guideline 210
GLP:	no
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates (Chronic Toxicity): NOEC 1.18 mg/l

Exposure Time:	21 days
Species:	Daphnia Magna [Water flea]
Analytical Monitoring:	Yes
Method:	OECD Test Guideline 211
GLP:	no
Remarks:	Fresh water.

Malic Acid

Toxicity to Fish: LC50 (Danio rerio [Zebra fish]) >100 mg/l

Exposure Time:	96 hrs
Method:	OECD Test Guideline 203
GLP:	yes
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]: 240 mg/l

Exposure Time:	48 hrs
Method:	OECD Test Guideline 202
GLP:	yes
Remarks:	Fresh water.

Toxicity to Algae: EC50 (Algae) : >100 mg/l

Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

NOEC (algae): 100 mg/l

Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

Sulphamidic Acid

Toxicity to Fish: LC50 (Pimephales promelas [fathead minnow]) : 70.3 mg/l

Exposure Time:	96 hrs
Method:	OECD Test Guideline 203
GLP:	no
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): 7.16 mg/l

Exposure Time:	48 hrs
Method:	OECD Test Guideline 202
GLP:	yes
Remarks:	Fresh water.

Toxicity to Algae: EC50 (Desmodesmus subspicatus [green algae]) : 48 mg/l

End Point:	Growth rate.
Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

NOEC (Desmodesmus subspicatus [green algae]) : 18 mg/l

End Point:	Growth rate.
Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
GLP:	yes
Remarks:	Fresh water.

Toxicity to Microorganisms: EC50: >200 mg/l

End Point:	Respiration inhibition.
Exposure Time:	3 hrs
Method:	OECD Test Guideline 209
GLP:	yes
Remarks:	Fresh water.

Toxicity to Fish (Chronic Toxicity) NOEC:>= 60 mg/l

Exposure Time:	34 days
Species:	Danio rerio [Zebra fish]
Method:	OECD Test Guideline 210

Toxicity to Daphnia and other Aquatic Invertebrates (Chronic Toxicity): NOEC 19 mg/l

Exposure Time:	21 days
Species:	Daphnia Magna [Water flea]
Method:	OECD Test Guideline 211

Dipotassium disulphate

Toxicity to Fish: LC50 (Pimephales promelas [fathead minnow]) : 680 mg/l

Exposure Time:	96 hrs
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): 720 mg/l

Exposure Time:	48 hrs
Remarks:	Fresh water.

Toxicity to Algae: EC50 (Pseudokirchneriella subcapitata [microalgae]) : 1492 mg/l

Exposure Time:	96 hrs
Remarks:	Fresh water.

EC10 (Pseudokirchneriella subcapitata [microalgae]): 656 mg/l

Exposure Time:	96 hrs
Remarks:	Fresh water.

Toxicity to Fish (Chronic Toxicity) NOEC:> 595 mg/l

Exposure Time:	7 days
Species:	Pimephales promelas [fathead minnow]
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates (Chronic Toxicity): NOEC 790 mg/l

Exposure Time:	7 days
Species:	Ceriodaphnia Dubia [Water flea]
Remarks:	Fresh water.

Sodium toluenesulfonate

Toxicity to Fish: LC50 (Oncorhynchus mykiss [Rainbow trout]) : >490 mg/l

Exposure Time:	96 hrs
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): >318 mg/l

Exposure Time:	48 hrs
Remarks:	Fresh water.

Toxicity to Algae: EC50 (Desmodesmus subspicatus [green algae] : 245 mg/l

Exposure Time:	72 hrs
Method:	OECD Test Guideline 201
Remarks:	Fresh water.

NOEC (Desmodesmus subspicatus [green algae] : 18 mg/l

Exposure Time:	72 hrs
Remarks:	Fresh water.

Dipotassium peroxodisulphate

Toxicity to Fish: LC50 (Oncorhynchus mykiss [Rainbow trout]) : 76.3 mg/l

Exposure Time:	96 hrs

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): 120 mg/l

Exposure Time:	48 hrs

Toxicity to Algae: EC50 (Pseudokirchneriella subcapitata [microalgae] : 83.7 mg/l
Exposure Time: 72 hrs
Method: OECD Test Guideline 201

Ecotoxicology Assessment

Long Term (Chronic) Aquatic Hazard: This product has no known ecotoxicological effects.

Dipentene

Toxicity to Fish: LC50 (Pimephales promelas [Fathead minnow]) : 0.702 mg/l

Exposure Time:	96 hrs
Remarks:	Fresh water.

Toxicity to Daphnia and other Aquatic Invertebrates: EC50 (Daphnia Magna [Water flea]): 0.421 mg/l

Exposure Time:	48 hrs
Remarks:	Fresh water.

M Factor (short term [acute] Aquatic hazard): 1

M Factor (Long term [acute] Aquatic hazard): 1

12.2 Persistence and Degradability

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate)

Biodegradability: Result: The methods for determining the biological degradability are not applicable to inorganic substances.

Benzenesulfonic acid, C10-13- alkyl derivs,. Sodium salts

Biodegradability:

Result:	Readily biodegradable.
Biodegradation:	83%
Exposure Time:	28 days
Method:	OECD Test Guideline 301B
GLP:	yes

Malic Acid

Biodegradability:	Test Type:	Aerobic
	Result:	Readily biodegradable
	Biodegradation:	67.5%
	Exposure Time:	28 days
	Method:	OECD Test Guideline 301B
	GLP:	yes

Sulphamidic Acid

Biodegradability:	Result:	The methods for determining the biological degradability are not applicable to inorganic substances.

Dipotassium disulphate

Biodegradability:	Result:	The methods for determining the biological degradability are not applicable to inorganic substances.

Sodium Toluenesulphonate

Biodegradability:	Result:	Not readily biodegradable
	Biodegradation:	0-2%
	Exposure Time:	28 days
	Method:	OECD Test Guideline 301C

Dipotassium Peroxodisulphate

Biodegradability:	Result:	The methods for determining the biological degradability are not applicable to inorganic substances.

Dipentene

Biodegradability:	Result:	Not readily biodegradable

12.3 Bioaccumulative Potential

COMPONENTS

Pentapotassium bis (peroxymonosulphate) bis (sulphate)

Partition coefficient: n-octanol/Water:	log Pow:	<0.3
	Method:	OECD Test Guideline 117

Benzenesulfonic acid, C10-13- alkyl derivs,. Sodium salts

Partition coefficient: n-octanol/Water:	log Pow:	1.4 (23ºC)
	Method:	OECD Test Guideline 123

Malic acid

Partition coefficient: n-octanol/Water:	log Pow:	-1.26

Sulphamidic acid

Partition coefficient: n-octanol/Water:	log Pow:	-4.34

12.4 Mobility in Soil

No data available.

12.5 Results of PBT & vPvB Assessment

PRODUCT

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.

12.6 Other Adverse Effects

PRODUCT

Additional Ecological Information: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Product: The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed Waste Management company.

Contaminated Packaging: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

14. TRANSPORT INFORMATION

UN Number: Not regulated as dangerous goods.

UN Proper Shipping Name : Not regulated as dangerous goods.

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Transport Hazard Class(es): Not regulated as dangerous goods.
Packing Group: Not regulated as dangerous goods.
Environmental Hazards: Not regulated as dangerous goods.

Special Precautions for User / Additional Advice

Hazard Statements: Not dangerous cargo.
Irritating to skin.
Keep dry,
Risk of serious damage to eyes.
Keep separated from foodstuffs.

Transport in Bulk, According to Annex II of MARPOL and the IBC Code: Not applicable for product as supplied.

15. REGULATORY INFORMATION

Safety, Health & Environmental regulations/legislation specific for substance/mixture

International Chemical Weapons Convention (CWC) Schedules of Toxic Chemicals and Precursors: Not applicable.

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59): Not applicable

REACH - List of Substances subject to Authorisation (Annex XIV): Not applicable.

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer: Not applicable.

Regulation (EC) No 850/2004 on persistent organic pollutants: Not applicable.

Council Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors : Neither banned nor restricted.

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII): Not applicable.

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances: Not applicable

Chemical Safety Assessment: Not applicable.

16. OTHER INFORMATION

SDS Revision Date: 4th November 2019.

Full text of H-Statements:

H226	Flammable liquid and vapour.
H272	May intensify fire; oxidizer.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects

Full text of other abbreviations

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Eye Dam.	Serious eye damage
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
Ox. Sol.	Oxidizing solids
Resp. Sens.	Respiratory sensitisation
Skin Corr.	Skin corrosion
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation
STOT SE	Specific target organ toxicity - single exposure

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ATE	Acute Toxicity Estimate.
BCF	Bioconcentration factor.
GHS	Globally Harmonised System of Classification and Labelling of Chemicals.

Further Information

Classification of the Mixture		**Classification Procedure**
H315	Skin Irrit 2	Based on product data or assessment.
H318	Eye Dam 1	Calculation method.
H412	Aquatic Chronic	Calculation method.

Notice to Reader: The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet and its Annex (if required according to Regulation [EC] 1907/2006 [REACH]) is to describe the products in terms of their safety requirements. The given details do not imply any guarantee concerning the composition, properties or performance.

End of Safety Data Sheet.