

Control Lysates

TGR BioSciences

Chemwatch Hazard Alert Code: 2

Chemwatch: 5223-48

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Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

L.GHS.USA.EN

SECTION 1 IDENTIFICATION

Product Identifier

Product name	Control Lysates
Synonyms	Positive Control Lysate
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Use according to manufacturer's directions.
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Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	TGR BioSciences
Address	31 Dalgleish St SA Thebarton 5031 Australia
Telephone	61 8 8354 6180
Fax	61 8 8354 6188
Website	www.tgrbio.com
Email	info@tgrbio.com

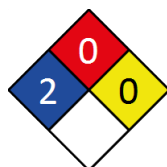
Emergency phone number

Association / Organisation	CHEMTREC/PerkinElmer
Emergency telephone numbers	+1 703-527-3887
Other emergency telephone numbers	+31 50 5445971

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture


NFPA 704 diamond



Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Skin Sensitizer Category 1
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Label elements

GHS label elements	
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SIGNAL WORD	WARNING
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Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H317	May cause an allergic skin reaction.

Hazard(s) not otherwise specified

Not Applicable

Control Lysates

Precautionary statement(s) Prevention

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary statement(s) Response

P362	Take off contaminated clothing and wash before reuse.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7647-14-5	<=2.5	<u>sodium chloride</u>
7447-40-7	<=2.5	<u>potassium chloride</u>
7782-85-6	<=2.5	<u>sodium phosphate, dibasic, heptahydrate</u>
7778-77-0	<=2.5	<u>potassium phosphate, monobasic</u>
7758-16-9	<=0.1	<u>sodium acid pyrophosphate</u>
7681-49-4	<=0.1	<u>sodium fluoride</u>
13721-39-6	<=0.1	<u>sodium orthovanadate</u>
9002-93-1	<=0.5	<u>p-tert-octylphenol ethoxylate</u>
55965-84-9	<=0.1	<u>isothiazolinones, mixed</u>
151-21-3	<=0.1	<u>sodium lauryl sulfate</u>
57-50-1	<=5	<u>sucrose</u>
Not Available	<=1	Cell extract (protein, not exceeding)
	balance	Ingredients determined not to be hazardous

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately with fresh running water. ▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. ▶ Seek medical attention without delay; if pain persists or recurs seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> ▶ Immediately remove all contaminated clothing, including footwear. ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▶ Other measures are usually unnecessary.
Ingestion	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 FIRE-FIGHTING MEASURES

Control Lysates

Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

- | | |
|-----------------------------|--|
| Fire Incompatibility | ▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result |
|-----------------------------|--|

Special protective equipment and precautions for fire-fighters

Fire Fighting	<ul style="list-style-type: none"> ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves in the event of a fire. ▶ Prevent, by any means available, spillage from entering drains or water courses. ▶ Use fire fighting procedures suitable for surrounding area. ▶ DO NOT approach containers suspected to be hot. ▶ Cool fire exposed containers with water spray from a protected location. ▶ If safe to do so, remove containers from path of fire. ▶ Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	<ul style="list-style-type: none"> ▶ Non combustible. ▶ Not considered to be a significant fire risk. ▶ Expansion or decomposition on heating may lead to violent rupture of containers. ▶ Decomposes on heating and may produce toxic fumes of carbon monoxide (CO). ▶ May emit acrid smoke. <p>Decomposition may produce toxic fumes of:</p> <ul style="list-style-type: none"> , carbon dioxide (CO₂) , hydrogen chloride , phosgene , hydrogen fluoride , nitrogen oxides (NO_x) , other pyrolysis products typical of burning organic material.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ Clean up all spills immediately. ▶ Avoid breathing vapours and contact with skin and eyes. ▶ Control personal contact with the substance, by using protective equipment. ▶ Contain and absorb spill with sand, earth, inert material or vermiculite. ▶ Wipe up. ▶ Place in a suitable, labelled container for waste disposal.
Major Spills	<p>Moderate hazard.</p> <ul style="list-style-type: none"> ▶ Clear area of personnel and move upwind. ▶ Alert Fire Brigade and tell them location and nature of hazard. ▶ Wear breathing apparatus plus protective gloves. ▶ Prevent, by any means available, spillage from entering drains or water course. ▶ Stop leak if safe to do so. ▶ Contain spill with sand, earth or vermiculite. ▶ Collect recoverable product into labelled containers for recycling. ▶ Neutralise/decontaminate residue (see Section 13 for specific agent). ▶ Collect solid residues and seal in labelled drums for disposal. ▶ Wash area and prevent runoff into drains. ▶ After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using. ▶ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ DO NOT allow clothing wet with material to stay in contact with skin ▶ Avoid all personal contact, including inhalation. ▶ Wear protective clothing when risk of exposure occurs. ▶ Use in a well-ventilated area. ▶ Avoid contact with moisture. ▶ Avoid contact with incompatible materials. ▶ When handling, DO NOT eat, drink or smoke. ▶ Keep containers securely sealed when not in use. ▶ Avoid physical damage to containers. ▶ Always wash hands with soap and water after handling.
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Continued...

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	<ul style="list-style-type: none"> ▶ Work clothes should be laundered separately. Launder contaminated clothing before re-use. ▶ Use good occupational work practice. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS. ▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Other information	<ul style="list-style-type: none"> ▶ Store in original containers. ▶ Keep containers securely sealed. ▶ Store in a cool, dry, well-ventilated area. ▶ Store away from incompatible materials and foodstuff containers. ▶ Protect containers against physical damage and check regularly for leaks. ▶ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	<ul style="list-style-type: none"> ▶ Polyethylene or polypropylene container. ▶ Packing as recommended by manufacturer. ▶ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	<ul style="list-style-type: none"> ▶ Avoid reaction with oxidising agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US OSHA Permissible Exposure Levels (PELs) - Table Z1	sodium fluoride	Fluorides	2.5 mg/m3	Not Available	Not Available	as F)
US OSHA Permissible Exposure Levels (PELs) - Table Z2	sodium fluoride	Fluoride as dust	2.5 mg/m3	Not Available	Not Available	(Z37.28-1969)
US ACGIH Threshold Limit Values (TLV)	sodium fluoride	Fluorides, as F	2.5 mg/m3	Not Available	Not Available	TLV® Basis: Bone dam; fluorosis; BEI
US NIOSH Recommended Exposure Limits (RELs)	sodium fluoride	Fluoride, Sodium monofluoride	2.5 mg/m3	Not Available	Not Available	[*Note: The REL also applies to other inorganic, solid fluorides (as F).]
US OSHA Permissible Exposure Levels (PELs) - Table Z1	sucrose	Sucrose / Sucrose - Respirable fraction	15 mg/m3 / 5 mg/m3	Not Available	Not Available	Total dust
US ACGIH Threshold Limit Values (TLV)	sucrose	Sucrose	10 mg/m3	Not Available	Not Available	TLV® Basis: Dental erosion
US NIOSH Recommended Exposure Limits (RELs)	sucrose	Beet sugar, Cane sugar, Confectioner's sugar, Granulated sugar, Rock candy, Saccarose, Sugar, Table sugar	10 (total), 5 (resp) mg/m3	Not Available	Not Available	Not Available

EMERGENCY LIMITS

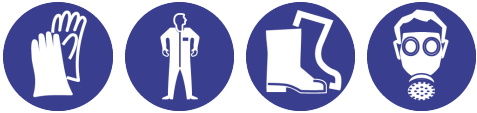
Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
sodium chloride	Chloride; (Chloride(1-); Chloride ions)	0.5 ppm	2 ppm	20 ppm
potassium chloride	Potassium chloride	7.8 mg/m3	86 mg/m3	510 mg/m3
potassium phosphate, monobasic	Potassium phosphate, monobasic	9.6 mg/m3	110 mg/m3	630 mg/m3
sodium acid pyrophosphate	Sodium polyphosphate	9.2 mg/m3	100 mg/m3	600 mg/m3
sodium acid pyrophosphate	Sodium hydrogen pyrophosphate	4.7 mg/m3	52 mg/m3	320 mg/m3
sodium acid pyrophosphate	Sodium pyrophosphate, di-	4.3 mg/m3	48 mg/m3	290 mg/m3
sodium fluoride	Sodium fluoride	17 mg/m3	90 mg/m3	1,100 mg/m3
sodium orthovanadate	Sodium orthovanadate	0.016 mg/m3	0.18 mg/m3	130 mg/m3
p-tert-octylphenol ethoxylate	Triton X-100; (Poly(oxyethylene)-p-tert-octylphenyl ether)	11 mg/m3	130 mg/m3	750 mg/m3
sodium lauryl sulfate	Sodium lauryl sulfate	3.9 mg/m3	43 mg/m3	260 mg/m3

Ingredient	Original IDLH	Revised IDLH
sodium chloride	Not Available	Not Available
potassium chloride	Not Available	Not Available
sodium phosphate, dibasic, heptahydrate	Not Available	Not Available
potassium phosphate, monobasic	Not Available	Not Available
sodium acid pyrophosphate	Not Available	Not Available
sodium fluoride	500 mg/m3	250 mg/m3
sodium orthovanadate	Not Available	Not Available
p-tert-octylphenol ethoxylate	Not Available	Not Available
isothiazolinones, mixed	Not Available	Not Available

sodium lauryl sulfate	Not Available	Not Available
sucrose	Not Available	Not Available
Cell extract (protein, not exceeding)	Not Available	Not Available

MATERIAL DATA

Exposure controls

Appropriate engineering controls	<p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.</p> <p>The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.</p>										
	<table border="1"> <thead> <tr> <th>Type of Contaminant:</th> <th>Air Speed:</th> </tr> </thead> <tbody> <tr> <td>solvent, vapours, degreasing etc., evaporating from tank (in still air).</td> <td>0.25-0.5 m/s (50-100 f/min)</td> </tr> <tr> <td>aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)</td> <td>0.5-1 m/s (100-200 f/min.)</td> </tr> <tr> <td>direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td> <td>1-2.5 m/s (200-500 f/min.)</td> </tr> <tr> <td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).</td> <td>2.5-10 m/s (500-2000 f/min.)</td> </tr> </tbody> </table>	Type of Contaminant:	Air Speed:	solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min)	aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)	direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)	grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)
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<p>Within each range the appropriate value depends on:</p> <table border="1"> <thead> <tr> <th>Lower end of the range</th> <th>Upper end of the range</th> </tr> </thead> <tbody> <tr> <td>1: Room air currents minimal or favourable to capture</td> <td>1: Disturbing room air currents</td> </tr> <tr> <td>2: Contaminants of low toxicity or of nuisance value only.</td> <td>2: Contaminants of high toxicity</td> </tr> <tr> <td>3: Intermittent, low production.</td> <td>3: High production, heavy use</td> </tr> <tr> <td>4: Large hood or large air mass in motion</td> <td>4: Small hood-local control only</td> </tr> </tbody> </table>	Lower end of the range	Upper end of the range	1: Room air currents minimal or favourable to capture	1: Disturbing room air currents	2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity	3: Intermittent, low production.	3: High production, heavy use	4: Large hood or large air mass in motion	4: Small hood-local control only	
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<p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>											
Personal protection											
Eye and face protection	<ul style="list-style-type: none"> ▶ Safety glasses with side shields. ▶ Chemical goggles. ▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent] 										
Skin protection	See Hand protection below										
Hands/feet protection	<ul style="list-style-type: none"> ▶ Wear chemical protective gloves, e.g. PVC. ▶ Wear safety footwear or safety gumboots, e.g. Rubber <p>NOTE:</p> <ul style="list-style-type: none"> ▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. ▶ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. <p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <p>The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.</p> <p>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:</p> <ul style="list-style-type: none"> • frequency and duration of contact, • chemical resistance of glove material, • glove thickness and • dexterity <p>Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).</p> <ul style="list-style-type: none"> • When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 										

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	<p>minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.</p> <ul style="list-style-type: none"> When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. Contaminated gloves should be replaced. <p>For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.</p> <p>It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.</p> <p>Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.</p> <p>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:</p> <ul style="list-style-type: none"> Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential <p>Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p>
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> Overalls. P.V.C. apron. Barrier cream. Skin cleansing cream. Eye wash unit.
Thermal hazards	Not Available

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

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Material	CPI
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NEOPRENE	C
NITRILE	C
PVC	C
##sodium	fluoride

* CPI - Chemwatch Performance Index

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type AK-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	AK-AUS P2	-	AK-PAPR-AUS / Class 1 P2
up to 50 x ES	-	AK-AUS / Class 1 P2	-
up to 100 x ES	-	AK-2 P2	AK-PAPR-2 P2 ^

^ - Full-face

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Liquid; mixes with water.		
Physical state	Liquid	Relative density (Water = 1)	Not Available
Odour	Not Available	Partition coefficient n-octanol / water	Not Available
Odour threshold	Not Available	Auto-ignition temperature (°C)	Not Applicable
pH (as supplied)	Not Available	Decomposition temperature	Not Available
Melting point / freezing point (°C)	Not Available	Viscosity (cSt)	Not Available
Initial boiling point and boiling range (°C)	Not Available	Molecular weight (g/mol)	Not Applicable
Flash point (°C)	Not Applicable	Taste	Not Available
Evaporation rate	Not Available	Explosive properties	Not Available
Flammability	Not Applicable	Oxidising properties	Not Available
Upper Explosive Limit (%)	Not Applicable	Surface Tension (dyn/cm or mN/m)	Not Available

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Lower Explosive Limit (%)	Not Applicable	Volatile Component (%vol)	Not Available
Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Miscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> ▶ Unstable in the presence of incompatible materials. ▶ Product is considered stable. ▶ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
Ingestion	The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.
Skin Contact	<p>Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.
Chronic	Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Control Lysates	TOXICITY	IRRITATION
	Not Available	Not Available
sodium chloride	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >10000 mg/kg ^[1]	Eye (rabbit): 10 mg - moderate
	Oral (rat) LD50: 3000 mg/kg ^[2]	Eye (rabbit): 100 mg/24h - moderate Skin (rabbit): 500 mg/24h - mild
potassium chloride	TOXICITY	IRRITATION
	Oral (rat) LD50: 2600 mg/kg ^[2]	Eye (rabbit): 500 mg/24h - mild
sodium phosphate, dibasic, heptahydrate	TOXICITY	IRRITATION
	Oral (rat) LD50: 12930 mg/kg ^[2]	Eye (rabbit): 500 mg/24h - mild Skin (rabbit): 500 mg/24h - mild
potassium phosphate, monobasic	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg ^[1] Oral (rat) LD50: 7.4 gm ^[1]	Not Available
sodium acid pyrophosphate	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg ^[1]	Eye (rabbit): 16.0/110.0

Control Lysates

	Oral (rat) LD50: >300-<2000 mg/kg ^[1]	Eye (rabbit): 66.5/110 SEVERE moderately irritating practically non-irritating Skin (rabbit): 0.0/8.0 Skin (rabbit): 0.7/8.0 - slight
sodium fluoride	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg ^[1] Oral (rat) LD50: >25-<2000 mg/kg ^[1]	Eye (rabbit): 20 mg/24h-moderate
sodium orthovanadate	TOXICITY	IRRITATION
	Oral (rat) LD50: 330 mg/kg ^[2]	Not Available
p-tert-octylphenol ethoxylate	TOXICITY	IRRITATION
	Oral (rat) LD50: 1800 mg/kg ^[2]	Eye (rabbit): 1 mg - moderate Skin (human): 2 mg/3d -I - mild
isothiazolinones, mixed	TOXICITY	IRRITATION
	Oral (rat) LD50: 53 mg/kg ^[2]	Not Available
sodium lauryl sulfate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >500 mg/kg ^[1] Oral (rat) LD50: 977 mg/kg ^[1]	Eye (rabbit):100 mg/24 hr-moderate Skin (human): 25 mg/24 hr - mild
sucrose	TOXICITY	IRRITATION
	Oral (rat) LD50: 29700 mg/kg ^[2]	Not Available

Legend:

1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

SODIUM PHOSPHATE, DIBASIC, HEPTAHYDRATE	for anhydrous material
POTASSIUM PHOSPHATE, MONOBASIC	No data of toxicological significance identified in literature search.
SODIUM ACID PYROPHOSPHATE	No birth defects were reported in mice, hamsters, or rabbits given sodium acid pyrophosphate during pregnancy. No adverse genetic effects were reported in standard tests using animals or bacterial and yeast cells
SODIUM FLUORIDE	The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
P-TERT-OCTYLPHENOL ETHOXYLATE	<p>Octoxynols:</p> <p>Octoxynols of various chain lengths as well as octoxynol salts and organic acids function in cosmetics either as surfactants-emulsifying agents, surfactants-cleansing agents, surfactant-solubilizing agents, or surfactants-hydrotropes in a wide variety of cosmetic products at concentrations ranging from 0.0008% to 25%, with most less than 5.0%. The octoxynols are chemically similar to nonoxynols. Long-chain nonoxynols (9 and above) were considered safe as used, whereas short-chain nonoxynols (8 and below) were considered safe as used in rinse-off products and safe at concentrations less than 5% in leave-on formulations. Acute exposure of hamsters to Octoxynol-9 by bronchopulmonary lavage produced pneumonia, pulmonary edema, and intra-alveolar hemorrhage. Octoxynol-9 at doses over 1 g/kg was toxic in rats and in mice in acute oral toxicity studies. No significant effects were noted in short-term oral studies of Octoxynol-9 in rats, in subchronic oral studies of Octoxynol-40 in rats and dogs, or in chronic oral studies of Octoxynol-40 in rats. The intraperitoneal LD50 of Octoxynol-9 in rats and mice was around 100 mg/kg. In skin irritation studies, octoxynols ranged from nonirritating to moderately irritating. Octoxynols were not ocular irritants in one rabbit study, but in others there was ocular irritation. No immune system toxicity in CF-1 female mice was noted following the intraperitoneal injection of Octoxynol-9 followed by subcutaneous immunization with sheep red blood cells (SRBCs). Octoxynol-9 produced no humoral and cell-mediated immune responses, or autoimmune response in mice. In the Ames test, Octoxynol-1 was not mutagenic with and without metabolic activation nor was Octoxynol-9 clastogenic. Results for Octoxynol-9 were negative in the following assays: unscheduled DNA synthesis, hypoxanthine guanine phosphoribosyl transferase mutation assay, malignant transformation assay, DNA alkaline unwinding test, and mouse lymphoma thymidine kinase locus forward mutation assay. Ethoxylated alkylphenols are generally considered to be estrogenic in that they mimic the effects of estradiol. Dermal exposure at three dose levels of rats to Octoxynol-9 failed to induce any malformations by category (external, visceral, or skeletal) or by individual anatomical location that were different from controls at statistically significant level. An increased incidence of a vestigial thoracic rib was observed in all dose groups. Octoxynol-9 also did not induce developmental toxicity (number of viable litters, live-born per litter, percentage survival, birth weight per pup, and weight gain per pup) in female specific pathogen-free CD-1 mice dosed daily by gavage on gestation days 6 through 13. No reproductive toxicity was seen in male albino rats which received 5% Octoxynol-40 in the diet daily for 3 months; however, in an in vitro test, Octoxynol-9 (0.24 mg/ml) totally immobilized all human spermatozoa within 20 s. Women who used Nonoxynol-9 or Octoxynol-9 as spermicides, but who did become pregnant, did not have an increase in the overall risk of fetal malformations. In a human skin irritation study, formulations containing 2.0% Octoxynol-9 were classified as moderately irritating and minimally irritating, respectively, in a 24-h single-insult, occlusive patch test. Octoxynol-9 (1.0%) was classified as a nonirritant in a clinical study of nine subjects patch tested for 4 consecutive days. The skin sensitization potential of Octoxynols-1, -3, -5, -9, and -13 was evaluated using 50 subjects. Octoxynol-1 induced sensitization in two subjects; all other results were negative. No sensitization was observed in the following studies: 8.0% Octoxynol-9 in 103 subjects, 0.5% Octoxynol-9 in 102 subjects, and 0.1% Octoxynol-9 in 206 subjects. Concerns about even trace levels of 1,4-dioxane, ethylene oxide, or unreacted C9 led to the recommendation that levels be limited. Concerns about the ocular irritancy of short-chain octoxynols led to a recommendation that they should not be used in products that will be used in the area surrounding the eyes. A limitation on the use concentration for short-chain octoxynols (8 and below) arose from consideration of the skin sensitization potential of octoxynols and the recognition that the short-chain octoxynols could be absorbed into the skin more than the long-chain octoxynols. Overall, based on the available data, it was concluded that long-chain octoxynols (9 and above) are safe as used, whereas short-chain octoxynols (8 and below) are safe as used in rinse-off products and safe at concentrations less than 5% in leave-on formulations.</p> <p>International Journal of Toxicology Vol 23 pp 59-111 Jan 2004</p> <p>Polyethers, for example, ethoxylated surfactants and polyethylene glycols, are highly susceptible towards air oxidation as the ether oxygens will stabilize</p>

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intermediary radicals involved. Investigations of a chemically well-defined alcohol (pentaethylene glycol mono-n-dodecyl ether) ethoxylate, showed that polyethers form complex mixtures of oxidation products when exposed to air.

Sensitization studies in guinea pigs revealed that the pure nonoxidized surfactant itself is nonsensitizing but that many of the investigated oxidation products are sensitizers. Two hydroperoxides were identified in the oxidation mixture, but only one (16-hydroperoxy-3,6,9,12,15-pentaoxaheptacosan-1-ol) was stable enough to be isolated. It was found to be a strong sensitizer in LLNA (local lymph node assay for detection of sensitization capacity). The formation of other hydroperoxides was indicated by the detection of their corresponding aldehydes in the oxidation mixture.

On the basis of the lower irritancy, nonionic surfactants are often preferred to ionic surfactants in topical products. However, their susceptibility towards autoxidation also increases the irritation. Because of their irritating effect, it is difficult to diagnose ACD to these compounds by patch testing.

Human beings have regular contact with alcohol ethoxylates through a variety of industrial and consumer products such as soaps, detergents, and other cleaning products. Exposure to these chemicals can occur through ingestion, inhalation, or contact with the skin or eyes. Studies of acute toxicity show that volumes well above a reasonable intake level would have to occur to produce any toxic response. Moreover, no fatal case of poisoning with alcohol ethoxylates has ever been reported. Multiple studies investigating the acute toxicity of alcohol ethoxylates have shown that the use of these compounds is of low concern in terms of oral and dermal toxicity.

Clinical animal studies indicate these chemicals may produce gastrointestinal irritation such as ulcerations of the stomach, pilo-erection, diarrhea, and lethargy. Similarly, slight to severe irritation of the skin or eye was generated when undiluted alcohol ethoxylates were applied to the skin and eyes of rabbits and rats. The chemical shows no indication of being a genotoxin, carcinogen, or mutagen (HERA 2007). No information was available on levels at which these effects might occur, though toxicity is thought to be substantially lower than that of nonylphenol ethoxylates.

Polyethers, for example, ethoxylated surfactants and polyethylene glycols, are highly susceptible towards air oxidation as the ether oxygens will stabilize intermediary radicals involved. Investigations of a chemically well-defined alcohol (pentaethylene glycol mono-n-dodecyl ether) ethoxylate, showed that polyethers form complex mixtures of oxidation products when exposed to air.

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Alcohol ethoxylates are according to CESIO (2000) classified as Irritant or Harmful depending on the number of EO-units:

EO < 5 gives Irritant (Xi) with R38 (Irritating to skin) and R41 (Risk of serious damage to eyes)

EO > 5-15 gives Harmful (Xn) with R22 (Harmful if swallowed) - R38/41

EO > 15-20 gives Harmful (Xn) with R22-41

>20 EO is not classified (CESIO 2000)

Oxo-AE, C13 EO10 and C13 EO15, are Irritating (Xi) with R36/38 (Irritating to eyes and skin).

AE are not included in Annex 1 of the list of dangerous substances of the Council Directive 67/548/EEC

In general, alcohol ethoxylates (AE) are readily absorbed through the skin of guinea pigs and rats and through the gastrointestinal mucosa of rats. AE are quickly eliminated from the body through the urine, faeces, and expired air (CO₂). Orally dosed AE was absorbed rapidly and extensively in rats, and more than 75% of the dose was absorbed. When applied to the skin of humans, the doses were absorbed slowly and incompletely (50% absorbed in 72 hours). Half of the absorbed surfactant was excreted promptly in the urine and smaller amounts of AE appeared in the faeces and expired air (CO₂). The metabolism of C12 AE yields PEG, carboxylic acids, and CO₂ as metabolites. The LD₅₀ values after oral administration to rats range from about 1-15 g/kg body weight indicating a low to moderate acute toxicity.

The ability of nonionic surfactants to cause a swelling of the stratum corneum of guinea pig skin has been studied. The swelling mechanism of the skin involves a combination of ionic binding of the hydrophilic group as well as hydrophobic interactions of the alkyl chain with the substrate. One of the mechanisms of skin irritation caused by surfactants is considered to be denaturation of the proteins of skin. It has also been established that there is a connection between the potential of surfactants to denature protein in vitro and their effect on the skin. Nonionic surfactants do not carry any net charge and, therefore, they can only form hydrophobic bonds with proteins. For this reason, proteins are not deactivated by nonionic surfactants, and proteins with poor solubility are not solubilized by nonionic surfactants. A substantial amount of toxicological data and information in vivo and in vitro demonstrates that there is no evidence for alcohol ethoxylates (AEs) being genotoxic, mutagenic or carcinogenic. No adverse reproductive or developmental effects were observed. The majority of available toxicity studies revealed NOAELs in excess of 100 mg/kg bw/d but the lowest NOAEL for an individual AE was established to be 50 mg/kg bw/day. This value was subsequently considered as a conservative, representative value in the risk assessment of AE. The effects were restricted to changes in organ weights with no histopathological organ changes with the exception of liver hypertrophy (indicative of an adaptive response to metabolism rather than a toxic effect). It is noteworthy that there was practically no difference in the NOAEL in oral studies of 90-day or 2 years of duration in rats. A comparison of the aggregate consumer exposure and the systemic NOAEL (taking into account an oral absorption value of 75%) results in a Margin of Exposure of 5,800. Taking into account the conservatism in the exposure assessment and the assigned systemic NOAEL, this margin of exposure is considered more than adequate to account for the inherent uncertainty and variability of the hazard database and inter and intra-species extrapolations.

AEs are not contact sensitizers. Neat AE are irritating to eyes and skin. The irritation potential of aqueous solutions of AEs depends on concentrations. Local dermal effects due to direct or indirect skin contact in certain use scenarios where the products are diluted are not of concern as AEs are not expected to be irritating to the skin at in-use concentrations. Potential irritation of the respiratory tract is not a concern given the very low levels of airborne AE generated as a consequence of spray cleaner aerosols or laundry powder detergent dust.

In summary, the human health risk assessment has demonstrated that the use of AE in household laundry and cleaning detergents is safe and does not cause concern with regard to consumer use.

ISOTHIAZOLINONES,
MIXED

The following information refers to contact allergens as a group and may not be specific to this product.

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

No significant acute toxicological data identified in literature search.

SODIUM LAURYL SULFATE

for alkyl sulfates; alkane sulfonates and alpha-olefin sulfonates

Most chemicals of this category are not defined substances, but mixtures of homologues with different alkyl chain lengths. Alpha-olefin sulfonates are mixtures of alkene sulfonate and hydroxyl alkane sulfonates with the sulfonate group in the terminal position and the double bond, or hydroxyl group, located at a position in the vicinity of the sulfonate group.

Common physical and/or biological pathways result in structurally similar breakdown products, and are, together with the surfactant properties, responsible for similar environmental behavior and essentially identical hazard profiles with regard to human health.

Acute toxicity: These substances are well absorbed after ingestion; penetration through the skin is however poor. After absorption, these chemicals are distributed mainly to the liver.

Acute oral LD₅₀ values of alkyl sulfates in rats and/or mice were (in mg/kg):

C10-; 290-580

C10-16-, and C12-; 1000-2000

C12-14, C12-15, C12-16, C12-18 and C16-18-; >2000

C14-18, C16-18-; >5000

The clinical signs observed were non-specific (piloerection, lethargy, decreased motor activity and respiratory rate, diarrhoea). At necropsy the major findings

Control Lysates

were irritation of the gastrointestinal tract and anemia of inner organs.

Based on limited data, the acute oral LD50 values of alkane sulfonates and alpha-olefin sulfonates of comparable chain lengths are assumed to be in the same range.

The counter ion does not appear to influence the toxicity in a substantial way.

Acute dermal LD50 values of alkyl sulfates in rabbits (mg/ kg):

C12-: 200

C12-13 and C10-16-: >500

Apart from moderate to severe skin irritation, clinical signs included tremor, tonic-clonic convulsions, respiratory failure, and body weight loss in the study with the C12- alkyl sulfate and decreased body weights after administration of the C10-16- alkyl sulfates. No data are available for alkane sulfonates but due to a comparable metabolism and effect concentrations in long-term studies effect concentrations are expected to be in the same range as found for alkyl sulfates.

There are no data available for acute inhalation toxicity of alkyl sulfates, alkane sulfonates or alpha-olefin sulfonates.

In skin irritation tests using rabbits (aqueous solutions, OECD TG 404):

C8-14 and C8-16 (30%), C12-14 (90%), C14-18 (60%)- corrosive

Under occlusive conditions:

C12, and C12-14 (25%), C12-15-, C13-15 and C15-16 (5-7%) - moderate to strong irritants

Comparative studies investigating skin effects like transepidermal water loss, epidermal electrical conductance, skin swelling, extraction of amino acids and proteins or development of erythema in human volunteers consistently showed a maximum of effects with C12-alkyl sulfate, sodium; this salt is routinely used as a positive internal control giving borderline irritant reactions in skin irritation studies performed on humans. As the most irritant alkyl sulfate it can be concluded that in humans 20% is the threshold concentration for irritative effects of alkyl sulfates in general. No data were available with regard to the skin irritation potential of alkane sulfonates. Based on the similar chemical structure they are assumed to exhibit similar skin irritation properties as alkyl sulfates or alpha-olefin sulfonates of comparable chain lengths.

In eye irritation tests, using rabbits, C12-containing alkyl sulfates (>10% concentration) were severely irritating and produced irreversible corneal effects. With increasing alkyl chain length, the irritating potential decreases, and C16-18 alkyl sulfate sodium, at a concentration of 25%, was only a mild irritant.

Concentrated C14-16- alpha-olefin sulfonates were severely irritating, but caused irreversible effects only if applied as undiluted powder. At concentrations below 10% mild to moderate, reversible effects, were found. No data were available for alkane sulfonates

Alkyl sulfates and C14-18 alpha-olefin sulfonates were not skin sensitizers in animal studies. No reliable data were available for alkane sulfonates. Based on the similar chemical structure, no sensitisation is expected.

However anecdotal evidence suggests that sodium lauryl sulfate causes pulmonary sensitisation resulting in hyperactive airway dysfunction and pulmonary allergy accompanied by fatigue, malaise and aching. Significant symptoms of exposure can persist for more than two years and can be activated by a variety of non-specific environmental stimuli such as an exhaust, perfumes and passive smoking.

Absorbed sulfonates are quickly distributed through living systems and are readily excreted. Toxic effects may result from the effects of binding to proteins and the ability of sulfonates to translocate potassium and nitrate (NO₃⁻) ions from cellular to interstitial fluids. Airborne sulfonates may be responsible for respiratory allergies and, in some instances, minor dermal allergies. Repeated skin contact with some sulfonated surfactants has produced sensitisation dermatitis in predisposed individuals

Repeat dose toxicity: After repeated oral application of alkyl sulfates with chain lengths between C12 and C18, the liver was the only target organ for systemic toxicity. Adverse effects on this organ included an increase in liver weight, enlargement of liver cells, and elevated levels of liver enzymes. The LOAEL for liver toxicity (parenchymal hypertrophy and an increase in comparative liver weight) was 230 mg/kg/day (in a 13 week study with C16-18 alkyl sulfate, sodium). The lowest NOAEL in rats was 55 mg/kg/day (in a 13 week study with C12-alkyl sulfate, sodium).

C14- and C14-16-alpha-olefin sulfonates produced NOAELs of 100 mg/kg/day (in 6 month- and 2 year studies). A reduction in body weight gain was the only adverse effect identified in these studies.

No data were available with regard to the repeated dose toxicity of alkane sulfonates. Based on the similarity of metabolic pathways between alkane sulfonates, alkyl sulfates and alkyl-olefin sulfonates, the repeated dose toxicity of alkane sulfonates is expected to be similar with NOAEL and LOAEL values in the same range as for alkyl sulfates and alpha-olefin sulfonates, i.e. 100 and 200-250 mg/kg/day, respectively, with the liver as potential target organ.

Genotoxicity: Alkyl sulfates of different chain lengths and with different counter ions were not mutagenic in standard bacterial and mammalian cell systems both in the absence and in the presence of metabolic activation. There was also no indication for a genotoxic potential of alkyl sulfates in various in vivo studies on mice (micronucleus assay, chromosome aberration test, and dominant lethal assay).

alpha-Olefin sulfonates were not mutagenic in the Ames test, and did not induce chromosome aberrations in vitro. No genotoxicity data were available for alkane sulfonates. Based on the overall negative results in the genotoxicity assays with alkyl sulfates and alpha-olefin sulfonates, the absence of structural elements indicating mutagenicity, and the overall database on different types of sulfonates, which were all tested negative in mutagenicity assays, a genotoxic potential of alkane sulfonates is not expected.

Carcinogenicity: Alkyl sulfates were not carcinogenic in feeding studies with male and female Wistar rats fed diets with C12-15 alkyl sulfate sodium for two years (corresponding to doses of up to 1125 mg/kg/day).

alpha-Olefin sulfonates were not carcinogenic in mice and rats after dermal application, and in rats after oral exposure.

No carcinogenicity studies were available for the alkane sulfonates.

Reproductive toxicity: No indication for adverse effects on reproductive organs was found in various oral studies with different alkyl sulfates. The NOAEL for male fertility was 1000 mg/kg/day for sodium dodecyl sulfate. In a study using alpha-olefin sulfonates in male and female rats, no adverse effects were identified up to 5000 ppm.

Developmental toxicity: In studies with various alkyl sulfates (C12 up to C16-18- alkyl) in rats, rabbits and mice, effects on litter parameters were restricted to doses that caused significant maternal toxicity (anorexia, weight loss, and death).

The principal effects were higher foetal loss and increased incidences of total litter losses. The incidences of malformations and visceral and skeletal anomalies were unaffected apart from a higher incidence of delayed ossification or skeletal variation in mice at > 500 mg/kg bw/day indicative of a delayed development. The lowest reliable NOAEL for maternal toxicity was about 200 mg/kg/day in rats, while the lowest NOAELs in offspring were 250 mg/kg/day in rats and 300 mg/kg/day for mice and rabbits.

For alpha-olefin sulfonates (C14-16-alpha-olefin sulfonate, sodium) the NOAEL was 600 mg/kg/day both for maternal and developmental toxicity.

No data were available for the reproductive and developmental toxicity of alkane sulfonates. Based on the available data, the similar toxicokinetic properties and a comparable metabolism of the alkyl sulfates and alkane sulfonates, alkane sulfonates are not considered to be developmental toxicants.

Although the database for category members with C<12 is limited, the available data are indicating no risk as the substances have comparable toxicokinetic properties and metabolic pathways. In addition, longer-term studies gave no indication for adverse effects on reproductive organs with different alkyl sulfates

Alkyl sulfates (AS) anionic surfactants are generally classified according to Comité Européen des Agents de Surface et leurs Intermédiaires Organiques (CESIO) as Irritant (Xi) with the risk phrases R38 (Irritating to skin) and R41 (Risk of serious damage to eyes). An exception has been made for C12 AS which is classified as Harmful (Xn) with the risk phrases R22 (Harmful if swallowed) and R38 and R41 (CESIO 2000). AS are not included in Annex 1 of list of dangerous substances of Council Directive 67/548/EEC.

AS are readily absorbed from the gastrointestinal tract after oral administration. Penetration of AS through intact skin appears to be minimal. AS are extensively metabolized in various species resulting in the formation of several metabolites. The primary metabolite is butyric acid-4-sulfate. The major site of metabolism

is the liver. AS and their metabolites are primarily eliminated via the urine and only minor amounts are eliminated via the faeces. In rats about 70-90% of the dose was eliminated via the urine within 48 hours after oral, intravenous or intraperitoneal administration of 1 mg of AS per rat. The acute toxicity of AS in animals is considered to be low after skin contact or oral intake.

For a homologous series of AS (C8 to C16), maximum swelling of stratum corneum (the outermost layer of epidermis) of the skin was produced by the C12 homologue. This is in accordance with the fact that the length of the hydrophobic alkyl chain influences the skin irritation potential. Other studies have shown that especially AS of chain lengths C11, C12 and C13 remove most amino acids and soluble proteins from the skin during washing.

Concentrated samples of AS are skin irritants in rabbits and guinea pigs. AS are non-irritant to laboratory animals at a 0.1% concentration. C12 AS is used in research laboratories as a standard substance to irritate skin and has been shown to induce an irritant eczema. AS were found, by many authors, to be the most irritating of the anionic surfactants, although others have judged the alkyl sulfates only as irritant as laurate (fatty acid soap).

A structure/effect relationship with regard to the length of the alkyl chain can also be observed on mucous membranes. The maximum eye irritation occurs at chain lengths of C10 to C14. In acute ocular tests, 10% C12 AS caused corneal damage to the rabbit eyes if not irrigated. Another study showed that a 1.0% aqueous C12 AS solution only had a slight effect on rabbit eyes, whereas 5% C12 AS caused temporary conjunctivitis, and 25% C12 AS resulted in corneal damage.

In a 13-week feeding study, rats were fed dietary levels of 0, 40, 200, 1,000 or 5,000 ppm of C12 AS. The only test material related effect observed was an increase in absolute organ weights in the rats fed with the highest concentration which was 5,000 ppm. The organ weights were not further specified and no other abnormalities were found.

In a mutagenicity study, rats were fed 1.13 and 0.56% C12 AS in the diet for 90 days. This treatment did not cause chromosomal aberrations in the bone marrow cells.

Mutagenicity studies with *Salmonella typhimurium* strains (Ames test) indicate no mutagenic effects of C12 AS. The available long-term studies in experimental animals (rats and mice) are inadequate to evaluate the carcinogenic potential of AS. However, in studies in which animals were administered AS in the diet at levels of up to 4% AS, there was no indication of increased risk of cancer after oral ingestion.

No specific teratogenic effects were observed in rabbits, rats or mice when pregnant animals were dosed with 0.2, 2.0, 300 and 600 mg C12 AS/kg body weight/day by gavage during the most important period of organogenesis (day 6 to 15 of pregnancy for mice and rats and day 6 to 18 of pregnancy for rabbits). Reduced litter size, high incidence of skeletal abnormalities and foetal loss were observed in mice at 600 mg C12 AS/kg/day, a dose level which also caused severe toxic effects in the parent animals in all three species. An aqueous solution of 2% AS was applied (0.1 ml) once daily to the dorsal skin (2 x 3 cm) of pregnant mice from day 1 to day 17 of gestation. A solution of 20% AS was tested likewise from day 1 to day 10 of gestation. The mice were killed on days 11 and 18, respectively. A significant decrease in the number of implantations was observed when mice were treated with 20% AS compared to a control group which was dosed with water. No evidence of teratogenic effects was noted.

When aqueous solutions of 2% and 20% AS (0.1 ml) were applied once per day to the dorsal skin (2 x 3 cm) of pregnant ICR/Jc1 mice from day 12 to day 17 of gestation no effects on pregnancy outcome were detected. Treatment with 20% AS resulted in growth retardation of suckling mice, but this effect disappeared after weaning. A 10% AS solution (0.1 ml) was applied twice daily to the dorsal skin (2 x 3 cm) of pregnant ICR/Jc1 mice during the preimplantation period (days 0-3 of gestation). A significant number of embryos collected on day 3 as severely deformed or remained at the morula stage. The number of embryos in the oviducts was significantly greater for the mice dosed with AS as compared to the control mice. No pathological changes were detected in the major organs of the dams

NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA. Eye (None) None: None None rabbit None 250 ugSkin (rabbit):25 mg/24 hr-moderate Skin (None) None: None rabbit None 50 mg/24Eye (rabbit) 10: mg-

SUCROSE
Oral (Human) TDLo: 9.6E-5 mg/kg

SODIUM CHLORIDE & SODIUM PHOSPHATE, DIBASIC, HEPTAHYDRATE & SODIUM FLUORIDE & ISOTHIAZOLINONES, MIXED & SODIUM LAURYL SULFATE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

SODIUM CHLORIDE & SODIUM FLUORIDE

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SODIUM CHLORIDE & ISOTHIAZOLINONES, MIXED

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

POTASSIUM CHLORIDE & ISOTHIAZOLINONES, MIXED

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Acute Toxicity	☐	Carcinogenicity	☐
Skin Irritation/Corrosion	✓	Reproductivity	☐
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	☐
Respiratory or Skin sensitisation	✓	STOT - Repeated Exposure	☐
Mutagenicity	☐	Aspiration Hazard	☐

Legend: ✗ – Data available but does not fill the criteria for classification
 ✓ – Data required to make classification available
 ☐ – Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
sodium chloride	LC50	96	Fish	620.199mg/L	3
sodium chloride	EC50	48	Crustacea	402.6mg/L	4
sodium chloride	EC50	96	Algae or other aquatic plants	2430mg/L	4
sodium chloride	EC50	384	Crustacea	140.582mg/L	3
sodium chloride	NOEC	6	Fish	0.001mg/L	4
potassium chloride	LC50	96	Fish	29.8000mg/L	4

Continued...

Control Lysates

potassium chloride	EC50	48	Crustacea	83mg/L	4
potassium chloride	EC50	96	Algae or other aquatic plants	1337mg/L	4
potassium chloride	EC50	24	Crustacea	7.35mg/L	4
potassium chloride	NOEC	48	Crustacea	240.45mg/L	4
sodium fluoride	LC50	96	Fish	51mg/L	2
sodium fluoride	EC50	48	Crustacea	58mg/L	4
sodium fluoride	EC50	96	Algae or other aquatic plants	181mg/L	1
sodium fluoride	BCF	240	Fish	5mg/L	4
sodium fluoride	EC50	96	Crustacea	23.3mg/L	1
sodium fluoride	NOEC	504	Fish	4mg/L	2
sodium orthovanadate	LC50	96	Fish	13.261mg/L	3
sodium orthovanadate	EC50	96	Algae or other aquatic plants	35.721mg/L	3
sodium orthovanadate	EC50	384	Crustacea	3.198mg/L	3
p-tert-octylphenol ethoxylate	LC50	96	Fish	0.347mg/L	3
p-tert-octylphenol ethoxylate	EC50	96	Algae or other aquatic plants	0.366mg/L	3
p-tert-octylphenol ethoxylate	BCFD	336	Algae or other aquatic plants	0.1mg/L	4
p-tert-octylphenol ethoxylate	EC50	384	Crustacea	0.089mg/L	3
sodium lauryl sulfate	LC50	96	Fish	0.59mg/L	4
sodium lauryl sulfate	EC50	48	Crustacea	0.67mg/L	4
sodium lauryl sulfate	EC50	96	Algae or other aquatic plants	1.2mg/L	4
sodium lauryl sulfate	BCF	1	Fish	0.85mg/L	4
sodium lauryl sulfate	EC50	96	Crustacea	0.12mg/L	4
sodium lauryl sulfate	NOEC	0.08	Fish	0.000013mg/L	4
sucrose	LC50	96	Fish	113.3799mg/L	3
sucrose	EC50	96	Algae or other aquatic plants	286533.52249mg/L	3
sucrose	EC50	384	Crustacea	1971.62453mg/L	3

Legend:

Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
sodium chloride	LOW	LOW
potassium chloride	HIGH	HIGH
sodium fluoride	LOW	LOW
sodium orthovanadate	HIGH	HIGH
p-tert-octylphenol ethoxylate	HIGH	HIGH
sodium lauryl sulfate	HIGH	HIGH
sucrose	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
sodium chloride	LOW (LogKOW = 0.5392)
potassium chloride	LOW (LogKOW = -0.4608)
sodium fluoride	LOW (BCF = 6.4)
sodium orthovanadate	LOW (LogKOW = 2.229)
p-tert-octylphenol ethoxylate	HIGH (LogKOW = 4.863)
sodium lauryl sulfate	LOW (BCF = 7.15)
sucrose	LOW (LogKOW = -3.7)

Mobility in soil

Ingredient	Mobility
sodium chloride	LOW (KOC = 14.3)
potassium chloride	LOW (KOC = 14.3)
sodium fluoride	LOW (KOC = 14.3)
sodium orthovanadate	LOW (KOC = 48.64)

Continued...

p-tert-octylphenol ethoxylate	LOW (KOC = 699.2)
sodium lauryl sulfate	LOW (KOC = 10220)
sucrose	LOW (KOC = 10)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ Containers may still present a chemical hazard/ danger when empty. ▶ Return to supplier for reuse/ recycling if possible. <p>Otherwise:</p> <ul style="list-style-type: none"> ▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill. ▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product. <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> ▶ Reduction ▶ Reuse ▶ Recycling ▶ Disposal (if all else fails) <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.</p> <ul style="list-style-type: none"> ▶ DO NOT allow wash water from cleaning or process equipment to enter drains. ▶ It may be necessary to collect all wash water for treatment before disposal. ▶ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▶ Where in doubt contact the responsible authority. ▶ Recycle wherever possible. ▶ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. ▶ Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or incineration in a licenced apparatus (after admixture with suitable combustible material). ▶ Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
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SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
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Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

SODIUM CHLORIDE(7647-14-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

POTASSIUM CHLORIDE(7447-40-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

SODIUM PHOSPHATE, DIBASIC, HEPTAHYDRATE(7782-85-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

POTASSIUM PHOSPHATE, MONOBASIC(7778-77-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

SODIUM ACID PYROPHOSPHATE(7758-16-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

SODIUM FLUORIDE(7681-49-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs	US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Alaska Limits for Air Contaminants	US - Washington Permissible exposure limits of air contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US - Washington Toxic air pollutants and their ASIL, SQER and de minimis emission values
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)	US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants	US - Wyoming Toxic and Hazardous Substances Table Z-2 Acceptable ceiling concentration, Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
US - Hawaii Air Contaminant Limits	US ACGIH Threshold Limit Values (TLV)
US - Idaho - Limits for Air Contaminants	US ACGIH Threshold Limit Values (TLV) - Carcinogens
US - Michigan Exposure Limits for Air Contaminants	US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US - Minnesota Permissible Exposure Limits (PELs)	US NIOSH Recommended Exposure Limits (RELS)
US - Oregon Permissible Exposure Limits (Z-1)	US OSHA Permissible Exposure Levels (PELs) - Table Z1
US - Oregon Permissible Exposure Limits (Z-2)	US OSHA Permissible Exposure Levels (PELs) - Table Z2
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	

SODIUM ORTHOVANADATE(13721-39-6) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US EPCRA Section 313 Chemical List	

P-TERT-OCTYLPHENOL ETHOXYLATE(9002-93-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
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ISOTHIAZOLINONES, MIXED(55965-84-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

SODIUM LAURYL SULFATE(151-21-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELS)	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	

SUCROSE(57-50-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants	US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants	US - Washington Permissible exposure limits of air contaminants
US - Hawaii Air Contaminant Limits	US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US - Idaho - Limits for Air Contaminants	US ACGIH Threshold Limit Values (TLV)
US - Michigan Exposure Limits for Air Contaminants	US ACGIH Threshold Limit Values (TLV) - Carcinogens
US - Minnesota Permissible Exposure Limits (PELs)	US NIOSH Recommended Exposure Limits (RELS)
US - Oregon Permissible Exposure Limits (Z-1)	US OSHA Permissible Exposure Levels (PELs) - Table Z1
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Immediate (acute) health hazard	Yes
Delayed (chronic) health hazard	No
Fire hazard	No
Pressure hazard	No
Reactivity hazard	No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

Name	Reportable Quantity in Pounds (lb)	Reportable Quantity in kg
Sodium phosphate, dibasic	5000	2270
Sodium fluoride	1000	454

State Regulations

US. CALIFORNIA PROPOSITION 65

None Reported

National Inventory	Status
Australia - AICS	N (isothiazolinones, mixed)
Canada - DSL	Y
Canada - NDSL	N (sucrose; sodium orthovanadate; sodium phosphate, dibasic, heptahydrate; potassium chloride; potassium phosphate, monobasic; sodium acid pyrophosphate; isothiazolinones, mixed; sodium fluoride; p-tert-octylphenol ethoxylate; sodium chloride)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (isothiazolinones, mixed; p-tert-octylphenol ethoxylate)
Japan - ENCS	N (sucrose; sodium acid pyrophosphate; p-tert-octylphenol ethoxylate)
Korea - KECI	Y
New Zealand - NZIoC	Y

Philippines - PICCS	N (sodium orthovanadate)
USA - TSCA	N (isothiazolinones, mixed)
Legend:	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
sodium chloride	7647-14-5, 14762-51-7, 16887-00-6
sodium acid pyrophosphate	7758-16-9, 10101-84-5, 68915-31-1
isothiazolinones, mixed	55965-84-9, 96118-96-6
sodium lauryl sulfate	151-21-3, 1335-72-4, 3088-31-1, 9004-82-4

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC – TWA: Permissible Concentration-Time Weighted Average
 PC – STEL: Permissible Concentration-Short Term Exposure Limit
 IARC: International Agency for Research on Cancer
 ACGIH: American Conference of Governmental Industrial Hygienists
 STEL: Short Term Exposure Limit
 TEEL: Temporary Emergency Exposure Limit,
 IDLH: Immediately Dangerous to Life or Health Concentrations
 OSF: Odour Safety Factor
 NOAEL: No Observed Adverse Effect Level
 LOAEL: Lowest Observed Adverse Effect Level
 TLV: Threshold Limit Value
 LOD: Limit Of Detection
 OTV: Odour Threshold Value
 BCF: BioConcentration Factors
 BEI: Biological Exposure Index

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