Crown X

Nowchem

Chemwatch Hazard Alert Code: **2**

Version No: **3.8**
Safety Data Sheet according to WHS and ADG requirements

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L.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Crown X
Synonyms	Not Available
Other means of identification	UltraShift (T743) by GTS Films

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

Relevant identified uses	Bathroom amenities, kitchen food preparation areas, machinery, truck bodies and general cleaning

Details of the supplier of the safety data sheet

		Details of the Distributor:
Registered company name	Nowchem	GTS Films Pty Ltd
Address	112A Albatross Road NSW Australia	Unit 9/24 Anzac Avenue, Smeaton Grange, NSW Australia
Telephone	(02) 4421 4099	02 4647 9199
Fax	(02) 4421 4923	02 4647 9167
Website	www.nowchem.com.au	www.gtsfilms.com.au
Email	sales@nowchem.com.au	sales@gtsfilms.com.au

Emergency telephone number

Association / Organisation	Nowchem
Emergency telephone numbers	(02) 4421 4099
Other emergency telephone numbers	0413 809 255

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the Model WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability	0		
Toxicity	0		
Body Contact	2		
Reactivity	1		
Chronic	0		

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule	Not Applicable
GHS Classification [1]	Skin Corrosion/Irritation Category 2, Serious Eye Damage Category 1, STOT - SE (Resp. Irr.) Category 3
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI*

Label elements

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GHS label elements	
SIGNAL WORD	**DANGER**

Hazard statement(s)

H315	Causes skin irritation
H318	Causes serious eye damage
H335	May cause respiratory irritation

Precautionary statement(s) Prevention

P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.

Precautionary statement(s) Response

P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician/first aider
P362	Take off contaminated clothing.
P302+P352	IF ON SKIN: Wash with plenty of water and soap
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P332+P313	If skin irritation occurs: Get medical advice/attention.

Precautionary statement(s) Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
29387-86-8	<10	propylene glycol monobutyl ether - mixed isomers
7320-34-5	<10	potassium pyrophosphate
8046-53-5	<10	(linear)alkylbenzenesulfonic acid, sodium salts
8051-30-7	<10	diethanolamine cocoate
2634-33-5	<0.1	1,2-benzisothiazoline-3-one

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	If this product comes in contact with the eyes: ▸ 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. If eye contact occurs, immediately rinse with water for a minimum of 15 minutes. If irritation persists, seek medical advice.
Skin Contact	If skin contact occurs: ▸ 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	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

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	▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay.
Ingestion	▸ Immediately give a glass of water. ▸ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

for phosphate salts intoxication:

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus, not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.
- Treatment should take into consideration both anionic and cation portion of the molecule.
- All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

SECTION 5 FIREFIGHTING MEASURES

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

Advice for firefighters

Fire Fighting	▸ 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. ▸ 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	Combustible. Will burn if ignited. Combustion products include carbon dioxide (CO2)other pyrolysis products typical of burning organic material.May emit poisonous fumesMay emit corrosive fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Minor Spills	Environmental hazard - contain spillage. ▸ 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	Environmental hazard - contain spillage. ▸ Absorb or contain isothiazolinone liquid spills with sand, earth, inert material or vermiculite. ▸ The absorbent (and surface soil to a depth sufficient to remove all of the biocide) should be shovelled into a drum and treated with an 11% solution of sodium metabisulfite (Na2S2O5) or sodium bisulfite (NaHSO3), or 12% sodium sulfite (Na2SO3) and 8% hydrochloric acid (HCl). ▸ Glutathione has also been used to inactivate the isothiazolinones. ▸ Use 20 volumes of decontaminating solution for each volume of biocide, and let containers stand for at least 30 minutes to deactivate microbicide before disposal. ▸ If contamination of drains or waterways occurs, advise emergency services. ▸ After clean up operations, decontaminate and launder all protective clothing ▸ and equipment before storing and re-using.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	▸ **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. ▸ Work clothes should be laundered separately. Launder contaminated clothing before re-use. ▸ Use good occupational work practice.

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	▸ Observe manufacturer's storage and handling recommendations contained within this MSDS. ▸ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Other information	

Conditions for safe storage, including any incompatibilities

Suitable container	▸ Polyethylene or polypropylene container. ▸ Packing as recommended by manufacturer (HDPE). ▸ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	▸ Avoid reaction with oxidising agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
potassium pyrophosphate	Potassium pyrophosphate; (Tetrapotassium diphosphorate)	22 mg/m3	250 mg/m3	1900 mg/m3

Ingredient	Original IDLH	Revised IDLH
propylene glycol monobutyl ether - mixed isomers	Not Available	Not Available
potassium pyrophosphate	Not Available	Not Available
(linear)alkylbenzenesulfonic acid, sodium salts	Not Available	Not Available
diethanolamine cocoate	Not Available	Not Available
1,2-benzisothiazoline-3-one	Not Available	Not Available

MATERIAL DATA

Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.
OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

1,2-Benzisothiazoline-3-one (BIT) produces sensitising effects and causes skin irritation at concentrations of 0.05%. Solutions containing the substance should contain levels considerably lower than 0.05%.
CEL TWA: 0.1 mg/m3; STEL 0.3 mg/m3 total isothiazolinones (Rohm and Haas)
(CEL = Chemwatch Exposure Limit)

Exposure controls

Appropriate engineering controls

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.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
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.
Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in special circumstances. If risk of overexposure exists, wear approved respirator. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
Provide adequate ventilation in warehouses and enclosed 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.

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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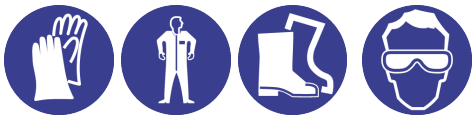
	Within each range the appropriate value depends on: Lower end of the range: 1: Room air currents minimal or favourable to capture; 2: Contaminants of low toxicity or of nuisance value only.; 3: Intermittent, low production.; 4: Large hood or large air mass in motion Upper end of the range: 1: Disturbing room air currents; 2: Contaminants of high toxicity; 3: High production, heavy use; 4: Small hood-local control only 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.
Personal protection	
Eye and face protection	▸ Safety glasses with side shields. ▸ 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	▸ Wear chemical protective gloves, e.g. PVC. ▸ Wear safety footwear (closed in shoes) or safety gumboots, e.g. Rubber **NOTE:** ▸ 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. No special equipment required due to the physical form of the product.
Body protection	See Other protection below
Other protection	▸ Overalls. ▸ P.V.C. apron. ▸ Barrier cream. ▸ Skin cleansing cream. ▸ Eye wash unit.
Thermal hazards	Not Available

Respiratory protection

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

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear Green Liquid

Physical state	Liquid	**Relative density (Water = 1)**	1.05 - 1.10
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	10.5 - 11.3	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	90 - 100	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Applicable	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Non Flammable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**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%)**	9.4 - 10.2
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

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SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ 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	Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system. The material has **NOT** been classified by EC Directives or other classification systems as 'harmful by inhalation'. This is because of the lack of corroborating animal or human evidence. In the absence of such evidence, care should be taken nevertheless to ensure exposure is kept to a minimum and that suitable control measures be used, in an occupational setting to control vapours, fumes and aerosols.
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. Isothiazolinones are moderately to highly toxic by oral administration. The major signs of toxicity were severe gastric irritation, lethargy, and ataxia Ingestion of anionic surfactants/ hydrotropes may produce diarrhoea, intestinal distension and occasional vomiting. Lethal doses in animals range from 1 to 5 gm/kg.
Skin Contact	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. The material may accentuate any pre-existing dermatitis condition Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. Solutions of 0.5% strength 1,2-benzisothiazoline-3-one (BIT) are irritating to the skin. Allergenic effects also begin at 0.05% and have been confirmed in a series of case and patch test studies. When the substance was applied to human volunteers under an occlusive patch the maximum tolerated doses was 0.05%. Five hours after application of 0.1% (1000 ppm) one person showed moderate erythema with papule development which was interpreted as a reaction to the sticking plaster; in four persons there was mild reddening of the skin. The reaction had ameliorated in several persons after 72 hours. A second application produced various severe dermal reactions (erythema and papules) in 8 persons. A third application to several of the group produced erythema. Provocation tests with BIT showed the material to be sensitising. Of 20 metal workers with dermatitis, 4 were shown to have been sensitised to BIT in cutting oils. Cases of contact eczema in workers producing polyacrylate emulsions for paints and wax polish, in which BIT was the preservative, have been described. Epicutaneous challenge tests to BIT were positive. Similar findings have been described in the paper-manufacturing industry, in the rubber industry, in the control laboratory of a chemical plant and among workers producing ceramic moulds in which BIT was added to the mould oil Aqueous solutions of isothiazolinones may be irritating or even corrosive depending on concentration. Solutions containing more than 0.5% (5000 ppm active substance) may produce severe irritation of human skin whilst solutions containing more than 100 ppm may irritate the skin. Anionic surfactants/ hydrotropes generally produce skin reactions following the removal of natural oils. The skin may appear red and may become sore. Papular dermatitis may also develop. Sensitive individuals may exhibit cracking, scaling and blistering. Open cuts, abraded or irritated skin should not be exposed to this material 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.
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. Solutions containing isothiazolinones may produce corrosion of the mucous membranes and cornea. Instillation of 0.1 ml of an aqueous solution containing 560 ppm isothiazolinone into rabbit eye did not produce irritation whereas concentrations, typically around 3% and 5.5 %, were severely irritating or corrosive to the eye.. Symptoms included clouding of the cornea, chemosis and swelling of the eyelids. Direct eye contact with some concentrated anionic surfactants/ hydrotropes produces corneal damage, in some cases severe. Low concentrations may produce immediate discomfort, conjunctival hyperaemia, and oedema of the corneal epithelium. Healing may take several days. Temporary clouding of the cornea may occur.
Chronic	Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population. Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking. There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals. In chronic animal studies inorganic polyphosphates produced growth inhibition, increased kidney weights (with calcium deposition and desquamation), bone

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decalcification, parathyroid hypertrophy and hyperplasia, inorganic phosphaturia, hepatic focal necrosis and alterations to the size of muscle fibres.
Inorganic phosphates are not genotoxic in bacterial systems nor are they carcinogenic in rats. No reproductive or developmental toxicity was seen in studies using rats exposed to sodium hexametaphosphate or sodium trimetaphosphate.
In a teratogenic study in rats concentrations of up to 40 mg/kg 1,2-benzisothiazoline-3-one (BIT) were neither embryotoxic nor teratogenic. The material is not mutagenic. In a 2-year carcinogenicity study with rats, BIT did not produce excess tumours. The results derived from this test are questionable because no dose series was administered and because there were too few animals.
A 90-day study with beagle dogs receiving oral doses showed reduced food consumption and body weight gain as well as mild anaemia, increases in the weights of liver and in male animals, brain and spleen weights.
The no-observed-effect-level (NOEL) was given as 165 mg/kg (ie 0.5 BIT in the diet). A 90-day study with rats receiving dietary BIT showed reduced liver and pituitary weights in males. The NOEL was less than 0.1 %.

Crown X

TOXICITY	IRRITATION
Not Available	Not Available

propylene glycol monobutyl ether - mixed isomers

TOXICITY	IRRITATION
>1000 ppm/8 h[2]	Eye (rabbit): 15 mg SEVERE
Dermal (rabbit) LD50: 3132.8 mg/kg[2]	Skin (rabbit): 500 mg open Mild
dermal (rat) LD50: >2000 mg/kg[2]	
Oral (rat) LD50: 1900 mg/kg[2]	
Oral (rat) LD50: 2490.4 mg/kg[2]	

potassium pyrophosphate

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[1]	[Albright]
Oral (rat) LD50: >300<2000 mg/kg[1]	

(linear)alkylbenzenesulfonic acid, sodium salts

TOXICITY	IRRITATION
Oral (rat) LD50: 800 mg/kg*d[2]	Not Available

diethanolamine cocoate

TOXICITY	IRRITATION
Not Available	Not Available

1,2-benzisothiazoline-3-one

TOXICITY	IRRITATION
Oral (rat) LD50: 670 mg/kg(male)*n[2]	*MAK Documentation

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*

Crown X

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.
No significant acute toxicological data identified in literature search.
Linear alkylbenzene sulfonates (LAS) are classified as Irritant (Xi) with the risk/hazard phrases R38/H315 (Irritating to skin) and R41/H318 (Risk of serious damage to eyes) according to CESIO (CESIO 2000). LAS are not included in Annex 1/6 of list of dangerous substances of Council Directive 67/548/EEC and 1272/2008 respectively.
Linear alkylbenzene sulfonic acids (LABS) are strong acids (pKa<2) are classified as corrosive (R34/H314)
Acute toxicity: The available data indicate minimal to moderate toxicity, with LD50 values ranging from 500 to 2000 mg/kg body weight (bw). Acute inhalation data also indicate a lack of significant toxicity.Available dermal exposure data also shows a lack of significant toxicity.
LAS are readily absorbed by the gastrointestinal tract after oral administration in animals. LAS are not readily absorbed through the skin . The bulk is metabolised in the liver to sulfophenylic carboxyl acids. The metabolites are excreted primarily via the urine and faeces. The main urinary metabolites in rats are sulfophenyl butanoic acid and sulfophenyl pentanoic acid. Accumulation of LAS or its main metabolites has not been established in any organ after repeated oral ingestion.
No serious injuries or fatalities in man have been reported following accidental ingestion of LAS-containing detergent. The main clinical signs observed after oral administration to rats of doses near or greater than the LD50 values consisted of reduced voluntary activity, diarrhoea, weakness etc. Death usually occurred within 24 hours of administration. Rats appear to be more sensitive to LAS than mice.
LAS and branched alkylbenzene sulfonates may cause irritation of the eyes, skin and mucous membranes. LAS are relatively more irritating to the skin than the corresponding branched alkylbenzene sulfonates. The potential of LAS to irritate the skin depends on the concentration applied. LAS have been classified as irritating to skin at concentrations above 20% according to EU-criteria. Human skin can tolerate contact with solution of up to 1% LAS for 24 hours resulting in only mild irritation. Application of > 5% LAS to the eyes of rabbits produced irritation. Concentration of < 0.1% LAS produced mild to no irritation.
Skin sensitization was not seen in 2,294 volunteers exposed to LAS or in 17,887 exposed to formulations of LAS.
Repeat dose toxicity: A feeding study indicated that LAS, when administered for 2 years at extremely high levels (0.5%) in the diets to rats,

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	produced no adverse effects on growth, health or feed efficiency. **Genotoxicity:** The mutagenic potential of LAS was tested using *Salmonella typhimurium* strains, using Ames test. In these studies, LAS was not mutagenic. The available long-term studies are inadequate for evaluating the carcinogenic potential of LAS in laboratory animals. The studies available (oral administration to rats and mice) do not show any evidence of carcinogenicity. **Reproductive toxicity:** In general no specific effect of LAS on reproductive processes has been seen, although dosages causing maternal toxicity may also induce some effects on reproduction. No teratogenic effects attributed to LAS exposure have been observed. Environmental and Health Assessment of Substances in Household Detergents and Cosmetic Detergent Products, Environment Project, 615, 2001. Torben Madsen et al: Miljoministeriet (Danish Environmental Protection Agency)
PROPYLENE GLYCOL MONOBUTYL ETHER - MIXED ISOMERS	
POTASSIUM PYROPHOSPHATE	
(LINEAR)ALKYLBENZENESULFONIC ACID, SODIUM SALTS	
DIETHANOLAMINE COCOATE	
1,2-BENZISOTHIAZOLINE-3-ONE	

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 required to make classification available*
✘ *– Data available but does not fill the criteria for classification*
⊘ *– Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

NOT AVAILABLE

Ingredient	Endpoint	Test Duration	Effect	Value	Species	BCF
propylene glycol monobutyl ether - mixed isomers	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
potassium pyrophosphate	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
(linear)alkylbenzenesulfonic acid, sodium salts	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
diethanolamine cocoate	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
1,2-benzisothiazoline-3-one	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.
for alkaryl sulfonate petroleum additives:
These are all dark colored viscous liquids at ambient temperature.
Environmental fate:
Based on their physicochemical properties and molecular structures, it was concluded that these chemicals were most likely to adsorb strongly to soil and sediments Compounds in this group were highly hydrophobic such that hydrolysis testing is not technically feasible and the lack of hydrolysable moieties made hydrolysis modeling unnecessary. Two of the alkaryl sulfonates and one homologue were subjected to biodegradability testing and found to be poorly biodegradable. Computer modeled data indicated that the alkaryl sulfonates do not readily photodegrade
Ecotoxicity:
Existing data on acute fish toxicity, acute invertebrate toxicity, and alga toxicity indicates a low order of toxicity to fish, aquatic invertebrates and alga when the appropriate test methods were used.
Fish toxicity: Overall, the LC50 for these substances was greater than 100 mg/L indicating a relatively low order of acute toxicity to fish.
Invertebrate toxicity (daphnid): Overall, the EC50 for these substances was greater than 100 mg/L indicating a relatively low order of acute toxicity to daphnids.
Alage toxicity: Overall, the EC50 for these substances was greater than 100 mg/L indicating a relatively low order of toxicity to algae.
For 3-methyl-3-methoxy butanol (MMB):
Environmental fate:
MMB is a colourless liquid with a water solubility of 100 g/l at25 C, a melting point of lower than –50 C, a boiling point of 173 C at1013 hPa, a vapour pressure of 1.25 hPa at 25 C and a density of 0.927 g/cm3 at25 C. Based on the measured log Kow value of 0.18 bio- or geoaccumulation ofthis chemical is unlikely. Environmental distribution using a Mackay level IIIfugacity model suggests that when MMB is released into air or water, it remainsin the original compartment whereas when released into soil, 29.4 % isdistributed into air, 9.3 % into water and 61.3 % remains in soil. A readybiodegradability test showed that MMB failed to meet a criterion for readybiodegradability (biodegradation rate = 50% after 28 days), however completebiodegradation was observed in an inherent biodegradation test. A study onhydrolysis indicates that MMB is stable in water. In the atmosphere MMB isindirectly photodegraded by reaction with OH radicals with a half-life of 1.1days
Ecotoxicity:
Algae.ErC50 (72 h): Selenastrum capricornutum >1000 mg/l; EbC50>1000 mg/l (OECD TG 201, open system)
Daphnia magna EC50 (48 h): >1000 mg/l (OECD TG 202, static)
Fish LC50:(96 h): Oryzias latipes >100 mg/l (OECD TG 203,semi-static)
For chronic toxicity to algae, a 72 h NOEbC of 1,000 mg/L (OECD TG201, *Selenastrum capricornutum*, open system) was reported. Indaphnids, an 21 d EC50 of>100 mg and a 21 d NOEC of 100 mg/L were reported (OECD TG 211, *Daphniamagna,* semi-static).
For glycol ethers:
Environmental fate:
Ether groups are generally stable to hydrolysis in water under neutral conditions and ambient temperatures. OECD guideline studies indicate ready biodegradability for several glycol ethers although higher molecular weight species seem to biodegrade at a slower rate. No glycol ethers that have been tested demonstrate marked resistance to biodegradative processes. Upon release to the atmosphere by evaporation, high boiling glycol ethers are estimated to undergo photodegradation (atmospheric half lives = 2.4-2.5 hr). When released to water, glycol ethers undergo biodegradation (typically 47-92% after 8-21 days) and have a low potential for bioaccumulation (log Kow ranges from -1.73 to +0.51).
Ecotoxicity:
Aquatic toxicity data indicate that the tri- and tetra ethylene glycol ethers are 'practically non-toxic' to aquatic species. No major differences are observed in the order of toxicity going from the methyl- to the butyl ethers.
Glycols exert a high oxygen demand for decomposition and once released to the environments cause the death of aquatic organisms if dissolved oxygen is depleted.

Continued...

The isothiazolinones are very toxic to marine organisms (fish, Daphnia magna and algae)
The high water solubility and low log Kow values of several chlorinated and non-chlorinated indicate a low potential for bioaccumulation.
Studies of 5-chloro-2-methyl-4-isothiazolin-3-one (CMI) in bluegill sunfish (Lepornis machrochirus) show BCF values of 102, 114 and 67 at nominal concentrations of 0.02, 0.12 and 0.8 mg/l. The BCF for 2-methyl-4-isothiazolin-3-one (MI) was determined at 2.3 at a nominal concentration of 0.12 mg/l
Primary biodegradation of MI and CMI occurred with half-lives of less than 24 hours in aerobic and anoxic sediments, and within a period of less than one week the parent compounds were depleted to very low levels that could not be clearly distinguished from analytical artifacts. The ultimate aerobic biodegradability of both MI and CMI attained levels of > 55% within 29 days.
Furthermore, the proposed metabolites of MI and CMI are considered to have a low aquatic toxicity on the basis of QSAR estimates and the measured toxicity of the structurally related N-(n-octyl) malonamic acid.
For linear alkylbenzene sulfonic acids (LABS) (and their salts):
Environmental fate:
LABS are highly water soluble (miscible) and have a relatively lowKow. The environmental fate data indicate that these chemicals are highlysusceptible to photo-and biodegradation.
LABS are strong acids (*p*Ka <1) that are completelyionised in aqueous solutions. The chemical species present in aqueous solutionsat neutral (physiological) pH is the linear alkylbenzene sulfonate (the LASion) (C10-14 linear alkyl benzene-SO3-), the identical species present insolutions of LAS, where the counter ion (typically sodium, calcium or ammonium)will disassociate to form the LAS anion. Thus, the physical-chemical,environmental fate, ecotoxicity and toxicity properties of the LABS and LASwould be expected to be similar. It should be noted that the LABS are liquidsand LAS is a solid at room temperature. However, in water the difference betweenthe LAB sulfonic acids and LAS disappears as dissociation results in the sameion in solution. Therefore, parameters such as Kow, water solubility and pH/pKaare appropriate to compare. The octanol-water partition coefficients are around2 (logKow) for all of the chemicals in this category
LABS are not expected to volatilise significantly. Fugacitymodeling predicts that most of these chemicals will partition to the soil andwater. Very little partitions to the air or sediment.
Photodegradation is estimated (using EPI Suite software) to be asignificant mechanism for breakdown. Based on the model estimates, the hydroxylradical reaction half-lives ranged from about 7 to 8.6 hours. Estimated datafor LAS were similar. Furthermore, measured data for LAS suggest even morerapid photodegradation, with 95% of the material degraded within 20 minutes at20 C in a laboratory study.
Experimental data data indicates that LAS is stable in water.
LABS are generally biodegradable. Measured biodegradation data indicatesubstantial microbial degradation under aerobic conditions. For dodecylbenzenesulfonic acid 69% of the material mineralised after 28 days. Biodegradation ofthe C10-16 derivatives and the LAS are also rapid, with 93% or greater of thematerial degrading within 28 or 37 days. In addition, studies show thatstraight chain alkylbenzene sulfonate materials readily degrade, with theshorter chain length compounds degrading more rapidly Thus, the dataindicate that these chemicals are highly susceptible to degradation, both byphotolytic and microbial mechanisms
The initial step in the biodegradation of LABS under aerobicconditions is an omega -oxidation of the terminal methyl group of the alkylchain to form a carboxylic acid. Further degradation proceeds by a stepwiseshortening of the alkyl chain by beta -oxidation leaving a short-chainsulfophenyl carboxylic acid. In the presence of molecular oxygen the aromaticring structure hydrolyses to form a dihydroxy-benzene structure which is openedbefore desulfonation of the formed sulfonated dicarboxylic acid. The finaldegradation steps have not been investigated in details but are likely to occurby general bacterial metabolic routes involving a total mineralisation andassimilation into biomass . Both the initial omega -oxidation and thehydroxylation of the ring structure of LAS require molecular oxygen, and theyare not expected to take place under anoxic conditions.
The BioConcentration Factor (BCF) tends to increase withincreasing alkyl chain length but also the position of the aryl sulfonatemoiety was important. A higher BCF was seen for linear alkyl benzenesulfonateisomers with the aryl sulfonate attached. Available data indicate that LABShave low to moderate bioaccumulation potential, with a bioconcentration factorfor dodecyl benzene sulfonic acid of 130. LAS has bioconcentration factors thatrange from 22 to 87.
Ecotoxicity:
Numerous studies have been performed to determine the effects ofLABS towards aquatic organisms. The aquatic effect concentrations that wereobserved in these studies are highly variable. This variation is partly relatedto the testing of different isomers and homologues, but it may also be due tothe specific test conditions and species. The length of the alkyl chain is animportant factor determining the aquatic toxicity. In general, the homologueswith the highest number of carbons in the alkyl chain are more toxic than arethose with shorter alkyl chains. Today, commercial LABS have a homologuedistribution between C10 and C13 with a typical average alkyl chain length ofC11.6.
The widest range in the toxicity of LABS towards species belongingto the same group is found for algae Approximately 90% of the data foundin the literature fall between 0.1 and 100 mg/l. Typical ranges of EC50 valuesare 1 to 100 mg/l for fresh water species and < 1 to 10 mg/l for marinespecies. Typical values lie between 29 and 170 mg/l
A very low EC100 value of 0.025 mg/l was determined for *Gymnodiumbreve*. Previous studies in which *Gymnodium breve* wasexposed with AES confirm that this species is highly sensitive to surfactants,and occasionally available data for *Gymnodium breve* shouldtherefore not be used for comparison of the aquatic toxicity between varioussurfactants.
LC50 values have been found in the range of 1 to 10 mg/lwhen *Daphnia magna* were exposed with LABS homologues betweenC10 and C13. The acute toxicity of LABS to *Daphnia magna* generallyincreases with increasing alkyl chain length. Typical values lie between3 and 12 mg/l.
A study with the marine crustacean *Acartia tonsa* indicatedthat a C10-13 LAS affected the survival at 0.54 mg/l (LC50) and the developmentrate at 0.51 mg/l (EC50) after 8 days of exposure. The 48 h-LC50 that wasobtained in the same study with *Acartia tonsa* was 2.1 mg/l.
Metabolites from biotransformation of LABS are reported to have amuch lower toxicity to invertebrates compared to the toxicity of the intactsurfactant.
The toxicity of LABS to fish generally increases with increasingalkyl chain length, and approximately a 10-fold difference in toxicity betweenhomologues separated by two carbon atoms has been observed. As also noted forinvertebrates, fish are less susceptible to metabolites from biotransformationof LABS . LC50 values below 1 mg/l were found for C11.9 (0.71 mg/l), C13 andC14 (both 0.4 mg/l) in studies with fathead minnow.
LABS sorb to sediment with partition coefficients of 50 to 1,000.The toxicity of LABS bound to sediment is relatively low compared to LABS insolution. NOEC and LOEC values were as high as 319 and 993 mg LABS/kg,respectively, for the sediment-living *Chironomus riparius*. Thecorresponding NOEC for LABS in solution was as low as 2.4 mg/l indicating thatonly a small fraction of the sorbed LABS was bioavailable. LABS dissolved inwater may also cause chronic effects like reduction of the growth rate of themarine mussel *Mytilus galloprovincialis*. LABS sorbed to sedimentsdid not have similar effects.
Environmental and Health Assessment of Substances in HouseholdDetergents and Cosmetic Detergent Products, Environment Project, 615, 2001.Torben Madsen et al: Miljoministeriet (Danish Environmental ProtectionAgency)Assessment Plan for the Linear Alkylbenzene (LAB) Sulfonic AcidsCategory in Accordance with the USEPA High Production Volume Chemical ChallengeProgram: The LAB Sulfonic Acids Coalition
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
propylene glycol monobutyl ether - mixed isomers	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
propylene glycol monobutyl ether - mixed isomers	LOW (LogKOW = 1.0577)

Mobility in soil

Ingredient	Mobility
propylene glycol monobutyl ether - mixed isomers	HIGH (KOC = 1.538)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	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. A Hierarchy of Controls seems to be common - the user should investigate:

Continued...

	▸ Reduction ▸ Reuse ▸ Recycling ▸ Disposal (if all else fails) 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. ▸ **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.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
HAZCHEM	Not Applicable

Land transport (Not Applicable): 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

SECTION 15 REGULATORY INFORMATION

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

PROPYLENE GLYCOL MONOBUTYL ETHER - MIXED ISOMERS(29387-86-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

POTASSIUM PYROPHOSPHATE(7320-34-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

(LINEAR)ALKYLBENZENESULFONIC ACID, SODIUM SALTS(8046-53-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

DIETHANOLAMINE COCOATE(8051-30-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)

1,2-BENZISOTHIAZOLINE-3-ONE(2634-33-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Hazardous Substances Information System - Consolidated Lists | Australia Inventory of Chemical Substances (AICS)

National Inventory	Status
Australia - AICS	N ((linear)alkylbenzenesulfonic acid, sodium salts)
Canada - DSL	N ((linear)alkylbenzenesulfonic acid, sodium salts)
Canada - NDSL	N (diethanolamine cocoate; 1,2-benzisothiazoline-3-one; propylene glycol monobutyl ether - mixed isomers; potassium pyrophosphate; (linear)alkylbenzenesulfonic acid, sodium salts)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N ((linear)alkylbenzenesulfonic acid, sodium salts)
Japan - ENCS	N (diethanolamine cocoate; (linear)alkylbenzenesulfonic acid, sodium salts)
Korea - KECI	N (propylene glycol monobutyl ether - mixed isomers; (linear)alkylbenzenesulfonic acid, sodium salts)
New Zealand - NZIoC	N ((linear)alkylbenzenesulfonic acid, sodium salts)
Philippines - PICCS	N (propylene glycol monobutyl ether - mixed isomers; (linear)alkylbenzenesulfonic acid, sodium salts)
USA - TSCA	N (propylene glycol monobutyl ether - mixed isomers; (linear)alkylbenzenesulfonic acid, sodium salts)
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
propylene glycol monobutyl ether - mixed isomers	29387-86-8, 63716-40-5

Continued...

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 (M)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.