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

Product identifier

Product name	24·7 Calcium for Dairy Cows
Chemical name	Not Applicable
Synonyms	Not Applicable
Chemical formula	Not Applicable
Other means of identification	Not Applicable

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

Relevant identified uses	For the prevention of subclinical hypocalcaemia and as an aid in the prevention of clinical hypocalcaemia (milk fever) in cows.

Details of the supplier of the safety data sheet

	Manufacturer	**Distributor in Australia**
Registered company name	Agrimin Ltd.	Pacific Biologics Pty. Ltd
Address	Humberside Airport, Kirmington, DN39 6YH, UK	35 Beach Street, Kippa-Ring, QLD 4021, Australia
Telephone	+44 1652 688046	+61 7 3283 5077
Fax	+44 1652 688049	+61 7 3283 5088
Website	www.agrimin.co.uk	www.pacificbiologics.com.au
Email	info@agrimin.co.uk	factory@pacificbiologics.com.au

Emergency telephone number

	Manufacturer	**Distributor in Australia**
Association / Organisation	Agrimin Ltd.	Pacific Biologics Pty. Ltd.
Emergency telephone numbers	+44 1652 688046	+61 7 3283 5077
Other emergency telephone numbers	Not Available	Not Available

SECTION 2 Hazards identification

Classification of the substance or mixture

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

Poisons Schedule	Not Applicable
Classification[1]	Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 2, Serious Eye Damage/Eye Irritation Category 2A, Specific Target Organ Toxicity - Single Exposure (Respiratory Tract Irritation) Category 3, Hazardous to the Aquatic Environment Acute Hazard Category 3
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 – Annex VI*

Label elements

Hazard pictogram(s)	
Signal word	Warning

Hazard statement(s)

H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H402	Harmful to aquatic life.

Precautionary statement(s) Prevention

P271	Avoid breathing dust/fumes.
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves, protective clothing, eye protection and face protection.

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.
P337+P313	If eye irritation persists: Get medical advice/attention.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
P302+P352	IF ON SKIN: Wash with plenty of water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P330	Rinse mouth.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

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 hazardous or special waste collection point in accordance with any local regulation.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No.	%[weight]	Name
10035-04-8	30-60	Calcium chloride, hydrated
10034-76-1	10-30	Calcium sulphate hemihydrate
61791-12-6	1-10	Castor oil, hydrogenated, ethoxylated
Not Available	balance	Ingredients determined not to be hazardous
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 – Annex VI*	

SECTION 4 First aid measures

Description of first aid measures

Eye contact	If this product comes into 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.
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. – 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	– **IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.** – **For advice, contact a Poisons Information Centre or a doctor.** – **Urgent hospital treatment is likely to be needed.** – **In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.** – **If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist.** – **If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS.** **Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:** – **INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.** **NOTE: Wear a protective glove when inducing vomiting by mechanical means.**

Indication of any immediate medical attention and special treatment needed

Treat symptomatically

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 firefighting 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. Slight hazard when exposed to heat, flame and oxidisers.
Fire/Explosion hazard	– Solid which exhibits difficult combustion or is difficult to ignite. – Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. – Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited; once initiated larger particles up to 1400 microns diameter will contribute to the propagation of an explosion. – A dust explosion may release large quantities of gaseous products; this in turn creates a subsequent pressure rise of explosive force capable of damaging plant and buildings and injuring people. – Usually, the initial or primary explosion takes place in a confined space such as plant or machinery, and can be of sufficient force to damage or rupture the plant. If the shock wave from the primary explosion enters the surrounding area, it will disturb any settled dust layers, forming a second dust cloud, and often initiate a much larger secondary explosion. All large-scale explosions have resulted from chain reactions of this type. – Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport. – Build-up of electrostatic charge may be prevented by bonding and grounding. – Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting. – All movable parts coming in contact with this material should have a speed of less than 1-metre/sec. Combustion products include: – carbon dioxide (CO2) – hydrogen chloride – phosgene – sulfur oxides (SOx) – other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes. Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place. Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard.

HAZCHEM	Not Applicable

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	– Clean up all spills immediately. – Secure load if safe to do so. – Bundle/collect recoverable product. – Collect remaining material in containers with covers for disposal.
Major spills	Minor hazard – Clear area of personnel. – Alert Fire Brigade and tell them location and nature of hazard. – Control personal contact with the substance, by using protective equipment as required. – Prevent spillage from entering drains or water ways. – Contain spill with sand, earth or vermiculite. – Collect recoverable product into labelled containers for recycling. – Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal. – Wash area and prevent runoff into drains or waterways. – 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	– Limit all unnecessary personal contact. – Wear protective clothing when risk of exposure occurs. – Use in a well-ventilated area. – When handling **DO NOT** eat, drink or smoke. – Always wash hands with soap and water after handling. – Avoid physical damage to containers. – Use good occupational work practice. – Observe manufacturer's storage and handling recommendations contained within this SDS.
Other information	– Store away from incompatible materials.

Conditions for safe storage, including incompatibilities

Suitable container	Polypropylene tube with LDPE lid. Generally packaging as originally supplied with the article or manufactured item is sufficient to protect against physical hazards. If repackaging is required ensure the article is intact and does not show signs of wear. As far as is practicably possible, reuse the original packaging or something providing a similar level of protection to both the article and the handler. – **DO NOT** use aluminium or galvanised containers.
Storage incompatibility	– Avoid reaction with oxidising agents.

SECTION 8 Exposure controls

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	Calcium sulfate hemihydrate	Calcium sulphate	10 mg/m^3	Not Available	Not Available	(a) This value is for inhalable dust containing no asbestos and < 1 % crystalline silica.

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
Calcium chloride, hydrated	16 mg/m^3	170 mg/m^3	1,100 mg/m^3
Calcium chloride, hydrated	12 mg/m^3	130 mg/m^3	790 mg/m^3
Calcium chloride, hydrated	13 mg/m^3	140 mg/m^3	850 mg/m^3
Calcium chloride, hydrated	24 mg/m^3	260 mg/m^3	1,600 mg/m^3

Ingredient	Original IDLH	Revised IDLH
Calcium chloride, hydrated	Not Available	Not Available
Calcium sulfate hemihydrate	Not Available	Not Available
Castor oil, hydrogenated, ethoxylated	Not Available	Not Available

Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
Calcium chloride, hydrated	E	≤ 0.01 mg/m^3
Castor oil, hydrogenated, ethoxylated	E	≤ 0.1 ppm
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

MATERIAL DATA

Exposure controls

Appropriate engineering controls	Articles or manufactured items, in their original condition, generally don't require engineering controls during handling or in normal use. Exceptions may arise following extensive use and subsequent wear, during recycling or disposal operations where substances, found in the article, may be released to the environment. General exhaust is adequate under normal operating conditions.
Personal protection	
Eye and face protection	No special equipment for minor exposure i.e. when handling small quantities. **OTHERWISE**: – 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	No Special equipment needed when handling small quantities. **OTHERWISE**: Wear chemical protective gloves, e.g. PVC.
Body protection	See Other protection below
Other protection	No special equipment needed when handling small quantities. **OTHERWISE**: – Overalls. – Barrier cream. – Eyewash unit.

Respiratory protection

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

Respiratory protection not normally required due to the physical form of the product.

Agrimin Ltd | t: +44 (0) 1652 688046 | e: info@agrimin.co.uk
Humberside Airport, Kirmington, North Lincolnshire, DN39 6YH, UK
www.agrimin.co.uk

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Wax coated white to yellow solid cylindrical bolus with no odour; soluble in water.

Physical state	Manufactured	**Relative density (Water = 1)**	Not Available
Odour	No odour	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Applicable
pH (as supplied)	Not Applicable	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	**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 Applicable
Lower Explosive Limit (%)	Not Applicable	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water	Miscible	**pH as a solution (pH)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

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.
Ingestion	Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments. Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Non-ionic surfactants may produce localised irritation of the oral or gastrointestinal mucosa and induce vomiting and mild diarrhoea.
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. Repeated exposure may cause skin cracking, flaking or drying following normal handling and use. Four students received severe hand burns whilst making moulds of their hands with dental plaster substituted for Plaster of Paris. The dental plaster known as "Stone" was a special form of calcium sulfate hemihydrate containing alpha-hemihydrate crystals that provide high compression strength to the moulds. Beta-hemihydrate (normal Plaster of Paris) does not cause skin burns in similar circumstances. 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. Non-ionic 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 non-ionic surfactants, and proteins with poor solubility are not solubilized by non-ionic surfactants. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the bloodstream 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. Some non-ionic surfactants may produce a localised anaesthetic effect on the cornea; this may effectively eliminate the warning discomfort produced by other substances and lead to corneal injury. Irritant effects range from minimal to severe dependent on the nature of the surfactant, its concentration and the duration of contact. Pain and corneal damage represent the most severe manifestation of irritation.
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. 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. Prolonged or repeated skin contact may cause degreasing with drying, cracking and dermatitis following.

24·7 Calcium for Dairy Cows	**TOXICITY**	**IRRITATION**
	Oral (None) LD50: 634.36 mg/kg*[2]	Not available

Calcium chloride, hydrated	**TOXICITY**	**IRRITATION**
	Oral (Rat) LD50: 1,000 mg/kg[2]	Not available

Calcium sulfate hemihydrate	**TOXICITY**	**IRRITATION**
	Inhalation (Rat) LC50: > 3.26 mg/l 4h[1]	Not available
	Oral (Rat) LD50: → 1581 mg/kg[1]	

Castor oil, hydrogenated, ethoxylated	**TOXICITY**	**IRRITATION**
	Dermal (Rat) LD50: > 2000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: 2000 mg/kg[2]	Skin (Human): non-irritant[1]
		Skin: no adverse effect observed (not irritating)[1]

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*

Calcium sulfate hemihydrate	No significant acute toxicological data identified in literature search. Gypsum (calcium sulfate dihydrate) is a skin, eye, mucous membrane, and respiratory system irritant. Early studies of gypsum miners did not relate pneumoconiosis with chronic exposure to gypsum. Other studies in humans (as well as animals) showed no lung fibrosis produced by natural dusts of calcium sulfate except in the presence of silica. However, a series of studies reported chronic nonspecific respiratory diseases in gypsum industry workers in Gacki, Poland. Unlike other fibres, gypsum is very soluble in the body; its half-life in the lungs has been estimated as minutes. In four healthy men receiving calcium supplementation with calcium sulfate ($CaSO_4 \cdot 1/2H_2O$) (200 or 220 mg) for 22 days, an average absorption of 28.3 % was reported. Several feeding studies in pigs on the bioavailability of calcium in calcium supplements, including gypsum, have been conducted. The bioavailability of calcium in gypsum was similar to that for calcitic limestone, oyster shell flour, marble dust, and aragonite, ranging from 85 to 102 %. In mice, the i.p. and intragastric LD50 values were 6200 and 4704 mg/kg, respectively, for phosphogypsum (98 % $CaSO_4 \cdot H_2O$). For Plaster of Paris, the values were 4415 and 5824, respectively. In rats, an intragastric LD50 of 9934 mg/kg was reported for phosphogypsum. **Repeat dose toxicity**: In a study of 241 underground male workers employed in four gypsum mines in Nottinghamshire and Sussex for a year (November 1976-December 1977), results of chest X-rays, lung function

tests, and respiratory systems suggested an association of the observed lung shadows with the higher quartz content in dust rather than to gypsum; the small round opacities in the lungs were characteristic of silica exposure.
Prophylactic examinations of workers in a gypsum extraction and production plant (dust concentration exceeded TLV 2.5- to 10-fold) reported no risk of pneumoconiosis due to gypsum exposure, while another study of gypsum manufacturing plant workers reported that chronic occupational exposure to gypsum dust had resulted in pulmonary ventilatory defect of the restrictive form.
Three cases of idiopathic interstitial pneumonia with multiple bullae throughout the lungs were seen in Japanese schoolteachers (lifetime occupation) exposed to chalk; 2/3 of the chalk was made from gypsum and small amounts of silica and other minerals.
In rats exposed to an aerosol of anhydrous calcium sulfate fibres (15 mg/m^3) or a combination of milled and fibrous calcium sulfate (60 mg/m^3) six hours per day, five days per week for three weeks, gypsum dust was quickly cleared from the lungs of via dissolution and mechanisms of particle clearance.
In guinea pigs given intraperitoneal (i.p.) injections of gypsum (doses not provided), gypsum was absorbed followed by the dissolution of gypsum in surrounding tissues. In another study, after i.p. injection of gypsum (2 cm^3 of a 5 or 10 % suspension in saline) into guinea pigs, which were sacrificed at intervals up to 180 days, most of the dust was found distributed in the peritoneum of the anterior abdominal wall. Gypsum dust produced irregular and clustered nodules, which decreased in size over time.
Direct administration of WTC PM2.5 [mostly composed of calcium-based compounds, including calcium sulfate (gypsum) and calcium carbonate (calcite)] (10, 32, or 100 µg) into the airways of mice produced mild to moderate lung inflammation and airway hyperresponsiveness at the high dose. [It was noted that WTC PM2.5 is composed of many chemical species and that their interactions may be related with development of airway hyperresponsiveness.]
In female SPF Wistar rats intratracheally (i.t.) instilled with anhydrite dust (35 mg) and sacrificed three months later, an increase in total lipid or hydroxyproline content in the lungs was not observed compared to controls.
In inhalation (nose-only) experiments in which male F344 rats were exposed to calcium sulfate fibre aerosols (100 mg/m^3) for six hours per day, five days per week for three weeks, there were no effects on the number of macrophages per alveolus, bronchoalveolar lavage fluid (BALF) protein concentration, or BALF g-glutamyl transpeptidase activity (g-GT). Following three weeks of recovery, nonprotein thiol levels (NPSH), mainly glutathione, were increased in animals. In follow-up experiments, rats were exposed to an aerosol of anhydrous calcium sulfate fibres (15 mg/m^3) or a combination of milled and fibrous calcium sulfate (60 mg/m^3) for the same duration. Calcium levels in the lungs were similar to those of controls; however, gypsum fibres were detected in the lungs of treated animals. Significant increases in NSPH levels in BALF were observed in rats killed immediately after exposure at both doses and in recovery group animals at the higher dose. At 15 mg/m^3, almost all NPSH was lost in macrophages from all treated animals (including those in recovery), but a significant decrease in extracellular g-GT activity was seen only in recovery group animals. Overall, the findings were "considered to be non-pathological local effects due to physical factors related to the shape of the gypsum fibres and not to calcium sulphate per se."
Intratracheal administration of man-made calcium sulfate fibre (2.0 mg) once per week for five weeks resulted in no deaths or significant body weight changes in female Syrian hamsters compared to controls.
Inflammation (specifically, chronic alveolitis with macrophage and neutrophil aggregation) was observed in the lung.
In guinea pigs, inhalation of calcined gypsum dust (1.6 x 104 particles/mL) for 44 hours per week in 5.5 days for two years, followed with or without a recovery period of up to 22 months, produced only minor effects in the lungs. There were 12 of 21 deaths over the entire experimental period. These were due to pneumonia or other pulmonary lesions; however, no significant gross signs of pulmonary disease or nodular or diffuse pneumoconiosis became significant. Beginning near 11 months, pigmentation and atelectasis were seen. During the recovery period, four of ten guinea pigs died; two died of pneumonia. Pigmentation continued in most animals but not atelectasis. Low-grade chronic inflammation, occurring in the first two months, also disappeared.
Mercury emissions controls on coal-fired power plants have increased the likelihood of the presence of mercury in synthetic gypsum formed in wet flue gas desulfurisation (FGD) systems and the finished wallboard produced from the FGD gypsum. In a study at a commercial wallboard plant, the raw FGD gypsum, the product stucco (beta form of $CaSO_4 \cdot 1/2H_2O$), and the finished dry wallboard each contained about 1 ug Hg/g dry weight. Total mercury loss from the original FGD gypsum content was about 0.045 g Hg/ton dry gypsum processed
Synergistic/Antagonistic Effects: In rats, i.t. administration of anhydrite (5-35 mg) successively and simultaneously with quartz reduced the toxic effect of quartz in lung tissue. This protective effect on quartz toxicity was also seen in guinea pigs; calcined gypsum dust prevented or hindered the development of fibrosis. Natural anhydrite, however, increased the fibrogenic effect of cadmium sulfide in rats. Additionally, calcined gypsum dust had a stimulatory effect on experimental tuberculosis in guinea pigs.
Cytotoxicity: In Syrian hamster embryo cells, gypsum (up to 10 ug/cm^2) did not induce apoptosis. Negative results were also found in mouse peritoneal macrophages (tested at 150 ug/mL gypsum dust) and in Chinese hamster lung V79-4 cells (tested up to 100 ug/mL).
Carcinogenicity: In female Sprague-Dawley rats, i.p. injection of natural anhydrite dusts from German coal mines (doses not provided) induced granulomas; whether gypsum was the causal factor was not established. In Wistar rats, four i.p. injections of gypsum (25 mg each) induced abdominal cavity tumours, mostly sarcomatous mesothelioma, in 5% of animals; first tumour was seen at 546 days. In a subsequent experiment using the same procedure, female Wistar rats exhibited the first tumour at 579 days after the last injection. Mean survival of the tumour-bearing rats (5.7 % of test group) was 583 days, while mean survival of the test group was 587 days. Tumour types seen were a sarcoma having cellular polymorphism, a carcinoma, and a reticulosarcoma.
Intratracheal administration of man-made calcium sulfate fibre (2.0 mg) once per week for five weeks produced tumours in three of 20 female Syrian hamsters observed two years later. An anaplastic carcinoma was found in the heart, and one dark cell carcinoma was seen in the kidney.
Two tumours of unspecified types were observed in the rib.
In guinea pigs, inhalation of gypsum (doses not provided) for 24 months produced no lung tumours.

	In rats, i.t. administration of gypsum (doses not provided in abstract) from FGD for up to 18 months produced no arterial blood gas changes or indications of secondary heart damage as compared to controls. In another study, a single i.t. dose (25 mg) of flue gas gypsum dust did not produce a pathological reaction when observed for up to 18 months. There were also no signs of developing granuloma of fibrosis of the lungs. Lead quickly accumulated in the femur after injection but was eliminated during the observation period. In the Ames test, the flue gas gypsum dust was negative. **Genotoxicity**: Calcium sulfate (up to 2.5 %) was negative in Salmonella typhimurium strains TA1535, TA1537, and TA1538 and in Saccharomyces cerevisiae strain D4 with and without metabolic activation. Developmental toxicity: In pregnant mice, rats, and rabbits, daily oral administration of calcium sulfate (16-1600 mg/kg bw) beginning on gestation day 6 up to 18 produced no effects on maternal body weights, maternal or foetal survival, or nidation; developmental effects were also not seen.
Castor oil, hydrogenated, ethoxylated	This product contains partially hydrogenated fatty acids and/ or trans fatty acids. The consumption of trans fats increases the risk of coronary heart disease by raising levels of LDL cholesterol and lowering levels of "good" HDL cholesterol. There is an ongoing debate about a possible differentiation between trans fats of natural origin and trans fats of man-made origin but so far, no scientific consensus has been found. Two Canadian studies have shown that the natural trans-fat vaccenic acid, found in beef and dairy products, may have an opposite health effect and could actually be beneficial compared to hydrogenated vegetable shortening, or a mixture of pork lard and soy fat, by lowering total and LDL cholesterol and triglyceride levels. In lack of recognized evidence and scientific agreement, nutritional authorities consider all trans fats as equally harmful for health and recommend that consumption of trans fats be reduced to trace amounts. The use of hydrogenated oils in foods has never been completely satisfactory. Because the centre arm of the triglyceride is shielded somewhat by the end fatty acids, most of the hydrogenation occurs on the end fatty acids. While full hydrogenation produces largely saturated fatty acids, partial hydrogenation results in the transformation of unsaturated cis fatty acids to trans fatty acids in the oil mixture due to the heat used in hydrogenation. Partially hydrogenated oils and their trans fats have increasingly been viewed as "unhealthy". Trans fat is the common name for unsaturated fat with trans-isomer (E-isomer) fatty acid(s). Because the term refers to the configuration of a double carbon-carbon bond, trans fats are sometimes monounsaturated or polyunsaturated, but never saturated. Trans fats do exist in nature but also occur during the processing of polyunsaturated fatty acids in food production. Trans fats occur naturally in a limited number of cases: vaccenyl and conjugated linoleyl (CLA) containing trans fats occur naturally in trace amounts in meat and dairy products from ruminants. The exact biochemical methods by which trans fats produce specific health problems are a topic of continuing research. One theory is that the human lipase enzyme works only on the cis configuration and cannot metabolise a trans-fat. A lipase is a water-soluble enzyme that helps digest, transport, and process dietary lipids such as triglycerides, fats, and oils in most - if not all - living organisms. While the mechanisms through which trans fats contribute to coronary heart disease are fairly well understood, the mechanism for trans fat's effect on diabetes is still under investigation. Trans fatty acids may impair the metabolism of long-chain polyunsaturated fatty acids (LCPUFAs), but maternal pregnancy trans-fatty acid intake has been inversely associated with LCPUFAs levels in infants at birth thought to underlie the positive association between breastfeeding and intelligence. There are suggestions that the negative consequences of trans-fat consumption go beyond the cardiovascular risk. In general, there is much less scientific consensus asserting that eating trans-fat specifically increases the risk of other chronic health problems: It has been suggested that the intake of both trans fats and saturated fats promote the development of Alzheimer disease, although not confirmed in an animal model. It has been found that trans fats impaired memory and learning in middle-age rats. The rats' brains of trans-fat eaters had fewer proteins critical to healthy neurological function. Inflammation in and around the hippocampus, the part of the brain responsible for learning and memory. These are the exact types of changes normally seen at the onset of Alzheimer's, but seen after six weeks, even though the rats were still young. There is a growing concern that the risk of type 2 diabetes increases with trans-fat consumption.[52] However, consensus has not been reached. For example, one study found that risk is higher for those in the highest quartile of trans fat consumption. Another study has found no diabetes risk once other factors such as total fat intake and BMI were accounted for. Research indicates that trans-fat may increase weight gain and abdominal fat, despite a similar caloric intake. A 6-year experiment revealed that monkeys fed a trans-fat diet gained 7.2 % of their body weight, as compared to 1.8 % for monkeys on a mono-unsaturated fat diet. Although obesity is frequently linked to trans-fat in the popular media, this is generally in the context of eating too many calories; there is not a strong scientific consensus connecting trans-fat and obesity, although the 6-year experiment did find such a link, concluding that "under controlled feeding conditions, long-term TFA consumption was an independent factor in weight gain. TFAs enhanced intra-abdominal deposition of fat, even in the absence of caloric excess, and were associated with insulin resistance, with evidence that there is impaired post-insulin receptor binding signal transduction. Liver Dysfunction: Trans fats are metabolised differently by the liver than other fats and interfere with delta 6 desaturase. Delta 6 desaturase is an enzyme involved in converting essential fatty acids to arachidonic acid and prostaglandins, both of which are important to the functioning of cells. Infertility in women: One 2007 study found, "Each 2 % increase in the intake of energy from trans unsaturated fats, as opposed to that from carbohydrates, was associated with a 73 % greater risk of ovulatory infertility...". Major depressive disorder: Spanish researchers analysed the diets of 12,059 people over six years and found those who ate the most trans fats had a 48 per cent higher risk of depression than those who did not eat trans fats. One mechanism may be trans-fats' substitution for docosahexaenoic acid (DHA) levels in the orbitofrontal cortex (OFC). Very high intake of trans-fatty acids (43 % of total fat) in mice from 2 to 16 months of age was associated with lowered DHA levels in the brain (p=0.001) When the brains of 15 major depressive subjects who had committed suicide were

	examined post-mortem and compared against 27 age-matched controls, the suicidal brains were found to have 16 % less (male average) to 32 % (female average) less DHA in the OFC. The OFC is known to control reward, reward expectation and empathy, which are all negatively impacted in depressive mood disorders, as well as regulating the limbic system. 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. Sensitisation studies in guinea pigs revealed that the pure non-oxidised surfactant itself is non-sensitising 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, non-ionic 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. Allergic Contact Dermatitis––Formation, Structural Requirements, and Reactivity of Skin Sensitizers. Ann-Therese Karlberg et al; Chem. Res. Toxicol.2008,21,53-69. Polyethylene glycols (PEGs) have a wide variety of PEG-derived mixtures due to their readily linkable terminal primary hydroxyl groups in combination with many possible compounds and complexes such as ethers, fatty acids, castor oils, amines, propylene glycols, among other derivatives. PEGs and their derivatives are broadly utilized in cosmetic products as surfactants, emulsifiers, cleansing agents, humectants, and skin conditioners. PEGs and PEG derivatives were generally regulated as safe for use in cosmetics, with the conditions that impurities and by-products, such as ethylene oxides and 1,4-dioxane, which are known carcinogenic materials, should be removed before they are mixed in cosmetic formulations. Most PEGs are commonly available commercially as mixtures of different oligomer sizes in broadly- or narrowly-defined molecular weight (MW) ranges. For instance, PEG-10,000 typically designates a mixture of PEG molecules (n = 195 to 265) having an average MW of 10,000. PEG is also known as polyethylene oxide (PEO) or polyoxyethylene (POE), with the three names being chemical synonyms. However, PEGs mainly refer to oligomers and polymers with molecular masses below 20,000 g/mol, while PEOs are polymers with molecular masses above 20,000 g/mol, and POEs are polymers of any molecular mass. Relatively small molecular weight PEGs are produced by the chemical reaction between ethylene oxide and water or ethylene glycol (or other ethylene glycol oligomers), as catalysed by acidic or basic catalysts. To produce PEO or high-molecular weight PEGs, synthesis is performed by suspension polymerization. It is necessary to hold the growing polymer chain in solution during the course of the poly-condensation process. The reaction is catalysed by magnesium-, aluminium-, or calcium-organoelement compounds. To prevent coagulation of polymer chains in the solution, chelating additives such as dimethylglyoxime are used Safety Evaluation of Polyethylene Glycol (PEG) Compounds for Cosmetic Use: Toxicol Res 2015; 31:105-136 The Korean Society of Toxicology http://doi.org/10.5487/TR.2015.31.2.105.
Calcium chloride, hydrated & Calcium sulfate hemihydrate	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 dyspnoea, cough and mucus production.

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 either not available or does not fill the criteria for classification*
✗ - *Data available to make classification*

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SECTION 12 Ecological information

Toxicity

24·7 Calcium for Dairy Cows

Endpoint	Test Duration	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

Calcium chloride, hydrated

Endpoint	Test Duration	Species	Value	Source
EC50	72 hr	Algae or other aquatic plants	2900 mg/l	2
LC50	96 hr	Fish	3 mg/l	1
EC50	48 hr	Crustacea	52 mg/ml	1
NOEC (ECx)	0 hr	Fish	8.879 mg/ml	4
EC50	96 hr	Algae or other aquatic plants	1109.9 mg/ml	4

Calcium sulfate hemihydrate

Endpoint	Test Duration	Species	Value	Source
NOEC (ECx)	0.25 hr	Fish	75 mg/l	4
EC50	72 hr	Algae or other aquatic plants	> 79 mg/l	2
LC50	96 hr	Fish	> 79 mg/l	2

Castor oil, hydrogenated, ethoxylated

Endpoint	Test Duration	Species	Value	Source
NOEC (ECx)	504 hr	Crustacea	< 0.001 mg/l	2
EC50	72 hr	Algae or other aquatic plants	6.61 mg/l	2
LC50	96 hr	Fish	> 7.33 mg/l	2
EC50	48 hr	Crustacea	> 25 mg/l	2

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered substances – Ecotoxicological Information – Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) – 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.*

Harmful to aquatic organisms.
DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
Calcium sulfate hemihydrate	HIGH	HIGH

Bioaccumulation potential

Ingredient	Bioaccumulation
Calcium sulfate hemihydrate	LOW (LogKOW = -2.002)

Mobility in soil

Ingredient	Mobility
Calcium sulfate hemihydrate	LOW (KOC = 6.124)

SECTION 13 Disposal considerations

Waste treatment methods

Product / Packaging disposal

Recycle wherever possible or consult manufacturer for recycling options.
Consult State Land Waste Management Authority for disposal.

- **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 or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 Transport information

Labels required

Marine pollutant	NO
HAZCHEM	No Applicable

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Land transport (ADG): 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 in accordance with MARPOL Annex V and the IMSBC Code

Not applicable

Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
Calcium chloride, hydrated	Not Available
Calcium sulfate hemihydrate	Not Available
Castor oil, hydrogenated, ethoxylated	Not Available

Transport in bulk in accordance with the ICG Code

Product name	Ship Type
Calcium chloride, hydrated	Not Available
Calcium sulfate hemihydrate	Not Available
Castor oil, hydrogenated, ethoxylated	Not Available

SECTION 15 Regulatory information

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

Calcium chloride, hydrated is found on the following regulatory lists

Australian Hazardous Chemical Information System (HCIS) – Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

Calcium sulfate hemihydrate is found in the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

Castor oil, hydrogenated, ethoxylated is found in the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (Calcium chloride, hydrated; Calcium sulfate hemihydrate; Castor oil, hydrogenated, ethoxylated)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16 Other information

Revision date	15 Nov 2021
Initial date	15 Nov 2021

SDS Version Summary

Version	Date of Update	Sections Updated
1.0	15 Nov 2021	New SDS

Other information

Ingredients with multiple CAS numbers

Name	CAS No.
Calcium chloride, hydrated	10035-04-8, 7774-34-7, 22691-02-7
Calcium sulfate, hemihydrate	10034-76-1, 26499-65-0
Castor oil, hydrogenated, ethoxylated	61791-12-6, 61788-85-0, 113148-98-4, 113148-99-5, 12656-75-6, 1360903-44-1, 37224-21-8, 391639-38-6, 51395-91-6, 55963-15-0, 56093-64-2, 56093-65-3, 562107-40-8, 57176-39-3, 60649-24-3, 60649-25-4, 60842-68-4, 62886-94-6, 865083-36-9, 107853-28-1, 1309581-05-2, 1384935-33-4, 193363-08-5, 2091900-74-0, 286015-78-9, 287181-21-9, 339268-85-8, 439806-92-5, 53571-36-1, 56257-95-5, 57572-22-2, 58076-69-0, 58968-70-0, 58985-57-2, 60364-31-0, 60649-23-2, 60746-65-8, 65862-71-7, 71123-59-6, 8035-98-1, 8047-16-3, 8051-35-2, 8051-83-0, 8051-90-9, 9038-23-7, 921590-10-5

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.
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
ES: Exposure Standard
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
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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