

SAFETY DATA SHEET

Issue date: 08-10-2010

Supersedes: 10-09-2008

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier	Calcium chloride 75-99 % Powder form. This MSDS is valid for all forms of medium dustiness powders of calcium chloride.
Chemical name/synonyms	Calcium chloride
	For Tech Grade, Road Grade and Food Grade, Powder Form
CAS-number	10043-52-4
EC-number	233-140-8
Index-number, CLP Annex VI	017-013-00-2
1.2 Relevant identified uses of the substance or mixture and uses advised against	See Annex 1 to this MSDS. Most common uses: Dust suppression, process aid during oil drilling, dehumidifying, road de-icing, food additive, cooling media. No uses advised against are identified.
1.3 Details of the supplier of the safety data sheet	
Supplier	Cowin Industry Limited
Address 1	Binhai District Weifang Shandong Province, P.R.China
Email Address:	info@icwain.com
	www.calciumchloride.cn
Remark	Safety Data Sheet for calcium chloride 75-99% Road Grade, Tech Grade, Food Grade, Powder Form
1.4 Emergency telephone number	24 hours service is available at NHS Direct in UK: +44(0)845 46 47 or call 112 or 999, see also www.nhsdirect.nhs.uk
MSDS issued by	

Section 2: Hazards identification

2.1 Classification of the substance or mixture

2.1.1 According to the CLP-constitution EG/1272/2008

Serious eye damage/eye irritation, Hazard Category 2; H319 Causes serious eye irritation.


See also section 15 about the classification.

2.1.1 Classification according to DSD 67/548/EEC

Xi; R36 Irritating to eyes.

2.2 Label elements

2.2.1 According to the CLP regulation

GHS hazard pictogram	
Signal word	Warning
Hazard statement	H319 Causes serious eye irritation.
Safety information – precautionary	P280 Wear protective gloves/protective clothing/eye protection/face protection.
Safety information – measures	P305 + P351 IF IN EYES: Rinse cautiously with water for several minutes. P337+P313 If eye irritation persists: Get medical advice/attention.
Safety information – storage	-
Safety information – waste	-

For safety phrases in plain text, see section 16.

Other labels:

Content: Calcium Chloride 75-99 %

2.3 Other hazards

The product could cause minor skin irritation and dry skin.

Section 3: Composition/information on ingredients

3.1 Substances

3.2 Mixtures

EC-no	CAS-no	Reg-no REACH	Name of component	Conc. wt/wt	Classification	Com.
233-140-8	10043-52-4	01-2119494219-28	Calcium chloride	75-99 %	CLP: Eye irritation, Category 2; H319 DSD: Xi; R36	
-	10035-04-8		Calcium chloride dihydrate	varying	CLP: Eye irritation, Category 2; H319 DSD: Xi; R36	
-	25094-02-4		Calcium chloride tetrahydrate	varying	CLP: Eye irritation, Category 2; H319 DSD: Xi; R36	
-	7774-34-7		Calcium chloride hexahydrate	varying	CLP: Eye irritation, Category 2; H319 DSD: Xi; R36	

215-137-3	1305-62-0		Calcium hydroxide	<1 %	CLP Corrosive Cat 1; H314 DSD ; C; R34	WEL
Explanation of abbreviations: CAS-nr. = Chemical Abstracts Service; EU-nr (Einecs- or Elincsnr) = European Inventory of Existing Commercial Chemical Substances or European List of Notified Chemical Substances. Content specified as; %, %wt/wt, %vol/wt, %vol/vol, mg/m ³ , ppb, ppm, wt%, vol%. WEL = The product have a workplace exposure limit, PBT = The product is declared since it's a PBT- or a vPvB-substance.						

Comments: In the REACH registration of calcium chloride the different hydrates in the product are regarded as the same substance as anhydrous with reference to the exemption to register hydrates in Annex V of REACH. All forms could be present in the products. Probable Contaminants: Calcium Carbonate, Calcium Oxide, Alkali Metal Chlorides, Alkaline Earth Metal Chlorides. Typical content of calcium hydroxide < 1 %.

For risk phrases in plain text, see section 16.

Section 4: First aid measures

4.1 Description of first aid measures	
Inhalation	Remove to fresh air, keep warm and at rest. If symptoms persist; Seek medical attention.
Skin contact	Remove contaminated clothing. Wash off any skin contamination immediately with plenty of water. Launder clothes before re-use.
Eye contact	Remove contact lenses if present. Rinse eye thoroughly with eye wash solution or clean water for at least 10 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical attention.
Ingestion	<u>DO NOT</u> induce vomiting. Wash out mouth with water and give plenty of water to drink (at least 300 ml). Obtain medical advice if symptoms persist.
4.2 Most important symptoms and effects, both acute and delayed	
Inhalation	Inhalation of aerosols from the product could irritate the respiratory systems. For single exposure no irreversible effect is known.
Skin contact	Could cause moderate skin irritation. The product will not give delayed symptoms.
Eye contact	Could cause severe irritation of the eye. If the eye is not washed thoroughly, there is a risk of irreversible eye damage.
Ingestion	Could cause irritation of esophagus and the stomach. No delayed or irreversible symptoms are expected.
4.3. Indication of any immediate medical attention and special treatment needed	<u>DO NOT</u> induce vomiting. The product could, together with the hydrogen chloride from the stomach cause irritation on esophagus or it might irritate the

	respiratory system. Wash out mouth with water and give plenty of water to drink (at least 300 ml.) and observe the patient.
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Section 5: Firefighting measures

5.1 Extinguishing media a. Recommended Extinguishing media b. Not Recommended Extinguishing media	a. The product is not combustible. Choose extinguishing media depending on surrounding fire. b. All extinguishing media are allowed; Select the appropriate extinguishing media depending on the surrounding fire.
5.2 Special hazards arising from the substance or mixture	Non specific.
5.3 Advise for firefighters	Depending on surrounding fire.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures	
6.1.1. For non-emergency personnel	For personal protection equipment see section 8.
6.1.2 For emergency responders	For personal protection equipment see section 8.
6.2 Environment precautions	Prevent uncontrolled discharges into the environment (rivers, water courses, sewers etc.). See relevant exposure scenarios covering intended use in the environment like de-icing and dust suppression.
6.3 Methods and material for containment and cleaning up 6.3.1. Surrounding embankment /sealing 6.3.2 Recommended cleaning up measures 6.3.3 Non-recommended measures	If large releases to a sensitive environment area; Embank with sand or other inert material and collect the material. Clean up contaminations/spillages as soon as they occur. Collect as much as possible in a suitable clean container, preferably for re-use, otherwise for disposal. Wash the spillage area with large quantities of water. Do not wash out with water in a sensitive environment.
6.4 Reference to other sections	For waste measures, see section 13.

Section 7: Handling and storage

7.1 Precaution for safe handling	Operate in a well-ventilated area, atmospheric levels should be controlled in compliance with the exposure scenarios and occupational exposure limits. Avoid inhalation of dusts. Avoid contact with skin and eyes. Wash contaminated skin or clothes immediately after contact with the product. Report any skin problems that may develop.
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	<p>See section 8 for personal protection and ventilation control measurements.</p> <p>Do not eat, drink or smoke when handling the product.</p> <p>Wash hands after finishing working with the product.</p> <p>See relevant exposure scenarios: ES1 Production (not enclosed to this MSDS as it only concerns the production of calcium chloride at the manufacturing site of Tetra Chemicals); ES2, Intermediates; ES3 Formulation and/or distribution; ES4 Use of calcium chloride as processing aid; ES5 Industrial outdoor use; ES6 Professional indoor use; ES7 Professional outdoor use</p>
7.2 Condition for safe storage, including any incompatibles	<p>Store at a dry place, not above normal room temperature.</p> <p>Do not store with acids or strong oxidizing or reducing agents.</p> <p>Avoid excessive ventilation <i>during storage</i> as the product can absorb moisture from the air.</p> <p>For ventilation during handling; See above and the different ES.</p>
7.3 Specific end use(s)	See the different exposure scenarios. None specific identified

Section 8: Exposure controls/personal protection

8.1 Control parameters

National occupational exposure limits values, EH 40, 2005 with updates

CAS-no	Substance name	WEL 8 h	WEL 5 min	WEL 15 min
	Dust (inhalable amount of any dust)	10 mg/m ³		
	Respirable dust	4 mg/m ³		
1305-62-0	Calcium hydroxide	5 mg/m ³		

WEL=Workplace Exposure Limit

Derived No Effect Level (DNEL)

CAS-no	Substance name	DNEL (way of exposure)	Exposure scenario Annex
10043-52-4	Calcium chloride	Worker DNELinhalation - long term 5 mg/m ³	ES1 Production (not enclosed); ES2, Intermediates; ES3 Formulation and/or distribution; ES4 Use of calcium chloride as processing aid; ES5 Industrial outdoor use; ES6 Professional indoor use; ES7 Professional outdoor use
10043-52-4	Calcium chloride	Worker DNELinhalation - short term 10 mg/m ³	See above ES.

10043-52-4	Calcium chloride	Consumer, general population DNELinhalation - long term 2.5 mg/m ³	ES10 (not enclosed, see the web page of Tetra Chemicals)
10043-52-4	Calcium chloride	Consumer, general population DNELinhalation - short term 5 mg/m ³	ES10 (not enclosed, see the web page of Tetra Chemicals)
10043-52-4	Calcium chloride	The DNELdermalacute needs only be derived if an acute toxicity hazard (leading to classification and labelling) has been identified and peak exposures are likely to occur. The available data do not trigger classification for acute systemic dermal toxicity.	
10043-52-4	Calcium chloride	DNELderma long term effects. DNEL not derived.	
10043-52-4	Calcium chloride	DNELinhalation long term systemic effects: No DNEL is derived. No long term effects are expected, also taking into account the recommended daily intake of 1000 mg/kg bw CaCl ₂ .	

The ES 1 for Production and ES 10 for consumer uses are not annexes to this ES.

Predicted No Effect Concentration (PNEC)

CAS-no	Substance name	PNEC (compartment environment)	Exposure-scenario Annex no2
10043-52-4	Calcium chloride	Deposition onto soil and plants: NE _{dep} * 150 g/m ²	When the product is used for de-icing or dust suppression. The NE _{dep} is only relevant for ES7.
10043-52-4	Calcium chloride	Sensitive terrestrial plants: 215 mg chloride/kg	When the product is used for de-icing or dust suppression. The NE _{dep} is only relevant for ES7.
10043-52-4	Calcium chloride	Because the calcium and chloride concentration varies between aquatic ecosystems (0.06-210 mg/L), it is not considered useful to derive a generic PNEC _{water} or PNEC _{marine} (neither added nor intermittent values)	
10043-52-4	Calcium chloride	No toxicity data on freshwater or marine sediment organisms are available. Calcium chloride is present in the environment as calcium and chloride ions, which implies that it will not adsorb on particulate matter, and it is not considered useful to derive a PNEC _{freshwater} or PNEC _{marine} sediment.	
10043-52-4	Calcium chloride	No reliable and relevant toxicity data on terrestrial organisms are available.	

		Calcium chloride is present in the environment as calcium and chloride ions, which implies that it will not adsorb on particulate matter, and it is not considered useful to derive a PNECterrestrial.	
10043-52-4	Calcium chloride	No toxicity tests on the effect of calcium chloride on sewage treatment plant (STP) organisms are available. Because the calcium and chloride concentration varies significantly between aquatic ecosystems, it is not considered useful to derive a generic PNECSTP or PNECSTP-added.	
10043-52-4	Calcium chloride	In view of the nutritional aspects, the metabolism, and the mechanisms of action of calcium and chloride ions, it is not considered useful to derive a PNECoral (secondary poisoning).	

* A tentative "PNEC", a so-called "no-effect-deposition" (NEdep) was derived for the exposure route for deposition of calcium via road salts or dust suppressors. It should be noted, that although the units refer to exposure via air, this value reflects effects caused by CaCl₂ deposited from air into soil or onto a plants' surface.

Biological limit values	None.
Recommended surveillance procedure	Normally not necessary. If there is a suspicion that occupational exposure limits or DNEL for inhalation values could be surpassed; Measurements of calcium chloride dust (total dust as worst case) could be done.

8.2 Exposure controls

8.2.1 Recommended technical control measures	See the different ES for appropriate engineering controls and ventilation. Operate in a well-ventilated area, atmospheric levels should be controlled in compliance with the exposure scenarios and occupational exposure limits. Normally outdoor use of calcium chloride, in powder form, does not demand any special exhaust ventilation. See outdoor industrial use (ES5) and outdoor professional use (ES 7). The only exception is when the product is sprayed. In this case there is a time limitation for the duration of the work or a demand to use a respirator or halfmask with filter P2 (ES 7). For indoor use of calcium chloride powder with medium dustiness with high possibility /duration of exposure. See ES 2, ES 3, ES 4, ES 6. It is important to provide a good standard of general ventilation (not less than 3 to 5 air changes per hour) or: Wear a halfmask conforming to EN140 with type P2 filter or a respirator with air supply.
8.2.2 Individual protection	

measures, e.g. personal protection equipment	
Eye/face protection	General advice in all ES. Use suitable eye protection if eye contact is likely. Most materials for protective goggles and face visors will probably be suitable e.g. polycarbonate.
Skin protection i) Hand protection (material, thickness, breakthrough time) ii) Other protection	General advice in all ES. i) Wear gloves (tested to EN374) if hand contamination is likely. Wash off any skin contamination immediately. Suitable glove materials are neoprene (chloroprene) and nitrile rubber. Permeation time for the material > 0.5 mm is probably 8 hours. The recommended materials are also suitable for normally occurring impurities in calcium chloride. Contaminated gloves should be carefully rinsed with water before reuse. Non suitable materials: Leather gloves (material decomposition). ii) Skin and Body Protection: Normal working clothes are suitable.
Respiratory protection	In the case of high dust levels or if DNEL or occupational exposure limits are surpassed; Wear a suitable respiratory protective equipment, ie. dust mask or a respirator with air supply. Wear a mask conforming to EN140 (half mask) or to EN 136 (full face mask) with particle filter P2. See ES2, ES3, ES4, ES5 (if spraying the product with insufficient ventilation), ES6 or ES7 (if spraying the product for > 1 hour).
8.2.3 Environmental exposure limits	None. See however ES 7 for deposition onto soil and plants.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

All data in this section is for the anhydrous calcium chloride if not otherwise specified.

Appearance/Form	Powder/solid
Colour	White; the substance could have small impurities of iron that gives light nuance coloration to the end product depending on the state of oxidation of iron itself (off-white, yellow, pink).
Odour	None
Odour threshold	Not applicable
pH	7-11 in 10 % water solution
Melting point/freezing point	782 °C
Initial boiling point	> 1600 °C
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability (solid, gas)	The substance is non-flammable.
Upper/lower flammability or explosive limits	Non applicable

Explosion limits	The substance is non-explosive.
Vapour pressure	Negligible
Vapour density	Non applicable
Relative density	2.15 g/cm ³ at 25 °C 2.15 g/cm ³ at 15 °C
Solubility (water)	745 g/L at 20 °C 1590 g/L at 100 °C
Partition coefficient n-octanol/water	Not applicable for an inorganic substance
Auto-ignition temperature	Not applicable
Decomposition temperature	Not applicable
Viscosity	Not applicable for a solid product
Explosive properties	The substance is non-explosive.
Oxidizing properties	The substance is non-oxidizing
Particle size distribution	Typical calcium chloride powder: D10 = 8.2 µm (RSD = 35.0%); D50 = 93.2 µm (RSD = 12.3%), D90 = 304.2 µm (RSD = 2.5%). D10%, D50% and D90% are the respective percentiles of the volume size distribution. RSD = Relative standard deviation

9.2 Other information

None

Section 10: Stability and reactivity

10.1 Reactivity	The substance could react with strong reducing or oxidizing agents.
10.2 Chemical stability	Stable under recommended storage and handling conditions.
10.3 Possibility of hazardous reactions	Calcium chloride could react violent with some strong reducing and oxidizing agents.
10.4 Conditions to avoid	Strong reducing and oxidizing agents.
10.5 Incompatible materials	Calcium chloride can cause pitting of and corrosion of some grades of stainless steel and under high temperature and stress conditions can promote stress corrosion cracking.
10.6 Hazardous decomposition products	None when used according to identified uses.

Section 11: Toxicological information

11.1 Information on toxicological effects

Calcium chloride is easily dissociated into calcium and chloride ions in water. The absorption, the distribution and the excretion of the ions are regulated separately. Calcium and chloride are essential constituents of the body of all animal species. Calcium is essential for the formation of skeletons and the regulation of neural transmission, muscle contraction and coagulation of the blood. Chloride is required for regulating intracellular osmotic pressure and buffering. Calcium and chloride are both essential nutrients for humans and a daily intake of more than 1000 mg for each of the ions is recommended. As for healthy humans, the tolerable upper intake level for calcium is

set at 2500 mg per day (equivalent to 6.9 g CaCl_2 per day) (Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, 1999). For chloride, the reference nutrient intake is set at 2500 mg/day (equivalent to 3.9 g CaCl_2 per day) (Department of Health, UK, 1991). The estimated intake of calcium chloride in a form of food additives (160-345 mg/day) is considerably smaller than these values. Consistent with this, the establishment of an ADI for calcium chloride has not been deemed necessary by JECFA (Joint FAO/WHO Expert Committee on Food Additives; 1974, 2001). Therefore small amounts of the product are normally not harmful except if in contact with the eye.

a) Acute toxicity

Short term exposure

Ingestion: Calcium chloride could irritate esophagus and the stomach.

LD50: 2301 mg/kg bw (rat male/female). Method OECD 401.

Inhalation: Could cause irritation of mucos membranes of pharinx and throat and unpleasant sensation in mouth already after the first inhalations if high concentrations of dust levels.

In accordance with column 2 of REACH Annex VIII, the study of acute inhalation does not need to be conducted, as reliable information on acute toxicity by two other routes of exposure, oral and dermal, is available. See however "Other information" below about experience in humans.

Eye contact: Calcium chloride is classified as irritating to eyes, category 2. The effect is however local and uptake or other systemic toxic effects through eye contact are not expected.

Skin contact:

LD50 (dermal) > 5000 mg/kg bw (male/female)

Long term exposure:

Ingestion: Taking into account the recommended daily intake of 1000 mg/kg bw CaCl_2 no adverse long term exposure is expected if ingested.

Inhalation: Based on the available data and taking into account the toxicokinetics and normal physiological role of calcium chloride systemic effects are not anticipated after repeated exposure.

Eye contact: No toxic effect is expected except from the irritation properties of calcium chloride. See below about eye irritation.

Skin contact: No toxic systemic effect is expected at long term dermal exposure of calcium chloride. The skin uptake is probably slow and calcium and chloride are normally occurring ions in the body.

b) Skin corrosion/irritation

Calcium chloride could give moderate irritation to the skin, especially the anhydrous calcium chloride.

Calcium chloride is however not classified as a skin irritant. Not irritating on rabbit according to OECD 404.

Long term effects:

Calcium chloride is not irritating to skin; thus it is not expected to induce local effects by dermal exposure. However all long term exposure with water solution with mild irritants could give atopic dermatitis and skin irritations for sensitive individuals

c) Serious eye damage/irritation

Anhydrous calcium chloride (rabbit): Highly irritating OECD 405.

Calcium chloride di- and tetrahydrates (rabbit): Irritating (OECD 405)

Calcium chloride hexahydrate (rabbit): Moderately irritating (OECD 405)

The difference in eye irritation between the water free substance and the hydrates could be explained by the reaction when the water free calcium chloride takes up crystal water from the eye. This reaction is exothermic and irritates the eye by drying the lenses and causes injuries when heat is evolved.

Long term contact with the eye or not washing the eye properly at short time exposure contact could give irreversible damage to the eye.

d) Respiratory or skin sensitisation

Calcium chloride is not a respiratory or skin sensitizer.

In accordance with section 1 of REACH Annex XI, testing does not appear scientifically necessary; Calcium chloride is considered not to have any sensitising properties, based on the physiological role of both its constituent ions, as well as the fact that sensitising effects of both ions have never been reported, despite long-term historical and wide dispersive use (e. g. via food and medication).

e) Germ cell mutagenicity

Bacterial reverse mutation assay: Negative for Salmonella. Typhimurium, other: TA92, TA1535, TA100, TA1537, TA94, TA98 (all strains/cell types tested); met. act.: with; cytotoxicity: no, but tested up to limit concentrations.

In vitro mammalian chromosome aberration test (chromosome aberration),
negative for Chinese hamster lung fibroblasts (V79) (all strains/cell types tested)

All tests for genotoxic properties were negative. Calcium and chloride are normal constituents of the body. The substance is not expected to be genotoxic.

f) Carcinogenicity

Calcium chloride is not genotoxic in vivo. Calcium and chloride are both essential nutrients for humans and a daily intake of more than 1000 mg for each of the ions is recommended. Based on this information, it is concluded that the substance is not carcinogenic.

g) Reproductive toxicity

Calcium chloride will usually not reach the foetus or the male and female reproductive organs when exposed orally, dermally or by inhalation, as it does not become available systemically.

An oral developmental study was performed in 3 species (mouse, rat and rabbit). In all three species no maternal or teratogenic effects were noted with calcium chloride, and NOAEL 's were above the highest dose given. Thus calcium chloride is not expected to have any reproductive toxicity.

h) STOT-single exposure

Respiratory tract: not irritating.

i) STOT-repeated exposures

Respiratory tract: not irritating.

j) Aspiration hazard

Not relevant for a solid substance.

k) Other information

Experience of calcium chloride inhalation in humans (Vinnikov): Sixty five tuberculosis patients (51 males, 14 females; age from below 30 till over 50) were treated with aerosol inhalations of 2-5% aqueous solution of calcium chloride. The number of inhalations varied from below 10 (24 patients), till over 30 (2 patients). Several patients reported irritation of mucos membranes of pharynx and throat and unpleasant sensation in mouth already after the first inhalations. However, the frequency of such cases was described as minor by the authors. Overall calcium chloride inhalations were said to have beneficiary effects on disease symptoms.

Section 12: Ecological information

12.1 Toxicity

Calcium chloride is not classified as hazardous for the environment.

Calcium and chloride are normally occurring ions in the entire ecosystem and release to the environment are not expected to have any long term negative effects. High amounts of chloride ions could however cause local disturbance and damage in a sensitive environment.

Acute toxicity

Fish (*Pimephales promelas*) LC50 (96 h): 4630 mg/L
 LC50 (48 h): > 6560 mg/L
 LC50 (24 h): > 6660 mg/L
 Method: other: EPA/600/4-90/027, EPA/600/6-91/003

Crustaceans (*Daphnia magna*) LC50 (48 h): 2400 mg/L based on: mobility (static OECD 202)

Algae: *Selenastrum capricornutum* (new name: *Pseudokirchneriella subcapitata*)
 EC50 (72 h): 2900 mg/L based on: biomass
 EC50 (72 h): > 4000 mg/L based on: growth rate
 EC20 (72 h): 1000 mg/L based on: biomass
 OECD Guideline 201 (Alga, Growth Inhibition Test)

algae/cyanobacteria: *Pseudokirchneriella subcapitata* (as *Selenastrum capricornutum*).
 EC50 (72 h) 2,9 and EC20 1,0 mg/L, OECD guideline 201.

Long term toxicity

Fish: No reliable studies are available. Calcium and chloride are normally occurring ions in the entire ecosystem and long term toxicity on fish is expected to be high.

Crustaceans (*Daphnia magna*): EC50 (21 d): 610 mg/L based on: reproductive impairment
 EC16 (21 d): 320 mg/L based on: reproductive impairment
 LC50 (21 d): 920 mg/L based on: mortality
 Method not mentioned

Alga: EC10/LC10 or NOEC for freshwater algae: 1000 mg/L

Terrestrial organisms

Calcium chloride is dissociated into calcium and chloride ions and chloride ions will not adsorb on particulate matter. The calcium ions may bind to particulate matter or may form stable inorganic salts with sulphate and carbonate ions, but calcium is naturally present in soil. Therefore, exposure or adverse effects of the soil compartment is unlikely.

Plants

Calcium is well known as an essential nutrient for higher plants and has important roles for cell wall formation, cell division and cell elongation. Chloride is an essential micronutrient for plants and has an important role in regulating osmotic pressure of cells (SIDS, 2002).

However high doses could harm sensitive plants

In one study of Sugar maples (*Acer saccharum*) were exposed to runoff of sodium chloride and calcium chloride for 6 winters (total treatment of 11.2 tonnes /ha per treatment and 15 treatments per winter at weekly intervals, equalling 11.2 kg/m² in total and 1.87 kg/m² in one season).

Results: Damage to roadside vegetation has been reported and is attributed largely to the absorption of salt splashed foliage. Leaves of these maple trees contained 3 to 6 times the chloride concentration compared to a control stand. Damage to the maples varied but could be correlated with the chloride concentration in the leaf.

One field study with spruce tree (*Picea* sp.) was carried out for ten weeks during a winter season, and a total dose of 1.5 kg/m² NaCl, CaCl₂ or a 75/25 NaCl/CaCl₂ mixture.

In the presence of calcium chloride the uptake of Cl⁻ in the root was inhibited. Effects of calcium chloride are present but it depends on the amount of accumulated Cl⁻.

Effects on micro-organisms living in wastewater treatment plants

No study is available.

Calcium plays crucial roles in strengthening cell walls. Chloride is also an essential micronutrient for bacteria and has important roles in the photosynthesis and osmoregulation. No adverse effect is suspected for micro-organisms living in sewage treatment plants.

12.2 Persistence and degradability

In accordance with column 2 of REACH Annex VII, biodegradability test does not need to be conducted as the substance is inorganic.

12.3 Bioaccumulative potential

Calcium chloride is easily dissociated into calcium and chloride ions and both ions are essential constituents of the body of all animals. No bioaccumulation or biomagnifications is expected for calcium chloride.

12.4 Mobility in soil

Calcium chloride is dissociated into calcium and chloride ions and chloride ions will not adsorb on particulate matter. The calcium ion may bind to soil particulate or may form stable inorganic salts with sulphate and carbonate ions, but calcium is naturally present in soil.

12.5 Results of PBT and vPvB assessment

Not applicable for an inorganic substance. According to Annex XIII of the REACH Regulation 1907/2006/EC inorganic substances do not need to be subjected to a PBT assessment.

12.6 Other adverse effects

None specific.

Section 13: Disposal consideration

13.1 Waste treatment methods	<p>Product</p> <p>If recycling or reuse is not practical then the product must be disposed of in accordance with local, state or national regulations. A suitable way of disposal is landfill or controlled emission to a large recipient, with naturally occurring levels of calcium and chloride ions, like the sea. Do not dispose of with acids or strong reducing or oxidizing agents.</p> <p>Packaging</p> <p>If recycling or reuse is not practical then the packaging material must be disposed of in accordance with local, state or national regulations.</p> <p>Clean packaging material with water and dispose of the water in accordance with local regulations.</p> <p>Package could be incinerated in a plant with a permit from competent authorities.</p>
Waste codes (EWC)	<p>Depends on where the waste is generated.</p> <p>Calcium chloride has a wide dispersive use in many areas and all relevant codes could not be given in this MSDS.</p>
The product is classified as hazardous waste	No
Waste codes (EWC) for the container	15 01 02 (plastic packaging); 15 01 05 (big bags of composite packaging)
A not thoroughly cleaned container is considered dangerous waste	No
Other information	See section 8 for personal protection when handling waste from the product.

Section 14: Transport information

General	Not regulated as hazardous goods.
14.1 UN number	-
14.2 UN Proper Shipping Name	-
14.3 Transport hazard class(es)	-

14.4 Packing group	-
14.5 Environmental hazards	-
14.6 Special precautions for users	-
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code	-

Section 15: Regulatory information

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

See EH44 DUST: GENERAL PRINCIPLES OF PROTECTION

15.2 Chemical safety assessment

Chemical safety assessment is performed for calcium chloride according to article 14 in REACH.

Section 16: Other information

This MSDS is changed in the following sections:

This MSDS is fully revised according to the CLP and REACH regulations and amended in many sections with the result from the chemical safety assessment in the REACH registration.

This MSDS supersedes all previous issues.

Hazard and Precautionary statements from section 2 and 3 in plain text (CLP):

H314: Causes severe skin burns and eye damage.

H319 Causes serious eye irritation.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305 + P351 IF IN EYES: Rinse cautiously with water for several minutes.

P337+P313 If eye irritation persists: Get medical advice/attention.

Hazard categories from section 2 and 3 in plain text according to DSD 67/548/EEC.

Xi = Irritating

C= Corrosive

Risk and Safety phrases from section 2 and 3 in plain text DSD 67/548/EEC:

R34 Causes burns

R36 Irritating to eyes

Sources for data in this MSDS

- Registration dossier according to the REACH regulation
- ESIS (European chemical Substances Information System)
- Quick Selection Guide to Chemical Protective Clothing, Krister Forsberg
- Vinnikov PL, Slepova RI, Sataev IF (1962). Inhalation of calcium chloride aerosols in complex therapy of pulmonary tuberculosis. Kazan Med Zh., 4, 7-9.
- OECD SIDS Initial Assessment Report, Oct. 2002. Calcium chloride

Other information:

Provide basic employee training to prevent/minimise exposures when handling the product.

The precautionary statements are chosen according to the CLP 1272/2008 regulation article 28. The precautionary statements for an Eye Irritant Category 2 are not mandatory and could vary depending on the form of calcium chloride that is put on the market. The registrant does not consider it necessary to use the statement "P264: Wash....thoroughly after handling" and "P338 Remove contact lenses, if present and easy to do. Continue rinsing." The full agreed CLP-classification and labelling given in the joint submission in IUCLID section 2.1.

Normally the registrant only uses the following precautionary statements in the labelling (see section 2 of this MSDS):

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P305 + P351 IF IN EYES: Rinse cautiously with water for several minutes.

P337+P313 If eye irritation persists: Get medical advice/attention.

The other precautionary statements (P 264 and P338) are communicated in section 4 "First aid measures" and in ES to this extended MSDS.

The safety data sheet is based on the REACH regulation EC 1907/2006 and the regulation EU 453/2010.

Classification according to both the CLP regulation EC 1272/2008 and directive 67/548/EEC.

Names in section 3 are given according to harmonised classified substances in Annex VI, CLP regulation EC/1272/2008. See article 18 in the CLP regulation.