

**ACTEWAGL AGRI-ASH**Hazard Alert Code:  
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 3

Chemwatch 4976-13

Issue Date: 31-Oct-2008

CD 2009/2

**Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION****PRODUCT NAME**

ActewAGL Agri-Ash

**SYNONYMS**

"liming agent", fertiliser

**PRODUCT USE**

Agricultural liming agent and as a low grade source of phosphate fertiliser.

**SUPPLIER**

Company: ActewAGL Distribution

Address:

221-223 London Circuit

CANBERRA

ACT, 2601

AUS

Telephone: +61 2 6248 3111

Fax: +61 2 6249 7237

**HAZARD RATINGS**

	Min	Max
Flammability:	1	
Toxicity:	2	
Body Contact:	3	
Reactivity:	1	
Chronio:	2	

Min/Nil=0.  
Low=1  
Moderate=2  
High=3  
Extreme=4

**Section 2 - HAZARDS IDENTIFICATION****STATEMENT OF HAZARDOUS NATURE**

HAZARDOUS SUBSTANCE, NON-DANGEROUS GOODS, According to the Criteria of NOHSC, and the ADG Code.

**POISONS SCHEDULE**

None

**RISK**

- » Causes burns.
- » Risk of serious damage to eyes.
- » Ingestion may produce health damage\*.
- » Cumulative effects may result following exposure\*.
- » Limited evidence of a carcinogenic effect\*.

\* (limited evidence).

**SAFETY**

- » Keep locked up.
- » Do not breathe dust.
- » Avoid contact with eyes.
- » Wear suitable protective clothing.
- » To clean the floor and all objects contaminated by this material use water and detergent.
- » Take off immediately all contaminated clothing.
- » In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).

**Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS**

NAME	CAS RN	%
calcium phosphate	10103-46-5	30-60
calcium oxide	1305-78-8	10-30
ferric oxide	1309-37-1	10-30
limestone	1317-65-3	5-15
silica crystalline - quartz	14808-60-7	1
trace heavy metals, unspecified		<1

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## Section 4 - FIRST AID MEASURES

### SWALLOWED

- » For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casually can comfortably drink.
- Transport to hospital or doctor without delay.

### EYE

- » If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with 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.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- » If skin or hair contact occurs:
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

### INHALED

- »
- If fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

- » Treat symptomatically.

## Section 5 - FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

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

### FIRE FIGHTING

- »
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### FIRE/EXPLOSION HAZARD

- »
- 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 of 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.

Decomposition may produce toxic fumes of:

carbon dioxide (CO<sub>2</sub>).

phosphorus oxides (PO<sub>x</sub>).

other pyrolysis products typical of burning organic material.

### FIRE INCOMPATIBILITY

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

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**HAZCHEM**  
None**Section 6 - ACCIDENTAL RELEASE MEASURES****EMERGENCY PROCEDURES****MINOR SPILLS**

- »
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

**MAJOR SPILLS**

- » Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Services and tell them location and nature of hazard.
- Control personal contact by wearing protective clothing.
- Prevent, by any means available, spillage from entering drains or water courses.
- Recover product wherever possible.
- IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET: Vacuum/shovel up and place in labelled containers for disposal.
- ALWAYS: Wash area down with large amounts of water and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise Emergency Services.

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

**Section 7 - HANDLING AND STORAGE****PROCEDURE FOR HANDLING**

- »
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- 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.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

**SUITABLE CONTAINER**

- »
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE INCOMPATIBILITY**

- »
- Avoid strong acids, acid chlorides and acid anhydrides..
- Avoid reaction with oxidising agents

**STORAGE REQUIREMENTS**

- »
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations

For major quantities:

- Consider storage in bunded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams).
- Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.

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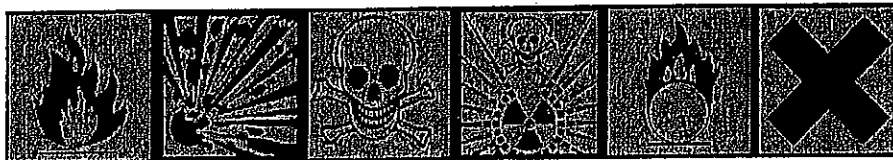
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## SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together  
O: May be stored together with specific precautions  
+: May be stored together

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>	TWA F/CC
Australia Exposure Standards	calcium oxide (Calcium oxide)		2					
Australia Exposure Standards	ferric oxide (Iron oxide fume (Fe <sub>2</sub> O <sub>3</sub> ) (as Fe))		5					
Australia Exposure Standards	limestone (Calcium carbonate (a))		10					
Australia Exposure Standards	silica crystalline - quartz (Silica - Crystalline Quartz)		0.1					

The following materials had no OELs on our records

- calcium phosphate: CAS:10103-46-5

### EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m <sup>3</sup> )	Revised IDLH Value (ppm)
calcium oxide	25	
ferric oxide	2,500	
silica crystalline - quartz	50	

### MATERIAL DATA

» Not available. Refer to individual constituents.

### INGREDIENT DATA

#### FERRIC OXIDE:

#### LIMESTONE:

» 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.

#### CALCIUM PHOSPHATE:

» It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

#### CALCIUM OXIDE:

The TLV-TWA is thought to be protective against undue irritation and is analogous to that recommended for sodium hydroxide.

#### FERRIC OXIDE:

» The recommended TLV is thought to reduce the likelihood of respiratory irritation and skin irritation from exposure to aerosols and mists of soluble iron salts.

Inhalation of iron oxide dust or fume may produce a benign pneumoconiosis (siderosis). The TLV-TWA is recommended to minimise the potential

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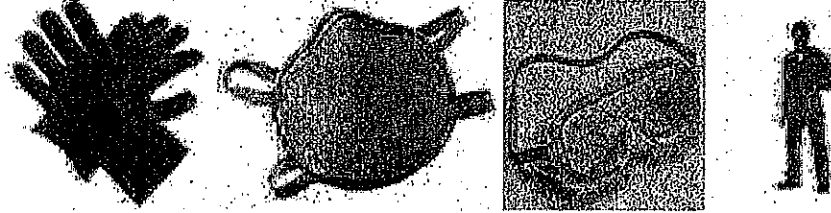
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for development of X-ray changes in the lung on long-term exposure. These changes are not considered to be associated with any physical impairment of lung function, although more sophisticated physiological testing, including measurement of the lung's mechanical properties and expiratory lung flow is required to reach firm and final conclusions.

**SILICA CRYSTALLINE - QUARTZ:**

» The concentration of dust, for application of respirable dust limits, is to be determined from the fraction that penetrates a separator whose size collection efficiency is described by a cumulative log-normal function with a median aerodynamic diameter of 4.0 µm (+/-) 0.3 µm and with a geometric standard deviation of 1.5 µm (+/-) 0.1 µm, i.e., generally less than 5 µm.

Because the margin of safety of the quartz TLV is not known with certainty and given the associated link between silicosis and lung cancer it is recommended that quartz concentrations be maintained as far below the TLV as prudent practices will allow.

**PERSONAL PROTECTION****EYE**

- »
- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens 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]

**HANDS/FEET**

- »
- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber

**OTHER**

- »
- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

**RESPIRATOR**

Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
10 x ES	P1 Air-line*	- -	PAPR-P1 -
50 x ES	Air-line**	P2	PAPR-P2
100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

\* - Negative pressure demand \*\* - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

**ENGINEERING CONTROLS**

- »
- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Such protection might consist of:

- (a) particle dust respirators, if necessary, combined with an absorption cartridge;
- (b) filter respirators with absorption cartridge or canister of the right type;
- (c) fresh-air hoods or masks.

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:

direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

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.

Air Speed:

1-2.5 m/s (200-500 f/min.)

2.5-10 m/s (500-2000 f/min.)

Upper end of the range

- 1: Disturbing room air currents
- 2: Contaminants of high toxicity
- 3: High production, heavy use

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4: Large hood or large air mass in motion

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 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 metres 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.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Reddish brown fine powder with no odour; partly soluble in water.

### PHYSICAL PROPERTIES

Molecular Weight: Not Applicable

Melting Range (°C): Not Applicable

Solubility in water (g/L): Partly Miscible

pH (1% solution): Not Available

Volatile Component (%vol): Not Available

Relative Vapour Density (air=1): Not Applicable

Lower Explosive Limit (%): Not Applicable

Autoignition Temp (°C): Not Applicable

State: Divided Solid

Boiling Range (°C): Not Applicable

Specific Gravity (water=1): 0.6-0.8

pH (as supplied): 12-13

Vapour Pressure (kPa): Not Applicable

Evaporation Rate: Not Applicable

Flash Point (°C): Not Applicable

Upper Explosive Limit (%): Not Applicable

Decomposition Temp (°C): Not Available

Viscosity: Not Applicable

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

»

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

» Accidental ingestion of the material may be damaging to the health of the individual.

As absorption of phosphates from the bowel is poor, poisoning this way is less likely. Effects can include vomiting, tiredness, fever, diarrhoea, low blood pressure, slow pulse, cyanosis, spasms of the wrist, coma and severe body spasms.

Iron poisoning results in pain in the upper abdomen and vomiting, and is followed hours later by shock, in severe cases coma and death. Iron toxicity increases in proportion to their solubility in the gastrointestinal tract. There is often vomiting of blood due to dilation of capillaries and bleeding from the walls of the gastrointestinal system. A watery diarrhoea can occur, often leading to cardiovascular collapse after fluid and mineral loss and there can be a relapse marked by profound metabolic acidosis after several hours of apparent recovery. There may also be liver damage. Symptoms of poisoning include metallic taste, restlessness, lethargy, loss of muscle tone, coma, pallor or cyanosis (blue-grey skin), fast and weak pulse, low blood pressure, hyperventilation, shock, vasomotor instability and cardiovascular collapse. There may be inflammation, swelling and bleeding from the lungs, convulsions, jaundice, low blood sugar, multiple blood clotting defects, kidney damage with absence of urine, damage to the pancreas, vascular damage, blood loss, shock and vascular collapse. Survivors can display stomach scarring, obstruction or narrowing of digestive tract sphincters, liver hardening or nervous system effects.

##### EYE

» If applied to the eyes, this material causes severe eye damage.

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

##### SKIN

» The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Entry into the blood-stream, through, for example, cuts, abrasions 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.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

##### INHALED

» The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

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Not normally a hazard due to non-volatile nature of product.

**CHRONIC HEALTH EFFECTS**

» Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. Chronic excessive intake of iron have been associated with damage to the liver and pancreas. People with a genetic disposition to poor control over iron are at an increased risk. Iron overload in men may lead to diabetes, joint inflammation, liver cancer, heart irregularities and problems with other organs.

**TOXICITY AND IRRITATION**

» None assigned. Refer to individual constituents.

**CALCIUM PHOSPHATE:**

» No significant acute toxicological data identified in literature search.

**CALCIUM OXIDE:**

» Not available. Refer to individual constituents.

**FERRIC OXIDE:**

» Not available. Refer to individual constituents.

**LIMESTONE:**

» unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

**TOXICITY**

Oral (rat) LD50: 6450 mg/kg

**IRRITATION**

Skin (rabbit): 500 mg/24h-Moderate

Eye (rabbit) 0.75: mg/24h -

» The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects.

**SILICA CRYSTALLINE - QUARTZ:**

» unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

**TOXICITY**Inhalation (human) LCLo: 0.3 mg/m<sup>3</sup>/10Y

Inhalation (human) TCLo: 16 mppcf\*6H/17.9Y

Inhalation (rat) TCLo: 50 mg/m<sup>3</sup>/6H/71W**IRRITATION**

Nil Reported

» **WARNING:** For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

Intermittent; focal fibrosis,

(pneumoconiosis), cough, dyspnoea

Intermittent; liver - tumours.

\* Millions of particles per cubic foot (based on impinger samples counted

by light field techniques).

**NOTE**

: the physical nature of quartz in the product determines whether

It is likely to present a chronic health problem. To be a hazard

the material must enter the breathing zone as respirable particles.

**CARCINOGEN**

ferric oxide

International Agency for Research on Cancer (IARC) Carcinogens

Group 3

silica crystalline - quartz

International Agency for Research on Cancer (IARC) Carcinogens

Group 1

**Section 12 - ECOLOGICAL INFORMATION**

» DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

**CALCIUM PHOSPHATE:**

» The principal problems of phosphate contamination of the environment relates to eutrophication processes in lakes and ponds. Phosphorus is an essential plant nutrient and is usually the limiting nutrient for blue-green algae. A lake undergoing eutrophication shows a rapid growth of algae in surface waters. Planktonic algae cause turbidity and flotation films. Shore algae cause ugly muddying, films and damage to reeds. Decay of these algae causes oxygen depletion in the deep water and shallow water near the shore. The process is self-perpetuating because anoxic conditions at the sediment/water interface causes the release of more adsorbed phosphates from the sediment. The growth of algae produces undesirable effects on the treatment of water for drinking purposes, on fisheries, and on the use of lakes for recreational purposes.

**CALCIUM OXIDE:****FERRIC OXIDE:****LIMESTONE:**

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**SILICA CRYSTALLINE - QUARTZ:**

» For silica:

The literature on the fate of silica in the environment concerns dissolved silica in the aquatic environment, irrespective of its origin (man-made or natural), or structure (crystalline or amorphous). Indeed, once released and dissolved into the environment no distinction can be made between the initial forms of silica. At normal environmental pH, dissolved silica exists exclusively as monosilicic acid  $[\text{Si}(\text{OH})_4]$ . At pH 9.4 the solubility of amorphous silica is about 120 mg  $\text{SiO}_2/\text{l}$ . Quartz has a solubility of only 6 mg/l, but its rate of dissolution is so slow at ordinary temperature and pressure that the solubility of amorphous silica represents the upper limit of dissolved silica concentration in natural waters. Moreover, silicic acid is the bioavailable form for aquatic organisms and it plays an important role in the biogeochemical cycle of Si, particularly in the oceans.

In the oceans, the transfer of dissolved silica from the marine hydrosphere to the biosphere initiates the global biological silicon cycle. Marine organisms such as diatoms, silicoflagellates and radiolarians build up their skeletons by taking up silicic acid from seawater. After these organisms die, the biogenic silica accumulated in them partly dissolves. The portion of the biogenic silica that does not dissolve settles and ultimately reaches the sediment. The transformation of opal (amorphous biogenic silica) deposits in sediments through diagenetic processes allows silica to re-enter the geological cycle. Silica is labile between the water and sediment interface.

**Ecotoxicity:**

Fish LC50 (96 h): Brachydanio rerio &gt;10000 mg/l; zebra fish &gt;10000 mg/l

Daphnia magna EC50 (24 h): &gt;1000 mg/l; LC50 (24 h): &gt;10000 mg/l.

» Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. Environmental processes (such as oxidation and the presence of acids or bases) may transform insoluble metals to more soluble ionic forms. Microbiological processes may also transform insoluble metals to more soluble forms. Such ionic species may bind to dissolved ligands or sorb to solid particles in aquatic or aqueous media. A significant proportion of dissolved/sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms.

When released to dry soil most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/or surface water ecosystems when soaked by rain or melt ice. Environmental processes may also be important in changing solubilities.

Even though many metals show few toxic effects at physiological pHs, transformation may introduce new or magnified effects.

A metal ion is considered infinitely persistent because it cannot degrade further.

The current state of science does not allow for an unambiguous interpretation of various measures of bioaccumulation.

The counter-ion may also create health and environmental concerns once isolated from the metal. Under normal physiological conditions the counter-ion may be essentially insoluble and may not be bioavailable.

Environmental processes may enhance bioavailability.

**Ecotoxicity**

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
ActewAGL		No		
Agri-Ash		data		
calcium		No		
phosphate		data		
calcium		No	LOW	
oxide		data		
ferric		No		
oxide		data		
limestone		No		
silica		data		
crystalline	LOW	No	LOW	HIGH
- quartz		data		

**Section 13 - DISPOSAL CONSIDERATIONS**

»

- 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 licensed land-fill or incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

**Section 14 - TRANSPORTATION INFORMATION**

HAZCHEM: None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, UN, IATA, IMDG

**Section 15 - REGULATORY INFORMATION****POISONS SCHEDULE**

None

**REGULATIONS**

ActewAGL Agri-Ash (CAS: None):

No regulations applicable

Regulations for ingredients

calcium phosphate (CAS: 10103-46-5) is found on the following regulatory lists;

Australia Inventory of Chemical Substances (AICS)

Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines

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China (Hong Kong) Food and Drugs (Composition and Labelling) Regulations - Additives In Certain Milk Products  
 China Hygienic Standards for Uses of Food Additives (GB 2760- 1996) - List of Processing Assistants Recommended for Use In Food Industry  
 China Inventory of Existing Chemical Substances  
 India Manufacture, Storage and Import of Hazardous Chemical Rules - Schedule 1: List of Hazardous and Toxic Chemicals  
 Indonesia Threshold Limit Value for chemical substances in the workplace (Bahasa Indonesian)  
 Japan Occupational Exposure Limits  
 Japan Occupational Exposure Limits for Dusts  
 Korea (South) Existing Chemicals List (KECL)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Chemicals (single components)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data  
 New Zealand Inventory of Chemicals (NZIoC)  
 OECD Representative List of High Production Volume (HPV) Chemicals  
 Philippines Inventory of Chemicals and Chemical Substances (PICCS)  
 Philippines Regulatory Guidelines Concerning Food Additives - Permitted Food Additives  
 Singapore Food Regulations - Food Additives - Chemical preservatives  
 Singapore Food Regulations - Food Additives - Sequestrants  
 calcium oxide (CAS: 1305- 78- 8) is found on the following regulatory lists;  
 Australia Exposure Standards  
 Australia Hazardous Substances  
 Australia High Volume Industrial Chemical List (HVICL)  
 Australia Inventory of Chemical Substances (AICS)  
 China (Hong Kong) Occupational Exposure Limits  
 China Hygienic Standards for Uses of Food Additives (GB 2760- 1996) - List of Processing Assistants Recommended for Use In Food Industry  
 China Inventory of Existing Chemical Substances  
 China Occupational Exposure Limits for Hazardous Agents In the Workplace  
 CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use In Food in General, Unless Otherwise Specified, in Accordance with GMP  
 India Permissible Levels of Certain Chemical Substances In Work Environment  
 Indonesia Threshold Limit Value for chemical substances in the workplace (Bahasa Indonesian)  
 International Air Transport Association (IATA) Dangerous Goods Regulations  
 International Council of Chemical Associations (ICCA) - High Production Volume List  
 Japan Chemical Substances Control Law - Existing/New Chemical Substances  
 Japan Fire Service Law - Obstacle Substances to Fire Fighting (Japanese)  
 Japan Food Sanitation Law - List of plant or animal sources of natural flavorings (Japanese)  
 Japan GHS Classifications (Japanese)  
 Japan Industrial Safety and Health Law (ISHL) - Corrosive Liquid (English)  
 Japan Industrial Safety and Health Law (ISHL) - Corrosive Liquid (Japanese)  
 Japan Industrial Safety and Health Law (ISHL) - Notifiable Substances (Japanese)  
 Japan List of Existing Food Additives  
 Japan List of plant or animal sources of natural flavorings (English)  
 Korea (South) Existing Chemicals List (KECL)  
 Korea (South) Occupational Exposure Standards (Korean)  
 Korea GHS Classifications (Korean)  
 Malaysia Permissible Exposure Limits  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Chemicals (single components)  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
 New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data  
 New Zealand Inventory of Chemicals (NZIoC)  
 New Zealand Workplace Exposure Standards (WES)  
 OECD Representative List of High Production Volume (HPV) Chemicals  
 Philippines Inventory of Chemicals and Chemical Substances (PICCS)  
 Philippines Regulatory Guidelines Concerning Food Additives - Permitted Food Additives  
 Singapore Food Regulations - Food Additives - Permitted Nutrient Supplement  
 Singapore Permissible Exposure Limits of Toxic Substances  
 Taiwan Permissible Concentration of Airborne Harmful Substances  
 Taiwan Rules for Hazard Communication for Dangerous and Harmful Materials - Harmful Materials (Chinese)  
 Taiwan Scope and Application Standards of Food Additives - Food quality improvement, fermentation and food processing agents  
 Taiwan Scope and Application Standards of Food Additives - Nutritional Additives  
 Thailand Harmful Chemicals - List I  
 ferric oxide (CAS: 1309- 37- 1) is found on the following regulatory lists;  
 Australia Exposure Standards  
 Australia Hazardous Substances  
 Australia High Volume Industrial Chemical List (HVICL)  
 Australia Inventory of Chemical Substances (AICS)  
 China (Hong Kong) Occupational Exposure Limits  
 China Hygienic Standards for Uses of Food Additives (GB 2760- 1996) - List of Processing Assistants Recommended for Use In Food Industry  
 China Inventory of Existing Chemical Substances  
 India Permissible Levels of Certain Chemical Substances In Work Environment  
 Indonesia Threshold Limit Value for chemical substances in the workplace (Bahasa Indonesian)  
 International Agency for Research on Cancer (IARC) Carcinogens  
 International Council of Chemical Associations (ICCA) - High Production Volume List  
 Japan Chemical Substances Control Law - Existing/New Chemical Substances  
 Japan Food Sanitation Law - Designated Additives  
 Japan Food Sanitation Law - Designated Additives (Japanese)  
 Japan Foreign Exchange and Foreign Trade Control Law

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Japan GHS Classifications (Japanese)  
Japan Industrial Safety and Health Law (ISHL) - Notifiable Substances (Japanese)  
Japan Occupational Exposure Limits  
Japan Occupational Exposure Limits for Dusts  
Japan Port Regulations Law (Japanese) - Chemical Liquid Waste  
Korea (South) Existing Chemicals List (KECL)  
Korea (South) Occupational Exposure Standards (Korean)  
Korea (South) Occupational Exposure Standards (Respirable microdust / Total dust) (Korean)  
Malaysia Permissible Exposure Limits  
New Zealand Inventory of Chemicals (NZIoC)  
New Zealand Workplace Exposure Standards (WES)  
OECD Representative List of High Production Volume (HPV) Chemicals  
Philippines Inventory of Chemicals and Chemical Substances (PICCS)  
Philippines Occupational Exposure Limits  
Philippines Regulatory Guidelines Concerning Food Additives - Permitted Food Additives  
Singapore Permissible Exposure Limits of Toxic Substances  
Taiwan Permissible Concentration of Airborne Harmful Substances  
Taiwan Scope and Application Standards of Food Additives - Colors  
Thailand Occupational Exposure Limits - Working Safety and Environmental Condition (Chemical) Table 1  
limestone (CAS: 1317-85-3) is found on the following regulatory lists;  
Australia Exposure Standards  
Australia Inventory of Chemical Substances (AICS)  
China (Hong Kong) Occupational Exposure Limits  
China Inventory of Existing Chemical Substances  
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust  
Indonesia Threshold Limit Value for chemical substances in the workplace (Bahasa Indonesian)  
Japan Occupational Exposure Limits - Carcinogens  
Japan Occupational Exposure Limits for Dusts  
Japan Occupational Exposure Limits for Dusts (Japanese)  
Korea (South) Existing Chemicals List (KECL)  
Korea (South) Occupational Exposure Standards (Korean)  
Korea (South) Occupational Exposure Standards (Respirable microdust / Total dust) (Korean)  
Malaysia Food Regulations - Permitted Food Conditioners  
Malaysia Occupational Safety and Health Act - Chemicals for which medical surveillance is appropriate  
Malaysia Permissible Exposure Limits  
New Zealand Inventory of Chemicals (NZIoC)  
New Zealand Workplace Exposure Standards (WES)  
OECD Representative List of High Production Volume (HPV) Chemicals  
Philippines Inventory of Chemicals and Chemical Substances (PICCS)  
Singapore Biological Monitoring of Industrial Chemicals  
Thailand Ground Water Act - Ground Water Quality Standards for Drinking Purposes  
silica crystalline - quartz (CAS: 14808-60-7) is found on the following regulatory lists;  
Australia - New South Wales Hazardous Substances Prohibited for Specific Uses  
Australia - New South Wales Hazardous Substances Requiring Health Surveillance  
Australia - South Australia Hazardous Substances Requiring Health Surveillance  
Australia - Tasmania Hazardous Substances Prohibited for Specified Uses  
Australia - Tasmania Hazardous Substances Requiring Health Surveillance  
Australia - Western Australia Hazardous Substances Requiring Health Surveillance  
Australia Exposure Standards  
Australia Hazardous Substances  
Australia Hazardous Substances Requiring Health Surveillance  
Australia High Volume Industrial Chemical List (HVICL)  
Australia Inventory of Chemical Substances (AICS)  
Australia Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations 1994 - Hazardous Substances Requiring Health Surveillance  
China (Hong Kong) Occupational Exposure Limits  
China First Imported Class Two Chemical List  
China Inventory of Existing Chemical Substances  
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust  
Indonesia Threshold Limit Value for chemical substances in the workplace (Bahasa Indonesian)  
International Agency for Research on Cancer (IARC) Carcinogens  
Japan Air Pollution Control Law - Hazardous Air Pollutants (Japanese)  
Japan Chemical Substances Control Law - Existing/New Chemical Substances  
Japan Food Sanitation Law - Designated Additives (Japanese)  
Japan GHS Classifications (Japanese)  
Japan Industrial Safety and Health Law (ISHL) - Notifiable Substances (Japanese)  
Japan Occupational Exposure Limits - Carcinogens  
Japan Occupational Exposure Limits for Dusts  
Japan Occupational Exposure Limits for Dusts (Japanese)  
Korea (South) Existing Chemicals List (KECL)  
Korea (South) Occupational Exposure Standards (Korean)  
Korea (South) Occupational Exposure Standards (Respirable microdust / Total dust) (Korean)  
Malaysia Food Regulations - Food Conditioner that may be added to specified food  
Malaysia Occupational Safety and Health Act - Chemicals for which medical surveillance is appropriate  
Malaysia Permissible Exposure Limits  
New Zealand Hazardous Substances and New Organisms (HSNO) Act - Chemicals (single components)  
New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals  
New Zealand Hazardous Substances and New Organisms (HSNO) Act - Classification of Chemicals - Classification Data  
New Zealand Inventory of Chemicals (NZIoC)  
New Zealand Workplace Exposure Standards (WES)

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OECD Representative List of High Production Volume (HPV) Chemicals  
Philippines Inventory of Chemicals and Chemical Substances (PICCS)  
Singapore Biological Monitoring of Industrial Chemicals  
Singapore Factories (Medical Examinations) Regulations - Chemicals for which Medical Examinations are Required  
Singapore Permissible Exposure Limits of Toxic Substances  
Taiwan Rules for Hazard Communication for Dangerous and Harmful Materials - Harmful Materials (Chinese)  
Taiwan Scope and Application Standards of Food Additives - Food quality improvement, fermentation and food processing agents  
Thailand Occupational Exposure Limits - Working Safety and Environmental Condition (Chemical) Table 4  
No data available for silica crystalline - quartz as CAS: 122304-48-7, CAS: 122304-49-8, CAS: 12425-26-2, CAS: 1317-79-9, CAS: 70594-95-5, CAS: 87347-84-0.

**Section 16 - OTHER INFORMATION****Ingredients with multiple CAS Nos**

Ingredient Name	CAS
silica crystalline - quartz	14808-60-7, 122304-48-7, 122304-49-8, 12425-26-2, 1317-79-9, 70594-95-5, 87347-84-0

» 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/references](http://www.chemwatch.net/references).

» 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.

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Issue Date: 31-Oct-2008

Print Date: 31-Jul-2009