1. Identification of Substance & Company

Product

Product name	MaizeKing Granules
Other names	no other names
Product codes	NA
HSNO approval	HSR002521
Approval description	Animal Nutritional and Animal Care Products Group Standard 2017
UN number	NA
DG class	NA
Proper Shipping Name	NA
Packaging group	NA
Hazchem code	NA
Uses	Maize Silage preservative/additive

Company Details

Company	**Biostart LTD**	**Biostart Brands PTY Ltd**
Address	216 Lake Road Hauraki Auckland 0622 New Zealand	L1/109 Jessie St Armidale NSW 2350 Australia
Telephone	+64 9 488 0180	1800 359 555
Website	biostart.co.nz	Biostart.com.au

New Zealand Emergency Telephone Number: 0800 764 766
Australian Emergency Number: 13 11 26

2. Hazard Identification

Approval

This product is an approved substance under the Hazardous Substances and New Organisms Act (HSNO, Approval HSR002521, Animal Nutritional and Animal Care Products Group Standard 2017): The substance has been classified as hazardous according to the criteria in the Hazardous substances (Minimum Degrees of Hazard) Notice 2017.

Classes	Hazard Statements
6.3A	H315 - Causes skin irritation.
6.4A	H320 - Causes eye irritation.
9.1D	H402 - Harmful to aquatic life.

SYMBOLS

WARNING

This mixture contains zeolite, which may contain crystalline silica. The following classification ONLY applies to this substance if it is in the form of a fine respirable dust in an occupational (chronic exposure) setting.:

6.7A	May cause cancer
6.9A	Causes damage to organs through prolonged or repeated exposure

Australian GHS Classification

Skin irritation cat 2	H315 - Causes skin irritation.
Eye irritation cat. 2	H320 - Causes eye irritation.
Aquatic acute cat 4	H402 - Harmful to aquatic life.

This mixture contains zeolite which may contain crystalline silica. The following classification ONLY applies to this substance if it is in the form of a fine respirable dust in an occupational (chronic exposure) setting:

Carcinogenicity, Cat 1A	H350	May cause cancer through inhalation of dust.
Specific Target Organ Toxicity, Cat 1	H372	Causes damage to lungs and respiratory system through prolonged or repeated exposure by inhalation of dusts.

Precautionary Statements

P103 - Read label before use.
P260 - Do not breathe vapours.
P264 - Wash hands 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/face protection*.
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.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P332+P313 - If skin irritation occurs: Get medical advice/ attention.
P362 - Take off contaminated clothing and wash before re-use.
P314 - Get medical advice/attention if you feel unwell.

3. Composition / Information on Ingredients

Component	CAS/ Identification	Conc (%)
Zeolite, granular: contains – crystalline aluminosilicates may contains oxides including silica* and aluminium oxide	1318-02-1	>60%
Nonviable fermentation products	proprietary	10-30%
Manganese sulphate monohydrate	7785-87-7	0.1-1%
Zinc sulphate	7733-02-0	0.1-1%
Ingredients not contributing to HSNO classes	Mixture	balance

This is a commercial product whose exact ratio of components may vary. Trace quantities of impurities are also likely.
* silica: may include cristobalite and quartz (crystalline silica).

4. First Aid

General Information

If medical advice is needed, have product container or label at hand. You should call the National Poisons Centre if you feel that you may have been harmed or irritated by this product. The number is 0800 764 766 (0800 POISON) (24 hr emergency service).

Recommended first aid facilities Ready access to running water is required. Accessible eyewash is required.

Exposure

Swallowed Do NOT induce vomiting. Give a glass of water to drink. Contact a doctor.

Eye contact IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Apply continuous irrigation with water for at least 15 minutes holding eyelids apart. If eye irritation persists: Get medical advice.

Skin contact IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: get medical advice/attention. Take off contaminated clothing and wash before re-use.

Inhaled Generally, inhalation of vapours is unlikely to result in adverse health effects. If coughing, dizziness or shortness of breath is experienced, remove the patient to fresh air immediately. If patient is unconscious, place in the recovery position (on the side) for transport and contact a doctor.

Advice to Doctor

Treat symptomatically

5. Firefighting Measures

Fire and explosion hazards:	There are no specific risks for fire/explosion for this chemical. It is non-flammable.
Suitable extinguishing substances:	Carbon dioxide, extinguishing powder or water jet. Fight larger fires with water jet or alcohol resistant foam.
Unsuitable extinguishing substances:	Unknown.
Products of combustion:	Carbon dioxide, and if combustion is incomplete, carbon monoxide and smoke. Water. May form toxic mixtures in air and may accumulate in sumps, pits and other low-lying spaces, forming potentially explosive mixtures.
Protective equipment:	Self-contained breathing apparatus. Safety boots, non-flammable overalls, gloves, hat and eye protection.
Hazchem code:	NA

6. Accidental Release Measures

Containment	If greater than 10000L is stored, secondary containment and emergency plans to manage any potential spills must be in place. In all cases design storage to prevent discharge to storm water.
Emergency procedures	In the event of large spillage alert the fire brigade to location and give brief description of hazard. Wear protective equipment to prevent skin, eye and respiratory exposure. Clear area of any unprotected personnel. Sweep up the solid. Avoid creating dust. If appropriate, use a gentle water spray to wet material to minimise dust generation.
Clean-up method	UCollect and seal in properly labelled containers or drums for disposal. If contamination of crops, sewers or waterways has occurred advise local emergency services.
Disposal	Sweep up and collect recoverable material into labelled containers for recycling or salvage. This material may be suitable for approved landfill. Dispose of only in accord with all regulations.
Precautions	Wear protective equipment to prevent skin and eye contamination and the inhalation of dusts. Work up wind or increase ventilation.

7. Storage & Handling

Storage	Avoid storage of harmful substances with food. Store out of reach of children. Containers should be kept closed in order to minimise contamination. Keep from extreme heat and open flames. Avoid contact with incompatible substances as listed in Section 10.
Handling	Keep exposure to a minimum, and minimise the quantities kept in work areas. See section 8 with regard to personal protective equipment requirements.

8. Exposure Controls / Personal Protective Equipment

Workplace Exposure Standards

A workplace exposure standard (WES) has not been established by WorkSafe NZ for this product. There is a general limit of 3mg/m^3 for respirable particulates and 10mg/m^3 for inhalable particulates when limits have not otherwise been established.

NZ Workplace Exposure Stds	Ingredient	WES-TWA*	WES-STEL
	Silicon dioxide	see crystalline silica	data unavailable
	Aluminium oxide	10mg/m^3	data unavailable
	Iron (II) Oxide	5mg/m^3 (as Fe)	data unavailable
	Magnesium oxide	10mg/m^3 (fume)	data unavailable
	Calcium oxide	2mg/m^3	data unavailable
	Titanium dioxide	10mg/m^3	data unavailable
	Quartz (SiO_2):		
	quartz, respirable dust	0.1mg/m^3	data unavailable
	cristobalite, respirable dust	0.1mg/m^3	data unavailable
	Zinc compounds	Zinc dust: 10mg/m^3 Zinc oxide: 3mg/m^3	data unavailable
	Manganese sulphate monohydrate	1mg/m^3	data unavailable

Exposure Standards - Australia

Australian Exposure Standards	Zinc compounds	Zinc oxide dust: 10mg/m^3	Data unavailable
	Manganese sulphate monohydrate	1mg/m^3	Data unavailable
	Silicon dioxide	see crystalline silica	data unavailable
	Aluminium oxide	10mg/m^3	data unavailable
	Iron (II) Oxide	5mg/m^3 (as Fe)	data unavailable
	Magnesium oxide	10mg/m^3 (fume)	data unavailable
	Calcium oxide	2mg/m^3	data unavailable
	Titanium dioxide	10mg/m^3	data unavailable
	Quartz (SiO_2):		
	quartz, respirable dust	0.1mg/m^3	data unavailable
	cristobalite, respirable dust	0.1mg/m^3	data unavailable

Engineering Controls

In industrial situations, it is expected that employee exposure to hazardous substances will be controlled to a level as far below the WES as practicable by applying the hierarchy of control required by the Health and Safety at Work Act (2015) and the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016. Exposure can be reduced by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods. If you believe air borne concentrations of mists, dusts or vapours are high, you are advised to modify processes or increase ventilation.

Personal Protective Equipment

Eyes

Avoid contact with eyes. Use safety glasses and or chemical splash goggles if splashes are possible. Select eye protection in accordance with AS/NZS 1337.

Skin

Protective gloves and clothing are not normally necessary. However, it is prudent to wear gloves when handling chemicals in bulk or for an extended period of time.

Respiratory

Respirator is not required under normal use. Ensure adequate natural ventilation. If product is being used in confined conditions, the use of a mask or respirator may be preferred.

WES Additional Information

Not applicable

9. Physical & Chemical Properties

Appearance	solid, granular, tan colour
Odour	mild characteristic odour
pH	~8
Vapour pressure	no data
Viscosity	no data
Boiling point	no data
Volatile materials	no data
Freezing / melting point	solid at room temperature
Solubility	completely soluble
Specific gravity / density	not specified
Flash point	no data
Danger of explosion	no data
Auto-ignition temperature	no data
Upper & lower flammable limits	no data
Corrosiveness	no data

10. Stability & Reactivity

Stability	Stable
Conditions to be avoided	Containers should be kept closed in order to avoid contamination. Keep from extreme heat and open flames. . Avoid the creation of dust.
Incompatible groups	Strong acids and bases, oxidisers, hydrogen fluoride.
Substance Specific Incompatibility	none known
Hazardous decomposition products	Oxides of carbon, sulphur
Hazardous reactions	Zeolites will react with hydrogen fluoride (HF) acid. Avoid contact with strong oxidsing agents.

11. Toxicological Information

Summary

IF SWALLOWED: may cause gastrointestinal irritation.
IF IN EYES: may be irritating to the eye.
IF ON SKIN: Material may cause drying out of skin.
IF INHALED: May cause respiratory irritation. Also see chronic effects..
CHRONIC TOXICITY: The adverse health effects from respirable crystalline silica exposure-silicosis, cancer, scleroderma, tuberculosis, and nephrotoxicity- are chronic effects. This product is granular, but may become a respirable dust through sanding/grinding/milling.

Supporting Data

Acute	**Oral**	Using LD_{50}'s for ingredients, the calculated LD_{50} (oral, rat) for the mixture is >5,000 mg/kg. Data considered includes: Manganese sulphate monohydrate 782mg/kg (rat), Zinc sulphate 926mg/kg (mouse).
	Dermal	No evidence of dermal toxicity.
	Inhaled	The substance is not considered acutely toxic if inhaled, however there may be irritation of the respiratory tract if dust is inhaled. Short term (acute) silicosis (see "systemic" below) can also occur with one-off exposures to extremely high levels of fine crystalline silica dust. Other short term effects include irritation, choking and difficulty breathing.
	Eye	The mixture is not considered to be an eye irritant. Dust may be an eye irritant (mechanical irritation).
	Skin	The mixture is considered to be a skin irritant.
Chronic	**Sensitisation**	No ingredient present at concentrations > 0.1% is considered a sensitizer.
	Mutagenicity	No ingredient present at concentrations > 0.1% is considered a mutagen.
	Carcinogenicity	Zeolites have been classed by IARC as group 3 – cannot be evaluated as to their carcinogenicity to humans. However, there is evidence that this material does contain quartz and cristobalite. Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC Group 1). Crystalline Silica triggers 6.7A classification (confirmed carcinogen). The carcinogenicity of silica is related to long term (e.g., 10 years) inhalation of very fine particulate (e.g., from sand blasting or dry cutting of quartz containing substrates). Carcinogenicity of silica appears linked to development of silicosis (see systematic below) followed by complications and, eventually lung cancer
	Reproductive / Developmental	No ingredient present at concentrations > 0.1% is considered a reproductive or developmental toxicant or have any effects on or via lactation.
	Systemic	The respirable fraction of the dust of this product is considered to be a target organ toxicant, because of the presence of crystalline silica at greater than 1%. Crystalline silica triggers 6.9A classification if it is in the form of a fine respirable dust in an occupational (chronic exposure) setting. This is due to the development of silicosis which can occur following exposure to extremely high levels of fine silica dust. Silicosis is a type of pneumoconiosis – a disease of the lung that causes inflammation, scar tissue, lesions and fibrosis in the lung (alveolar). Symptoms include shortness of breath, cough, fever, loss of appetite and cyanosis (bluish skin). Silicosis can occur following prolonged exposure (e.g., 10 years) to relatively high levels of fine crystalline silica dust. Based on limited animal research, it is possible that repeated inhalation of cellulose fibre dust may lead to inflammation and scarring of the lung.
	Aggravation of existing conditions	None known.

12. Ecological Data

Summary

This mixture may be harmful towards aquatic organisms

Supporting Data

Aquatic	Using EC_{50}'s for ingredients, the calculated EC_{50} for the mixture is between 1 and 100 mg/L. Data considered includes: Zinc sulphate 98.77ug/L (96hr, Oncorhynchus mykiss), 0.09877mg/L (48hr, Daphnia hyalina), 0.02469mg/L (5d, Ditylum brightwellii Diatom).
Bioaccumulation	No data
Degradability	No data
Soil	No evidence of soil toxicity.
Terrestrial vertebrate	See acute toxicity.
Terrestrial invertebrate	No evidence of toxicity towards terrestrial invertebrates.
Biocidal	no data

13. Disposal Considerations

Restrictions	There are no product-specific restrictions, however, local council, resource consent and state disposal conditions may apply, including requirements of trade waste consents.
Disposal method	In New Zealand disposal of this product must comply with the Hazardous Substances (Disposal) Notice 2017 and the requirements of the Resource Management Act for which approval should be sought from the Regional Authority. In Australia disposal of this product must comply with the requirements of state and local disposal regulations. The substance must be treated and therefore rendered non-hazardous before discharge to the environment.
Contaminated packaging	Disposal of contaminated packaging must comply with the Hazardous Substances (Disposal) Notice 2017 clause 12. Ensure that the package is rendered incapable of containing any substance and is disposed in a manner that is consistent with the requirements of the substance it contained and the material of the package. If possible reuse or recycle packaging.

14. Transport Information

There are no specific restrictions for this product (not a dangerous good).

UN number:	NA	**Proper shipping name:**	NA
Class(es)	NA	**Packing group:**	NA
Precautions:	NA	**Hazchem code:**	NA

15. Regulatory Information

NZ regulations

This product is an approved substance under the Hazardous Substances and New Organisms Act (HSNO). Approval code: HSR002521, Animal Nutritional and Animal Care Products Group Standard 2017.
All ingredients appear on the NZIoC.

Specific Controls

Key workplace requirements are:	
SDS	To be available within 10 minutes in workplaces storing any quantity.
Inventory	An inventory of all hazardous substances must be prepared and maintained.
Packaging	All hazardous substances should be appropriately packaged including substances that have been decanted, transferred or manufactured for own use or have been supplied
Labelling	Must comply with the Hazardous Substances (Labelling) Notice 2017.
Emergency plan	Required if > 10000L is stored.
Certified handler	Not required.
Tracking	Not required.
Bunding & secondary containment	Required if > 10000L is stored.
Signage	Required if > 10000L is stored.
Location compliance certificate	Not required.
Flammable zone	Not required.
Fire extinguisher	Not required.

Note: The above workplace requirements apply if only this particular substance is present. The complete set of controls for a location will depend on the classification and total quantities of other substances present in that location.

Other Legislation

In New Zealand, the use of this product may come under the Resource Management Act and Regulations, the Health and Safety at Work Act 2015 and the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, local Council Rules and Regional Council Plans.

Australian regulations

Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP)	Not scheduled
Applicable prohibitions and notifications/licensing requirements	Not listed
Agricultural and Veterinary Chemicals Act	Not listed
Listing in the Australian Inventory of Chemical Substances (AICS)	Magnesium sulphate, heptahydrate - IMAP - Tier I - Human Health Manganous sulphate, monohydrate - IMAP - Tier II - Human Health Zinc sulphate - IMAP - Tier II - Human Health Zeolites - IMAP - Tier I - Human Health Silicon dioxide - IMAP - Tier II - Human Health Crystalline silica quartz - IMAP - Tier II - Human Health
Additional information	Not applicable

16. Other Information

Abbreviations

Approval Code	Approval HSR002521, Animal Nutritional and Animal Care Products Group Standard 2017 Controls, EPA. www.epa.govt.nz
AICS	Australian Inventory of Chemical Substances
CAS Number	Unique Chemical Abstracts Service Registry Number
Ceiling	Ceiling Exposure Value: The maximum airborne concentration of a biological or chemical agent to which a worker may be exposed at any time.
Controls Matrix	List of default controls linking regulation numbers to Matrix code (e.g. T1, I16).
EC_{50}	Ecotoxic Concentration 50% – concentration in water which is fatal to 50% of a test population (e.g. daphnia, fish species)
ES	Exposure Standard - The airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day.
EPA	Environmental Protection Authority (New Zealand)
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
HAZCHEM Code	Emergency action code of numbers and letters that provide information to emergency services, especially fire fighters
HSNO	Hazardous Substances and New Organisms (Act and Regulations)
IARC	International Agency for Research on Cancer
IMAP	Inventory Multi-tiered Assessment and Prioritisation (NICNAS Australia)
LEL/UEL	Lower Explosive Limit/ Upper Explosive Limit
LD_{50}	Lethal Dose 50% – dose which is fatal to 50% of a test population (usually rats).
LC_{50}	Lethal Concentration 50% – concentration in air which is fatal to 50% of a test population (usually rats)
MSDS (SDS)	Material Safety Data Sheet (or Safety Data Sheet)
NICNAS	National Industrial Chemicals Notification and Assessment Scheme
NZIoC	New Zealand Inventory of Chemicals
STEL	Short Term Exposure Limit - The maximum airborne concentration of a chemical or biological agent to which a worker may be exposed in any 15 minute period, provided the TWA is not exceeded
TWA	Time Weighted Average – generally referred to WES averaged over typical work day (usually 8 hours)
UN Number	United Nations Number
WES	Workplace Exposure Standard - The airborne concentration of a biological or chemical agent to which a worker may be exposed during work hours (usually 8 hours, 5 days a week). The WES relates to exposure that has been measured by personal monitoring using procedures that gather air samples in the worker's breathing zone.

References

Data	Unless otherwise stated comes from the EPA HSNO chemical classification information database (CCID).
Controls	EPA notices, www.epa.govt.nz, Health and Safety at Work (Hazardous Substances) Regulations 2017, www.legislation.govt.nz
WES	The latest NZ Workplace Exposure Standards, published by WorkSafe NZ and available on their web site – www.worksafe.govt.nz.
ES	Workplace Exposure standards for airborne contaminants – Safework Australia.
Other References:	Suppliers SDS, EU ECHA, ingredients SDS's, ChemIDplus

Review

Date	**Reason for review**
June 2019	Not applicable – new SDS

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