Section 1 - Identification of The Material and Supplier

Product Name:	**RESILIENCE BY BUCHANAN TURF**
Other Names	Calcium dinitrate, tetrahydrate
Product Use:	A multi-coloured granular fertiliser for soil application.
Chemical Family:	No Data Available
Chemical Formula:	Ca(NO3)2.4H2O
Chemical Name:	Nitric acid, calcium salt, tetrahydrate
Product Description:	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

Section 2 - Hazards Identification

Poisons Schedule (Aust)	Not Scheduled
Hazard Classification	Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories

Oxidising Solids - Category 3
Acute Toxicity (Oral) - Category 4
Serious Eye Damage/Irritation - Category 2A

Pictograms

Signal Word Warning

Hazard Statements

H272	May intensify fire; oxidizer.
H302	Harmful if swallowed.
H319	Causes serious eye irritation.

Precautionary Statements

Prevention	**P270**	Do not eat, drink or smoke when using this product.
	P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
	P220	Keep/Store away from clothing/combustible materials.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
Response	**P370 + P378**	In case of fire: Use water for extinction.
	P337 + P313	If eye irritation persists: Get medical advice/attention.
	P330	Rinse mouth.
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
Disposal	**P501**	Dispose of contents/container in accordance with local/regional/national/international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Physical Hazards	**5.1.1C**	Oxidising substances that are liquids or solids: low hazard
	Health Hazards	**6.1D**	Substances that are acutely toxic - Harmful
		6.4A	Substances that are irritating to the eye

Section 3 - Composition/Information on Ingredients

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Calcium nitrate, tetrahydrate	Ca(NO3)2.4H2O	13477-34-4	>=98 - 100 %

Section 4 - First Aid Measures

Description of necessary measures according to routes of exposure

Swallowed IF SWALLOWED: Rinse mouth. Call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.

Eye IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. Get medical advice/attention.

Skin IF ON SKIN: Wash off immediately with plenty of soap and water while removing all contaminated clothes and shoes. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.

Inhaled IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician for advice. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.

Advice to Doctor In all cases of doubt, or when symptoms persist, seek medical attention. Treat symptomatically. Keep victim calm and warm - Obtain immediate medical care. Ensure that attending medical personnel are aware of identity and nature of the product(s) involved, and take precautions to protect themselves.

Medical Conditions Aggravated by Exposure No information available.

Section 5 - Fire Fighting Measures

General Measures If safe to do so, move undamaged containers from fire area. Do not move cargo if cargo has been exposed to heat. Cool containers with flooding quantities of water until well after fire is out – If impossible, withdraw from area and let fire burn. Avoid getting water inside containers - a violent reaction may occur. Dam fire control water for later disposal.

Flammability Conditions OXIDISING SUBSTANCE: Will accelerate burning when involved in a fire. Not combustible; Has a fire-promoting effect due to release of oxygen. May ignite combustibles.

Extinguishing Media If material is involved in a fire, use flooding quantities of water for extinction – Do not use dry chemicals, Carbon dioxide (CO2) or foam. Large fire: Flood fire area with water from a protected position.

Fire and Explosion Hazard Risk if violent reaction or explosion! May explode from heating, shock, friction or contamination. May intensify fire; oxidizer.

Hazardous Products of Combustion Ambient fire may liberate hazardous vapours. Fire/decomposition may cause evolution of nitrous gases, nitrogen oxides.

Special Fire Fighting Instructions Contain runoff from fire control or dilution water - Runoff may pollute waterways; Runoff may create fire or explosion hazard.

Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. Structural firefighter's uniform will provide limited protection.
Flash Point	132 °C
Lower Explosion	Limit No Data Available
Upper Explosion	Limit No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	1Z

Section 6 - Accidental Release Measures

General Response Procedure	Ensure adequate ventilation, especially in confined areas. Do not contaminate - Keep combustibles away from spilled material. ELIMINATE all ignition sources – Prevent exposure to heat. Do not touch or walk through spilled material – Slippery when spilt! Avoid accidents, clean up immediately. Avoid generating dust. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Use clean, non-sparking tools to transfer material to a suitable container for reclamation or disposal (see SECTION 13). Move container from spill area.
Containment	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Use water spray to knock down vapours or divert vapour clouds.
Decontamination	Small amounts of residue may be flushed to sewer with plenty of water.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground. Large spill: Immediately contact Police or Fire Brigade; Consider initial downwind evacuation of areas within at least 100m.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8).

Section 7 - Handling and Storage

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation, especially in confined areas. Handle in accordance with good industrial hygiene and safety practice. The substance must not be present at workplaces in quantities above that required for work to be progressed. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). OXIDISING SUBSTANCE: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Do not contaminate. Use leak-proof equipment with exhaust for refilling or transfer.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed - Do not leave container open. Protect from moisture – Substance is hygroscopic. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep away from clothing and combustible materials, foodstuffs and other incompatible materials (see

	SECTION 10).
Container	Keep in the original container. Containers of this material may be hazardous when empty since they retain product residues; Observe all warnings and precautions listed for the product.

Section 8 - Exposure Controls and Personal Protection

General	This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies. For dusts from solid substances without specific occupational exposure standards: - Safe Work Australia Exposure Standard (Nuisance dusts): 8 hr TWA = 10 mg/m3 (measured as inhalable dust). - New Zealand WES (Particulates not otherwise classified): TWA = 10 mg/m3; TWA = 3 mg/m3 (respirable dust).
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation or in an emergency (e.g. unintentional release of substance), respiratory protection must be worn. Recommended: Particle filter P2 or P3 (refer to AS/NZS 1715 &1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Wear glasses with side protection. - Hand protection: Handle with gloves. Recommended: Natural rubber/Natural latex (NR) (0.5 mm), Polychloroprene (CR) (0.5 mm), Nitrile rubber/Nitrile latex (NBR) (0.35 mm), Butyl rubber (Butyl) (0.5 mm), Fluoro carbon rubber (FKM (0.4 mm), Polyvinyl chloride (PVC) (0.5 mm). - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Depending on the risk, wear a tight, long apron and boots or suitable chemical protection clothing.
Special Hazards Precautions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use. Take care to maintain clean working place. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

Section 9 - Physical and Chemical Properties:

Physical State	Solid
Appearance	Crystals
Odour	Odourless
Colour	White
pH	5.0 - 7.0 at 20 °C

Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	132 °C
Melting Point	45 °C
Freezing Point	No Data Available
Solubility	No Data Available
Specific Gravity	1.86
Flash Point	132 °C
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Protect from moisture - Substance is hygroscopic.
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	Risk if violent reaction or explosion! May explode from heating, shock, friction or contamination. May intensify fire; oxidizer.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	OXIDISING SUBSTANCE: Will accelerate burning when involved in a fire. Not combustible; Has a fire-promoting effect due to release of oxygen. May ignite combustibles.
Reactions That Release Gases or Vapours	Ambient fire may liberate hazardous vapours. Fire/decomposition may cause evolution of nitrous gases, nitrogen oxides.

Release of Invisible Flammable Vapours and Gases	Release of oxygen at temperatures above 130 °C.

Section 10 - Stability and Reactivity

General Information	Risk of explosion in contact with organic substances, ammonium nitrate/combustible liquids, metals in the form of powder, ammonium compounds.
Chemical Stability	Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not contaminate.
Materials to Avoid	Incompatible/reactive with reducing agents, combustible substances.
Hazardous Decomposition Products	Fire/decomposition may cause evolution of nitrous gases, nitrogen oxides. *Release of oxygen at temperatures above 130 °C.
Hazardous Polymerisation	Hazardous polymerisation will not occur.

Section 11 - Toxicological Information

General Information	- Acute toxicity: Harmful if swallowed. May cause abdominal pain, blue lips or fingernails, blue skin, confusion, convulsions, dizziness, headache, nausea, unconsciousness. - Skin corrosion/irritation: Non-irritating to the skin. - Eye damage/irritation: Causes serious eye irritation; Redness. - Respiratory/skin sensitisation: No sensitization responses were observed. - Germ cell mutagenicity: No information available. - Carcinogenicity: Nitrate or nitrite (ingested) under conditions that result in endogenous nitridation is classified by the IARC Monographs as "possibly carcinogenic to humans" (Group 2A). - Reproductive toxicity: No information available. - STOT (single exposure): Inhalation may cause cough, sore throat. - STOT (repeated exposure): No information available. - Aspiration toxicity: No information available.
Acute	
Ingestion	Acute toxicity (Oral): - LD50, Rat: 3,900 mg/kg
Carcinogen Category	None

Section 12 - Ecological Information

Ecotoxicity	Aquatic toxicity: - LC50, Fish (Poecilia reticulata): 1,378 mg/l (96 h). - EC50, Crustacea (Daphnia magna): 490 mg/l (48 h). - EC50, Algae/aquatic plants (Benthic diatoms): 1,700 mg/l (10 d).
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	Do not let product enter drains. Discharge into the environment must be avoided.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

Section 13 - Disposal Considerations

General Information	Dispose of contents/container in accordance with local/regional/national regulations. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.
Special Precautions for Land Fill	Contaminated packaging: Containers of this material may be hazardous when empty since they retain product residues; Observe all warnings and precautions listed for the product.

Section 14 - Transport Information

Land Transport (Australia)
ADG Code

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
EPG	31 Oxidizing Substances
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

Land Transport (Indonesia)

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
EPG	31 Oxidizing Substances
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
EPG	31 Oxidizing Substances
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
EPG	31 Oxidizing Substances

UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
ERG	140 Oxidizers
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available
EMS	F-A, S-Q
Marine Pollutant	No

Air Transport
IATA DGR

Proper Shipping Name	CALCIUM NITRATE
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	No Data Available
UN Number	1454
Hazchem	1Z
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Section 15 - Regulatory Information

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR002570 HSR003543 (Revoked)

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe(REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

Section 16 - Other Information

Related Product Codes

CANITR0100, CANITR0200, CANITR0300, CANITR0400, CANITR0401, CANITR0500, CANITR0502, CANITR0503, CANITR0700, CANITR0800, CANITR1000, CANITR1001, CANITR1002, CANITR1003, CANITR1004, CANITR1005, CANITR1006, CANITR1007, CANITR1008, CANITR1009, CANITR1010, CANITR1011, CANITR1012, CANITR1013, CANITR1014, CANITR1015, CANITR1016, CANITR1017, CANITR1018, CANITR1019, CANITR1100, CANITR1107, CANITR1108, CANITR1110, CANITR1200, CANITR1201, CANITR1215, CANITR1217, CANITR1300, CANITR1500, CANITR1802, CANITR1803, CANITR1804, CANITR1805, CANITR1806, CANITR1807, CANITR1808, CANITR1809, CANITR1900, CANITR2200, CANITR2201, CANITR2202, CANITR2204, CANITR2205, CANITR2500, CANITR2501, CANITR2600, CANITR2900, CANITR3000, CANITR3001, CANITR3002, CANITR3003, CANITR3004, CANITR3005, CANITR3006, CANITR3100, CANITR3200, CANITR3300, CANITR3501, CANITR3502, CANITR3700, CANITR3800, CANITR3900, CANITR4000, CANITR4001, CANITR4300, CANITR4301, CANITR4302, CANITR4600, CANITR4800, CANITR4900, CANITR5100, CANITR5200, CANITR5300, CANITR5400, CANITR5500, CANITR5800, CANITR5801, CANITR5900, CANITR5901, CANITR6300, CANITR6500, CANITR6900, CANITR7000, CANITR7500, CANITR8000, CANITR8001, CANITR8002, CANITR8900, CANITR9000, CANITR9400, CANITR9600, CANITR9700, CANITR9800, CANITR9900, CANITR9901, CANITR9902

Revision

5

Revision Date

22 Sep 2019

Key/Legend

<	Less Than
>	Greater Than
AICS	Australian Inventory of Chemical Substances
atm	Atmosphere
CAS	Chemical Abstracts Service (Registry Number)
cm^2	Square Centimetres

CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
deg C (°C)	Degrees Celsius
EPA (NZ)	Environmental Protection Authority of New Zealand
deg F (°F)	Degrees Fahrenheit
g	Grams
g/cm^3	Grams per Cubic Centimetre
g/l	Grams per Litre
HSNO	Hazardous Substance and New Organism
IDLH	Immediately Dangerous to Life and Health
immiscible	Liquids are insoluble in each other.
inHg	Inch of Mercury
inH2O	Inch of Water
K	Kelvin
kg	Kilogram
kg/m^3	Kilograms per Cubic Metre
lb	Pound
LC50	LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50	LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L**	Litre
m^3	Cubic Metre
mbar	Millibar
mg	Milligram
mg/24H	Milligrams per 24 Hours
mg/kg	Milligrams per Kilogram
mg/m^3	Milligrams per Cubic Metre
Misc or **Miscible**	Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm	Millimetre
mmH2O	Millimetres of Water
mPa.s	Millipascals per Second
N/A	Not Applicable
NIOSH	National Institute for Occupational Safety and Health
NOHSC	National Occupational Health and Safety Commission
OECD	Organisation for Economic Co-operation and Development
Oz	Ounce
PEL	Permissible Exposure Limit
Pa	Pascal
ppb	Parts per Billion
ppm	Parts per Million
ppm/2h	Parts per Million per 2 Hours
ppm/6h	Parts per Million per 6 Hours
psi	Pounds per Square Inch
R	Rankine
RCP	Reciprocal Calculation Procedure

STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
tne	Tonne
TWA	Time Weighted Average
ug/24H	Micrograms per 24 Hours
UN	United Nations
wt	Weight