1.0 Identification

Product Identifier	**Break Out Powder**
Other Means of Identification	APTUS Plant Technology Break Out Powder
Recommended Use and Restrictions on use	Use as directed on product label
Details of Importer	APTUS PLANT TECH Australia Unit 1/11 Didswith St, East Brisbane QLD 4169
Emergency Phone Number	Australian Poisons Information (24 hours / 7 days) ☎ 13 11 26

2.0 GHS Hazard identification

Classification of The Hazardous Chemical	Cat. 1
Signal Word	**DANGER**
Hazard Statement	Causes serious eye damage Causes damage to organs through prolonged or repeated exposure through inhalation and oral routes Harmful if swallowed
Precautionary Statements	Wear eye protection/face protection. Do not breathe dusts or mists. Wash exposed skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Get medical advice/attention if you feel unwell. Collect Spillage
GHS Pictograms	

3.0 Ingredients / Composition %w/w

Ingredient Name/Nature	**<10**	**10>20**	**>30**	**>40**	**>50**	**>60**	**>70**	**>80**	**>90**	**100**
Proprietary Ingredients determined not to be hazardous at the concentration										
Manganese sulfate CAS 7785-87-7										
Citric Acid CAS 77-92-9										

4.0 First Aid Measures

First Aid Instructions	**D**anger? **R**esponse? Yes ⇨ Make comfortable, monitor ⇘ No **S**end for Help. **A**irway? **B**reathing? No ⇨**C**PR (30 compress: 2 breaths). **D**efibrillation. ⇘ Yes (Recovery Position & Monitor)
Swallowed	Rinse mouth and SPIT. Do NOT induce vomiting. Immediately call a POISON CENTER 13 11 26
Eye	IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER 13 11 26.
Skin	(or hair): Take off immediately all contaminated clothing. Wipe any excess off skin. Rinse skin with cold water/shower.
Inhaled	Remove person to fresh air and keep comfortable for breathing.
Symptoms caused by exposure	Local irritation effects can be anticipated due to corrosive nature.
Medical Attention / Special Treatment	Dilute. (This product is supplied as an effervescent powder, that releases CO_2 on contact with water)

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5.0 Fire Fighting Measures

Extinguishing media	As merited by packaging &/or surrounding materials, dry chemical or carbon dioxide;
Specific Hazards arising from the chemical	Non-combustible solid. *Adding water to this product releases asphyxiating gas (CO_2)* Decomposes on heating emitting toxic fumes, including those of oxides of manganese, oxides of sulfur.
Special protective equipment and precautions for fire fighters HAZCHEM	Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

6.0 Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Keep only in original container. Obtain special instructions before use, Wear protective gloves/protective clothing/eye protection/face protection. Wash hands thoroughly after handling
Environmental precautions	Concentrate as supplied should not enter to waterways, may cause localised effects.
Methods and materials for containment and cleaning up	Collect excess without raising dusts, dispose as solid waste. Dilute residue and contain residue where possible. Take off contaminated clothing and wash it before reuse.

7.0 Storage and Handling

Precautions for Safe Handling	Keep dry in well-ventilated area. Wear eye protection/face protection. Do not breathe dusts or mists. Wash exposed skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Get medical advice/attention if you feel unwell.
Safe Storage Practice	Keep tightly closed in original container; store away from moisture, foods and cross reactive substances
- Avoid	Storing with incompatible substances; acids, flammable materials
- Control	Formation of dusts
- Maintain	Keep tightly closed
- Other	When diluting add this powder to already dispersed water. Avoid formation of dust and splashing concentrated materials on skin / in eyes. Dilute / use only in a well-ventilated area.

8.0 Exposure Controls / Personal Protection

National Exposure Standards	Manganese, dust & compounds (as Mn): 8hr TWA = 1 mg/m^3			
Control Banding	~~Band Zero – Household or Consumer Use~~	~~Band 1 – good industrial hygiene practice~~	Band 2 – use local exhaust ventilation	~~Band 3 – enclose the process~~ ~~Other~~
Engineering Controls	Local exhaust ventilation is generally preferred because it can control the dust at its source, and dissipate CO_2 released during effervescence.			
PPE	Wear protective gloves/protective clothing/eye protection/face protection			

9.0 Physical & Chemical Properties

Appearance	White crystalline powder	**Partition Co-efficient n-Octonol/water**	No data
Odour	Neutral - **do not inhale**	**Solubility**	100% water soluble
pH	6 to 8	**Vapour Pressure**	No data
Melting / Freezing Pt	Na – crystalline solids	**Vapour Density**	No data
Boiling Point	Na - crystalline solids	**Relative Density**	1.85 g/mL
Flash Point	Not established	**Auto-ignition Temp**	No data
Evaporation Rate	Na - crystalline solids	**Decomposition Temp**	No data
Flammability	Not classified as flammable	**Viscosity**	No data
Explosive Limits	No data	**Other**	Releases CO_2 with water

10.0 Stability & Reactivity

Reactivity	Releases CO_2 on contact with water
Chemical Stability	Formulated as stable
Possibility of Hazardous Reactions	Hazardous polymerisation will not occur.
Conditions to avoid	Avoid exposure to moisture. Avoid high temperatures.
In compatible materials	Incompatible with strong oxidising agents, strong acids, aluminium.
Hazardous Decomposition Products	Oxides of manganese. Oxides of sulfur.

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11.1 Known Toxicological Information ~25% Manganese sulfate CAS 7785-87-7

Ingredient Name / Type	Data
Acute Toxicity	Moderate oral acute toxicity in animals. LD_{50} values for Manganese salts ranges from 236 mg Mn/kg bw in female rats for manganese chloride to 2000 mg/kg bw in female Wistar rats for manganese phosphate.
Skin Corrosion / Irritation	Based on the data available for manganese chloride, manganese sulfate, manganese oxalate and manganese phosphate, the chemicals are **not considered to be irritating to skin**. In an in vitro skin irritation test (according to EU method B.46), reconstituted human epidermis (EPISKIN TM model) was uniformly exposed to flakes (10 ± 2 mg) of manganese chloride for 15 minutes. No irritation was observed at 42 hours post exposure, measured by the mean viability of the reconstituted human epidermis, which was not significantly changed by chemical exposure compared with the control.
Serious Eye Damage Irritation	Based on the weight of evidence from the in vivo data available, likely to be a severe eye irritant. In an eye irritation study conducted according to OECD TG 405, two male NZW rabbits were exposed to approximately 100 mg of manganese chloride for up to 72 hours. The maximum mean total score was 53/110 at 48 hours post-exposure, and corneal and conjunctival lesions were not reversible by 21 days post-exposure.
Respiratory or skin sensitisation	Unlikely to be a sensitiser.
Germ cell mutagenicity	Not considered to be genotoxic.
Carcinogenicity	Based on the available data for manganese sulfate monohydrate, not considered to be carcinogenic.
Reproductive toxicity	Based on the available data for manganese sulfate monohydrate, not considered to be toxic to reproduction.
Specific Target Organ Toxicity – (STOT) – repeated exposure	Chronic exposure to manganese via inhalation and oral routes impairs the central nervous system (CNS) function in humans. Long-term occupational inhalation exposure to low levels of chemical dust (0.07–0.97 mg manganese/m^3) resulted in impaired motor and cognitive function (e.g. poorer hand-eye coordination, hand steadiness and postural stability; reduced reaction time), as well as altered mood in workers. The proportion of manganese in the chemical dusts ranged from <20–80 % of total dust levels (ATSDR, 2012). A reference dose (RfD) of 0.14 mg/kg bw/day for manganese was reported based on chronic oral exposure data in humans (IRIS). Long-term occupational exposure to high levels of inorganic manganese dust at concentrations of 2–22 mg manganese/m^3 resulted in a neurological syndrome known as manganism. Early symptoms included weakness and lethargy, irritability, aggressiveness, hallucinations, concentration difficulties and memory problems. Clinical signs included tremors, walking difficulties, facial muscle spasms and speech disturbances. With disease progression, severe muscle tension and rigidity can develop, leading to complete and irreversible physical disability. Frank manganism, as reported in workers in manganese mines or foundries, also includes psychomotor excitement known as 'manganese madness'—nervousness, irritability, aggression, destructivenenss and uncontrollable acts of laughter or crying or singing or aimless running. Cases of frank manganism increased with increasing duration of exposure to high levels of the chemical, and neurological impairments persisted even after exposure had ceased (ATSDR, 2012). In men exposed to manganese in an occupational setting, and in particular in those with clinical signs of a neurological syndrome known as manganism decreased libido, impotence, sexual dysfunction and reduced sperm quality have been reported, which could decrease reproductive success. However, there was conflicting evidence. Reduced fertility (assessed as fewer children per married couple) was reported in male workers exposed to manganese dust at 0.97 mg/m^3 for 1–19 years. In another study, 314 men exposed to 0.145 mg/m^3 (mean value) manganese dust for up to 35 years reported impotence and lack of sexual desire, although there were no significant differences in reproductive outcomes compared with the control group (ATSDR, 2012).
Aspiration hazard.	In 2013, the American Conference of Governmental Industrial Hygienists (ACGIH) adopted a threshold limit value (TLV) for manganese (elemental and inorganic compounds) of 0.02 mg/m^3 TWA for respirable particulate matter and 0.1 mg/m^3 TWA for inhalable particulate matter.
Skin - Acute	No acute effects anticipated; Dermal exposure to the chemical was not considered to be an important route of potential systemic toxicity (ATSDR, 2012).
Inhaled - Acute	No acute effects anticipated. The lowest published toxic concentration (TCLo) was reported to be 2300 µg/m^3 for inhalation exposure (RTECS). Following inhalation exposure, the chemical is deposited in the nasal mucosa, upper airways and lungs. The particle size of the chemical is a major determinant of inhalation absorption. Smaller particles entering the lower airways (respirable fraction, ≤5 µM in size) can, upon dissolution, be absorbed into blood and lymph fluids directly, whereas larger particles accumulating in the nasal mucosa (inhalable fraction) can be transported into the brain via neural tracts. Only limited data are available for the chemical. based on human cross-sectional and epidemiological data the chemical warrants hazard classification for repeated dose inhalation toxicity.

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Swallowed - Acute	No acute effects anticipated. Based on Western diets, a tolerable UL of 11 mg/day has been set for manganese. Following oral exposure, manganese metal is solubilised at stomach pH. Gastrointestinal absorption of the chemical is rapid and in the range of 3–8 %. The chemical is primarily excreted in the faeces; with a very small portion (<2 %) excreted via the urine; and even less through sweating, the hair or breast milk (EPA, 2004; ATSDR, 2012). The chemical has low acute toxicity based on results from animal tests following oral exposure. The median lethal dose was reported to be 9 g/kg bw in rats (RTECS). In female Wistar rats, the LD_{50} was reported to be >2000 mg/kg bw (REACH).
Eye - Acute	Severe eye irritant. In a eye irritation study conducted according to OECD TG 405, two male NZW rabbits were exposed to approximately 100 mg of manganese chloride for up to 72 hours. The maximum mean total score was 53/110 at 48 hours post-exposure, and corneal and conjunctival lesions were not reversible by 21 days post-exposure. The chemical was reported to be a severe eye irritant. In an eye irritation study (OECD TG 405), one male NZW rabbit was exposed to approximately 80 mg of manganese sulphate for up to 72 hours. The maximum mean total score was 36/110 at 48 hours post-exposure. Lesions were not reversible by seven days post-exposure. The rabbit was euthanised seven days post- exposure due to its moribund condition and the chemical was reported to be at least a moderate eye irritant (Conflicting data exists)
Early Onset Symptoms	No data
Delayed Health Effects from exposure	No data
Exposure Level & Health Effects	No data
Interactive effects	No data
Other	As a nutrient, no estimated average requirement (EAR) or upper level of intake (UL) has been established for manganese due to the lack of suitable data. An adequate intake (AI) of 0.6–5.5 mg manganese/day has been estimated based on median intakes from different age–gender groups reported in the 23rd Australian Total Diet Study. Specifically, for children 7–12 months of age, the AI is 0.6 mg/day; for children 2–18 years of age, the AI is 2.0–3.5 mg/day; and for adults over 19 years of age the AI is 5.0–5.5 mg/day. In drinking water, the National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines 6 state that 'Based on aesthetic considerations, the concentration of manganese in drinking water should not exceed 0.1 mg/L, measured at the customer's tap. Manganese would not be a health consideration unless the concentration exceeded 0.5 mg/L.' (NHMRC, 2011).

12.0 Ecological Information

Ecotoxicity (as supplied)	Avoid release to waterways
Persistence & Biodegradability	No data
Bioaccumulative Potential	No data
Mobility in soil	No data
Other effects	No data

13.0 Disposal Considerations

Disposal Containers & Methods	Rinse container; dispose as permitted by local jurisdiction.
Physical/chemical properties that may affect disposal options.	None identified
Effects of sewage disposal.	Diluted solutions are unlike to contribute to issues of concern
Special precautions for incineration or land fill.	Diluted solutions are unlike to contribute to issues of concern

14.0 Transport Information

UN Number	Proper Shipping Name / Technical Name	Transport Hazard Class	Packaging Group
nil	nil	nil	nil
Environmental Hazards for Transport Purposes		**Special Precautions for user**	
nil		nil	

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15.0 Regulatory Information

Montreal Protocol	Stockholm Convention	Rotterdam Convention	Basel Convention	MARPOL
Not applicable	Not included	Not Included	Not Included	Not Included
SUSMP	Excluded by concentration & use.			
Prohibitions / Licensing Restrictions	None identified			
APVMA	Excluded by purpose			
NICNAS	All ingredients are included in AICS			

16.0 Other Information

16.1 Consumer & General Usage Information

Directions for use	as directed on the label.
Directions for Removal	Rinse under running water.
Nano Materials	None identified
Animal Derived Ingredients	None identified

16.2 SDS Preparation

Date Prepared	23rd May 2018
Changes Made	First edition for Australia
Reference Standards	Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice February 2016. ISBN 978-0-642-33311-7. GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) Fourth revised edition
Resources Relied upon include	Hazardous Substances Data Bank (HSDB) https://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB Suppliers' SDS; RTECS Toxicity Database; IRAC; CDC NIOSH, HSIS, Safework Australia GHS Hazardous Chemical Information List. Information provided by manufacturer(s).

Disclaimer: This SDS provides safety data only for the product and circumstances of use nominated. The SDS summarises our best knowledge of the specific, well-known and equivocally demonstrated health and safety hazard information pertaining to workplace use of the nominated substance(s) however the author expressly disclaims that the SDS is complete, is a representation or is a guarantee. Published and other resources have been relied upon, and in some cases conflicting information has been identified. Each user should read the SDS and consider the information in the context of their specific conditions and circumstances, and in conjunction with other products. If clarification is required or further information sought in order to make a risk assessment the user should contact the nominated sponsor company. The responsibility for products sold is subject to our standard terms and conditions that are available on request.

16.3 Key abbreviations or acronyms used

%	Percent (parts per hundred)
***C or ºC**	degrees Celsius
<	less than
>	greater than
ACCC	Australian Competition and Consumer Commission
ADG	Australian Dangerous Goods
AICS	Australian Inventory of Chemical Substances
APVMA	Australian Pesticides and Veterinary Medicines Authority
AS	Australian Standard
ASCC	Australian Society of Cosmetic Chemists
bw	Body weight (nominally a human adult of 60kg is applied)
BOD	Biochemical Oxygen Demand
CAS	Chemical Abstracts Service (Registry Number)
cc	cubic centimetres (equivalent to mL)
COD	Chemical Oxygen Demand
CMR	CMR substances: Article 15 of the EU Cosmetics Regulation 1223/2009 contains provisions on the use of CMR in cosmetic products. Typically substances classified as CMR substances Cat 1A, 1B, or 2 under Part 3 of Annex IV Regulation (EC) No 1272/2008 are banned for use in cosmetic products
COSING	The European Commission database with information on Cosmetic Ingredients & Substances Dangerous Goods
EINECS	European Inventory of Existing Commercial Chemical Substances (Identifying Number)
dw	Dry weight
DNEL	Derived No effect level

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EU	Europe / European
FSANZ	Food Standards Australia New Zealand
g	gram
GHS	Globally Harmonised System (safety symbols and labelling)
GMO	Genetically modified organism
h or hr	Hour
HAZCHEM	Emergency action code of numbers and letters that provide information to emergency services especially fire fighters
HSIS	The Safe Work Australia Hazardous Substances Information System
IATA	The International Air Transport Association
IMAP	NICNAS Inventory Multi-tiered Assessment and Prioritisation
ICAO	The International Civil Aviation Organization
IFA	The International Fragrance Association
INCI	The International Nomenclature of Cosmetic Ingredients
kg	kilogram
L	Litre
LC_{50}	LC_{50} is the average concentration of a material (by a defined route) that causes the death of 50% (one half) of a group of (defined) test animals. Normally quoted in mg/kg body weight.
LD_{50}	LD_{50} is the average dose of a material, given all at once, which causes the death of 50% of a group of (defined) test animals. Normally quoted in mg/kg body weight. Products with a LD_{50} of less than 5000mg/kg are scheduled poisons in Australia (see SUSMP)
LD_{LO}	Lethal Dose Low, is the minimum amount of a material shown to be lethal to a specified type of animal. Typically quoted in mg/kg body weight.
m or min	minute
m^3	cubic metre
Max or max	maximum
mg	milligram
Min or min	minimum
mL	millilitre
mm	millimetre
mm Hg	millimetre of Mercury
MOS	Margin of Safety
MRL	Maximum Residue Limit
MSDS	Material Safety Data Sheet (see also SDS)
Nano	Nano(sized) material / Nano Technology; …industrial materials (including a cosmetic ingredient) comprising 10% or more by composition that has been intentionally produced, manufactured or engineered to have either an internal or external property that is a size range typically between 1 nm and 100 nm.
ng	nanogram
NICNAS	The National Industrial Chemicals Notification and Assessment Scheme (AUSTRALIA)
NIOSH	The National Institute for Occupational Safety and Health (USA)
NOAEL	No observed Adverse Effects Limit
NOHSC	National Occupational Health and Safety Commission (AUSTRALIA)
NOS	Not otherwise specified
NZS	New Zealand Standard
OECD	Organization for Economic Co-operation and Development (Test Method number)
OSHA	The Occupational Safety and Health Administration (USA)
Perm.	Permethrin (Active ingredient of this formulation)
PEL	Permissible Exposure Limit
pH	(pH) A measure of acidic (less than 7) or alkalinity (above 7); extreme values represent extreme acidic or alkaline conditions. Typically products with a pH less than three or greater than 11 are scheduled poisons (SUSMP)
PNEC	Predicted no effect concentration
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million
RTECS	The Registry of Toxic Effects of Chemical Substances
S2	Schedule 2, SUSMP **Pharmacy Medicine** – Substances, the safe use of which may require advice from a pharmacist and which should be available from a pharmacy or, where a pharmacy service is not available, from a licensed person.
S3	Schedule 3, SUSMP **Pharmacist Only Medicine** – Substances, the safe use of which requires professional advice but which should be available to the public from a pharmacist without a prescription.

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S4	Schedule 4, SUSMP **Prescription Only Medicine**, or **Prescription Animal Remedy** – Substances, the use or supply of which should be by or on the order of persons permitted by State or Territory legislation to prescribe and should be available from a pharmacist on prescription.
S5	Schedule 5, SUSMP **Caution** – Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.
S6	Schedule 6, SUSMP **Poison** – Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label.
S7	Schedule 7, SUSMP **Dangerous Poison** – Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special regulations restricting their availability, possession, storage or use may apply.
S8	Schedule 8, SUSMP **Controlled Drug** – Substances which should be available for use but require restriction of manufacture, supply, distribution, possession and use to reduce abuse, misuse and physical or psychological dependence.
S9	Schedule 9, SUSMP **Prohibited Substance** – Substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities.
S10	Schedule 10, SUSMP **Substances of such danger to health as to warrant prohibition of sale, supply and use** - Substances which are prohibited for the purpose or purposes listed for each poison.
SCCP	Scientific Committee on Cosmetic Products and Non-Food Products (EUROPE)
SDS	Safety Data Sheet, (previously called MSDS) now SDS under GHS
STEL	Short Term Exposure Limit
SUSMP	Standard for the Uniform Scheduling of Medicine & Poisons (AUSTRALIA) also Poisons Standard. Poisons are not scheduled on the basis of a universal scale of toxicity. Although toxicity is one of the factors considered, and is itself a complex of factors, the decision to include a substance in a particular Schedule also takes into account many other criteria such as the purpose of use, potential for abuse, safety in use and the need for the substance.
T1 or TI	NICNAS IMPA Framework Low risk; chemicals that are not expected to pose a concern to workers, public health or the environment
T2 or TII	NICNAS IMPA Framework Assessable risk; products not classified as T1 risk information on a substance-by-substance or chemical category-by-category
TGA	Therapeutic Goods Administration (AUSTRALIA)
TLV	Threshold Limit Value
TWA	Time Weighted Average
ug	microgram
uL	microlitre
UN	United Nations (number)
US or USA	The United States of America

End of SDS