1. IDENTIFICATION

Product Name	**Disodium octaborate, tetrahydrate**
Other Names	Actibor; CHEMIEBOR 20; Disodium octaborate [CAS#12008-41-2]; DOT; ETIDOT-67; FertiBagra 21 Powder
Uses	Agriculture (fertilizer); Wood articles; Flame-retardant agent.
Chemical Family	No Data Available
Chemical Formula	Na2B8O13.4H2O
Chemical Name	Disodium octaborate, 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

For emergencies only; DO NOT contact these companies for general product advice.

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

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not Scheduled

Globally Harmonised System

Hazard Classification			Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories			Acute Toxicity (Oral) - Category 5 Toxic To Reproduction - Category 2
Pictograms			
Signal Word			Warning
Hazard Statements		**H303**	May be harmful if swallowed.
		H361d	Suspected of damaging the unborn child.
Precautionary Statements	Prevention	**P201**	Obtain special instructions before use.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P308 + P313**	IF exposed or concerned: Get medical advice.
		P312	Call a POISON CENTER or doctor if you feel unwell.
	Storage	**P405**	Store locked up.
	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	NOT 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	Health Hazards	**6.4A**	Substances that are irritating to the eye
		6.8B	Substances that are suspected human reproductive or developmental toxicants
	Environmental Hazards	**9.1D**	Substances that are slightly harmful to the aquatic environment or are otherwise designed for biocidal action

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Disodium octaborate, tetrahydrate	Na2B8O13.4H2O	12280-03-4	<=100 %

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.
*If large amounts are swallowed (i.e. more than one teaspoon), contact a doctor or toxicity centre immediately.

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. If eye irritation persists, get medical advice/attention.
Skin	IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs, get medical advice/attention.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention.
Advice to Doctor	If exposed or concerned, get medical advice/attention. Treat symptomatically. *Observation only is required for adult ingestion of less than 4 grams of product. For ingestion in excess of 4 grams, maintain adequate kidney function and force fluids. Gastric lavage is recommended for symptomatic patients only. Haemodialysis should be reserved for massive acute ingestion or patients with renal failure. Boron analyses of urine or blood are only useful for documenting exposure and should not be used to evaluate severity of poisoning or to guide treatment.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	Do not attempt to take action without suitable protective equipment. If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Not combustible. *The product is itself a flame retardant.
Extinguishing Media	If material is involved in a fire, use water spray, dry powder, foam. Any fire extinguishing media may be used on nearby fires.
Fire and Explosion Hazard	Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas, which could create an explosive hazard.
Hazardous Products of Combustion	In case of fire, toxic fumes may be released.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may cause pollution.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid dust formation. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Mechanically recover the product. Vacuum, shovel or sweep up and place in containers for recovery or disposal (see SECTION 13).
Containment	Stop leak if you can do it without risk. Prevent dust cloud. Prevent entry into waterways, sewers, basements or confined areas.
Decontamination	Ventilate spillage area.
Environmental Precautionary Measures	Prevent entry into drains and waterways. Notify authorities if product enters sewers or public waters.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Do not attempt to take action without suitable protective equipment. In case of exposure to high level of airborne dust, wear a personal respirator (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Obtain special instructions before use - Do not handle until all safety precautions have been read and understood. 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).
Storage	Store indoors, in a dry and well-ventilated place, out of direct sunlight. Keep container tightly closed and prevent any accidental damage. Protect from moisture. Keep away from incompatible materials (see SECTION 10). Store locked up. *To maintain package integrity and to minimise caking of the product, bags should be handled on a first-in first-out basis.
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. 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: Wear respiratory protection, in case of inadequate ventilation or prolonged exposure to dust. Recommended: Dust mask/particulate respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Safety glasses. Goggles may be warranted if environment is excessively dusty. - Hand protection: Wear protective gloves. Recommended: Impervious gloves. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Overalls, safety shoes.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Take off contaminated clothing and wash it before reuse. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder
Odour	Odourless
Colour	White
pH	8.53 (1% solution)
Vapour Pressure	Negligible (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	815 °C
Freezing Point	No Data Available
Solubility	9.7% in water @ 20 °C - 27.4% in water @ 40 °C
Specific Gravity	No Data Available
Flash Point	No Data Available
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	412.5 g/mol
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	No information available.
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	No information available.
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	Not combustible. *The product is itself a flame retardant.
Reactions That Release Gases or Vapours	In case of fire, toxic fumes may be released.
Release of Invisible Flammable Vapours and Gases	Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas, which could create an explosive hazard.

10. STABILITY AND REACTIVITY

General Information	The product is non-reactive under normal conditions of use, storage and transport.
Chemical Stability	Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Conditions to Avoid	Avoid dust formation. Avoid contact with incompatible materials.
Materials to Avoid	Incompatible/reactive with strong reducing agents (such as metal hydrides), alkali metals.
Hazardous Decomposition Products	Under normal conditions of storage and use, hazardous decomposition products should not be produced. In case of fire, toxic fumes may be released. *Reaction with strong reducing agents such as metal hydrides or alkali metals will generate hydrogen gas, which could create an explosive hazard.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: May be harmful if swallowed. Not intended for ingestion. Small amounts (i.e. less than one teaspoon) swallowed accidentally are not likely to cause effects; swallowing larger amounts may cause gastrointestinal symptoms. Symptoms of overexposure have been associated with ingestion or absorption through large areas of damaged skin. These may include nausea, vomiting and diarrhoea, with delayed effects of skin redness and peeling. Dermal exposure is not usually a concern because it is poorly absorbed through intact skin. - Skin corrosion/irritation: Does not cause irritation to intact skin. - Eye damage/irritation: Non-irritating to eyes in normal industrial use. - Respiratory/skin sensitisation: Disodium octaborate, tetrahydrate is not a skin sensitiser.

- Germ cell mutagenicity: Disodium octaborate, tetrahydrate is not mutagenic.
- Carcinogenicity: Disodium octaborate, tetrahydrate is not carcinogenic.
- Reproductive toxicity: Suspected of damaging the unborn child.
- STOT (single exposure): Occasional mild irritation effects to nose and throat may occur from inhalation of high levels of dusts.
- STOT (repeated exposure): No information available.
- Aspiration toxicity: Disodium octaborate, tetrahydrate has no aspiration hazard.

Acute

Ingestion Acute toxicity (Oral):
- LD50, Rats: 2,550 mg/kg bw. (Disodium octaborate).

Other Acute toxicity (Dermal):
- LD50, Rabbits: >2,000 mg/kg bw.

Reproduction Animal feeding studies at high doses have demonstrated effects on fertility and testes. Studies in rat, mouse and rabbit, at high doses, demonstrate developmental effects on the foetus, including foetal weight loss and minor skeletal variations. The doses administered were many times in excess of those which humans would normally be exposed to. While boron has been shown to adversely affect male reproduction in laboratory animals, there is no clear evidence of male reproductive effects attributable to boron in studies of highly exposed workers. An epidemiology study under the conditions of normal occupational exposure to borate dusts indicated no effect on fertility. Human epidemiological studies show no increase in pulmonary disease in occupational populations with chronic exposures to borate dusts. A study conducted in Turkey with boron exposed mine workers showed that mean blood concentrations of the high exposure group is ~6 times and ~9 times lower than those of the highest no effect level of boron in blood with regard to developmental and reprotoxic effects (respectively) in rats. With those findings, no unfavourable effects of boron exposure on reproductive indicators are observed in humans.

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity Aquatic toxicity:
- LC50, Fish (Pimephales promelas): 79.7 mg B/L or 380 mg Disodium octaborate, tetrahydrate/L (96 h).
- LC50, Crustacea (Daphnia magna): 133 mg B/L or 635 mg Disodium octaborate, tetrahydrate/L (48 h).
- EC50, Algae (Pseudokirchneriella subcapitata), biomass: 40 mg B/L or 191 mg Disodium octaborate, tetrahydrate/L (72 h).

Persistence/Degradability Boron is naturally occurring and ubiquitous in the environment. Disodium octaborate, tetrahydrate decomposes in the environment to natural borate.

Mobility Disodium octaborate, tetrahydrate is soluble in water and is leachable through normal soil.

Environmental Fate Boron is an essential micronutrient for healthy growth of plants; however, it can be harmful to boron sensitive plants in higher quantities. Care should be taken to minimise the amount of borate product released to the environment. Disodium octaborate, tetrahydrate should only be used as part of a balanced plant nutrition program preferably after soil and/or tissue analysis.

Bioaccumulation Potential Not bioaccumulative.

Environmental Impact No Data Available

13. DISPOSAL CONSIDERATIONS

General Information Dispose of contents/container in accordance with local/regional/national regulations.

Special Precautions for Land Fill Small quantities of product can usually be disposed of at landfill sites. Tonnage quantities are not recommended to be sent to landfills - such material should, if possible, be used for an appropriate application.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)
US DOT

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport
IMDG Code

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available

Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport
IATA DGR

Proper Shipping Name	Disodium octaborate, tetrahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

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

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

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	HSR003137 (Reissued)

National/Regional Inventories

Australia (AIIC)	Listed
Canada (DSL)	Listed
Canada (NDSL)	Not Determined
China (IECSC)	Listed
Europe (EINECS)	215-540-4
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Listed

Korea (KECI)	9312-3213
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Listed
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Listed

16. OTHER INFORMATION

Related Product Codes	MULTIB1000, MULTIB1001, MULTIB1002, MULTIB1003, MULTIB1004, MULTIB1005, MULTIB1006, MULTIB1007, MULTIB1008, MULTIB1800, MULTIB1801, MULTIB1802, MULTIB1803, MULTIB1804, MULTIB1805, MULTIB1806, MULTIB1807, MULTIB2000, MULTIB2100, MULTIB2200, MULTIB2500, MULTIB2501, MULTIB2600, MULTIB2601, MULTIB2700, MULTIB2701, MULTIB2750, MULTIB2751, MULTIB2800, MULTIB2801, MULTIB3300, MULTIB3400, MULTIB4000, MULTIB4001, MULTIB4200, MULTIB4500, MULTIB5000, MULTIB5500, MULTIB5501, MULTIB5530, MULTIB6000, MULTIB6001, MULTIB6300, MULTIB6310, MULTIB6500, MULTIB6501, MULTIB6505, MULTIB6510, MULTIB7000, MULTIB7100, MULTIB8000, MULTIB8010
Revision	5
Revision Date	10 Oct 2021
Reason for Issue	update sds
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius **EPA (New Zealand)** Environmental Protection Authority of New Zealand **deg F (°F)** Degrees Farenheit **g** Grams **g/cm³** 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 insoluable in each other. **inHg** Inch of Mercury **inH2O** Inch of Water **K** Kelvin **kg** Kilogram **kg/m³** 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 **m³** Cubic Metre **mbar** Millibar **mg** Milligram **mg/24H** Milligrams per 24 Hours **mg/kg** Milligrams per Kilogram **mg/m³** 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 Heath 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