SAFETY DATA SHEET

Section 1 - Identification

Product identifier **PersulfOx®**

Other means of identification None.

Recommended use of the chemical and restrictions on use

Recommended use Soil and Groundwater Remediation.

Restrictions on use None known.

Details of manufacturer or importer

Company name REGENESIS

Address 1011 Calle Sombra
San Clemente, CA 92673
USA

General information 949-366-8000

E-mail CustomerService@regenesis.com

Emergency phone number For Dangerous Goods Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:

Australia 0011-1-703-527-3887

International +1 703-741-5970

Section 2 - Hazard(s) identification

Classification of the hazardous chemical

Physical hazards	Oxidising solids	Category 3
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Sensitization, respiratory	Category 1
	Sensitization, skin	Category 1
	Specific target organ toxicity following single exposure	Category 3 respiratory tract irritation

Label elements, including precautionary statements

Hazard symbol(s)

Flame over circle | Health hazard | Exclamation mark

Signal word Danger

Hazard statement(s) May intensify fire; oxidiser. Harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation.

Precautionary statement(s)

Prevention Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep/Store away from clothing and other combustible materials. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection.

Response IF ON SKIN: Wash with plenty of soap and water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTRE or doctor/physician if you feel unwell.

Storage	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Supplemental information	None.
Other hazards which do not result in classification	None known.

Section 3 - Composition and information on ingredients

Mixture

Identity of chemical ingredients	CAS number and other unique identifiers	Concentration of ingredients
Sodium persulfate	7775-27-1	≥90
Silicic acid, sodium salt	1344-09-8	≤10

Composition comments All concentrations are in percent by weight unless otherwise indicated.

Section 4 - First aid measures

Description of necessary first aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a POISON CENTRE or doctor/physician.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.
Eye contact	Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Never give anything by mouth to a victim who is unconscious or is having convulsions. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.
Personal protection for first-aid responders	Take off all contaminated clothing immediately. Contact with combustible material may cause fire. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.
Symptoms caused by exposure	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.
Medical attention and special treatment	Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

Section 5 - Firefighting measures

Extinguishing media

Suitable extinguishing equipment	Water spray, fog (flooding amounts).
Unsuitable extinguishing equipment	Do not use water unless flooding amounts are available. Material reacts with water. Do not use carbon dioxide or other gas filled fire extinguishers; they will have no effect on decomposing persulfates.
Specific hazards arising from the chemical	Greatly increases the burning rate of combustible materials. Containers may explode when heated. During fire, gases hazardous to health may be formed. Combustion products may include: sulfur oxides.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.
Hazchem code	1Y
General fire hazards	May intensify fire; oxidiser. Contact with combustible material may cause fire.
Specific methods	Cool containers exposed to flames with water until well after the fire is out. Avoid dust formation.

Section 6 - Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep away from clothing and other combustible materials. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.
For emergency responders	Keep unnecessary personnel away. Use personal protection recommended in Section 8 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with HEPA filter. If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Keep combustibles (wood, paper, oil etc) away from spilled material. Ventilate the contaminated area. Stop the flow of material, if this is without risk. Spillage collected should be monitored for signs of reaction or decomposition (fuming/smoking). If spilled material is wet, dissolve with large quantity of water. Large Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Minimise dust generation and accumulation. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Place all material into loosely covered plastic containers for later disposal. For waste disposal, see section 13 of the SDS.

Section 7 - Handling and storage

Precautions for safe handling	Minimise dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Keep away from heat. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Avoid contamination. Wear appropriate personal protective equipment (See Section 8). Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Keep away from heat. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Do not store near combustible materials. Store away from incompatible materials (see Section 10 of the SDS). Recommended storage temperature: less than 40°C.

Section 8 - Exposure controls and personal protection

Control parameters Follow standard monitoring procedures.

Occupational exposure limits

Australia. National Workplace OELs (Workplace Exposure Standards for Airborne Contaminants, Appendix A)

Components	Type	Value
Sodium persulfate (CAS 7775-27-1)	Ceiling	0.01 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value
Sodium persulfate (CAS 7775-27-1)	TWA	0.1 mg/m3

Biological limit values No biological exposure limits noted for the ingredient(s).

Control banding Not available.

Engineering controls Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL (occupational exposure limit), suitable respiratory protection must be worn. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection	Use dust-tight, unvented chemical safety goggles when there is potential for eye contact.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Rubber, neoprene or PVC gloves are recommended. Breakthrough time: > 480 minutes.
Other	Wear appropriate chemical resistant clothing.
Respiratory protection	If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn. Respirator type: Wear respirator with dust filter.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
Hygiene measures	Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

Section 9 - Physical and chemical properties

Physical state	Solid.
Form	Free-flowing powder.
Colour	White.
Odour	Odourless.
Odour threshold	Not available.
pH	11.5 (10 % solution, 25 °C (77 °F))
Melting point/freezing point	Not determined.
Boiling point and boiling range	Not determined.
Flash point	Not applicable.
Evaporation rate	Not available.
Flammability (solid, gas)	Oxidizer.
Upper/lower explosive limits	
Explosion limit - lower (%)	Not determined.
Explosion limit - upper (%)	Not determined.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Relative density	> 1.5 - < 1.8 (20 °C (68 °F))
Solubility	
Solubility (water)	Soluble in water.
Partition coefficient: n-octanol/water	Not applicable, product is a mixture.
Auto-ignition temperature	Not determined.
Decomposition temperature	Decomposition will occur upon heating.
Viscosity	Not available.
Particle characteristics	Not determined.
Data relevant with regard to physical hazard classes	No relevant additional information available.

Other physical and chemical parameters

Density	Not determined.
Kinematic viscosity	Not applicable.

Section 10 - Stability and reactivity

Reactivity	Greatly increases the burning rate of combustible materials.
Chemical stability	Decomposes on heating.
Possibility of hazardous reactions	Oxidising, avoid contact with reducing agents.
Conditions to avoid	Heat. Contact with incompatible materials. Avoid dust formation.

Incompatible materials	Acids. Bases. Combustible material. Reducing Agents. Metals. Organic compounds.
Hazardous decomposition products	Oxygen. Sulphur oxides.

Section 11 - Toxicological information

Information on possible routes of exposure

Inhalation	May cause allergy or asthma symptoms or breathing difficulties if inhaled. Dust may irritate respiratory system.
Skin contact	Causes skin irritation. May cause an allergic skin reaction.
Eye contact	Causes serious eye irritation.
Ingestion	Harmful if swallowed.
Early onset symptoms related to exposure	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Dusts may irritate the respiratory tract, skin and eyes. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.
Delayed health effects from exposure	Not available.
Acute toxicity	Harmful if swallowed.

Components	**Species**	**Test Results**
Silicic acid, sodium salt (CAS 1344-09-8)		
Acute		
Dermal		
LD50	Rat	> 5000 mg/kg, 24 Hours
Inhalation		
Vapour		
LC50	Rat	> 2.06 mg/l, 4 Hours
Oral		
LD50	Rat	3400 mg/kg
Sodium persulfate (CAS 7775-27-1)		
Acute		
Dermal		
LD50	Rabbit	> 2000 mg/kg
Inhalation		
LC50	Rat	2950 mg/m³, 4 h
Oral		
LD50	Rat	300 mg/kg

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/irritation	Causes serious eye irritation.
Respiratory or skin sensitisation	
Respiratory sensitisation	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	Not classifiable as to carcinogenicity to humans.
Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.
Chronic effects	Prolonged exposure may cause chronic effects.

Section 12 - Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
Silicic acid, sodium salt (CAS 1344-09-8)			
Aquatic			
Acute			
Algae	EC50	Scenedesmus subspicatus	7.5 mg/l, 72 hours
Crustacea	EC50	Aquatic invertebrates	1700 mg/l, 48 hours
Fish	LC50	Danio rerio	1108 mg/l, 96 hours
		Oncorhynchus mykiss	>= 260 - <= 310 mg/l, 96 hours
	NOEC	Fish	348 mg/l, 96 hours
Sodium persulfate (CAS 7775-27-1)			
Aquatic			
Acute			
Algae	LC50	Algae	320 mg/l, 72 hours
Crustacea	EC50	Abra alba	11 mg/l, 5 days
		Daphnia magna	120 mg/l, 48 hours
Fish	LC50	Oncorhynchus mykiss	76.3 mg/l, 96 hours
		Scophthalmus maximus	107.6 mg/l, 96 hours

Persistence and degradability The product contains inorganic compounds which are not biodegradable.

Bioaccumulative potential No data available.

Partition coefficient n-octanol / water (log Kow) Not applicable, product is a mixture.

Mobility in soil No data available for this product.

Other adverse effects None known.

Section 13 - Disposal considerations

Disposal methods Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Residual waste Dispose in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

Section 14 - Transport information

ADG

UN number 1479

UN proper shipping name OXIDISING SOLID, N.O.S. (Sodium persulfate)

Transport hazard class(es)

Class 5.1

Subsidiary risk -

Packing group III

Environmental hazards No.

Hazchem code 1Y

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

RID

UN number 1479

UN proper shipping name OXIDIZING SOLID, N.O.S. (Sodium persulfate)

Transport hazard class(es)

Class 5.1

Subsidiary risk -

Label(s) 5.1

Packing group	III
Environmental hazards	No.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IATA

UN number	1479
UN proper shipping name	Oxidizing solid, n.o.s. (Sodium persulfate)
Transport hazard class(es)	
Class	5.1
Subsidiary risk	-
Packing group	III
Environmental hazards	No.
ERG Code	5L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	1479
UN proper shipping name	OXIDIZING SOLID, N.O.S. (Sodium persulfate)
Transport hazard class(es)	
Class	5.1
Subsidiary risk	-
Packing group	III
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-Q
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

Section 15 - Regulatory information

Safety, health and environmental regulations

National regulations This Safety Data Sheet was prepared in accordance with Australia Model Code of Practice for the preparation of Safety Data Sheets for Hazardous Chemicals (23/12/2011).

Australia Medicines & Poisons Appendix E

Silicic acid, sodium salt (CAS 1344-09-8)
Sodium persulfate (CAS 7775-27-1)

Australia Medicines & Poisons Appendix F

Silicic acid, sodium salt (CAS 1344-09-8)
Sodium persulfate (CAS 7775-27-1)

Australia Medicines & Poisons Schedule 10

Silicic acid, sodium salt (CAS 1344-09-8)

Australia Medicines & Poisons Schedule 5

Silicic acid, sodium salt (CAS 1344-09-8)

Australia Medicines & Poisons Schedule 6

Silicic acid, sodium salt (CAS 1344-09-8)
Sodium persulfate (CAS 7775-27-1)

High Volume Industrial Chemicals (HVIC)

Silicic acid, sodium salt (CAS 1344-09-8) 10000 - 99999 TONNES See the regulation for additional information.

Importation of Ozone Depleting Substances (Customs(Prohibited imports) Regulations 1956, Schedule 10, as amended)

Not listed.

National Pollutant Inventory (NPI) substance reporting list

Not listed.

Prohibited Carcinogenic Substances

Not regulated.

Prohibited Substances (National Model Regulation for the control of Workplace Hazardous Substances, Schedule 2 NOHSC:1005 (1994) as amended)

Not listed.

Restricted Carcinogenic Substances

Not regulated.

Restricted Importation of Organochlorine Chemicals (Customs(Prohibited Imports) Regulations 1956, Schedule 9)

Not listed.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto Protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

Section 16 - Any other relevant information

Issue date 12-February-2015

Revision date 07-February-2023

References

ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2019
National Toxicology Program (NTP) Report on Carcinogens

Disclaimer

Regenesis cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.