SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

GreensandPlus™

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Supplier: Inversand Company
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Precautions: Entering Tanks

HMIS (NPCA)	
Health	2
Flammability	0
Reactivity	1
Personal Protection	E

Product ID: EFP-044
Product Number: N/A
MSDS Number: GSP

Description: GreensandPlus™ is a specially selected granular substrate with a manganese dioxide coating used for water purification - the removal of heavy metals and sulfur compounds.

Product Information:

CAS Number: Mixture (For ingredient CAS numbers, see SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

Synonyms: No product synonyms. (For ingredient synonyms, see SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

SECTION 2: HAZARDS IDENTIFICATION

Emergency Overview: Not a fire or spill hazard. Low toxicity, dry dust is a nuisance particulate. Generally, health effects are provided for exposure to dust that may be generated during product transfer and handling.

Component	Percentage (by wgt.)	OHSA		ACGIH TLV		NIOSH REL		LISTED CARCINOGEN (YES/NO)		
		PEL (mg/m^3)	CEILING (mg/m^3)	TWA (mg/m^3)	STEL (mg/m^3)	TWA (mg/m^3)	STEL (mg/m^3)	NTP	IARC	OSHA
Manganese Dioxide (MnO_2)	3.2-4.8.	N/A	5F (as Mn)	5F (as Mn)	NL	1 (as Mn)	3 (as Mn)	NO	NO	NO
Nonhazardous Ingredients / Inert Materials / Proprietary	3.2-4.8	1S T; S	NL	10 T; 5R	NL	NL	NL	NO	NO	NO
Quartz (SiO_2)	90.4-93.6	10/(% SiO2+2)	NL	0.025	0.1	0.05	NL	YES	YES	YES

Notes:

T Total Dust; R = Respirable dust, F = Fume

1. Exposure limits listed for each ingredient is for exposure to dust that may be generated during product transfer and handling.
2. Solid Manganese: 0.35-1.00 mm is formulated for use in water purification. Health effects resulting from this product being used for any other purpose of process is not addressed in the material safety data sheet.
3. NTP Class 2A: Reasonably anticipated to be a carcinogen limited evidence of carcinogenicity from studies in humans.
4. IARC Group 2A: Probably carcinogenic to humans.
5. NIOSH considers crystalline silica to be a potential occupational carcinogen as defined by the OSHA carcinogen policy [29 cfr 1990].

Potential Health Effects:

Primary Route of Exposure: Inhalation

Relevant route(s) of Exposure:

Eye Contact: Contact with particulate may cause slight to moderate eye irritation. Abrasive action of dust particulate can damage eye.

Skin Contact: Prolonged or repeated contact may cause slight to moderate skin irritation.

Inhalation: Overexposure by inhalation of airborne particulate, dust, or fumes is irritating to the nose, throat, and respiratory tract. Inhalation of excessive levels of dust or fumes may be harmful.

Ingestion: Ingestion is an unlikely route of exposure; no hazard in normal industrial use. Small amounts (<tablespoon) swallowed during normal handling operations are not likely to cause injury, however, swallowing larger amounts may cause injury. If ingested, quantity may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain, and diarrhea.

Target Organs: Respiratory system, eyes, central nervous system.

Acute Effects of Exposure: Excessive, short term exposure to airborne mineral dusts and particulate may cause upper respiratory and eye irritation. Exposure via inhalation to high concentration of dusts containing manganese compounds for as little as three months have affected the central nervous system.

Chronic effects of exposure: Excessive, long-term, inhalation of airborne mineral dusts and particulate may contribute to the development of bronchitis, reduced breathing capacity, and may lead to the increased susceptibility to lung disease. **Manganese poisoning**: The excessive, chronic inhalation of manganese compounds usually begins with complaints of languor and sleepiness. This is followed by weakness in the legs and the development of stolid, mask-like faces. The patient speaks with a slow monotonous voice. Then muscular twitching appears, varying from a fine tremor of the hands to coarse, rhythmical movements of the arms, legs, and trunk. There is a slight increase in tendon reflexes, ankle and patellar clonus, and a typical Parkinsonian slapping gate. Silicosis has been associated with an increased risk of lung cancer, autoimmune and chronic kidney diseases, tuberculosis and non-malignant respiratory diseases. Crystalline silica should be considered a possible human carcinogen based on this association. Fused silica has not been identified as a carcinogen.

Signs and Symptoms of exposure: (Dust) tearing of eyes, burning sensation in the throat, cough, and chest discomfort.

Medical Conditions Generally Known to be Aggravated by Exposure: The excessive inhalation of mineral dust may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.

Reproductive Hazards: Not a reproductive hazard.

POTENTIAL ENVIRONMENTAL EFFECTS: Derived from natural ores; no adverse environmental affects known. However, prevent spilled product from entering streams, water bodies, and wastewater systems. This material is used as an agricultural product.

SECTION 3: COMPOSTION / INFORMATION ON INGREDIENTS

Component	Synonyms and Trade Names	CAS No.	% by Wgt.
Manganese Dioxide	Manganese Dioxide; Manganese Black; Manganese (IV) Oxide; Peroxide Manganese Superoxide.	1313-13-9	3.2-4.8
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	N/A	3.2-4.8
Quartz (SiO_2)	Agate; Cristobalite; Crystallizes Silicone Dioxide; Quartz Silica; Silica Dust; Silica Flour (Powdered Crystalline Silica); Silica, Crystalline Quartz; Tripoli.	14808-60-7	90.4-93.6

SECTION 4: FIRST-AID MEASURES

Eye Contact: Remove material by immediately flushing eyes with clean, flowing, lukewarm water (low pressure) for at least at least 15 minutes. Get medical attention if pain or irritation persists.

Skin Contact: Immediately wash affected area with mild soap and water to remove any dust adhering to the skin. Get medical attention if irritation develops or persists.

Inhalation: If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel and get medical attention.

Ingestion: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious; give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel since particles may be aspirated into lungs. Seek immediate medical attention.

Note to Physicians: None.

SECTION 5: FIRE-FIGHTING MEASURES

Flammable Properties: Material will not burn. Although not combustible, this material is a strong oxidizing agent, which liberates oxygen during thermal decomposition. It may increase the burning rate of combustibles with a flare-burning effect. It may cause reignition after a fire is extinguished.

Extinguishing Media: Use dry chemical or CO2 to extinguish fires involving this material.

Protection for Firefighters: Material should be kept out of eyes and of skin. As in any fire, wear self-contained breathing apparatus pressure-demand. MSHA/NIOSH (approved or equivalent) and full protective gear. Do not release runoff from fire control methods to sewers or waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Containment: Product is dry solid (granular or powder) and not readily soluble in water. However, prevent spilled product from entering streams, water bodies, and wastewater systems.

Cleanup: Vacuum or sweep up dry material and place in container for reuse. Avoid creating excessive airborne dust. Cleanup personnel need to wear approved respiratory protection (air-purifying or air supply), gloves, long sleeved clothing, and goggles to prevent irritation from contact and inhalation.

Collection: If possible, collect and reuse spilled product.

Reporting: See SECTION 15: REGULATORY INFORMATION

Evacuation: Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

SECTION 7: HANDLING AND STORAGE

Handling: Minimize dust generation and accumulation. Avoid breathing dust. Avoid contact with skin and eyes.

Storage: Store in a cool, dry area. Keep container closed when not in use. Product or component is a powerful oxidizer, hence it should not be stored near organic material or other easily oxidizable substances; e.g. sulfur, sulfides phosphides, hypophosphides, etc. or incompatible materials such as hydrogen peroxide and sodium peroxide.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits in SECTION 2.

Personal Protective Equipment:

Eye & Face Protection: Corrosive to eyes. Wear protective safety goggles when dust generation is likely.

Skin Protection: Wear clothing sufficient to cover the skin, safety shoes, and leather gloves for hand protections against dry material.

Respiratory Protection: Use NIOSH.MSHA approved respiratory protection (air-purifying or air supply) when concentrations are above exposure limit value. A respiratory protection program that meets OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

General Hygiene Considerations: Wash thoroughly after using product. Wash contaminated clothing. Wash hands before eating or drinking.

Exposure Guidelines: See SECTION 3.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: A uniform, brownish-black, granular material.

Odor: Odorless.

Physical/Chemical Properties:

Bulk Density:	88 lbs./ft^3	**Freeze Point:**	Solid at STP	**% Volatile by Volume:**	1-2% H_2O
Water Solubility:	Slight	**Melting Point**	>2800 ^{O}F	**Vapor Density:**	N/A
pH: (10% aqueous slurry);	6.5 - 7.5	**Boiling Point:**	N/A	**Vapor Pressure:**	N/A

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage.

Conditions to Avoid: None under normal conditions.

Materials to Avoid: Manganese dioxide (MnO_2) is a powerful oxidizer, hence it should not be heated with organic matter or other easily oxidizable substances, e.g. sulfur, sulfides, phosphides, hypophosphides, etc. Material is flammable by chemical reaction. Incompatible with hydrogen peroxide and sodium peroxide. Keep away from heat and flammable materials.

Hazardous Decomposition Products: None under normal circumstances.

Hazardous Polymerization: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

RTECS Toxicity Data for Product Components:

Component	CAS No.	RTECS Toxicity Data
Manganese Dioxide (MnO_2)	1313-13-9	Acute Dermal: Mouse LD 50 Route; Subcutaneous Dose: 422 mg/kg. Chronic (Multiple Dose) Inhalation: Rate Dose:1800 ug/m^3/24H/35D-C; Toxic Effects: Brain and coverings – Recordings from specific areas of CNS; Biochemical –Charges in serum composition; Biochemical – True cholinesterase. Reproductive/Teratogenic: Mouse Route: Inhalation; Dose: 49 mg/m3/7H; Duration: female 75D prior to mating effects on Newborn – Growth statistics; Behavioral.
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	N/A
Quartz (SiO_2)	14808-60-7	Acute Inhalation: Human LC Lo Dose: 300 ug/m3/10Y-1; toxic Effects: Liver - Other changes; Human TC Lo Dose: 16 mppcf/8H/17,9Y-1; Toxic Effects: Lungs, thorax of Respiration-Fibrosis, focal (pneumoconiosis); Lungs, Thorax of Respiration - Cough; Lungs, Thorax of Respiration - Dyspnea. Chronic (Multiple Dose) Inhalation: Rat Dose: 80 mg/m3/28W-1; Toxic Effects: Lungs, Thorax of Respiration - Fibrosis, focal (pneumoconiosis); Blood – Changes in spleen. Rat Dose: 108 mg/m3/6H/3D-1; Toxic Effects: Biochemical – Other oxidoreductases; Biochemical - Other Proteins: Rat Dose: 58 mg/m3/13W-1; Toxic Effects: Lungs, Thorax of Respiration – Other changes: Endocrine – Changes in thymus weight; blood – Changes in leukocyte (WBC) cell count. Rat Dose: 4932 mg/m3/8H21W-1; Toxic Effects: Endocrine – Changes in spleen weight. Immunological including allergic – Decrease in humoral immune response. Rat Dose: 20 mg/m3/3W-1; Toxic Effects: Lungs, Thorax of Respiration – Other changes: Lungs, Thorax of Respiration – Changes in Lung weight.

Component	CAS No.	RTECS Toxicity Data
Quartz (SiO_2)	14808-60-7	Biomedical – Other enzymes. Mutagenic: Human Micronucleus Test: Cell Type: lung, Dose 40 mg.cm2. Hamster Micronucleus Test: Cell type: lung; Dose 50 mg/cm2. Tumorigenic: Rat Route: Inhalation: Dose 50 mg/m3/6H/71W-1: Toxic Effects: Tumorigenic – Carcinogenic by RTECS, criteria: Liver, Tumors, Rat Route: Intravenous: Dose: 50 mg/kg: Toxic Effects: Tumorigenic – Equivocal tumorigenic agent by RTECS criteria; Blood – Lymphoma including Hodgkin's disease.

SECTION 12: ECOLOGICAL INFORMATION

Derived from mineral ores. No data available on any adverse effects of this material on the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

RCRA: This product as manufactured is not a RCRA listed hazardous waste and does not exhibit any characteristics of a hazardous waste, including toxicity (by EPA TCLP method).

Disposal Method: This product is generally suitable for landfill disposal. Follow all applicable Federal, State, and Local laws, rules, and regulations regarding the proper disposal of this material. If this product has been altered or contaminated with other hazardous materials, appropriate waste analysis may be necessary to determine the proper method of disposal. A qualified environmental professional should determine waste characterization, disposal, and treatment methods for this material in accordance with applicable Federal, State, and Local regulations and requirements.

SECTION 14: TRANSPORT INFORMATION

USDOT Information: This product is not regulated by USDOT as a hazardous material (49 CFR part 172.101). No placard required for transportation.

Label:

CAUTION:
Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling and use. Keep in closed container in a well-ventilated area.

First Aid Measures:

Eye Contact: Remove material by immediately flushing eyes with clean, flowing, lukewarm water (low pressure) for at least at least 15 minutes. Get medical attention if pain or irritation persists.

Skin Contact: Immediately wash affected area with mild soap and water to remove any dust adhering to the skin. Get medical attention if irritation develops or persists.

Inhalation: If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop. If not breathing, give artificial respiration or give oxygen by trained personnel and get medical attention.

Ingestion: Ingestion is an unlikely route of exposure. If ingested in sufficient quantity and victim is conscious, give 1-2 glasses of water or milk. Never give anything by mouth to an unconscious person. Leave decision to induce vomiting to qualified medical personnel since particles may be aspirated into lungs. Seek immediate medical attention.

SECTION 15: REGULATORY INFORMATION

Components Listed in Federal Regulations and State "Right-To-Know" Laws:

Component	CAS No.	Federal					State (Right-To-Know)			
		RCRA	CERCLA	SARA	SARA EHS	TSCA	PA	NJ	MA	CA
Manganese Dioxide (MnO_2)	1313-13-9	NO	YES[1]	YES (as compound)	NO	YES	NO	NO	NO	NO
Nonhazardous Ingredients / Inert Materials / Proprietary	N/A	NO	NO	NO	NO	NO	NO	NO	NO	NO
Quartz (SiO_2)	14808-80-7	NO	NO	NO	NO	YES	YES	NO	YES	NO

Notes:
1. Listed as Compound per CAA Section 112
2. Listed per CWA Section 307(a) RQ: 10 lb. (4.535 kg)
3. Listed as compound

SECTION 16: OTHER INFORMATION

Hazardous Materials Identification System of the National Paint & Coatings Association

Health
0 – Normal Material
1 – Slightly Hazard / Significant Irritation
2 – Hazardous / Temporary incapacitation or residual injury
3 – Extreme Danger / Serious or permanent injury
4 – Deadly

HMIS (NPCA)	
Health	**2**
Flammability	**0**
Reactivity	**1**
Personal Protection	**E**

Reactivity
0 – Stable
1 – Unstable under heat or pressure
2 – Violent chemical change under heat or pressure
3 – Shock and heat may detonate
4 – Capable of detonation or explosion

Flammability
0 – Will not burn
1 – Must be preheated before ignition will occur (Flash point greater than 200^{O}F)
2 – Must be moderately heated before ignition will occur (Flash point 100^{O}F to 200^{O}F)
3 – Can be ignited under almost all ambient temperatures (Flash point 73^{O}F to 100^{O}F)
4 – Will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or will burn readily when dispersed in air (Flash point below 73^{O}F)

Personal Protection
A – Safety Glasses
B – Safety Glasses + Gloves
C – Safety Glasses + Gloves + Apron
D – Face Shield + Gloves + Apron
E – Safety Glasses + Gloves + Dust Respirator
F – Safety Glasses + Gloves + Apron + Dust Respirator
G – Safety Glasses + Gloves + Vapor Respirator
H – Splash Goggles + Gloves + Apron + Vapor Respirator
I – Safety Glasses + Gloves + Dust and Vapor Respirator
J – Splash Goggles + Gloves + Apron + Dust and Vapor Respirator
K – Air Line Hood or Mask + Gloves + Full Suit Boots
X – Ask supervisor or safety specialist for handling instructions

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