

Inversand Company
SINCE 1925

ORIGINAL DEVELOPERS OF MANGANESE GREENSAND & GREENSANDPLUS

GreensandPlus Product Information

GREENSAND^{plus}[™]

The Inversand Company - Supplying Greensand products since 1925

- WQA Gold Seal Certification for NSF/ANSI 61 Compliance
- Removes Iron, Manganese, Arsenic, Radium and Hydrogen Sulfide
- GreensandPlus is a direct replacement for the original Manganese Greensand
- Packaged in ½ Cu.ft bag or 1 metric ton (2,205lbs) bulk sack



GreensandPlus Product Information

GREENSAND *plus*™

**Internationally Accepted
Tried & Proven Choice *that's just right!***

- **Not Too Coarse** – Providing better trapping of colloidal material than coarse media
- **Not Too Fine** – Providing excellent balance of run times between backwashes
- **Not Too Heavy** – Minimizes backwash flow rates and waste volumes
- **Not Too Light** - Providing excellent separation between media and filtered contaminants to eliminate media loss during backwash

GreensandPlus Product Information



Improved Operating Characteristics

- Operates at Higher Flux Rates (\cong 12gpm/sqft)
- Not Affected by High Differential Pressure
- Harder Material Resistant to Breakdown
- No Potassium Permanganate Required / Simply use CL_2
- Lowers Iron & Manganese to $\mu\text{g/L}$ Levels

GreensandPlus Product Information

GREENSAND *plus*[™]

Media Properties

- **GreensandPlus media consists of a solid silica sand core with thermally bonded coating of manganese dioxide.**
- **Effective at higher differential pressures than standard manganese greensand that can fracture. Tolerance to higher DP can provide longer runtimes between backwash cycles.**
- **Effective at higher temperatures with lower apparent density (88lbs/cuft) the backwash flow requirements are less. (10-12gpm/sqft)**
- **Effective Size 0.30mm – 0.35mm / Uniformity Coefficient (UC)= Less than 1.6**
- **Capacity: 700 – 1200 grains**
- **Service Flow Rates = 2.0 – 12.0 GPM**

GreensandPlus Product Information



Loading & Conditioning

- Follow filter manufacturers loading instructions of all media.
- After loading support gravel layers, backwash gravel at $\frac{1}{2}$ normal flow rate then load GreensandPlus.
- GreensandPlus must be backwashed and the fines removed prior to loading Anthracite layer.
- GreensandPlus must be conditioned with oxidant prior to being placed into service.

GreensandPlus Product Information

GREENSAND^{plus}™

Fines removal process

- After backwashing GreensandPlus for 30min. at normal flow rates the fines must be removed.
- Using a flat blade shovel remove the top ½"-1" layer of fines. **Do Not Scrape or Rake** the top layer of fines.
- This process must be completed before Anthracite is loaded if being used in the filter system.



GreensandPlus Product Information



Conditioning Process

Chemical Dosages:

Every 100 cubic feet of Greensand or GreensandPlus requires:

20 gallons of 15% bleach, or

50 gallons of 6% bleach, or

11.5 gallons of Carusol 20*, or

6 gallons of Carusol 40*, or

25 pounds of potassium permanganate dissolved in 100 gallons of water.

*Media should soak in conditioning solution for a minimum of 4hrs, if possible overnight.

* Carusol-20 and Carusol-40 are liquid sodium permanganate products produced by Carus Chemical.

GreensandPlus Product Information

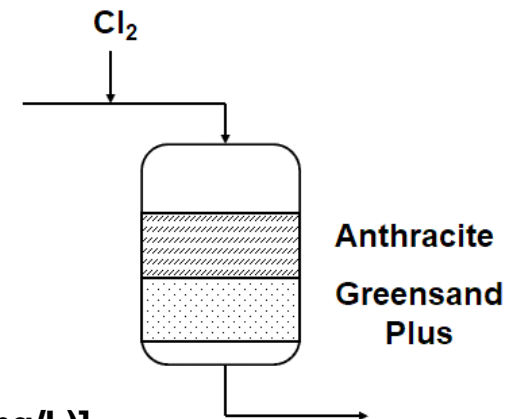


Method of Operation (CO)

- Catalytic Oxidation operation is recommended in applications where Iron removal is the main objective in well waters with/without presence of Manganese.
- Catalytic Oxidation requires the feeding of a predetermined amount of oxidant in the raw water before the filter with a contact time of 10-20 seconds or as far upstream of the filter as possible.
- A free chlorine residual of 0.5 – 1ppm carried through the filter will maintain GreensandPlus in a continuously regenerated condition.
- When using chlorine as the oxidant, the demand can be estimated as follows: mg/L of $Cl_2 =$

$$[Fe(mg/L) \times 1] + [Mn (mg/L \times 3)] + [H_2S (mg/L \times 6)] + [NH_3 (mg/L \times 8)] + [1 (mg/L)]$$

Typical CR Flow Diagram



GreensandPlus Product Information

GREENSAND *plus*™

Suggested Operating Conditions

- **Bed Type:** Dual Media / Anthracite Cap 15" – 18" (381 – 457mm)
GreensandPlus 15" – 24" (381 – 610mm)

- **Flow Rate:** Continuous Oxidation operation (2 – 12gpm/sqft*)
(* Contaminant concentration determines flow rates)

- **Contaminant Loading Calculation:**

$$[\text{Fe (mg/L)} \times 1] + [\text{Mn (mg/L)} \times 2] + [\text{H}_2\text{S (mg/L)} \times 6] = A$$

$$A \div 17.1 = \text{grains/gallon or "grain loading"}$$

$$\text{Filter Surface Area in Sqft} \times \text{Stated Media Grains Capacity} = \text{Tank Grains Capacity}$$

$$\text{Tank Grains Capacity} \div \text{Grain Loading} = \text{GWTBB (gallons water treated between backwash)}$$

$$\text{GWTBB} \div \text{Design Flow (GPM)} = \text{Time Between Backwash (min.)} \div 60 = \text{Hrs.}$$

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Suggested Operating Conditions

- **Backwash** flow rate should be sufficient to produce a 40% bed expansion until water is clear, or for 10 minutes, whichever occurs first.
- **Raw Water Rinse** at normal service flow rate for 3 minutes or until effluent is acceptable.
- **Air Scour** systems should use air flow rates of 0.8 – 2.0 cfm/sq.ft with a simultaneous treated water backwash at 4.0 – 4.5gpm/sqft
- **pH:** Raw waters with natural water pH of 6.2 or above require no correction. Raw waters with a pH lower than 6.2 should be pH-corrected to 6.5 – 6.8 pre-filter.

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GreensandPlus Product Information



Thank you for participating in today's GreensandPlus product session

Additional technical information on GreensandPlus can be found at:

www.inversand.com

For technical support please call (856-881-6859)

Or email us at:

info@inversand.com