

GreensandPlus™ is a black filter media used for removing soluble iron, manganese, and hydrogen sulfide from water supplies.

GreensandPlus™

The manganese dioxide coated surface of GreensandPlus™ promotes the oxidation reaction of iron, manganese, and hydrogen sulfide.

The silica sand core of GreensandPlus allows it to withstand operating conditions in waters that are low in silica, TDS and hardness.

GreensandPlus is effective at higher operating temperatures and higher differential pressures than ordinary Manganese Greensand. Tolerance to higher differential pressure can provide for longer run times between backwashes and a greater margin of safety.

Systems may be designed using either vertical or horizontal pressure filters, as well as open gravity filters.

GreensandPlus is a proven technology for iron, manganese, and hydrogen sulfide removal. There is no need for extensive preconditioning of filter media or lengthy startup periods.

GreensandPlus is an exact replacement for Manganese Greensand. It can be used in Continuous Regeneration or Intermittent Regeneration applications and requires no changes in backwash rate, times or chemical feeds.

GreensandPlus is NOT shipped in a regenerated form; therefore it is necessary, prior to use, to regenerate it by contacting the bed for a minimum of 4 hours.

A regeneration level of 4 ounces of $KMnO_4$ or chlorine per cubic foot of GreensandPlus is recommended. Before placing into service, the filter must be rinsed of all remaining traces of potassium permanganate.

GreensandPlus has the WQA Gold Seal Certification for compliance with NSF/ANSI Standard 61.



PHYSICAL PROPERTIES

- Physical Form: Black, nodular granules. Shipped in a dry form.
- Shipping Weight: 89 lbs./cu.ft. gross (1426 kg/m³ gross)
- Specific Gravity: Approximately 2.4
- Porosity: Approximately 0.45
- Screen Grading (dry): 18 x 60 mesh
- Effective Size: 0.30 to 0.35 mm
- Uniformity Coefficient: Less than 1.60
- pH Range: 6.2-8.5
- Maximum Temperature: 100°F/38°C
- Backwash Rate: Minimum 12 gpm/sq.ft. at 55°F (30 m/hr at 13°C)
- Service Flow Rate: 2-5 gpm/sq.ft. (5-12 m/hr)
- Minimum Bed Depth: 24 in. (0.6m) 15 - 18 in. (0.4m-0.45m) of each media for dual media beds

CONDITIONS FOR OPERATION

- Bed Type: Dual media: Anthracite 15-36 in. (0.4-0.9 m) and GreensandPlus 15-24 in. (0.4-0.6 m)
- Capacity: 700-1200 grains of oxidized iron and manganese/sq.ft. of bed area (490-840 g/m²) based on oxidant demand and operation to iron break through.
- Backwash: Sufficient rate using treated water to produce 40% bed expansion.
- Air/Water Scour: Optional using 0.8-2.0 cfm/sq.ft. (15-37 m/hr) with a simultaneous treated water backwash at 4.0-4.5 gpm/sq.ft. (10-11 m/hr).
- Raw Water Rinse: At normal service flow rate for 3-5 minutes or until effluent is acceptable.
- Flow Rate: Recommended flow rates with Continuous Regeneration operation are 2-5 gpm/sq. ft. (5-12 m/hr). Extremely high concentrations of iron and manganese usually require lower flow rates for equivalent run lengths. Higher flow rates can be considered with very low concentrations of iron and manganese. For optimum design parameters, pilot plant testing is recommended. The run length between backwashes can be estimated as follows:

What is the run length for a water containing 1.7 mg/L iron and 0.3 mg/L manganese at a 4 gpm/sq. ft. (10 m/hr) operating rate?

 $KMnO_4$ demand

$$= (1 \times \text{mg/L Fe}) + (2 \times \text{mg/L Mn})$$

$$= (1 \times 1.7) + (2 \times 0.3)$$

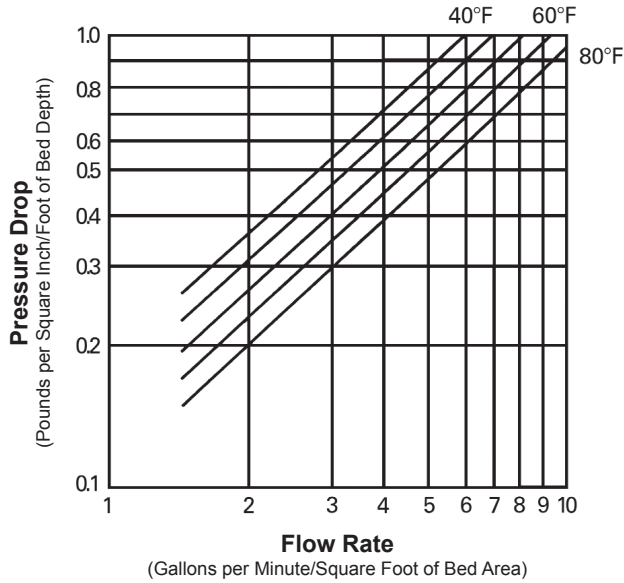
$$= (2.3 \text{ mg/L or } 2.3/17.1 = 0.13 \text{ grains/gal. (gpg) } (2.3 \text{ g/m}^3)$$

At 1,000 grains/sq. ft. loading: $1000 \text{ grain/sq. ft.} \div 0.13 \text{ gpg} = 7,692 \text{ gal./sq. ft. (313.4 m}^3/\text{m}^2)$

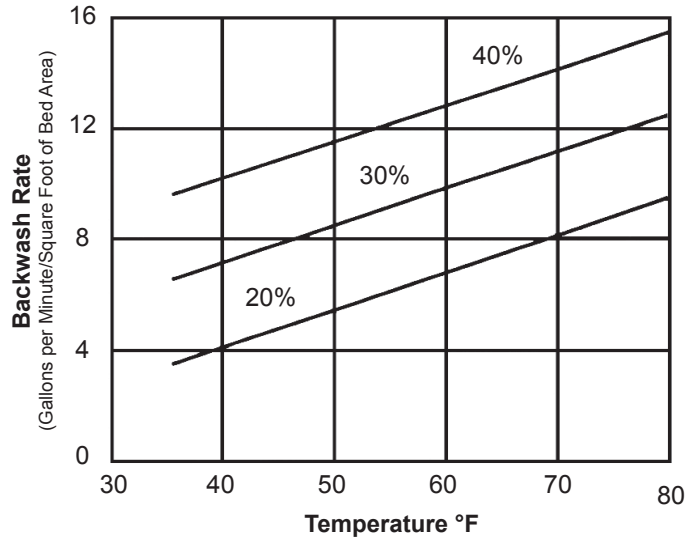
At 4 gpm/sq. ft. (10 m/hr) service rate:
 $7,692 \text{ gal./sq. ft.} \div 4 \text{ gpm/sq. ft.} = 1,923 \text{ minutes}$

The backwash frequency is approximately every 30-36 hours of actual operation.

Pressure Drop (Clean Bed)



Bed Expansion During Backwashing



GreensandPlus™ is tested and certified by WQA against NSF/ANSI Standard 61 for material requirement(s) only.

GreensandPlus™ is manufactured by Inversand Company.

ORDER INFORMATION

Part No.	Description	Cu. Ft./Bag	Wt./Cu. Ft.*	Bags/Pallet	Weight/Pallet	Pallet Dimensions
A8042	GreensandPlus™	0.5	89 Lbs.	55	2497 Lbs.	44" x 44" x 30"

*Weight per cubic foot is approximate. Packaged in approximately 45 lb. bags. 27.5 cubic feet per pallet. Sold by the cubic foot (2 bags).

GreensandPlus™ is a trademark of Inversand Company.

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The information and recommendations given in this publication should not be understood as recommending the use of our products in violation of any patent or as a license to use any patents of the Clack Corporation.

The filter medias listed in this brochure do not remove or kill bacteria. Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfection before or after the system.

Clack will not be liable under any circumstance for consequential or incidental damages, including but not limited to, lost profits resulting from the use of our products.

CALIFORNIA PROPOSITION 65 WARNING: This product contains crystalline silica which is known to the State of California to cause cancer and other substances which are known to the State of California to cause cancer, birth defects and reproductive harm.