

Omni-SORB™ Filter Media

Providing iron and manganese removal

The Omni-SORB™ granular filter media from Severn Trent Services was specifically designed to provide removal of iron and manganese compounds from water and wastewater supplies. Unlike other iron (Fe) and manganese (Mn) removal media, Omni-SORB is not a processed mineral. It is an engineered product using refined manganese that has high catalytic activity for oxidation and adsorption of these metals. These catalytic properties allow the media to be efficiently used without the addition of potassium permanganate (K_2MnO_4), a strong oxidant required for Fe and Mn removal with greensand and other media.



The Omni-SORB media does not require extensive preconditioning before start-up. The high capacity Omni-SORB media is durable and can withstand high operational temperatures and differential pressures, leading to longer run lengths between backwashes and less backwash waste. Omni-SORB media catalyzes oxidation of soluble reduced Fe and Mn and either filters out precipitates or reversibly adsorbs the oxidized metal. Its efficiency is enhanced by predosing the water with chlorine or hypochlorite.

Severn Trent Services offers the Omni-SORB media in easy-to-handle half cubic foot bags or 1 metric ton (2205 lbs) bulk sacs. The media has the WQA Gold Seal of Certification for compliance with NSF/ANSI 61.

Omni-SORB™ Benefits

- Durable, will not crush at high differential pressure (15 or 20 psi)
- Will not soften when treating low solids, low hardness or warm water (over 70° F)
- High capacity 700 to 1,200 grains per ft²
- Does not require potassium permanganate for regeneration or conditioning

Omni-SORB™ Applications

Omni-SORB is employed for the removal of arsenic (As) from high iron bearing waters. The coagulation/filtration process reduces two contaminant levels simultaneously – arsenic is lowered well below the new maximum contaminant level (MCL) of 10 µg/L, and iron is lowered well below the secondary standard of 300 µg/L. The process works efficiently when the water's iron-to-arsenic weight ratio exceeds 25 ($Fe/As > 25$). Simultaneous removal of arsenic occurs because when iron is oxidized, it precipitates, and that solid will adsorb arsenic present in the water.

- Removal of Fe up to 10 ppm
- Removal of Hydrogen Sulfide up to 3 ppm
- Removal of Mn up to 5 ppm
- Expensive, hazardous oxidizing agents not required
- Not recommended for tannin, organics and Fe or Mn bacteria removal
- Simultaneous As and Fe removal from high iron water sources



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- Physical form: black, nodular granules shipped in dry form
- Apparent density: 85 lbs/ft³ (net)
- Shipping weight: 85 lbs/ft³ (gross)
- Specific gravity: 2.4
- Porosity: approximately 0.45
- Screen sizing: 20 x 40 mesh
- Effective size: 0.30 to 0.35
- Uniformity coefficient: less than 1.60
- pH range: 6.2-8.5
- Maximum temperature: no limit
- Backwash rate: minimum 12 gpm/ft² at 55°F
- Service flow rate: 7-10 gpm/ft²
- Minimum bed depth: 24 inches

Omni-SORB™ Operating Conditions

- Loading rates: typical service loading rate of 7-11 gpm/ft²
- Raw water rinse: 3-5 minutes at normal service flow recommended, or until effluent is acceptable.
- Flow rate: 7-10 gpm/ft² recommended. High concentrations of Fe and Mn usually require lower flow rates for equivalent run lengths. Higher flow rate can be considered with very low concentrations of Fe and Mn.
- Media backwashing rates: 14-16 gpm/ft² for 10 minutes. Sufficient rate to produce 40% bed expansion.
- Backwashing frequency: 16-480 hours depending upon Fe, Mn or H₂S concentrations
- Media life: 7-10 years

Omni-SORB™ Operational Notes

Continuous Regeneration

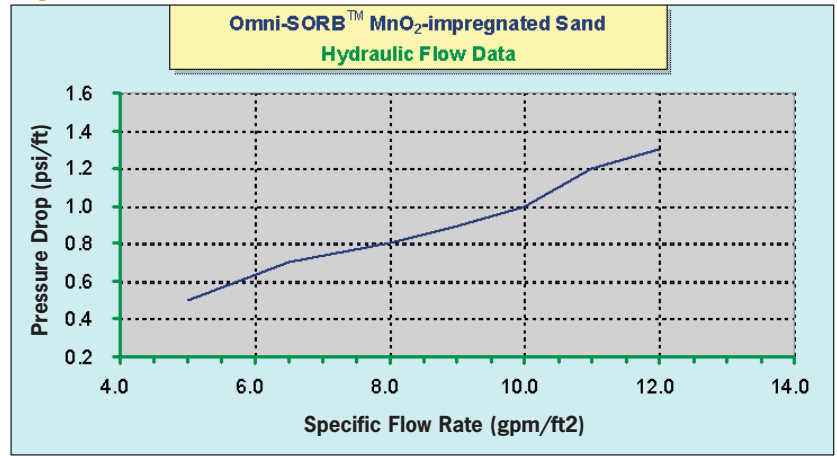
Continuous regeneration operation is the recommended mode of operation in applications where Fe removal is the main objective, with or without the presence of Mn. With continuous regeneration, a predetermined amount of chlorine is fed directly into the raw water before it enters the Omni-SORB media. Chlorine is fed at least 10-20 seconds upstream to insure adequate contact time. The dosage of chlorine may be estimated as follows:

$$\text{mg/L Cl}_2 = \text{mg/L Fe}$$

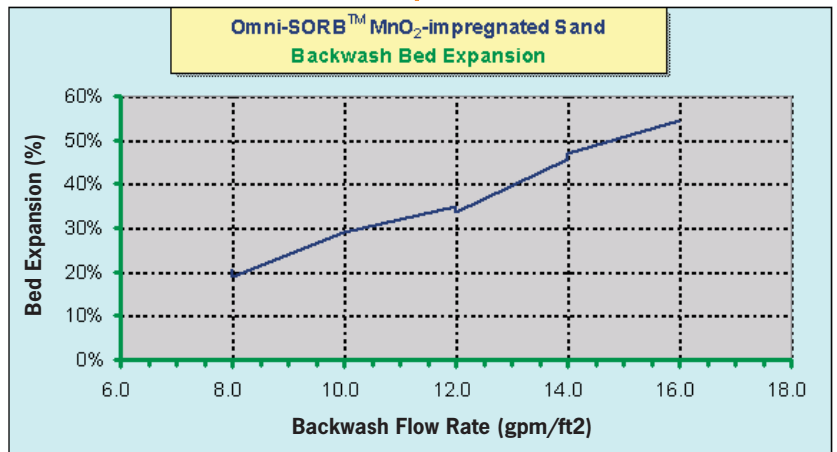
$$\text{mg/L Cl}_2 = (1 \times \text{mg/L Fe}) + (3 \times \text{mg/L Mn})$$

pH

Hydraulic Flow Data



Backwash Bed Expansion Data



Raw waters having a natural pH of 6.2 or greater can be filtered through the Omni-SORB media without pH correction. Raw water with a pH lower than 6.2 should be pH corrected to 6.5-6.8 before entering filtering through the Omni-SORB media. Additional alkali should be added following the filters if pH is higher than 6.5-6.8 is desired. This prevents the possible adverse reaction and formation of colloidal precipitate that can occur with iron and alkali at pH above 6.8.

Fine Removal and Initial Conditioning

The Omni-SORB media should be backwashed thoroughly with chlorinated water before being placed into service.