

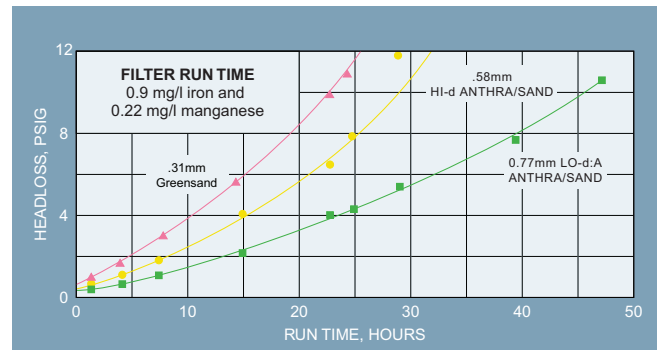
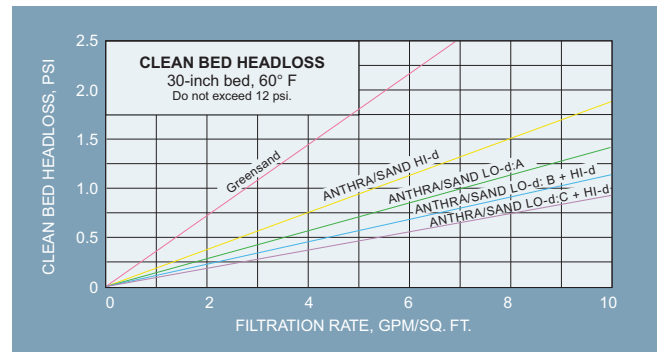
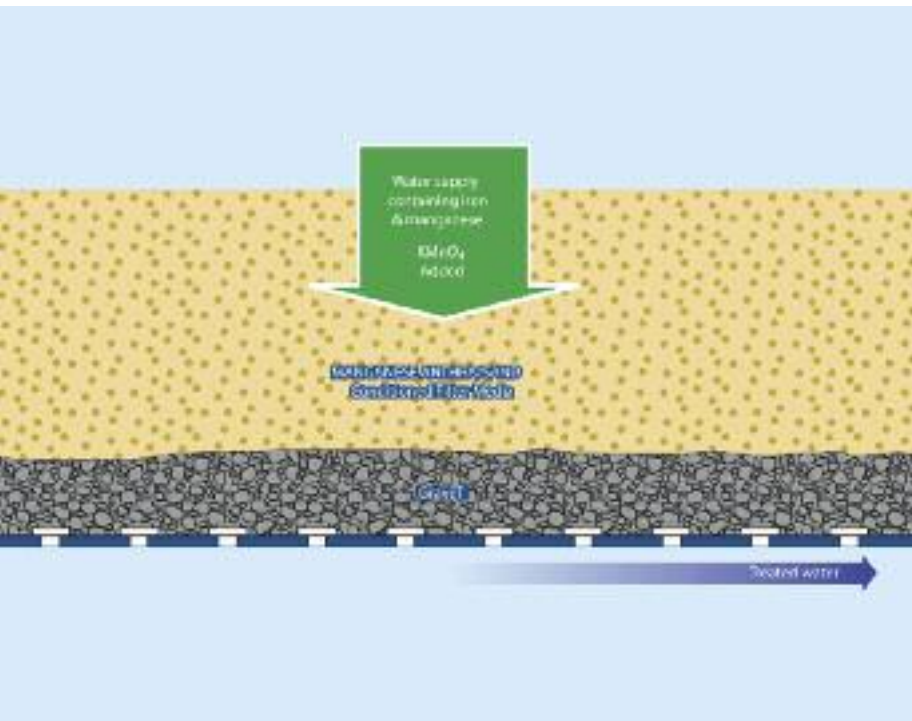


Manganese Anthra/Sand For Iron and Manganese Removal

Water Technologies

SIEMENS





Conditioned Media For Iron and Manganese Removal

Clean-bed Headloss and Filter Run Time

A Cost Effective Alternative

In 1980 the first full scale installation of Manganese ANTHRA/SAND™ media was placed into operation. This alternative to manganese greensand was developed by Siemens Water Technologies to provide a lower cost and more flexible solution for manganese removal. Today hundreds of full scale installations are a testament to the effectiveness of this media design developed based on the natural greensand effect. Manganese ANTHRA/SAND™ filter media provides an effective means for removing iron and manganese from water supplies. It can be used in any granular media filter configuration and offers a cost-effective alternative to manganese greensand. The principle advantage of Manganese ANTHRA/SAND™ media is utilization of larger media grain sizes. This has the advantages of increasing filter run lengths and making it practical for use in gravity filter systems.

Manganese ANTHRA/SAND™ media is a conditioned filter medium formed by adding a special coating to granular media which has been selected carefully to insure compatibility with the coating process. Conditioning is completed after the media has been installed in the filter. The manganese removal capacity of Manganese ANTHRA/SAND™ media is approximately equal to that of manganese greensand when measured on a surface area bases. However, Manganese ANTHRA/SAND™ media is available in four different media grain sizes, permitting a better fit to your project. Because of our extensive experience with iron and/or manganese removal process, we can help select the proper size or combination of sizes for your application. The end result is efficient and dependable filtration.

Advantages over Greensand

- Lower initial cost
- Larger media grain sizes
- Lower total head requirement
- Lower total backwash water volume
- Longer run length between backwashes
- Gravel retaining screens are not required
- Adaptable for use in gravity filters
- Air scouring is not required
- Media can be reconditioned in place if required
- Reduced loss of media resulting from washout or abrasion
- Reduced chance of media migrating into graded gravel support system
- Media grain sizes can be selected to match water quality requirements

Continuous Regeneration of Manganese ANTHRA/SAND™ Media

Manganese ANTHRA/SAND™ media is maintained in an active state by using a continuous feed of potassium permanganate (KMnO_4). Occasionally, chlorine is used in combination with KMnO_4 to provide additional capacity to oxidize iron and manganese and to minimize treatment costs in addition to providing disinfection.

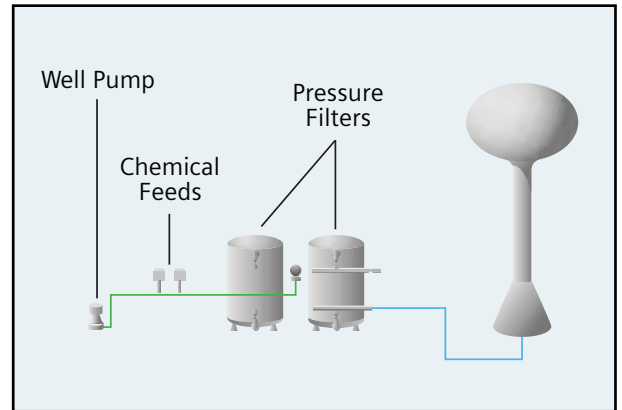
When KMnO_4 only is used, the permanganate demand can be determined as follows:
 $\text{mg/l KMnO}_4 = 1 \times \text{mg/l Fe} + 2 \times \text{mg/l Mn}$

Application of Manganese ANTHRA/SAND™ Media

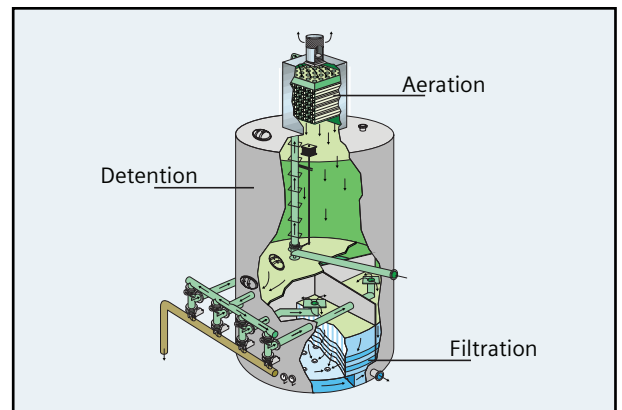
When both chlorine and KMnO_4 are added to the filter influent, the amount of chlorine and KMnO_4 required can be estimated as follows:
 $\text{mg/l Cl}_2 = 1 \times \text{mg/l Fe}$
 $\text{mg/l KMnO}_4 = 0.2 \times \text{mg/l Fe} + 2 \text{ mg/l Mn}$

A small amount of polymer may be added to the filter influent to stabilize the chemical floc to help promote capture of finely dispersed manganese oxide precipitates. Chemical feed rates are fine-tuned during start-up of the process to optimize iron and manganese removal and to maximize filter run length.

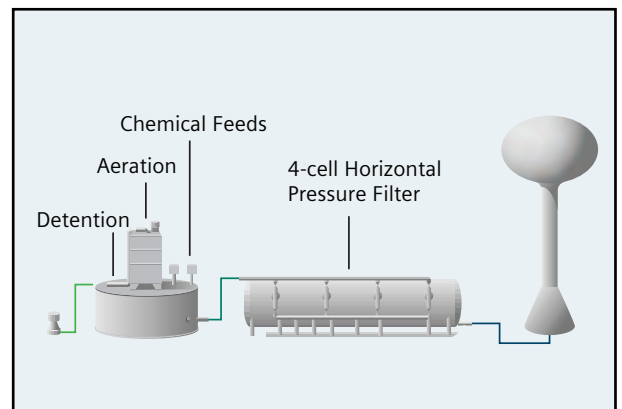
To help you finalize your equipment or plant design, we offer several pilot plants equipped with Manganese ANTHRA/SAND™ media. Pilot plants come with either fully automatic or manual controls and with single or multiple cells. They are suitable for installation at most locations. The self-contained pilot units are ideal to verify process design, to evaluate full-scale operation or to estimate ancillary equipment requirements.



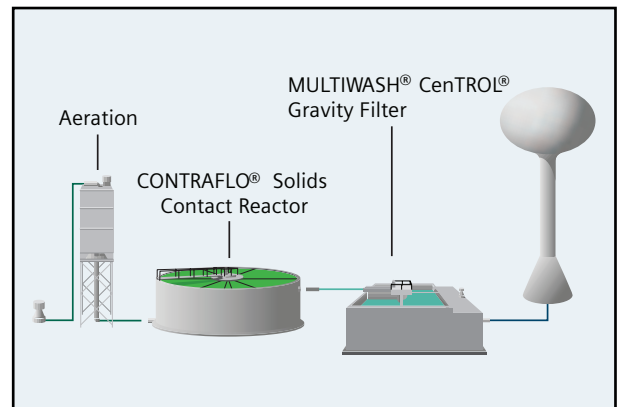
Vertical pressure filter



Type II AERALATER® unit



Aeration, detention, and horizontal pressure filter



Aeration, solids contact clarifier and CenTROL® gravity filter

Manganese ANTHRA/SAND, MULTIWASH, AERALATER, CenTROL and MULTICELL are trademarks of Siemens, its subsidiaries or affiliates.

The information provided in this brochure contains merely general descriptions or characteristics of performance which in actual case of use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

East Tel: +1.508.849.4600

Central and International Tel: +1. 515.268.8400

West Tel: +1.719.622.5320

GF-ANTHRASAND-BR-0709

Subject to change without prior notice.

© 2009 Siemens Water Technologies Corp.