

MANGANOX[®]

The most effective filter media for reducing iron, manganese and hydrogen sulphide.

MANGANOX™ is a high rate, granular filter media used for removing hydrogen sulfide, iron and manganese compounds from water supplies. MANGANOX operates both as a classical filter working with an oxidant and as a catalytic media due to its ability to accelerate the reaction between the oxidizing agent and any prevalent dissolved oxygen with sulfide, iron and manganese present. Dissolved iron, manganese and hydrogen sulfide will stay in solution unless the equilibrium is changed. Iron and manganese that is not oxidized become catalytically precipitated and then adsorbed directly on the media. MANGANOX is a very dense media that stops oxidized (precipitated) forms of iron, manganese and hydrogen sulfide from passing through the bed. Most of the manganous manganese is rapidly removed in the first few inches of the media where it is further oxidized to manganese dioxide.

The adsorbed manganese, iron and precipitated sulfur are expelled during backwash. Any insoluble ferric hydroxide particulate growths are expelled during backwash. The media must be properly backwashed to break loose and remove the filtered contaminants and precipitated iron, manganese and hydrogen sulfide.

Proper system sizing of the control valve and tank are necessary to sustain media performance.

A continuous reaction occurs with the addition of an oxidant, regenerating the media surface and replenishing the MANGANOX. For difficult applications, MANGANOX filters can be enhanced with aeration, chlorination, or ozone. Because of MANGANOX's naturally high manganese dioxide content, it provides a higher adsorption capacity than other media. A MANGANOX filter is recommended before softeners to protect the ion exchange resin from fouling.

ADVANTAGES

- Efficient reduction of manganese, iron and hydrogen sulfide
- Long service life
- Only regular backwashing is required
- Ability to process high flow rates with low pressure drop
- Continuous regeneration
- Ability to be utilized with common oxidants including:
- CL2 (gas) - Sodium hypochlorite – Potassium Permanganate
- 10 – 30 second reaction time with oxidant additive
- Converts ferrous iron to ferric iron
- Converts H₂S to sulfur
- Converts Manganese to MnO₂
- No chemical regeneration is required but may reduce service life
- Allows for adequate reaction time to permit for the formation of ferric hydroxide
- Allows for physical straining of the ferric hydroxide floc and sulfur until media requires backwashing
- Allows for adsorption of MnO₂

APPLICATIONS

- Removal of Iron up to 10 ppm
- Removal of Manganese up to 5 ppm
- Removal of Hydrogen Sulfide (rotten egg smell) up to 3 ppm
- Not recommended for Iron Bacteria and Manganese bacteria removal
- Not recommended for tannin and organics removal

PHYSICAL PROPERTIES

Physical Form -	Granular
Color -	Black
Purity -	>85 %
C.A.S No. -	1313-13-9
Moisture content -	<0.5%
Bulk density -	125 lbs/ft ³
Specific Gravity -	3.8
Mesh size -	(US-Unit) 8 x 20 / 20 x 40
Mesh size -	(mm) 0.85 – 2.36 / 0.425 – 0.85
Uniformity Coefficient -	1.77

OPERATING CONDITIONS

PH -	6 – 9
Bed depth -	36 – 48 inches (900 – 1200 mm)
Service flow rate -	5 – 10 gpm / sq ft. (12 – 20 m/h)
Back wash flow rate -	22 - 30 gpm / Sq ft (50 - 72 m/h)
Back wash expansion -	15 – 30%
Freeboard -	70% of bed depth
Oxidant type -	Chlorine
Oxidant Form -	12.5% Sodium Hypochlorite
Oxidant contact time -	10 – 30 seconds
Typical oxidant dosage -	0.5 – 2 ppm
Regeneration -	Continuous w / oxidant addition
Removal efficiency -	95 – 99% for Iron - 99 % for Manganese
Back wash efficiency -	Every 24 hours (optimal)