



NATURAL MINERAL FILTER MEDIA

MangaLox-85 G

**Natural manganese dioxide.
A clear treatment purpose.**

A proposed granular pyrolusite grade for oxidation and filtration processes targeting iron, manganese and hydrogen sulfide.

85% MnO₂

TARGET MINIMUM BY MASS • ASSAY
PENDING

Fe

IRON

IRON

Oxidation + filtration

Mn

MANGANESE

MANGANESE

Catalytic treatment

H₂S

SULFIDE

HYDROGEN SULFIDE

Treatment evaluation

MANGALOX-85 G

UNDERSTAND THE MATERIAL

SELECTED FOR A MINERAL-MEDIA APPROACH

MangaLox-85 G is being developed around natural MnO_2 -bearing granules. The intended material is a bulk mineral medium, with the active manganese dioxide present within the ore particle. Its product identity is distinct from a manganese dioxide coating on a separate support material.

The application focus is source-water treatment for professional water-treatment companies and OEMs, including evaluation for bottled-water production. Media selection, oxidation conditions and filter design are matched to the incoming water.



MATERIAL SCIENCE

Natural. Synthetic. Coated.

Three terms describe different aspects of manganese dioxide filter media. Understanding the distinction makes product selection clearer.

MEDIA CATEGORY	WHAT IT IS	WHAT THE TERM TELLS YOU
Natural MnO_2	Mined MnO_2 -bearing ore, processed into a selected particle grade.	The active oxide occurs in the mineral. MangaLox-85 G is proposed in this category.
Synthetic MnO_2	Manganese dioxide manufactured through chemical or electrochemical processing.	The oxide is produced under controlled conditions. Synthetic does not mean coated.
MnO_2-coated media	A support particle, such as silica sand, carrying a manganese dioxide layer.	The term describes particle construction. The coating may itself use synthetic oxide.

WHAT DOES "SYNTHETIC MANGANESE" MEAN?

In this water-filtration context, the precise name is synthetic manganese dioxide (MnO_2). It is a manufactured manganese oxide, not manganese metal. Two established production routes are:

CMD • Chemical route

Chemical manganese dioxide is produced by reactions including oxidation and precipitation from manganese-containing solutions.

EMD • Electrolytic route

Electrolytic manganese dioxide forms on an anode during electrolysis, then is recovered and processed for its intended use.

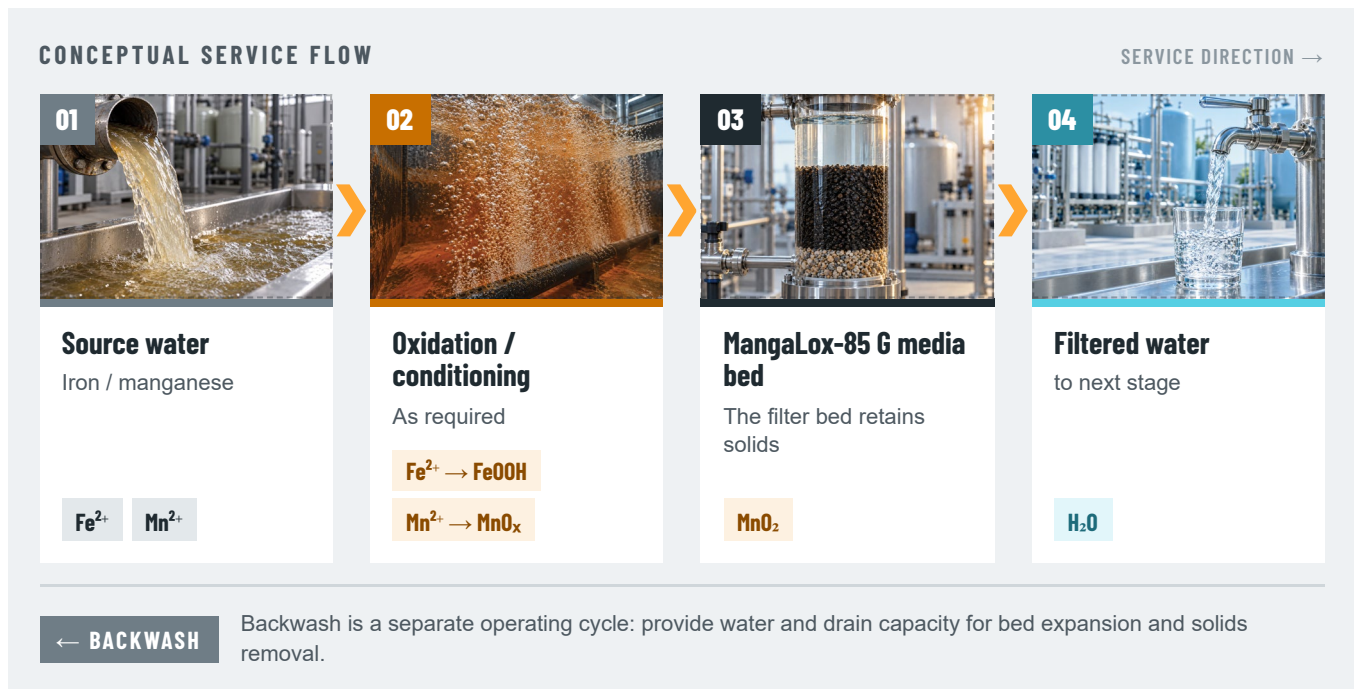
Purity is one selection criterion. Natural origin alone does not establish better performance, and synthetic origin does not establish poorer suitability. Compare measured removal, release of impurities, particle strength, pressure loss and backwash requirements.

OXIDATION + FILTRATION

TREATMENT PRINCIPLE

Turn dissolved contaminants into removable solids.

MnO₂ surfaces can participate in oxidation and support catalytic treatment. The filter bed retains solids; backwashing removes the accumulated load.



- | | |
|--|---|
| <p>pH</p> <p>01 Establish the water conditions</p> <p>Measure iron, manganese, pH, alkalinity, dissolved oxygen, turbidity and any hydrogen sulfide. Evaluate competing demands on the oxidation process.</p> | <p>Fe</p> <p>02 Oxidize and retain</p> <p>Under suitable conditions, dissolved iron forms iron oxyhydroxide solids and dissolved manganese forms manganese oxide solids that can be filtered.</p> |
| <p>O₂</p> <p>03 Match the oxidation strategy</p> <p>Select aeration and/or oxidant addition for the source water and treatment target. High MnO₂ content alone does not define a chemical-free operating envelope.</p> | <p>↑↓</p> <p>04 Backwash the mineral bed</p> <p>Dense mineral media require appropriate backwash flow and freeboard. Backwashing removes solids; it does not by itself restore consumed oxidation capacity.</p> |

H₂S
SULFIDE

HYDROGEN SULFIDE

Hydrogen sulfide treatment is an additional evaluation area. Reaction products, oxidant demand and downstream polishing depend on operating conditions.

Diagram is conceptual, not a construction design.

APPLICATION FOCUS

Source-water treatment for bottled-water production.

A proposed application for MangaLox-85 G: iron and manganese treatment upstream of the remaining production and filling process.

Bottled-water producers need stable treatment, controlled startup rinsing and a material compatible with their source water and product requirements. The proposed natural mineral grade will be assessed for those needs, including impurity release and fines. The filter is one treatment step; it is not a complete disinfection or bottling system.

CURRENT PRODUCT SPECIFICATION

PARAMETER	MANGALOX-85 G • DEVELOPMENT BASIS
Material / form	Selected natural pyrolusite / granular mineral media
MnO ₂ content	Target minimum 85% by mass; supplier assay pending
Particle grade / density	Supplier confirmation pending
Service / backwash design	Grade-specific flow, bed depth and expansion data pending
Operating envelope	pH, temperature and oxidation conditions to be established
Product documentation	Supplier analysis, SDS and Watch Water qualification results

FOR APPLICATION ASSESSMENT

Provide the following:

 01	 02	 03	 04	 05
Complete source-water analysis	Required treated-water quality	Operating flow	Available backwash flow	Treatment layout



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