

HYDROX

NATURAL MANGANESE DIOXIDE

Filter material EN 13752
for catalytic removal of manganese

General

Derived from a naturally occurring manganese compound, HYDROX is commonly employed for catalytic removal of iron and manganese in both potable and mineral water processing. Thanks to its elevated reactive surface, it efficiently supports the oxidation of these metals especially in oxygen-rich environments leading to the generation of insoluble metal hydroxides that can be readily captured through standard filtration.

Features and Benefits

- Delivers consistent manganese reduction starting from pH 6.8 and above.
- HYDROX requires no conditioning phase it functions at full capacity right from initial operation, unlike traditional manganese filtration methods.
- No chemical regeneration is necessary; standard systems often rely on periodic dosing with agents like permanganate, but this material remains effective without such treatment.
- Offers excellent particle-holding performance, even when contact times are short or flow rates are high.
- Remains stable and effective in the presence of dissolved carbonic acid, avoiding common degradation issues.

Physical characteristics

Colour	black
Form	granulated
Grain size	0,5 – 1,5 mm
Bulk density	approx. 1500 kg/m ³ ±100 kg/m ³
Specific density	approx. 3,9 g/cm ³

Chemical analysis

MnO ₂	approx. 68 %
Fe ₂ O ₃	approx. 7 %
SiO ₂	approx. 4 %
Al ₂ O ₃	approx. 1 %

Application

1 st step	Oxygen enrichment (if required)
2 nd step	Dual media filter of Sand and HYDROX for the removal of iron and manganese

HYDROX can be applied either as a standalone filtration layer or positioned at the base of a dual-media filter, substituting traditional gravel or quartz sand. It may also be used in a blended bed configuration with quartz, depending on system design.

When handling raw water with elevated iron levels, it is advisable to include a generously sized upper filtration layer. This top section traps most of the iron content, preserving the catalytic action of the lower manganese-selective layer.

Due to its resistance to dissolved CO₂, HYDROX consistently removes manganese even under mildly acidic conditions (typically above pH 6.8). In many cases, this eliminates the need for pH correction prior to treatment.



Operating parameters

Filtration velocity	10 – 25 m/h
Headloss	approx. 120 mbar/m
Backwash velocity	approx. 55 m/h
Filter bed expansion	10 - 15 %
Material loss	< 1 % per year

Backwashing procedure

The backwashing of HYDROX should be executed with air / water separately. A combined backwash cannot be recommended due to an increased abrasion of HYDROX.

Before starting the backwash with air the water level has to be lowered to a few centimeters above the filter material surface to avoid unexpected loss of filter material.

1) 1 - 3 minutes air	approx. 60 m/h
2) 1 - 2 minutes pause	
3) 4 - 8 minutes water	approx. 55 m/h

Following the initial aeration phase, a rest period of approximately 2 minutes is advised to allow proper degassing of the filter media and support plate. During the backwash cycle, it is recommended to replace the filter volume at least twice to ensure effective cleaning. A backwash flow rate of around 55 meters per hour is typically required to achieve a bed expansion of roughly 10–15%.

If the outcome of the water backwash is inadequate, simply increasing the backwash duration will not improve performance. Instead, a full repetition of the cleaning cycle is recommended, following this sequence:

Lower the water level → perform air scouring → allow a brief pause → proceed with water backwash.

Packaging and delivery

HYDROX – filter material is supplied in	25 kg (15 L) paper bag
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