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WATERITE TECHNOLOGIES, INC.
PRODUCT SPECIFICATION SHEET
M-GS-001R5

MANGANITE™ WATER FILTER MEDIA FOR IRON, MANGANESE AND H_2S REDUCTION

ABSTRACT

Manganite™ Filter Media is manufactured using a silica base material with a bonded coating of pure manganese dioxide. It is capable of reducing iron, manganese and hydrogen sulphide from water through oxidation and filtration. This material has a high buffering or oxidation-reduction capacity due to the well-defined manganese oxide coating. Soluble iron and manganese are oxidized and precipitated by contact with the higher oxide of manganese on the Manganite granules. The hydrogen sulphide is eliminated by oxidation into sulphate and an insoluble precipitate. Manganite is typically installed in an automatic backwashing filter, equipped to chemically regenerate the media bed periodically. It is equivalent to manganese greensand and may be used as a replacement media in greensand installations.

The irregular shape of the Manganite particles makes this media an excellent filter media. The tortuous path created by the irregular shape is highly desirable for optimum filtration. Precipitates are then filtered and removed from the filter bed by backwashing. When the oxidizing capacity power of the Manganite bed is exhausted, the bed needs to be regenerated with a weak potassium permanganate ($KMnO_4$) solution thus restoring the oxidizing capacity of the bed. 1.5 - 2 oz. (42 - 56 g) in solution per CF of Manganite is required to regenerate the bed. It is recommended that the bed be vigorously backwashed prior to regeneration. It is also recommended that the bed be regenerated before complete exhaustion of capacity occurs.

Water treatment with Manganite requires no detention time, does not require additional expensive filter media, no high concentration of chlorine, and no sulphur dioxide. Manganite is catalytic by nature and is not soluble. There is no increase in the total dissolved solids of the treated water.

ADVANTAGES OF MANGANITE™

1. Optimum grain size and shape to retain oxidation precipitation products of iron and manganese.
2. Manganite is equivalent to traditional manganese greensand and may be used as a replacement media. No changes in system operation is required for Manganite.
3. All Manganite grains have the same finite uniform coating, which is firmly attached.
4. All Manganite is processed to exact specifications and tested prior to shipment or placement into filters.
5. Unequalled oxidation-reduction buffer capacity. Can tolerate slight over or underfeed of continuously fed oxidants.
6. Unequalled effluent water quality.
7. Adaptable for gravity, vertical, or horizontal pressure filters.
8. No on-site batch chemical preparation required to attempt to form a manganese oxide coating.
9. No media reconditioning is required because coating is firmly attached to the Manganite.
10. Manganese oxide coating is not removed during backwashing.
11. No expensive polymer or filter aid is required.
12. No excessive concentration of chlorine is ever needed.
13. No detention time is normally required.
14. No leakage of alkaline substances that cause increased hardness and elevated pH, under certain conditions.
15. Precipitated products rapidly settle out of backwash water, making wash water reclamation simple and economical.

A. PHYSICAL PROPERTIES

COLOR:	Dark black-brown
BULK DENSITY:	87.5 lbs/ft ^{3} (1401.6 kg/m^3)
SPECIFIC GRAVITY:	2.4-2.9
EFFECTIVE SIZE:	0.30 mm - 0.40 mm
MESH SIZE:	20X50

B. OPERATING CONDITIONS

WATER pH:	6.2-8.5
MAX WATER TEMP:	80°F (27°C)
BED DEPTH:	30” minimum (76 cm)
FREEBOARD:	50% of bed depth minimum
SERVICE FLOW:	3-5 GPM/ft^2 (8-10GPM/ft^2 intermittent flow)

BACKWASH FLOWRATE:	Sufficient rate to expand bed 15-40% of original bed depth. Minimum 12 gpm/ft2 at 55 ˚F (30m/hr at 13˚C).
REGENERATION:	1.5-2.0 oz. of $KMnO_4$ by weight/ft^3
MAX. PRACTICAL LIMIT OF IRON (Fe++)	15 ppm
MAX. PRACTICAL LIMIT OF MANGANESE (Mn++)	15 ppm
MAX. PRACTICAL LIMIT OF HYDROGEN SULFIDE (H_2S)	5 ppm
ATTRITION LOSS PER YEAR	2%-3%

C. CAPACITY PER CF *(approximate)*

IRON ALONE	600 gr (10,000 USG of water containing 1.0 ppm Fe)
IRON & MANGANESE	400 gr (7000 USG of water containing 0.5 ppm Fe and 0.5 ppm of Mn)
HYDROGEN SULFIDE	175 gr (3,000 gal of water containing 1.0 ppm H_2S)

D. STANDARD SYSTEM DESIGN PARAMETER

For each 1 ft3 media:

20 minutes backwash with 12gpm/ft2 surface area @ 55 degrees F

75 minutes regeneration draw & slow rinse with 0.5 gpm @ 40 psi

10 minutes fast rinse with 12 gpm/ft2 surface area @ 55 degrees F

NOTE:
Initial media bed has to be soaked in KMnO4 solution for a minimum of 4 hours.

E. OTHER

PACKAGING: 1 CF per white 30 mil woven poly bag, 35 bags to pallet

TRADE NAME: **MANGANITE™**

MARK:

CERTIFICATION: WQA Gold Seal certification to ANSI/NSF Standard 61 for health effects only