

ADVANCED OXIDATION FILTRATION MEDIA

DMI-65 is an extremely powerful silica sand based catalytic water filtration media that is designed for the removal of Iron and Manganese without the use of potassium permanganate. The unique microporous structure of DMI-65 efficiently removes dissolved iron to the almost undetectable levels as low as 0.001 PPM and manganese to 0.001 PPM. DMI-65 acts as an oxidation catalyst with immediate oxidation and filtration of the insoluble precipitates derived from this oxidation reaction. DMI-65 can also remove Arsenic, Aluminium and other heavy metals and Hydrogen Sulfide under certain conditions.

DMI-65® Catalytic Media

DMI-65 is infused technology and not just a surface coating technology unlike other catalytic water filtration media, giving DMI-65 the advantage of a long life span between 5 to 10 years and powerful performance. It also removes the chance of any chemical leaching into the water stream.

It is a media that utilises an oxidation, adsorption and filtration process similar to Greensand and Birm, but at a much higher level of performance and capacity and significantly lower whole of life cost.

The media has been used extensively in many countries for drinking water applications and in a wide variety of other applications to prevent nuisance iron and manganese bio fouling in water treatment systems.



Image: Emalahleni Water Purification Plant – Witbank City Government
Office The Witbank Municipal WTP in Durban South Africa

How It Works?

DMI-65 is infused technology and not just a surface coating technology, unlike other catalytic water filtration media, which removes the chance of any chemical leaching into the water stream.

In order to begin the process of oxidation of the iron (and manganese) in solution DMI-65 is designed to operate in the presence of chlorine or other oxidant. In this process the oxidant removes electrons and is consumed in the process. The operator needs to ensure that there is a 0.1 – 0.3 ppm free chlorine residual in the effluent water. Chlorine, fed as sodium hypochlorite or bleach (12.5% NaOCl), is the preferred oxidant since it is relatively inexpensive, readily available around the world and it is effective. It also performs the vast majority of any disinfectant process.

Unlike ion exchange resins where higher regenerant dosages will increase the ion exchange capacity, chlorine residuals or concentrations higher than required to oxidize the Fe and Mn do not increase the oxidative properties of the media. Additionally, a higher free chlorine residual in an RO system would require more extensive post treatment to reduce the residual and protect the membranes from chlorine attack.





DMI-65® Advanced Oxidation Process

This process will work in most vertical filtration configurations!

Our Advanced Oxidation Process ("AOP") uses the highly reactive catalytic material DMI-65 to boost the reduction/oxidation (redox) processes in water. This material promotes stronger oxidation than molecular oxygen and ordinary oxidants. Under certain conditions heavy metals may be difficult to oxidise to insoluble hydroxides, however our DMI-65 based AOP increases the rate of reaction and achieves a higher degree of purification.

In essence, the oxidants and the media work together to oxidize a dissolved solid into a suspended solid that is then filtered out in the depth of the media bed. If an element can't be oxidized and precipitated the media can't remove it. The media "helps" chemical reactions to occur by interacting with the oxidation reaction without being permanently altered.

Iron and manganese exist in bore water as bicarbonate. DMI-65 acts as an oxidation catalyst in the true meaning of the word and facilitates oxidation – precipitation – filtration. Strictly speaking, the media facilitates chemical reactions and does not explicitly remove anything, though once oxidised, the depth filtration aspect of the media removes the solids created by the oxidation that are then periodically backwashed out of the filter vessels. Chlorine, fed as sodium hypochlorite or bleach (12.5% NaOCl), is the preferred oxidant since it is relatively inexpensive, readily available around the world and it is effective.

Other oxidants such as hydrogen peroxide (H₂O₂), chlorine dioxide (ClO₂) or ozone can also be used so long as a residual can be measured and maintained. Choice of oxidants needs to be subject to detailed analysis as performance varies according to the operating environment.

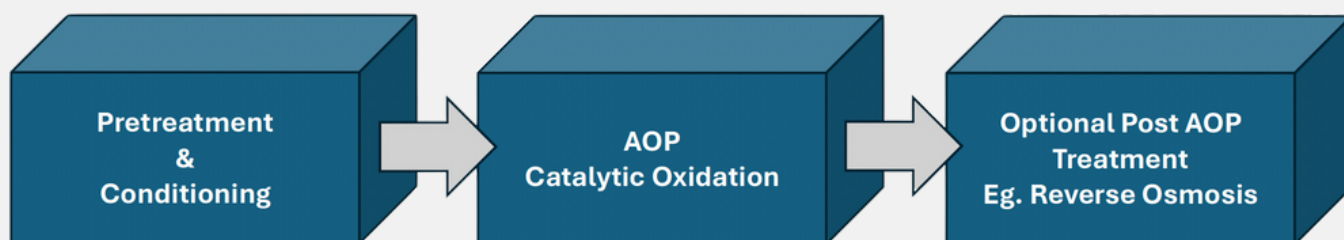
Another function of the Chlorine is that it keeps the media free from bacterial bio fouling or slime growth which reduce its performance. The need to add an oxidizer as part of the DMI-65 process also means that the final stage of the disinfection process of water treatment is also addressed.

For effective treatment results, DMI-65 Advanced Oxidation Process is integrated into a complete treatment system. The treatment processes are arranged in three stages: pretreatment-conditioning, DMI-65 catalytic AOP treatment and post DMI-65 catalytic AOP treatment.





Advanced Oxidation Process continued...



The DMI-65 Advanced Oxidation Process will work in most vertical filtration configurations.

Pre-treatment allows flexible implementation of a range of traditional processes; however significant performance improvements and cost reductions are generally achieved from the integration with the next stage, AOP.

Post DMI-65 catalytic treatment stage may include fine filtration comprising 5 and 1 micron filters, a secondary filtration barrier using fine resolution filters.

ARSENIC REMOVAL

The media can also be used to remove Arsenic (As). In this case, the media does not actually remove the As but rather relies on the fact that Arsenic and Iron (Fe) readily form a complex and when the media takes out the Fe it takes the As with it. If water has As present but no Fe it will be necessary to add ferric chloride to the water. It should be noted that this only applies to inorganic As (As III and V) since not all organic As readily bonds with the Fe. As Arsenic is extremely poisonous (classified as a group 1 human carcinogenic substance), water treatment plant design must be proven through pilot testing to establish correct settings, or the use of already proven DMI-65 based arsenic removal systems.

HYDROGEN SULPHIDE REMOVAL

The media can also be used as a simple and low-cost technology to remove H₂S. The DMI-65 Advanced Oxidation Process acts as an oxidation catalyst and facilitates the oxidation of any H₂S not oxidized by the chlorine injection. The sulfur is then filtered in the media bed.





DMI-65® Uses

In addition to the basic human right to have access to clean and safe drinking water, most industries that use water in their production require water purification to ensure integrity of their products of the highest quality and that the performance of their processing or manufacturing equipment is not compromised.

Water for consumption or used in food processing industries needs to be clean, with iron and manganese well below regulated levels, low in hardness and alkalinity and free of undesirable taste, odours and chlorine.

Water used in processing industries and systems need water that is treated for the removal of iron and manganese in order to achieve the highest possible performance from their systems. This performance can be a measure of output or downtime for maintenance. Impact on the environment must also be addressed. Spent water, or output from dewatering operations must have excess iron and manganese removed in order to avoid damage to the ecosystem output areas. Facilities must be compliant, chemical reduced, discharges recycled and minimised.

Certification

DMI-65® is Tested and Certified Under Industry Standards: NSF / ANSI 61 Drinking Water System Components by the Water Quality Association of USA Gold Seal Program covering safety and health effects for drinking water components.

Compliant : Drinking Water Inspectorate safe to use according to: Reg. 31(4)(a) of water supply (Water Quality) regulations 2010 for UK, England and Wales.

DMI-65 has also been tested by many other water treatment authorities and laboratories.

DMI-65 is manufactured in Australia.



Call us for
more info



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dami65®





Advantages of using DMI-65®

Lowest Whole Life Cost Solution!

DMI-65 significantly reduces the operating costs of iron and manganese removal in water filtration due to the following performance features:

Regeneration Not Required

The media operates with a continuous injection of sodium hypochlorite at low residual levels (0.1 to 0.3 ppm) which eliminates the need for Potassium Permanganate.

Long Life

DMI-65 is not consumed in the process, providing considerable advantages over other processes or media. The media does not display a decaying capacity to do its catalytic work. Over a 5 to 10 year period, through many backwashing operations of the bed to remove retained solids, an attrition loss of the media occurs by contact between particles and mechanical abrasion.

High Load Capacity

Because of the increased surface area due to the micro-porous structure of the matrix material, the DMI-65 also has higher iron and manganese load capacity which can extend the duration of filter runs and the time between backwashing, thereby reducing downtime, operating expense and wastage.

Reduced Total Water Treatment Solution Costs

The use of DMI-65 in a water treatment solution for the removal of iron and manganese contributes to a reduction in the capital investment cost of the water filtration solution:

High Flow Rates

The infused technology of DMI-65 promotes the highest oxidation rate of any catalytic filtration media. This permits a significantly higher water flow rate to achieve the same level of iron and manganese removal. DMI-65 can operate at linear filtration velocities up to twice that of conventional media with a corresponding reduction in capital equipment costs.

Wide Operating Environment

Stable and satisfactory performance at pH 5.8 to 8.6 and a maximum operating temperature of 113° F (45°C) reduces the need for investment to alter the operating environment.

Reduce Redundancy

Iron and Manganese contamination can materially reduce the performance of water treatment systems. The effectiveness of DMI-65 in removing iron and manganese contamination levels allows the water filtration system to function closer to rated levels thereby reducing the amount of costly overcapacity that would be acquired to achieve required output levels.





Applications & Industries We Serve

- ✓ Drinking Water Treatment
- ✓ Reverse Osmosis
- ✓ Arsenic Removal
- ✓ Mining Industry
- ✓ Industrial Applications
- ✓ Irrigation Systems
- ✓ Landscape Reticulation
- ✓ Cooling Towers & Boilers
- ✓ Environmental Dewatering
- ✓ Food & Beverage

Why DMI-65®?

-  **Expertise & Experience**
Years of industry experience, we offer knowledgeable & professional services
-  **Customer-Centric Approach**
We put YOU first, offering solutions tailored to your specific needs.
-  **Highest Quality**
We're committed to providing the highest quality in everything we do.
-  **Competitive Pricing**
Our rates are competitive giving you the best value for your money.
-  **Reputation**
We have built trust, professionalism and exceptional service within the community.
-  **Innovative Solutions**
Our cutting-edge technology is efficient and meets modern demands.

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