

# ADVANCED



**WATCHER**<sup>®</sup>  
WATCH WATER  
*a Water Company*

RED-OXY TREATMENT  
FILTRATION  
**ADSORPTION**  
FILTERS ORB  
INSTANT PRODUCTS

## METAL ORGANIC FRAMEWORKS

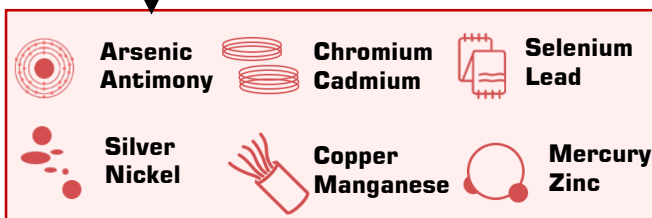
# FERROLOX-X

METAL ORGANIC  
EXTRA CAPACITY

**Watch Water® Next Generation Adsorber to the Modern Water Treatment with a New State-of-the-art Technology**

### Product Description

**Conventional activated carbons** have trouble in removing heavy metals and bulky organic compounds from water in the same process. In addition, iron hydroxides and all adsorbers have the same problems. **Watch Water®** have designed a new adsorber named **FERROLOX-X**, where Iron particles are attached on carbon surface. **Watch Water®** is the first company in the world to commercialize **Metal Organic Frameworks (MOF's)** technology. Environmental friendly coating that repeatedly absorbs large amount of pollutants such as heavy metals. The list of heavy metals generally includes.



Heavy metals exist in two forms, organic and inorganic. Both forms of heavy metals are toxic. The higher the heavy metal content in drinking water, the greater will be the damage to heart.

RO purifiers are not required for water treated with **FERROLOX-X**. The TDS content in the RO water is normally less than 50-100 mg/L and keeping in mind all healthy minerals are removed. Where as, water treated by **FERROLOX-X** contains minerals for drinking water without organic and heavy metals.

	Granular Ferric Hydroxide	Titanium Dioxide	Activated Carbons	Metal Organic Frameworks
	Based Adsorber	Based Adsorber	Based Adsorber	<b>Ferrolox - x</b> Based Adsorber
Surface Area	250 – 300 m <sup>2</sup> /g	400 – 600 m <sup>2</sup> /g	1000 – 1250 m <sup>2</sup> /g	<b>Up to 5000 m<sup>2</sup>/g</b>
Structure	Crystalline	Crystalline	Crystalline	<b>Macro Porous</b>
Pore Size	0.3 – 1.0 nm	0.3 – 3.0 nm	0.3 – 5.0 nm	<b>0.3 – 10.0 nm</b>
Pore Size	Narrow	Narrow	Broad	<b>Narrow</b>
Molecular Tunability	Low	Low	Very Large	<b>Large</b>
Particle Size	0.2 – 2.0 mm	0.6 – 2.0 mm	0.6 – 2.0 mm	<b>0.5 – 2.0 mm</b>

**The reason we are using the MOFs, the rare coal itself is because the heavy metals are tied up in such a way that they are easy to get out.**

**RO Technology** creates dead water, which is bereft of necessary minerals and salts which is not good at all for human consumption. "This technology has been mainly promoted by market forces by creating a fear psychosis, and not because people really need it". They have come up with the heavily - Loaded- Word – called "**PURE**" and people fall for it. This word is making children, the elderly and those who are ill drinking dead water without realising what they are drinking and the consequences. People are inviting serious medical problems by drinking dead water that comes out from RO **PURIFIERS**.



## BEST AVAILABLE ADSORBER

For example, if the water does not have required **Magnesium** content, it can lead and cause to all possible sicknesses and mental imbalances. The only issue in the drinking water is Arsenic, fluorides and heavy metals including pesticides, PFOA's, microplastics, pharmaceuticals and which **FERROLOX-X** is best available technology for each **Residential and Commercial** applications which is economical and efficient in all prospects for providing water without organics and heavy metals. Watch Water request all government utilities to **Forbid** all RO Systems and request people and make aware "These is **no need** to install RO systems. There is, in fact no limits of minimum mineral content in Drinking Water by German Standards as well as the World Health Organization.

Standards	
pH	6.5 - 10.5
Conductivity	2790 us/cm
Iron	0.2 mg/L
Manganese	0.05 mg/L

## FERROLOX - X

**Watch Water** have developed an **MOF** based Adsorbent that can selectively capture soluble organic and inorganic, Heavy metals in water. This water is passed through granules which have carbon core surrounded by a **Hematite** ferrite shell. At the same time it has the highest Adsorption capacity. **FERROLOX-X** is applied in a very simple passive pump-and-treat system applying the technology of Fixed-bed-Adsorption.



**Rapid, Selective Heavy Metal Removed From Water by a Metal-Organic-Framework**

## BENEFITS

The highest Adsorption capacity media available in the market. An addition advantage is the increased mechanized stability of the **FERROLOX-X**. Media is absolutely stress free because of its very large surface area. Compared to the conventional **FERROLOX** media, the high Iron content of the product also significantly increased adsorption capacity, which in turn extends filter life.

## Applications

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- Drinking Water treatment
- Food and beverage industry
- Purification of sugar + Beverages
- Municipal Water
- Condensate polishing
- Agriculture + Irrigation
- Aquatic and aquarium water
- Wastewater Treatment
- Metal Industry
- Final Purification + Polishing
- Water Reuse
- **Phosphorous Diffusion and Sorption**  
**(Improve Agriculture-Production)**  
**The first of its kind Fertilizer**



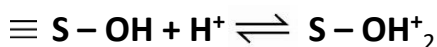
## FERROLOX - X TECHNICAL DETAILS

**Ferrolox-x** is an engineered adsorbent with the highest adsorption capacities. **Ferrolox-x** is produced under strict quality control. To guarantee the safety of drinking water all products manufactured for use in drinking water treatment

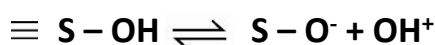
**MUST have WQA certification**  
All Watch Water products are certified by WQA to NSF/ANSI standards.

Since the adsorption process is a surface process. Only the surface area of the adsorbent is of great importance. **FERROLOX-X** internal surface area is consisting of **70% Macropores** and **20% Mesopores** and only **10% micropores**. The macropores and the mesopores are primarily relevant for the mass transfer into the interior of the **FERROLOX-X** granules. **FERROLOX-X** surface is covered with surface OH groups. These groups are subject to

### Protonation



### Deprotonation



And it all depends on the pH value of the polluted water.

Symbol  $\equiv S$  stands for the surface of the solid material.

In simple words the surface is positively charged at **LOW pH** values and negatively charged at **HIGH pH** values.

**More Simple:** The adsorption of **Cation's** increases with **increasing pH**, where as the adsorption of **Anions** increases with **decreasing pH**

### Physical Properties

Type	MOF's Adsorber
Form	Solid Granules
Color	Reddish black
Particle Size	0.5 – 2.0 mm
Bulk Density	ca. 690 kg/m <sup>3</sup>

### Specifications

Carbon content	min 34%
FeOOH content	min 66%
Moisture content	Max: 5 – 10%
Adsorption Capacity	80 g/L (by volume)
Specific surface area	3000 m <sup>2</sup> /g

### Operating Parameters

Flow Direction	Down Flow
Freeboard	40%
pH	5 – 9
Minimal Bed Depth	US 31.5 inch SI 80 cm
Optimal Bed Depth	US 47 inch SI 120 cm
Service Velocity	US 6 – 12 gpm/ft <sup>2</sup> SI 15 – 30 m/h
Backwash Velocity	US 10 – 12 gpm/ft <sup>2</sup> SI 25 – 30 m/h





## REGENERATION WITH SOLAR OXY-3C

### Removal of Organic's (Micropores)

10% of the surface area of activated carbon have oxygen containing functional group. These pores are able to adsorb a wide spectrum of organic substances. With this reason high adsorption capacity of inorganics make **FERROLOX-X** to be the excellent Adsorber in all water treatment processes and the ability to remove **Organic Impurities**.

Loaded **FERROLOX-X** Adsorber can be regenerated using **SOLAR OXY-3C**

### SOLAR OXY-3C

**Watch Water**<sup>®</sup> has developed a process that combines the benefits of **(MOF) adsorption** and oxidation: Adsorption coupled with **Solaroxy-3C** to regenerate all kinds of **adsorbers**, such that adsorption and regeneration can be achieved **continuously and simultaneously**.

This delivers a process where the **organics** are concentrated onto the surface of conducting carbon-based adsorbent, but than oxidize the organics to Carbon dioxide (CO<sub>2</sub>) and water (H<sub>2</sub>O) through (VAOP) oxidation, which regenerates the adsorbent for reuse. All **inorganics** are passed over to **Watch Water**<sup>®</sup> **modified Titanium dioxide (TiO<sub>2</sub>)** as photocatalyst that works with solar or sunlight.



With innovative chemistry design, we use our **photocatalyst** to purify water and wastewater with natural sunlight instead of disposing of **adsorber or activated carbon-based** adsorbent which dramatically reduces costs for operators. **SolarOxy-3C** can completely decompose **Organics** and **Inorganic** pollutants in water or wastewater in **20 minutes**, compared with the leading commercialised products, which take 1-2 hours to decompose only 30% of the same pollutants.

**SolarOxy-3C** could be used for treating water for human consumption and has potential applications in making all surfaces clean including disinfection without using chemical biocides, chlorine or bromine.

**“• It's an amazing breakthrough for Science and Water treatment industry •”**

For more information please see **SolarOxy-3C** brochure for regeneration

### SOLAR OXY-3C For Regeneration of Adsorbers

**Watch Water**<sup>®</sup> is a team of highly experienced specialists in Water Treatment Sector and provide new superior technologies compare to old conventional technologies and products.

Our experience and very successful products are unmatched in the industry and we have been recognized as an innovative industry leader. **Watch Water**<sup>®</sup> takes full responsibility in all water treatment problems, with its innovative concepts and pragmatic solutions, geared towards bio-friendly water treatment chemicals and systems.

**Disclaimer:** The information and recommendation in this publication are true and based on data we believe to be reliable. They are offered in good faith but do not imply any warranty, liability or performance guarantee. Specifications are subject to change without notice. Watch Water<sup>®</sup> will not be liable under any circumstance for consequential or incidental damages, including but not limited to, lost profits resulting from the use of our products.