

INTELLIGENT WATER TREATMENT

FIVE STEP PURIFICATION PROCESS



Five steps purification process including Catalyst, Oxidation, Adsorption, Filtration and finally Polishing is a revolution in the treatment of all kinds of water including wastewater. Treatment of any kind of water with this technology has shown the best results for the removal of turbidity, colour, odour, BOD, COD and inactivation of bacteria.

The **REDOXY Five-Step Technology** combines salts of **RED^x**, **OXY^x**, and **ADSORB^x** to generate cost-effective oxidants, disinfectants, and adsorbents. It eliminates the need for hazardous and toxic oxidants like chlorine or ozone, making it safer for workers and the environment. Our Xtremely intelligent and carefully crafted generators provide our customers with the freedom to produce the precise amounts of oxidants, disinfectants, and adsorbents they require, exactly when they need them.

A RISING PROBLEM!!!

TOXIC TYRE WASTE 6PPD-QUINONE

Salmon returning to rivers and streams frequently die before they can reproduce. The culprit chemical is 6PPD-quinone, a hazardous a compound released by automobile tires. RedOxy is the best solution to treat wastewater contaminated with these toxic chemicals.



APPLICATIONS



IRRIGATION



PULP AND PAPER INDUSTRIES



DRINKING WATER TREATMENT



MINING



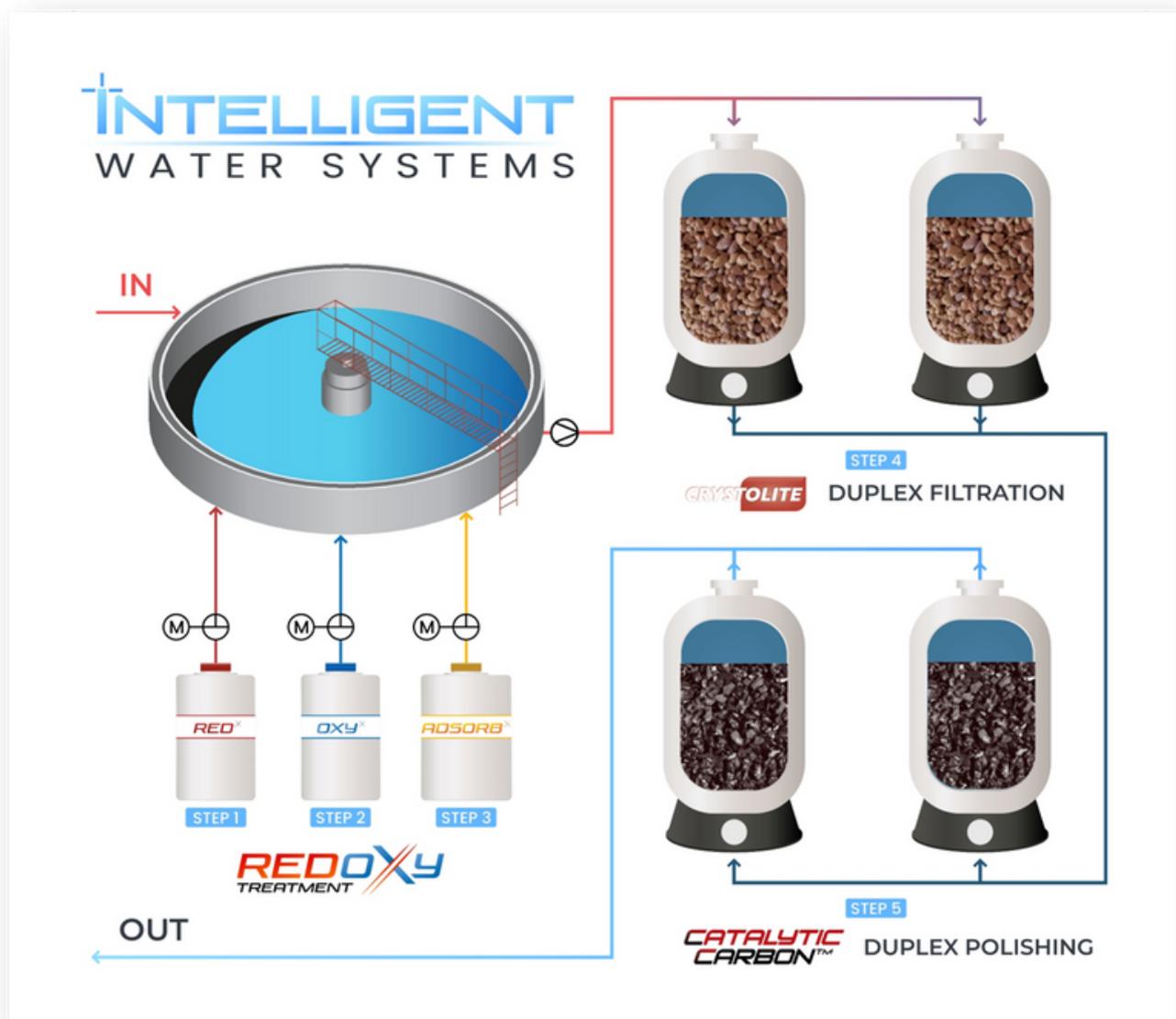
PETROCHEMICAL INDUSTRIES



WASTEWATER TREATMENT

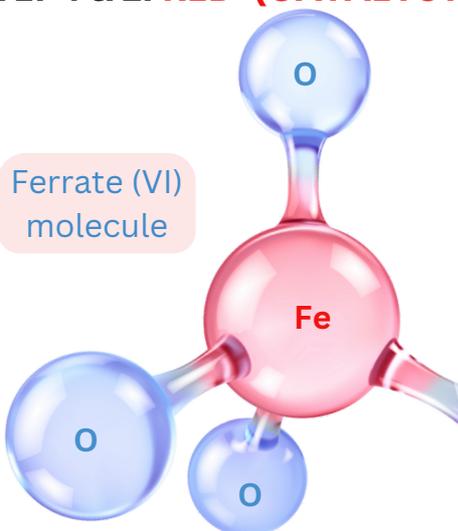
GREEN CHEMISTRY SOLUTION TO WATER POLLUTION

REVOLUTIONARY WATER TREATMENT BY WATCH WATER



The system is designed to provide efficient and environmentally friendly treatment option. The treatment process involves five crucial steps, each of which have their own significance. These steps are explained as followed:

STEP 1 & 2: **RED^X(CATALYST)** & **OXY^X(OXIDATION)**



The oxidation-reduction reaction is the strongest reaction with a particular significance in the entire water treatment industry. Ferrate (VI) is one such powerful oxidizing agent that has a REDOX potential of 2.2V and can be utilized in many applications, but it is very unstable. Watch Water, through its ground-breaking invention, stabilized the Ferrate (VI) in the most stable and preservable form.

This stable Ferrate (VI) is generated by Watch Water's proprietary process consisting of just two Components, i.e., Ferric hexahydrate Granules

UNMATCHED REDOX POTENTIAL

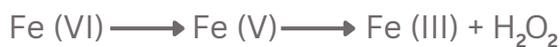
(**RED^x**) and a strong acid halogen (**OXY^x**). The REDOX potential of this oxidant is as high as hydroxyl radicals. Along, with the generation of Ferrate, **RED^x** also acts as a catalyst and generates a lot of Hydroxyl (OH[•]) and Sulphate (SR[•]) radicals in the presence of **OXY^x**. The hydroxyl radicals and sulphate radicals provide an additional REDOX potential of 2.7 and 3.1 respectively.

REDOX POTENTIAL	
Ferrate (VI)	2.2
Hydroxyl Radical (OH [•])	2.7
Sulphate Radical (SR [•])	3.1

Ferrate Coupled with Sulphate Radicals

Very advanced oxidation process (VAOP) = $\text{SO}_4^{2-} + \text{H}_2\text{O} \longrightarrow \text{SO}_4^{\cdot-} + \text{OH}^{\cdot} + \text{H}^+$
Hydroxyl Radicals are produced from ferrate decomposition and interaction of ferrate species.

Hydroxyl Radicals



Hydroxyl radicals are produced from the interaction of surface hydroxyl on resultant ferrate particles.

REDOXY process of mixing Hydrated ferric solution and strong **OXY^x** solution is the purest method to produce Ferrate producing more than 99 % pure ferrate in the mixed form. Watch Water guarantees that both compositions in **RED^x** and **OXY^x** are a 100% biodegradable.

STEP 3: **ADSORB^x**(ADSORPTION)

The ferrate molecules precipitate out of the solution in the form of Fe(OH)_3 and now the adsorption process starts to collect cations and anions from the water. After treatment with **RED^x**, the pollutant molecules remain dispersed and dissolved and dispersed evenly in water. **ADSORB^x** stabilizes the outer shell of the particles and form larger aggregate that can be removed through filtration. This unique adsorbent has a very high surface of Iron Oxy hydroxide FeO(OH) . The best adsorption process will be achieved at inlet pH of 6.5.



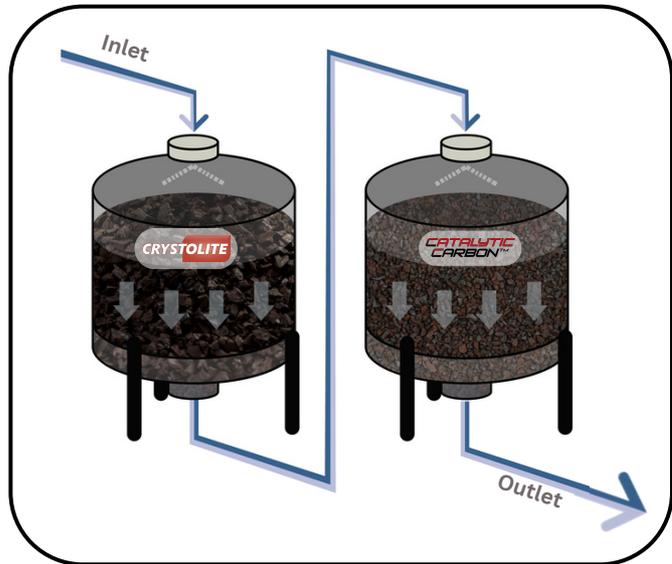
A real prototype of **REDOXY** Dosing system
(made by Watch-Water® Germany)

FINAL POLISHING AND DOSAGE AMOUNT

STEP 4: CRYSTOLITE (FILTRATION)

After the oxidation of all organics and inorganics, the final left over is the ferric ion. **ADSORB^X** is dosed to create the floc of this ferric ion and catch the inorganic precipitates of cations and adsorb anions and all suspended particles including colloids. The cations, anions suspended matter, and colloids are precipitated and filtered out using Crystolite filtration media.

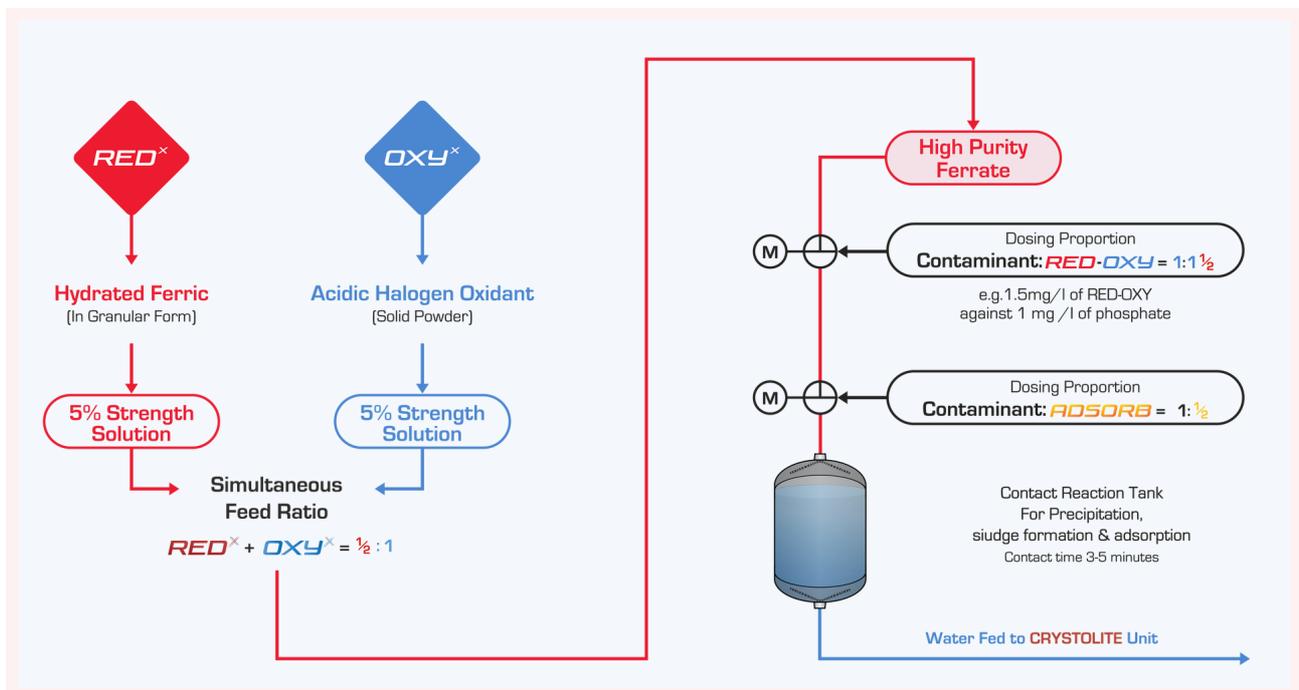
Note: The sludge formed in the Reaction Tank must be removed before feeding the water to the Crystolite Filtration system.



STEP 5: CATALYTIC CARBON (POLISHING)

Water at outlet of Crystolite filtration is itself sufficiently clean. For further cleaning Catalytic Carbon is used as the polishing filter. Polishing is used for better taste and odour and to remove microorganisms. The wastewater contaminants can include aluminium, chlorine, atrazine, and all possible bio-accumulative organics. Furthermore, arsenic, cyanide, chromium, pathogens and selenium, fluorides, lead and copper, phosphates, nitrates can also be present. Catalytic Carbon technology can solve all the problems of trace toxic contaminants prior to discharge and provide the best quality re-usable water.

DOSING



TRY IT YOURSELF!!

The dosing amount in each step is approximated by the total concentration of contaminants to be treated. For example, if the total cations (Iron, Lead, Copper, etc) and anions (Arsenic Phosphate, silicate, etc.) in waste water are 'x' mg/L, then the dosing for RED^x, OXY^x and ADSORB^x should be 'x/2', 'x' and 'x/2' ml/m³ respectively. All three chemicals should be dosed as a liquid with 5% strength.

PLEASE NOTE: The values mentioned here are just for approximation. The exact dosing amount should be estimated beforehand by the customer using our Lab Test-kit.

REDOXY TEST KIT

Still not convinced with our product? You can check the performance of our REDOXY technology yourself easily with our mobile Lab-Kit.

Step 1: To begin test, a sample jar should be filled with the contaminated water.

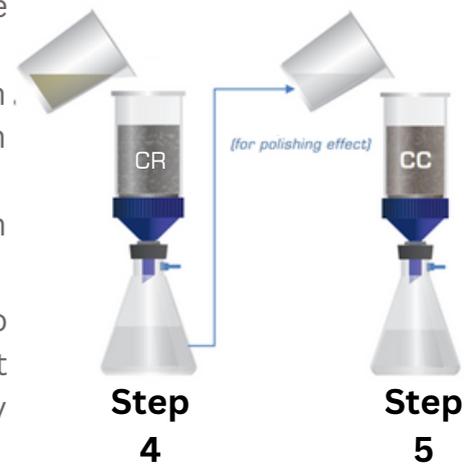
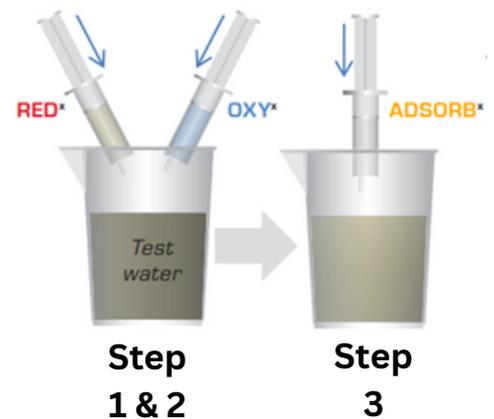
Step 2: And then, RED^x and OXY^x are injected into the sample.

Step 3: Subsequently, ADSORB^x is added to obtain the best results forming immediate sludge and precipitation.

Step 4: The treated sample is then poured through Crystolite filtration media column and then collected again.

Step 5: The collected sample is again poured through Catalytic Carbon column for polishing effect.

Samples from both the columns can be sent to investigate water quality parameters. A Test Result with RED-OXY® Lab showed 95 % reduction of very high concentration of sulfate.



THE DREAM OF
SUSTAINABLE WATER RE-USE
IS NOW A REALITY

... THANKS TO

REDOXY
TREATMENT

CONTACT US

WATCH WATER GmbH
Fahrlachstr. 14,
68199 Mannheim,
Germany

Tel: +49 (0) 621 87951 51 0
Fax: +49 (0) 621 87951-99
Email: info@watchwater.de
Website: www.watchwater.de