WATCH WATER
a Water Company

HYDROOXY TREATMENT

Unlocking the Power of Catalytic Precipitation & Oxidation: The Ultimate Solution for industrial wastewater treatment.

INNOVATING TODAY FOR A CLEANER TOMORROW...

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INTRODUCTION

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Finding efficient techniques to remove metals & **heavy metals**, especially the persistent ones such as chromium and copper has been a constant struggle in the ever-changing environment of industrial wastewater treatment. These toxins endanger both the environment and public health.

After the world-wide success of our RedOxy Treatment, **(Advanced Oxidation Process)**, we have taken things to the next level with **HYDROOXY**. Watch Water's HydroOxy Treatment is a ground-breaking mix of three cutting-edge technologies: **RED^{x}**, **OXY^{x}**, and **HYDRO^{x}**. HydroOxy is your go to solution for addressing industrial wastewater quality issues, particularly when dealing with high levels of heavy metals in water.

WHAT IS RED^{x}?

The elemental form of **RED^{x}** is 'iron', which is a transition metal exhibiting various valences. **RED^{x}** is basically ferric granules which act as catalyst and generate a lot of Ferrate(VI), which can be utilized to create Fenton's Reaction and generate a very high **REDOX** potential.

WHAT IS OXY^{x}?

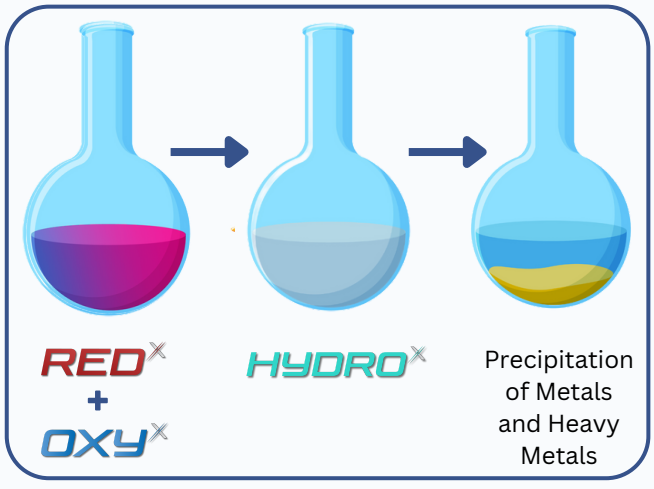
OXY^{x} is a very strong acidic halogen oxidant, generating a lot of **Sulphate** radicals in the presence of **RED^{x}** catalyst. **OXY^{x}** in combination of **RED^{x}** can provide the ultimate treatment for any kind of water.

What is HYDRO^{x}?

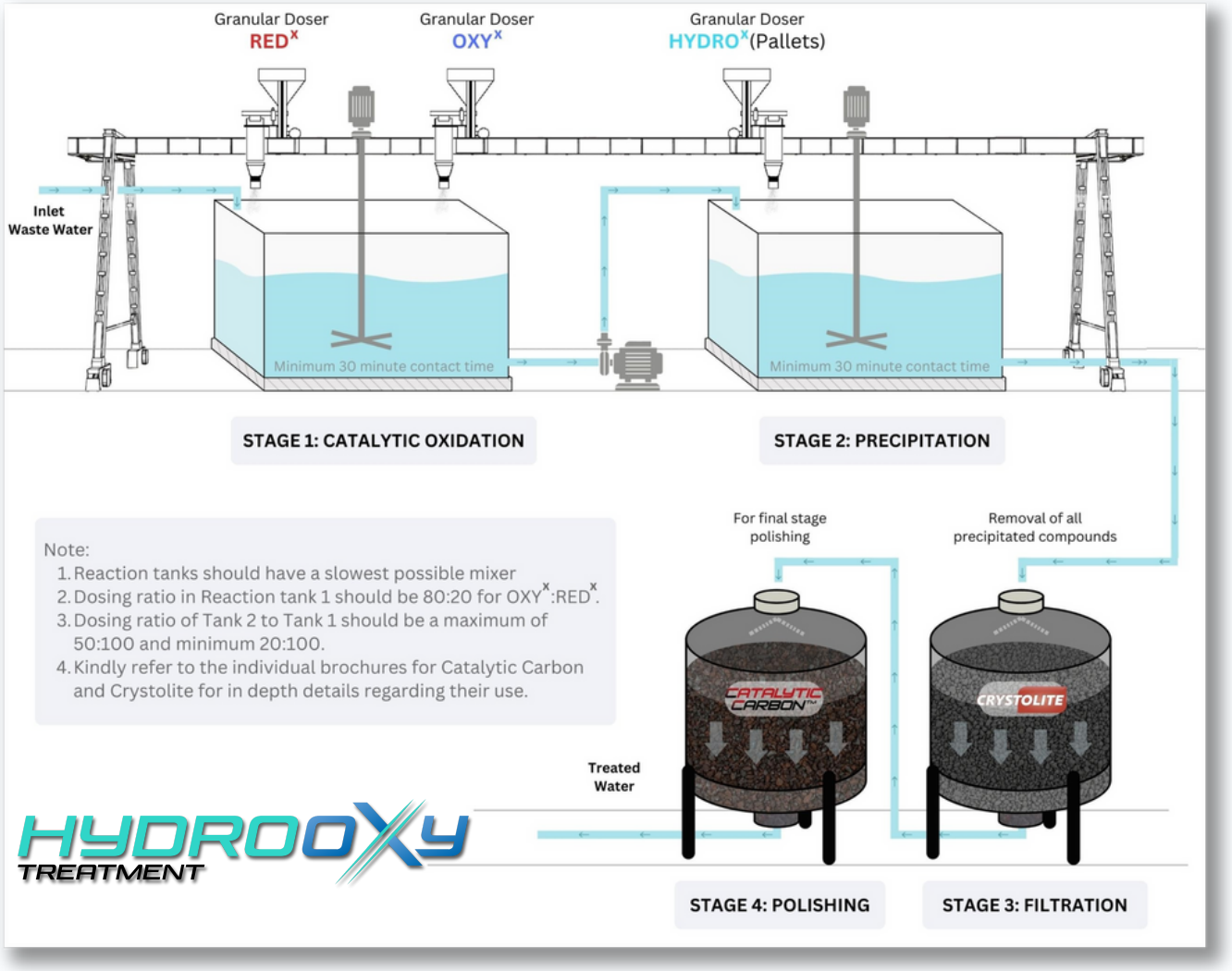
Metal and heavy metal removal from inorganic industrial wastewater effluent has traditionally relied on solidification and precipitation. The idea behind this method is straightforward: convert the dissolved pollutants into solid particles that can be readily removed from the water. **HYDRO^{x}** forms insoluble precipitates of heavy metals as **Hydroxides**. This is the core concept on which **HYDRO^{x}** is based.

HYDRO^{x} stands out to be most Advanced Solidification technique. The hydroxyl radicals oxidize target pollutant molecules without the addition of an external catalyst.

Removal efficiency of **HYDRO^{x}** can be significantly improved by tunning/adjusting the pH to strong basic conditions to 9.5 – 10. Automatic pH Control is advisable.



HYDRO-OXY PROCESS: A FOUR-STAGE MARVEL



STAGE 1: CATALYTIC OXIDATION

In the first stage, our proprietary powders **RED^x** (Catalyst) and **OXY^x** (strong oxidant) are used to generate extremely high Oxidation reduction potential. This high **REDOX** potential is generated because of production of **Ferrate(VI)** and **sulphate radicals (S˙)**. Ferrate(VI) is one of the most powerful oxidizing agent, but it is very unstable. Watch Water, through its ground-breaking invention, stabilized the Ferrate (VI) in the most stable and preservable form. Thus, the combination of **RED^x** and **OXY^x** oxidize even the most stringent anions in water like **Chrom-ium**. Even other heavy metals and organics don't stand a chance against these radicals.

STAGE 2: PRECIPITATION

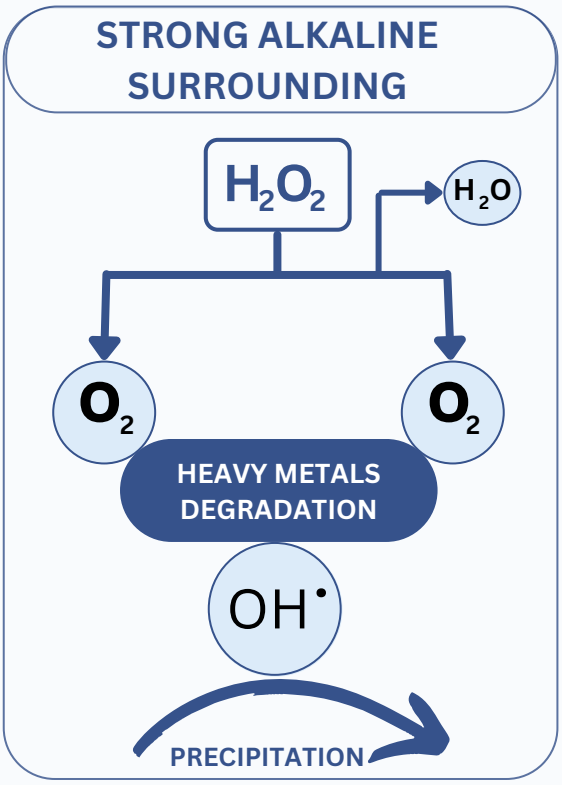
Hydro^x dosage, a major game-changer in the water treatment industry, is introduced in Stage 2. This stage speeds up the **precipitation** of any residual impurities, mostly in the form of hydroxides. Hydroxide precipitation is considered as one of the most sophisticated solidification processes in the industry, and our market experience has shown its efficiency. Most of the toxic cations are precipitated out in this stage.

DOSING

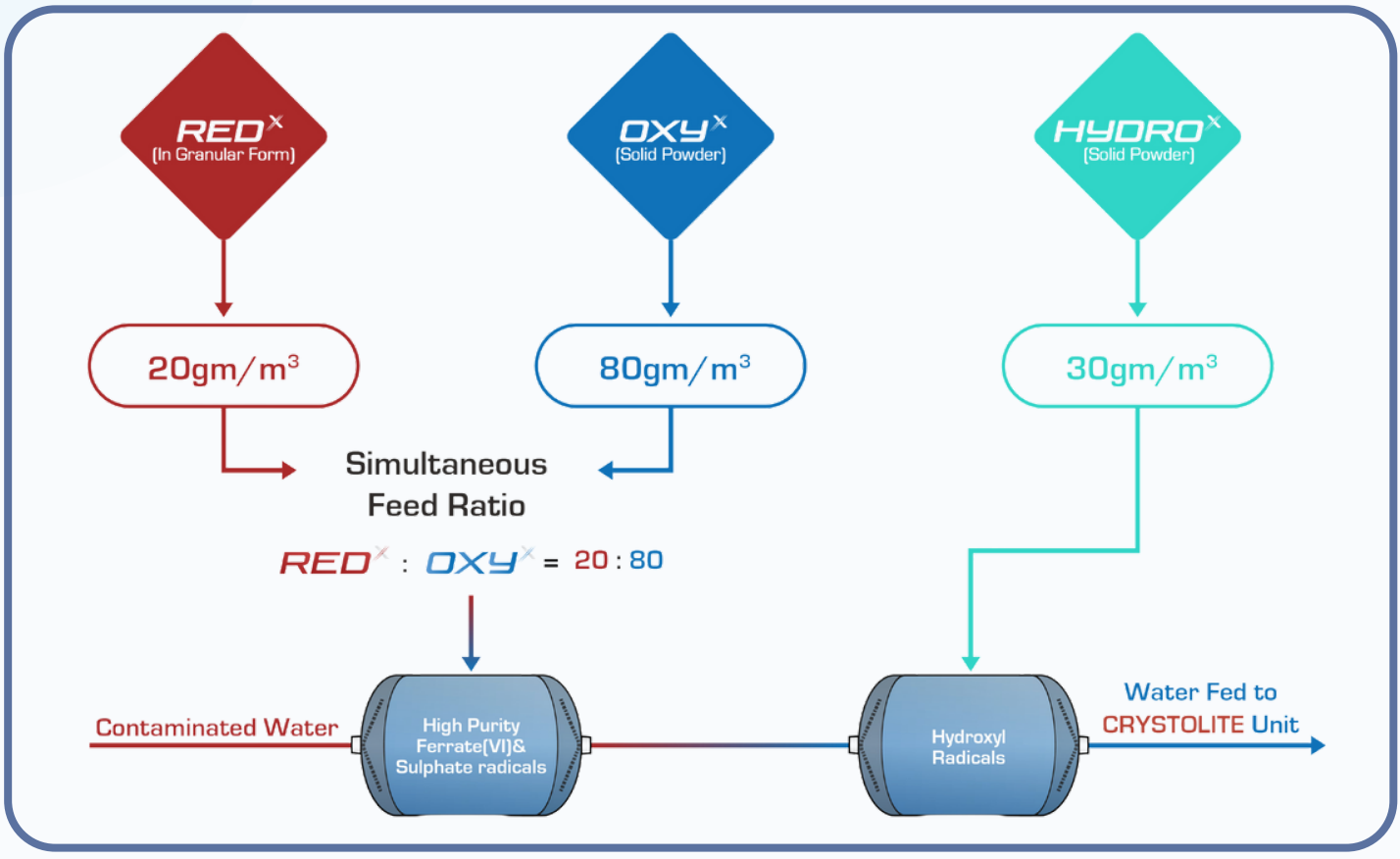
STAGE 3 & 4: FILTRATION AND FINAL POLISHING

The cations, anions suspended matter, and colloids are precipitated and filtered out using **CRYSTOLITE filtration** media. Crystolite is a robust, microfiltration media, that can provide filtration up to **0.5 microns**. Please note, the sludge formed in the Reaction Tank must be removed before feeding the water to the Crystolite Filtration system.

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. **CATALYTIC CARBON** technology can solve all the problems of trace toxic contaminants prior to discharge and provide the best quality re-usable water.

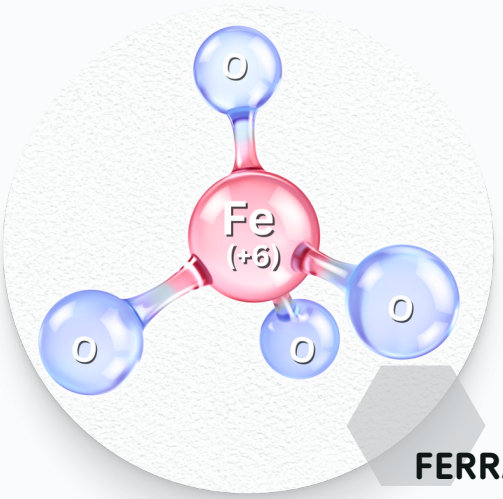


DOSAGE AMOUNTS



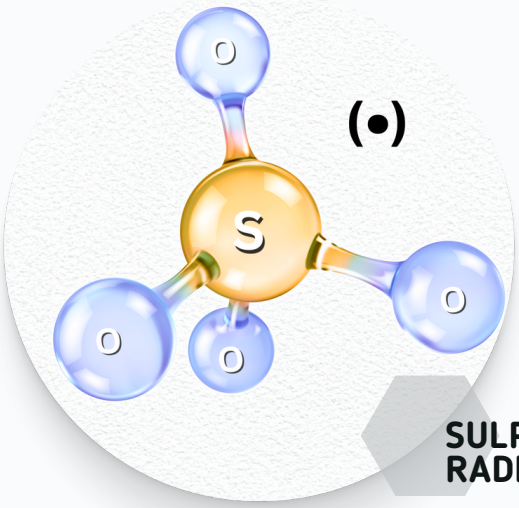
Please note: The values provided here in this diagram are just reference values. The actually dosing amount will vary on site and will in fact be much lower than the values given here. The exact dosing amount should be estimated beforehand by the customer using our Lab Test-kit.

RADICAL CHEMISTRY



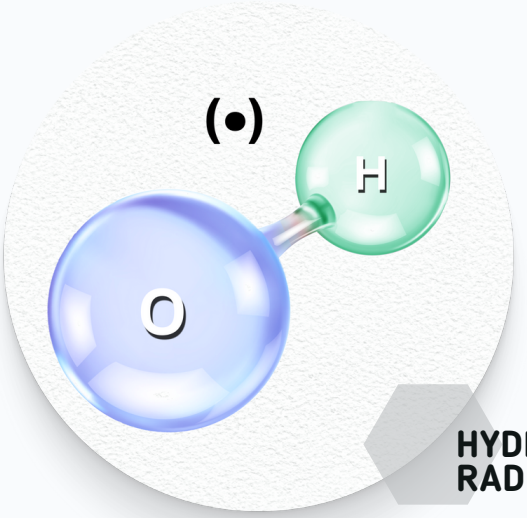
FERRATE(VI)

Ferrate(VI) has one of the highest REDOX potentials, with no negative impacts on humans or the environment. Purifying your wastewater using **Ferrate(VI)** can kill a huge number of microorganisms. It has the capacity to oxidize both **organic and inorganic** pollutants and remove suspended/colloidal particle materials. Recently, researchers are reported employing ferrate(VI) to treat developing micropollutants in water purification systems.



SULPHATE RADICALS

Advanced oxidation processes based on sulfate radicals have been employed effectively in wastewater treatment. It has proven to be an efficient approach for removing **refractory** organic pollutants from wastewater.



HYDROXYL RADICALS

The most reactive oxidizing agent in water treatment is the hydroxyl radical. **OH•** has strong **nonselective** behavior and interacts quickly with a wide range of contaminants. In **STRONG ALKALINE SURROUNDINGS**, hydroxyl radicals attach to the cations to generate precipitable hydroxides. When they react with organic molecules, they form carbon-centered radicals ($R^{\bullet}$ or $R\text{-}OH^{\bullet}$). These carbon-center radicals are converted to organic peroxyl radicals ($ROO^{\bullet}$) when reacting with O_2. All of the radicals continue to react, resulting in the creation of highly reactive species such as H_2O_2 and super oxide ($O2^{\bullet-}$), which leads to chemical deterioration and even mineralization of these organic molecules.

REDOX POTENTIAL (V)	
Ferrate (VI)	2.2
Hydroxyl Radical (OH)	2.7
Sulphate Radical (SR)	3.1

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PACKAGING

A BRIGHTER FUTURE WITH HYDRO-OXY

HYDROOXY, we believe, will be the game-changer for your wastewater treatment process requirements. Its novel four-stage approach distinguishes it as an industry-leading solutions. It combines the strength of **RED^{x}**, **OXY^{x}**, and **HYDRO^{x}** with accurate dosing, hydroxide precipitation, superior filtering and polishing procedures.

RED^{x}, **OXY^{x}**, and **HYDRO^{x}** are each packed separately as mentioned in the following table. For packaging of Filtration and Polishing media, please refer to their brochure.

Product	Weight of product	Bags/Box	Quantity/ Pallet	Total Weight
Bag	5Kg	4	-	20Kg
Drum	60Kg	-	18	1080Kg
Big Bag	1000 Kg		1	1000 Kg

**Other Packaging can be considered on request*

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