**FENTOX****WET CHEMICAL OXIDATION OF CRITICAL WASTE WATER INGREDIENTS**

THE FENTOX PROCESS COMBINES OXIDATION AND FLOCCULATION IN AN EXTREMELY EFFICIENT WAY.

In recent years, limits for discharging contaminants into rivers and lakes have been tightened significantly across the globe. Special attention is currently paid to hazardous single compounds that resist biodegradation; among them pesticides, pharmaceuticals, or other persistent compounds. Moreover, cyanide and non-biodegradable phosphonic acids are in the focus of the authorities.

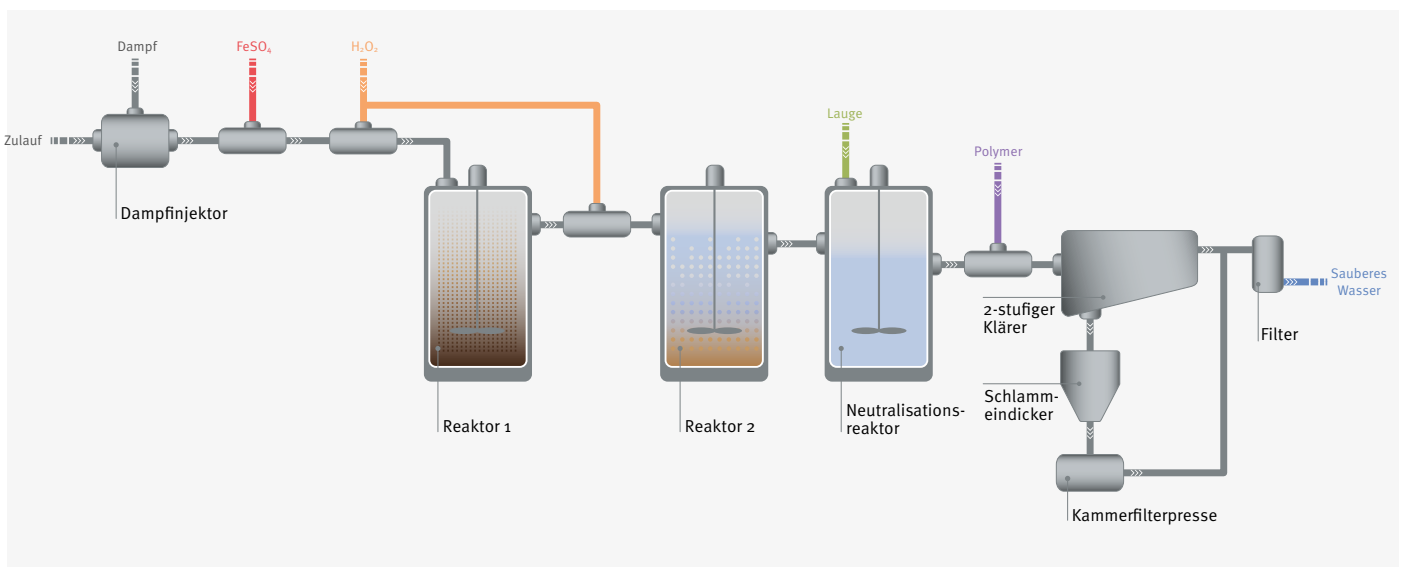
The Fentox process

EISENMANN has developed the Fentox process, following the Fenton reaction. Here, iron salts and hydrogen peroxide react at acidic conditions producing OH radicals. These exhibit a strong oxidation potential and react with the harmful water ingredients. The following figure shows the process. After the removal of bulk particles, the acidic iron salts are added and the water diverted in a two-stage reactor cascade. Here, peroxide is dosed

carefully, keeping the consumption at a low level. The organical matrix is changed, biodegradable and can be precipitated. During neutralization, about 50% of the removed organic load is precipitated with the formed iron sludge, keeping operation costs at a minimum.

A wide range of applications

In many cases, the combination of chemical-physical treatment with biological treatment does not sufficiently reduce critical compounds. Then, EISENMANN tries to figure out the crucial streams comprising the highest loads of the critical water ingredient. These streams will then be treated by Fentox. In most of the cases, a transformation of the persistent compounds resulted in a change of the molecule properties, increasing biodegradability or allowing precipitation.



The Fentox process overview



FENTOX

WET CHEMICAL OXIDATION OF CRITICAL WASTE WATER INGREDIENTS

We have tailored different solutions depending on the application

Fentox OCR (Organic Carbon Removal) aims at the increase of biodegradability of organic compounds. Typical applications are in the field of pesticides or hazardous chemicals production. Fentox PRU (Phosphorus Removal Unit) aims at the oxidation of highly persistent phosphonic acids into phosphate that can be precipitated. Fentox CRU (Cyanide Removal Unit) aims at the oxidation of highly toxic cyanide in a continuous system with on site analysis.

Laboratory results confirm the efficacy of the Fentox process

In EISENMANNs laboratories in Holzgerlingen, the process is tested with real waste water samples. A container based mobile unit can confirm the upscale even at difficult conditions on site.

Advantages at a glance

- Much more cost-efficient than waste water incineration
- Very effective in cases where a biological treatment alone is insufficient
- Effective reduction of COD and AOX up to 90%
- Easily combined with physical/chemical precipitation or biological treatment
- Oxidation of toxic substances to below the detection limit
- Worldwide customer references underscore EISENMANNs deep process skills



Plant for pesticide treatment

EISENMANN

Environmental Technology

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