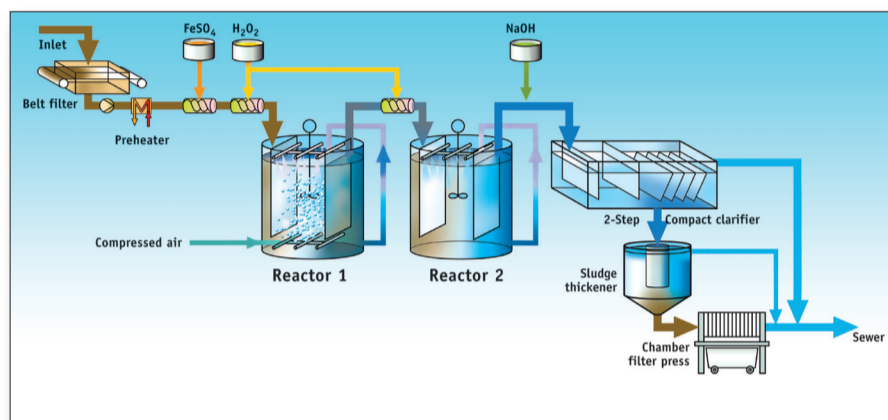


# Problem-Solver Oxidative Waste Water Treatment

## With the FENTOX® process, Toxic Waste Waters are Rendered Biodegradable



Authorities impose strict requirements for the biodegradability of unwanted substances in water. This applies for the chemical oxygen demand (COD) in particular. At the same time, industrial waste water, for instance from chemical, pharmaceutical or cosmetics production, often has such a high concentration of toxic organic substances that their degradation is not possible in a biological sewage treatment plant. Also, high concentrations of salt, high temperatures or high variabilities in waste water flow can make the biological degradation of organic compounds difficult. In such cases, the necessary reduction of the COD can only be achieved by chemical oxidation, usually with ozone, UV light, hydrogen peroxide or corresponding combinations. All these methods, however, are associated with very high investment and operating costs and are comparatively inflexible. At the same time the operation costs are high due to high consumption of chemicals and electricity.

Therefore, **Eisenmann** has developed a new process based on the Fenton reagent. The patented FENTOX® process is based on the oxidation of organic substances in water with a mixture of hydrogen peroxide and iron II salts acting as a catalyst. Thanks to the hydroxyl radicals created during the reaction, problematic or bacteria-toxic pollutants can be detoxified, rendered biodegradable or completely oxidised before being fed into municipal sewage treatment plants or public water bodies. The chosen multiple-step process as a reactor cascade is more economical and practical than previous one-step solutions. The low oxidation agent consumption, which can be precisely adjusted to the individual case, and the significantly reduced creation of sludge make the tried and tested multiple-step procedure as interesting as do the low investment costs, minimal space requirements and easy upgrading.

The FENTOX® process is mainly used as a waste water pre-treatment step for problematic waste water from all kind of chemical production processes, such as the pre-treatment of toxic waste water from the pesticide production of a global chemical group. From four lines, with 8,000 production hours per year, some 2.5 m<sup>3</sup> of waste water are created hourly whose COD content is up to 40,000 mg per liter. In the multiple-step FENTOX® process, toxicity is eliminated and thus biodegradability ensured. This allows the safe feeding into the in-house biological sewage treatment system. Also tried and tested is the process for the COD reduction in landfill leachate before entering a biological treatment, as required by the local administration. The specialists from Eisenmann have a wide experience in the field of oxidation. If necessary, laboratory scale experiments are carried out. Combining experience and experimental results, an upscale is possible. Thus, investment and operation costs of the advanced FENTOX® process can be shown and compared with existing common systems.

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