



## ENVIRONMENTAL TECHNOLOGY SOLUTIONS FOR THE FOOD AND BEVERAGE INDUSTRY

### Background

The food and beverage industry is characterized by high water consumption and strict feed water quality standards. Waste waters are usually easily biodegradable, but contain high levels of organic pollution as well as nitrogen and phosphorus. Water composition can vary considerably due to production cycles and seasonal operation. High levels of suspended solids and salts can cause treatment problems.

Odor production is another important topic in the food industry. Malodors occur for example in meat and fish processing, in rendering plants and in flavor and chocolate production.

### Water purification

Feed water quality has to be consistently high since water source and composition can have a strong influence on taste and quality of the product, for example in brewing. Eisenmann offers all the required technologies for water purification, such as sand or activated carbon filtration, aeration, coagulation, ion exchange, membrane filtration and disinfection.



Rinse water recycling system with a capacity of 25 m<sup>3</sup>/h.

### Waste water treatment

Eisenmann designs and builds made-to-measure waste water treatment plants. We offer the complete range of processes including mechanical, physical-chemical and biological treatment as well as polishing.

Waste water treatment in the food industry typically consists of a pre-treatment stage to remove suspended solids and fats, followed by biological treatment to remove organic pollution and nitrogen. In many cases, phosphorus has to be removed by precipitation.

Biological waste water treatment can be divided in aerobic and anaerobic processes. Aerobic treatment is required if low effluent limit values have to be complied with (e.g. NOM-001). However, it has disadvantages such as high energy consumption for aeration, high waste sludge production (i.e. high disposal costs) and large reactor volumes.

Anaerobic treatment is an excellent choice for highly polluted waste water, because it does not require aeration and the produced biogas can be used for electricity and heat production in a CHP (combined heat and power) plant.

Eisenmann employs an efficient, high-loaded reactor for anaerobic waste water treatment. This reactor has proven its reliability in a wide range of applications such as breweries, fish and meat processing and yeast production.

### Advantages of anaerobic treatment

- Less energy consumption (-1 kWh/kg COD)
- Energy production: biogas (1,3 kWh/kg COD)
- Less waste sludge (80-90% reduction)
- Less reactor volume (70-90% reduction)
- Robust and stable process

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### Water recycling

Instead of discharging treated water, it can also be reused, for example as make-up water for boilers and cooling towers, as process water for cleaning or as utility water for irrigation. Water recycling reduces water supply costs and increases independence from water quality and quantity fluctuations.

### Exhaust air purification

Some food processing steps result in exhaust air streams with very strong and unpleasant odors. Thermal oxidation is the most reliable technology to remove these odors.



*Regenerative thermal oxidation (RTO) with rotating distributor to minimize pressure fluctuations.*

Eisenmann offers recuperative and regenerative thermal oxidation plants (TO and RTO) as well as adsorption processes (ADR).

Our RTO plants have the fewest moving parts and the highest reliability in the industry. Due to efficient heat recovery from the clean gas, energy demand is minimal.

### Benefits

Exact control of feed water is a pre-requisite for high-quality food production. Waste water treatment is equally important, not only because of legal limit values, but also because of its energy production potential (biogas).

Eisenmann offers you numerous advantages:

- State-of-the-art water purification plants ensure excellent water quality for production
- Our waste water treatment plants are clean, safe and reliable due to their fully automated operation
- Anaerobic technology reduces costs for biological treatment by about 50% and produces additional energy (biogas)
- Our regenerative thermal oxidation plants (RTO) contain very few moving parts, resulting in reliable operation and low pressure loss
- Tailored solution based on laboratory and pilot plants in our R&D Center

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