

► Wastewater

In the vast majority of cases, communal wastewater and water from communal clarification plants is only slightly corrosive, so that unalloyed pump materials are almost always adequate.

But wastewater and leachate from landfills are a completely different story. Modern landfills have a base cover and facilities for capturing the water that leaks from the landfill, which is known as leachate.

The leachate comes from precipitation, reaction water, and residual moisture from the refuse. It contains both organic and inorganic substances picked up from the garbage deposited in the landfill.

This contaminated water must be treated before it can enter a body of water.

Landfill leachate usually contains chlorides and fluorides. Traces of hydrogen sulfide and halogenated hydrocarbons may also be present.

These components make the leachate very aggressive, something that must be considered when choosing a pump material.

Duplex materials like 1.4517 are usually required when pumping cold landfill leachate. Austenitic cast steel 1.4408 is also sufficient in some cases. Copper alloys are generally not appropriate.

Duplex cast steel 1.4517 is adequate in most cases for evaporative concentration of leachate.

Under more difficult conditions (higher chloride content and low pH), super austenite 1.4529 or even nickel-based materials are advisable, depending on the composition.

Industrial wastewater usually requires special treatment before it can enter public clarification plants or move directly into bodies of water.

However, some plants reuse treated wastewater as internal service water.

The composition of industrial wastewater varies greatly depending on its origin and the plant that generates it. That's why materials must be selected on a case-by-case basis.

Companies in the food industry generate a large amount of industrial wastewater, including breweries, soft drink plants, distilleries, and dairies.

In most cases, these businesses are connected to public clarification plants, since their wastewater is usually easily biodegradable.

Wastewater from metal processing and extraction plants, surface treatment plants, and the chemical industry are much more aggressive.

Acidic components eliminate the possibility of using unalloyed materials.

Chloride or small amounts of hydrochloric acid cause pitting corrosion, crevice corrosion, and sometimes even stress corrosion cracking in stainless steels.

These types of wastewater commonly include compounds with heavy metals, organic solvents, and other poisonous compounds.

They also include leachate from landfills as well as the wastewater from burning trash and flue-gas desulfurization.

Materials must be chosen with special care when wastewater comes from completely different areas of a plant and its composition varies greatly for this reason.

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Not all of these types of wastewater can be disposed at communal clarification plants, so they must be treated separately instead. Treatment usually occurs by means of evaporative concentration.

The wastewater is evaporated off in several stages; in the final stage, the contents fall out in the form of granulate.

These evaporation plants come in a variety of types and configurations.

The materials for the Centrifugal Pumps and Propeller Pumps used in these plants will depend on the type of wastewater that is being processed.

Various grades of duplex steel and duplex cast steel like 1.4517 are the minimum requirements, but even these often will not fulfill the requirements.

In most cases, only super austenites like 1.4529 or even nickel-based alloys will be adequate to meet the corrosion requirements of these plants.

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