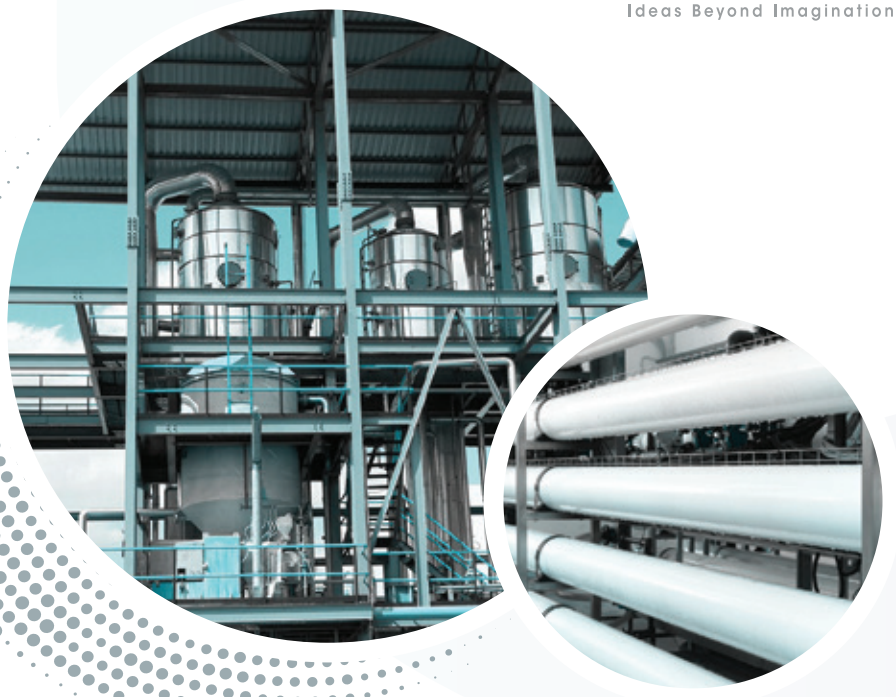
GLORINDA
Ideas Beyond Imagination



About ZLD

One of the most powerful methods for treating industrial wastewater, often considered the final stage, is the Zero Liquid Discharge (ZLD) method. In the ZLD process, state-of-the-art engineering and design are utilized to design a process that separates contaminants present in the wastewater to nearly 100%. In other words, the aim of this process is to increase water recovery with minimal waste. In general, the ZLD process significantly contributes to addressing the issue of diminishing water resources by maximizing water recovery that can be reused for process or can meet environmental standards to be released.

The key advantages of this technology include:

- **Complete treatment of factory wastewater, ensuring compliance with environmental regulations and producing clean, transparent, high-quality water, with a recovery rate of 95–98%.**
- **Depending on the type of incoming wastewater, the solid output of the system can be in the form of chemical fertilizer, animal feed, or salt.**
- **The system's cleaning process is automatic, utilizing chemical cleaning (CIP) and rinsing without the need for operator intervention.**
- **The system operates 24/7 due to its automatic nature, eliminating the need for operator involvement in day-to-day processes.**

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ZLD System
Applications

The ZLD technology is designed and customized according to customer needs, and it can be employed in treating wastewater across various industries, including:

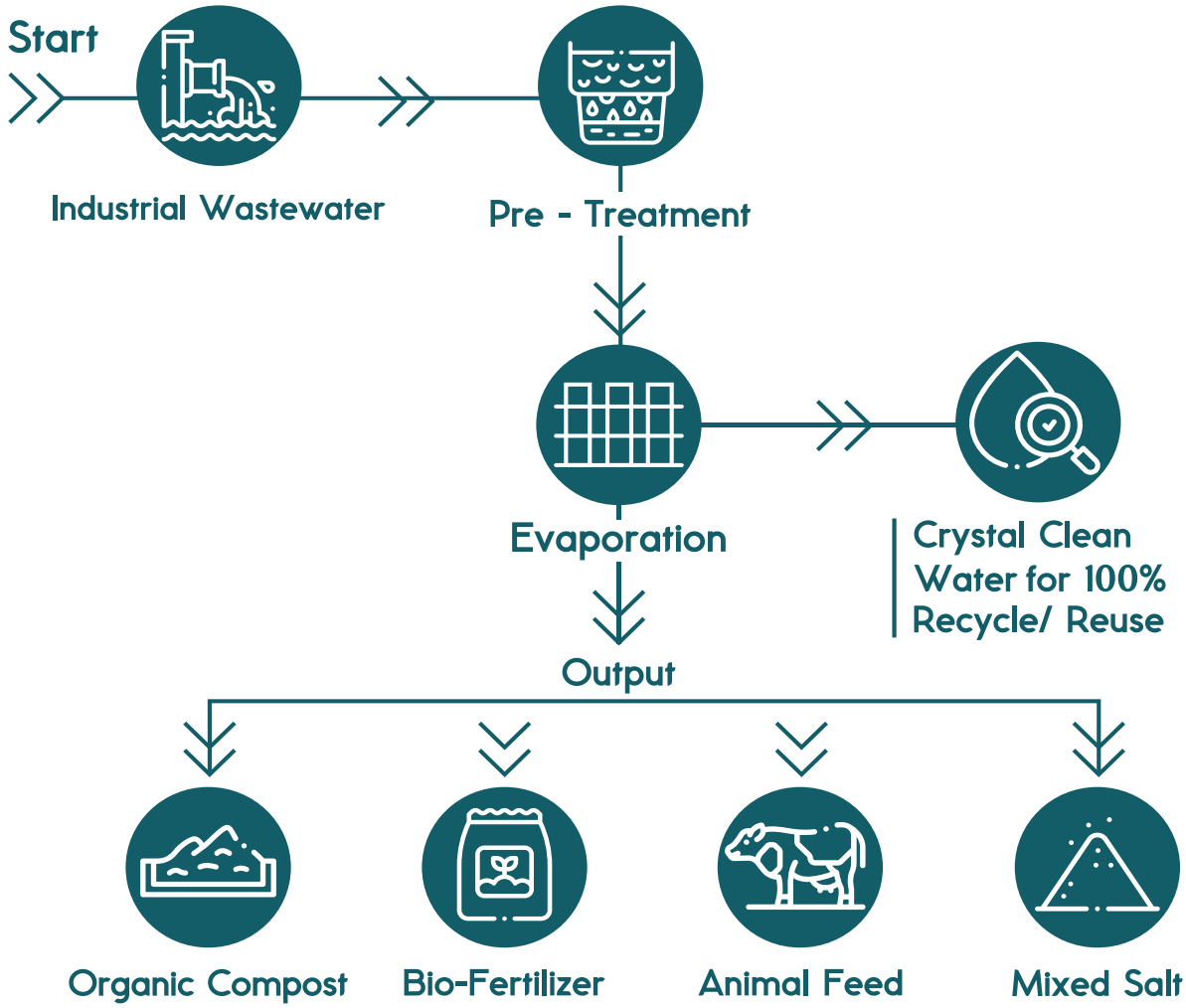
- **Oil, Gas, and Petrochemical Industries**
- **Power Generation Industries**
- **Food and Livestock Industries**
- **Cement Industries**
- **Steel Industries**
- **Rubber Manufacturing**
- **Consumer Goods Manufacturing (CGMF)**
- **Pharmaceutical Industries**
- **Mining Industries**
- **Textile Industries**
- **Wood and Paper Industries**
- **Municipal Wastewater Treatment**
- **Electronic Industries**
- **Palm Oil**
- **Concentration of RO reject**
- **Concentration and disposal of high COD streams**
- **Recovery of dissolved solids**
- **Solvent Recovery**

How Does ZLD Technology Work?

The operational stages of a ZLD system are designed based on factors such as:

- **Volume of contaminants present in wastewater**
- **Desired wastewater flow rate**
- **Specific types of contaminants**

In other words, it is not possible to precisely determine the operational steps of the ZLD process without sufficient information about the characteristics of the wastewater. Initially, it is essential to identify the types of contaminants involved and then, based on this information, implement the appropriate ZLD process roadmap for that particular wastewater. Generally, the ZLD process can be illustrated by the following diagram.



Final System Output:

The solid output of the system can be managed in various ways:

Conversion to Organic Compost: Suitable for production lines with organic materials, where the solid output is transformed into compost by reducing its moisture content to 30%.

Incineration: With a concentration of approximately 70%, the solid output can be incinerated using backup fuels like wood waste or bagasse, serving as an energy source.

Use as Organic Fertilizer/Animal Feed: Dry non-hygroscopic powder with a concentration of 98% can be utilized as organic fertilizer or animal feed, ideal for production lines containing organic materials.

Salt Crystallization: Valuable salts in the effluent can be separated into powder form through crystallization, suitable for reintroduction into processes or sale as a product.

Disposal: If other methods are impractical, the solid output can be disposed of through moisture removal, following industrial guidelines such as complete drying or landfill disposal.

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Our Services

Glorinda takes a comprehensive approach to managing Zero Liquid Discharge (ZLD) projects, overseeing the entire process from pre-treatment to the final stages.
Pre-treatment is a crucial stage, especially for treating complex wastewater. When executed correctly, it can significantly reduce the size and cost of evaporation and crystallization units, which are the most expensive parts of a ZLD system. Glorinda utilizes advanced technologies such as CCRO and HERO in designing the pretreatment stage. This allows us to implement ZLD systems for a wide range of industries, regardless of wastewater complexity, at an affordable price. This innovative approach sets us apart from other ZLD system providers.

All of Glorinda's turnkey projects are supervised by skilled professionals, ensuring a seamless process from design to commissioning. Our mission is to provide efficient engineering services, strategically minimizing operational costs for clients through optimal investments. Furthermore, Glorinda's experts conduct meticulous analyses of each client's needs and the unique characteristics of fluids, providing fully personalized solutions tailored to specific industrial activities.

Our ZLD Services Include:

- **Pre-feasibility studies and Consultation**
- **Basic Engineering**
- **Detailed Engineering**
- **Procurement and Integration**
- **Installation and start-up**
- **Training operators**
- **Aftersales services**