29. Degumming Tank

1. Function and Application

The de-gumming tank is a critical piece of equipment in the oil refining process, primarily used to remove colloidal impurities from crude oil. These impurities primarily include phospholipids, proteins, and mucilage, which can adversely affect the quality and storage stability of the oil and also have a negative impact on subsequent alkali refining and deacidification processes. The degumming tank separates these colloidal impurities from the oil through a specific process, thereby improving the purity and stability of the oil.

2. Working Principle

The working principle of the degumming tank is based on the hydrophilic nature of colloidal impurities. These impurities absorb water and coagulate when exposed to water or specific electrolyte solutions, thereby separating from the oil. Common degumming methods include hydration degumming and acid refining degumming.

1. Hydration Degumming

Hydration degumming utilizes the hydrophilic nature of colloidal impurities such as phospholipids. A certain amount of hot water, NaCl, phosphoric acid, and other electrolyte solutions are added to hot oil under stirring, causing the colloidal impurities to absorb water, aggregate into flocculent particles, and settle, thereby separating from the oil. This process is typically carried out in a degumming tank, where parameters such as temperature, stirring speed, and water addition are controlled to achieve efficient degumming results.

2. Acid Refining Degumming

Acid refining degumming utilizes inorganic acids or organic acids such as hydrochloric acid or phosphoric acid to remove phospholipid colloids from oils more thoroughly, even effectively removing non-hydratable colloids. This method is suitable for refining processes with high requirements for oil quality.

III. Technical Features

1. Efficient Degumming

The degumming tank precisely controls parameters such as temperature, stirring speed, and water addition to ensure that colloidal impurities can fully absorb water, coagulate, and settle, thereby achieving efficient degumming.

2. Multi-functional Integration

The degumming tank not only performs degumming but can also be integrated with the neutralization process, enabling multi-functional integrated operations. This design reduces equipment footprint and enhances production efficiency.

3. Automated Control

Modern degumming tanks are typically equipped with automated control systems that monitor and adjust operational parameters in real-time, ensuring the stability and consistency of the degumming process.

IV. Application Areas

De-gumming tanks are widely used in the edible oil refining industry to process various crude oils, such as soybean oil, rapeseed oil, and sunflower seed oil. Additionally, they can be used for refining industrial oils to remove impurities and harmful substances.

V. Advantages

1. Improving Oil Quality

By removing colloidal impurities, the degumming tank significantly improves the purity and stability of oils, ensuring compliance with national standards.

2. Energy Saving and Cost Reduction

The degumming tank's efficient degumming process reduces energy consumption and material usage in subsequent processes.

3. Environmental Protection

The use of the degumming tank reduces impurity content in oils, minimizing environmental pollution.

4. Stable Operation

The degumming tank features a rational structural design, ensuring stable operation and low maintenance costs.

6. Summary

The degumming tank is an indispensable piece of equipment in the oil refining process. Through its efficient degumming process, it significantly improves the quality and stability of oils. Its multifunctional integrated design and automated control system have made it widely adopted in the modern oil refining industry.