

POLYETHYLENE WAX PROCESSING PLANT



In Association with SVCH-Technologii, Moscow (Russia)

ISO 9001:2015 | ISO 14001:2015 | ISO 45001:2018

ABOUT US

KERONE is now renowned for serving the specialized needs of customers with the best quality and economical process of Heating /cooling and drying products, manufactured in a high-quality environment by a trained and qualified workforce (special purpose machinery)

-  48+ Years Manufacturing Excellence
-  Great Sale Support
-  Highly Customized Product
-  Adherence to Standards
-  Sound Infrastructure
-  Team of experts Delivering Quality
-  Timely Delivery
-  Cost Effective Solutions



KERONE is a pioneer in application and implementation engineering with its vast experience and team of professionals.



KERONE is devoteded to serve the industry to optimize its operations both economically and environmentally with its specialized heating and drying solutions.



KERONE is having immense expertise in manufacturing and implementing various types of engineering solutions.



KERONE is possessing employee strength of more than 280+ experts continuously putting efforts for happy industrial engineering solutions.

WHY CHOOSE US

With decades of expertise, cutting-edge technology, and a customer-centric approach, Kerone Engineering offers tailor-made heating solutions that prioritize quality, flexibility, and cost-effectiveness. Benefit from our commitment to excellence, post-sales support, and innovative solutions for your unique heating needs. Choose Kerone Engineering for reliability, performance, and unmatched value.

MISSION

- ✓ To enhance the value of customer operation through our customer need centric engineering solution
- ✓ We are committed to provide our customers, unique and best in class products in Industrial heating drying and cooling segment with strategic tie-up for the technical know-how with renowned leader in the industry specific segment

VISION

- ✓ Turn into a world leader in providing specialized, top-notch quality and ecological industrial heating, cooling, and drying solutions across the globe.
- ✓ To attain global recognition as the best of quality and environment-friendly engineering solution company.

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Enhance the value of customer operation through our customer need centric engineering solution.

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Introduction

Polyethylene wax processing plant is a specialized industrial facility designed to produce and refine polyethylene wax, a type of synthetic wax derived from polyethylene, which is a widely used polymer material.

Polyethylene wax is a versatile product with various applications across industries such as plastics, coatings, adhesives, rubber, and printing inks.

Its unique properties make it an essential additive for improving the performance and processing characteristics of various products.

Polyethylene wax is a synthetic wax obtained by the polymerization of ethylene gas. It is a low molecular weight polymer that can exist in various forms, including solid flakes, powders, and pastilles.

The chemical composition of polyethylene wax determines its melting point, hardness, and other physical properties, making it suitable for diverse applications.



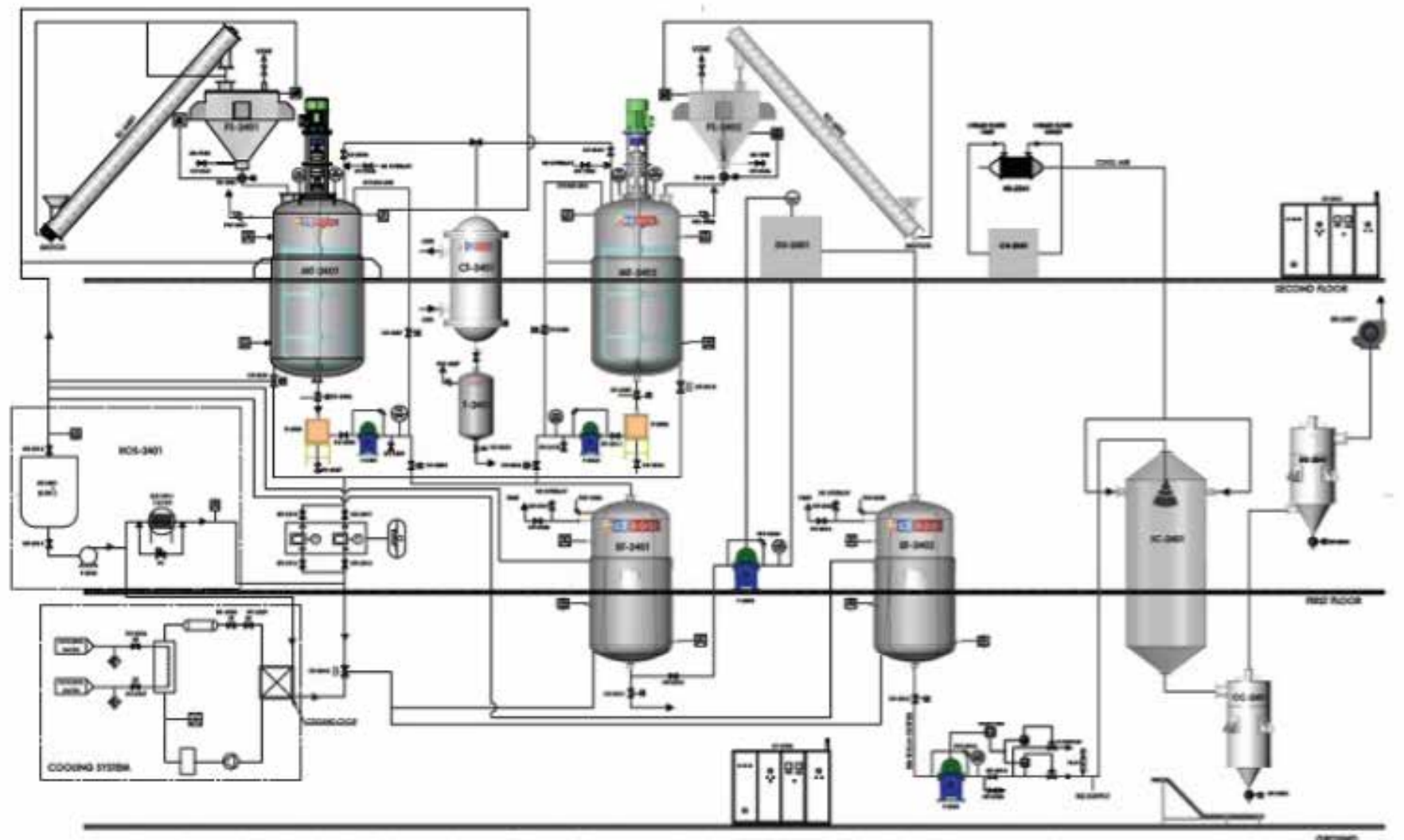
What is Polyethylene Wax?

- | Polyethylene wax is a synthetic wax derived from the polymerization of ethylene gas. It is a low molecular weight polymer with a variety of forms, such as solid flakes, powders, and pastilles. The chemical composition of polyethylene wax influences its physical properties, including melting point and hardness, making it suitable for diverse applications.
- | Polyethylene wax is considered relatively eco-friendly. It is non-toxic and non-hazardous when used and handled appropriately. Furthermore, its production process typically involves less energy consumption compared to other types of wax.
- | Polyethylene wax is a valuable additive that contributes to the improvement of various products across multiple industries. As industries continue to advance, polyethylene wax will remain a crucial component, enabling the development of high-quality and high-performance products.
- | The processed to form polyethylene wax through methods like oxidative degradation or thermal cracking. To ensure high quality, the wax undergoes refining and purification, involving techniques like filtration, distillation, and solvent extraction.

Production

Ethylene Polymerization

The production process begins with the polymerization of ethylene gas, which is a simple hydrocarbon with the molecular formula C_2H_4 . Ethylene is obtained from various sources, including crude oil refining and natural gas processing. It is fed into a reactor where it undergoes polymerization, converting the gaseous ethylene molecules into a low molecular weight polyethylene.



Wax Formation

Oxidative Degradation

This method involves subjecting the polyethylene to controlled oxidation, typically using air or oxygen at elevated temperatures. The oxidative degradation breaks down the long polyethylene chains into shorter ones, resulting in lower molecular weight and the formation of polyethylene wax.

Thermal Cracking

In thermal cracking, the polyethylene is heated to high temperatures in the absence of oxygen. The heat causes the long polyethylene chains to break apart into smaller molecules, leading to the formation of polyethylene wax.

Refining and Purification

The raw polyethylene wax obtained from the above processes may contain impurities and undesired components. To ensure the production of high-quality polyethylene wax, the material undergoes refining and purification steps.

Distillation

Fractional distillation is employed to separate the different components based on their boiling points. This process helps eliminate unwanted substances and obtain wax with the desired properties.

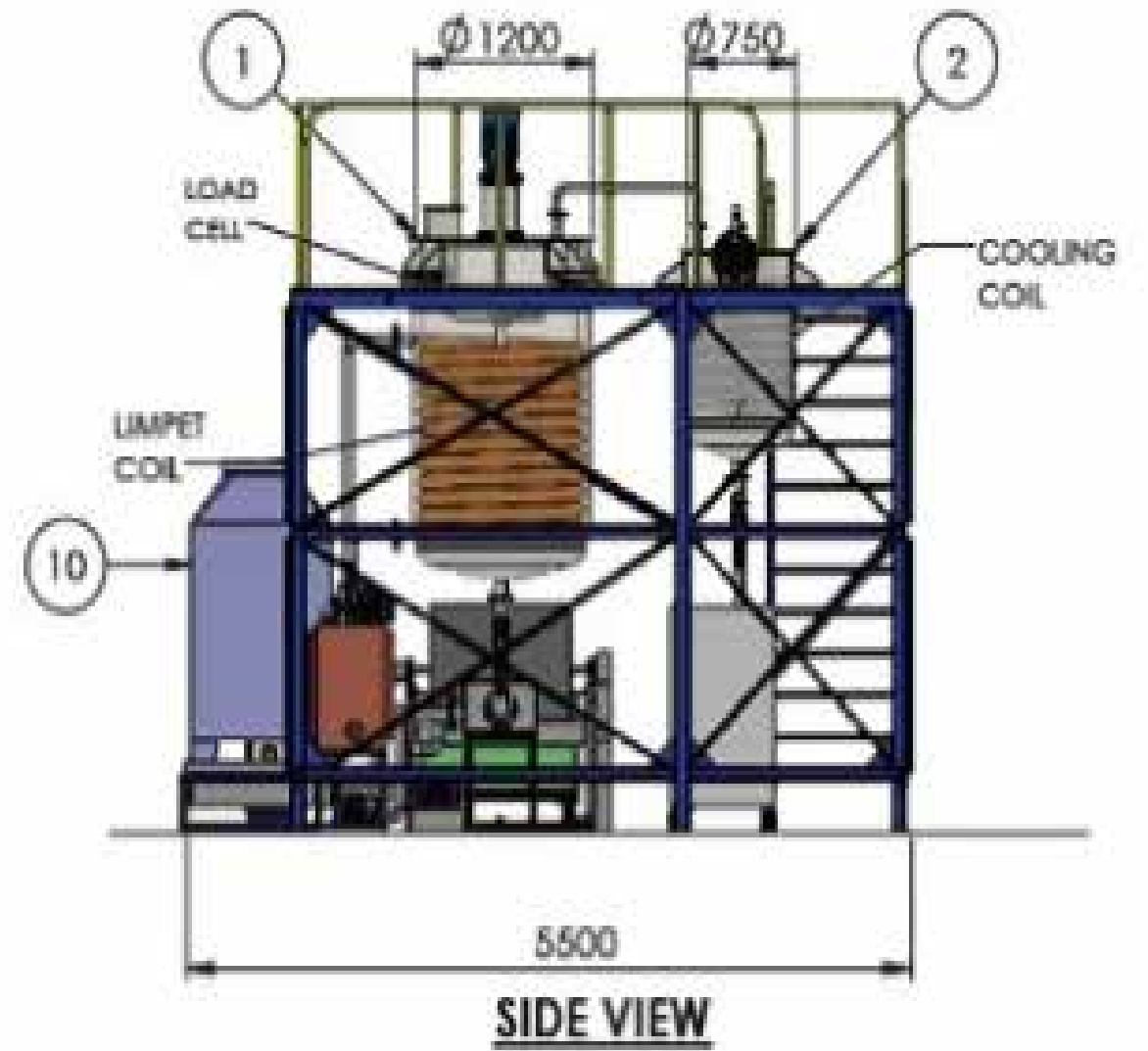
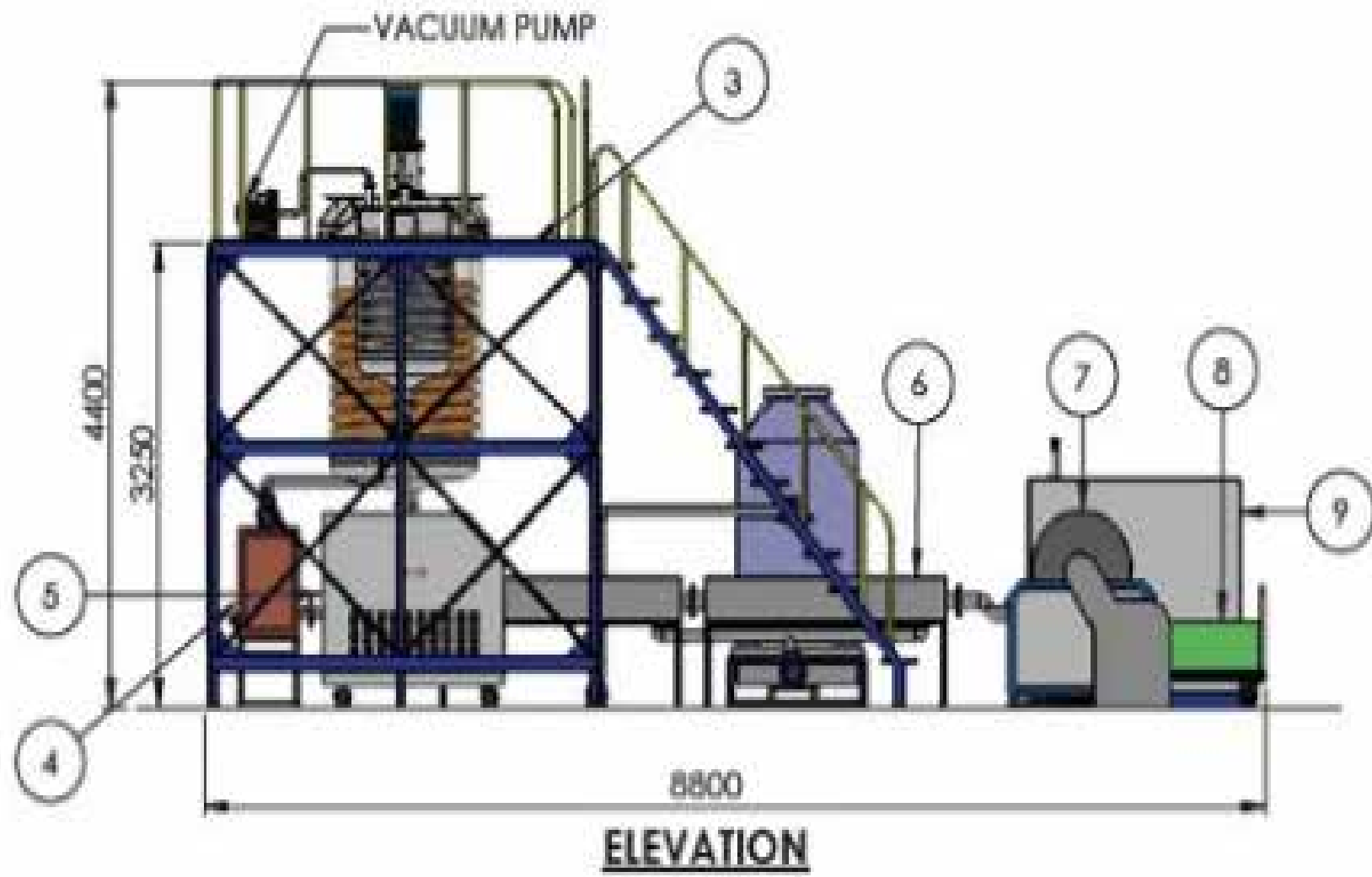
Filtration

The wax is passed through various filters to remove solid particles and larger impurities.

Solvent Extraction

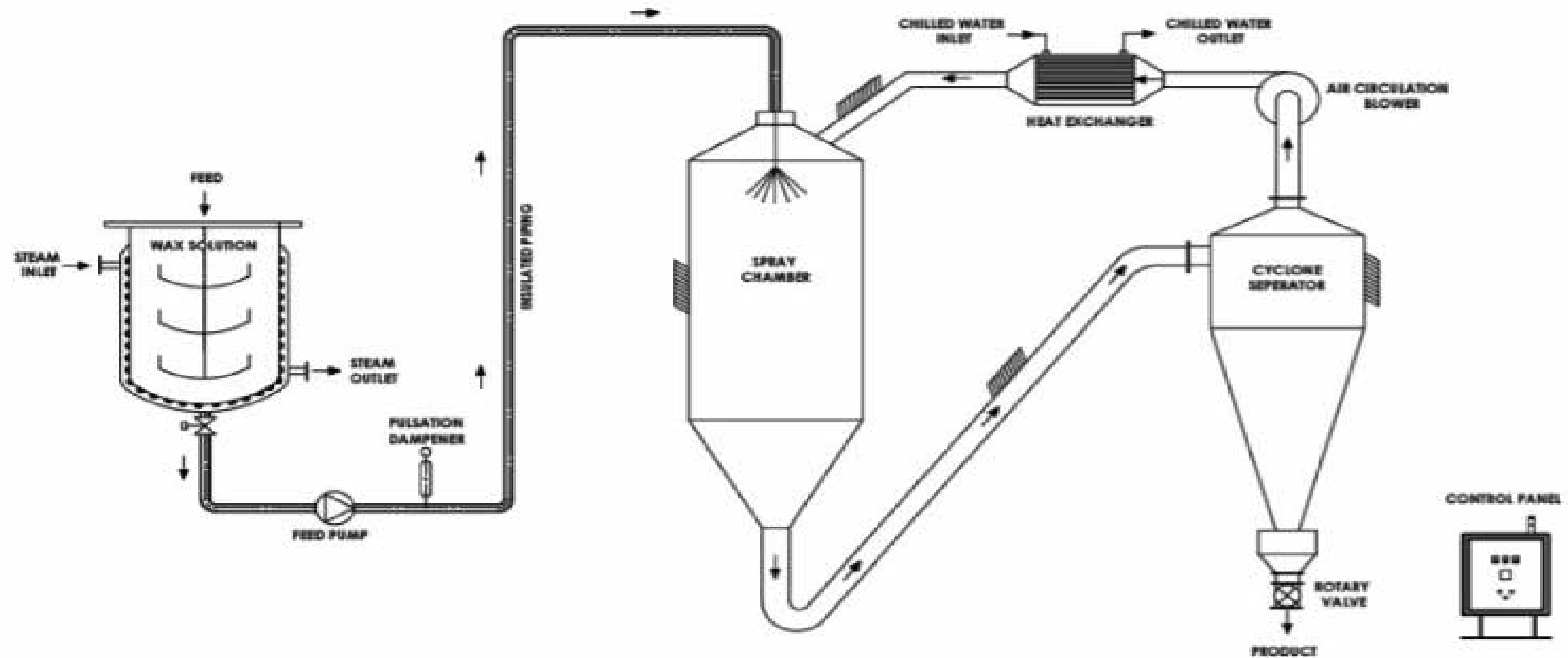
Solvent extraction can be utilized to remove specific impurities or to further refine the wax.

Wax Processing Plant



Types of Polyethylene Wax

- Low-Density Polyethylene (LDPE) Wax
- High-Density Polyethylene (HDPE) Wax
- Emulsified Polyethylene Wax
- Oxidized Polyethylene Wax
- Micronized Polyethylene Wax
- Synthetic Fischer-Tropsch Polyethylene Wax



Types of Polyethylene Wax

Low-Density Polyethylene (LDPE) Wax

LDPE wax is derived from low-density polyethylene, which has a relatively low molecular weight. It is commonly used as a lubricant and processing aid in the plastics industry. LDPE wax improves the flow of molten plastic during extrusion and molding processes, leading to better surface finish and reduced energy consumption. It is also used in coatings, inks, and adhesives to enhance properties like scratch resistance and gloss.

High-Density Polyethylene (HDPE) Wax

HDPE wax is produced from high-density polyethylene, characterized by a higher molecular weight compared to LDPE wax. It offers excellent lubrication and processing benefits in plastics, rubber, and adhesive applications. HDPE wax is often used as an external lubricant in PVC processing, improving the flow properties of the polymer during extrusion and injection molding. It also imparts surface smoothness and gloss to PVC products.

Types of Polyethylene Wax

Oxidized Polyethylene Wax

Oxidized polyethylene wax is created by subjecting regular polyethylene wax to controlled oxidative processes. This treatment introduces polar functional groups, such as carbonyl and carboxyl, onto the wax molecules, making it more compatible with polar materials like coatings and printing inks. Oxidized polyethylene wax improves scratch and abrasion resistance and enhances adhesion properties in coatings and inks.

Micronized Polyethylene Wax

Micronized polyethylene wax refers to polyethylene wax that has been ground into fine particles with a specific particle size distribution. The micronization process increases the surface area of the wax particles, which improves its dispersion and incorporation into various systems. This type of polyethylene wax is commonly used in powder coatings, inks, and toners.

Types of Polyethylene Wax

Emulsified Polyethylene Wax

Emulsified polyethylene wax is produced by emulsifying polyethylene wax particles in water with the help of emulsifiers. This type of wax is used in water-based formulations, such as water-based coatings and adhesives. The emulsification process allows the polyethylene wax to disperse uniformly in water, providing the desired properties without the need for organic solvents.

Synthetic Fischer-Tropsch Polyethylene Wax

Fischer-Tropsch polyethylene wax is derived from natural gas through the Fischer-Tropsch process, which converts syngas (a mixture of hydrogen and carbon monoxide) into hydrocarbons. The resulting polyethylene wax has a narrow molecular weight distribution, high melting point, and excellent hardness. It is used in various applications, including PVC processing, coatings, and printing inks.

Reactor and Polymerization

Reactor in Polyethylene Wax Production

The reactor is essential in the chemical industry, particularly for ethylene polymerization. In polyethylene wax production, it provides a controlled environment to produce low molecular weight polyethylene with desired properties.

Polymerization Process

Polymerization is a chemical process in which small molecules, called monomers, combine to form larger molecules known as polymers. In the case of polyethylene wax production, the polymerization process involves the transformation of ethylene gas (C_2H_4) into polyethylene.

Initiation

Polymerization begins with a catalyst that accelerates the reaction without being consumed. Catalysts like Ziegler-Natta or metallocene activate ethylene, shaping the molecular structure and properties of polyethylene.

Propagation

Once the ethylene molecules are activated by the catalyst, they start reacting with each other. The activated ethylene monomers undergo a series of chain-growth reactions, where each monomer attaches to the growing polymer chain, extending its length. As this process continues, a long-chain polyethylene molecule is formed.

Reactor and Polymerization

Termination

The polymerization process is terminated when there are no more available monomers or when the chain-growth reaction is halted. Termination occurs when the chain ends are deactivated, preventing further monomer attachment. This results in the formation of low molecular weight polyethylene.

Polyethylene Wax Formation

Low molecular weight polyethylene is further processed into polyethylene wax through methods like oxidative degradation or thermal cracking, breaking long chains into shorter, wax-like molecules

Application

- Hot melt (raising the melting point of adhesives without raising the mixture's viscosity and enhancing the way hot melts behave at high temperatures)
- Distribution of loads and colors (master batch)
- Coating paper to provide high-quality surfaces and increase gloss and flexibility.
- Emulsions. ● Textile. ● Polishes.
- Process aids that improve the process ability of, for example, rubber and PVC mixes.
- Producing toners and inks.
- Paraffin mixture additives.
- Cable filling products.
- Asphalt-specific additives.

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