

Working Principle of a Twin-Screw Extruder

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In the rapidly developing modern food industry, twin-screw extruders, as efficient and versatile processing equipment, are increasingly demonstrating their indispensable importance. Twin-screw extrusion technology has not only revolutionized food production processes but has also significantly promoted innovation and progress within the food industry. The working principle of a twin-screw extruder primarily involves the conveying, mixing, shearing, heating, melting, and puffing of materials within the twin-screw extruder chamber.



The following is a detailed explanation of its working principle:

1. Material Conveying: Raw materials enter the twin-screw extruder chamber through a feeding device. The rotation of the twin screws creates friction and shear forces between the screws and barrel, propelling the material forward.

2. **Mixing and Shearing:** During the conveying process, the intermeshing and misalignment of the twin screws subject the material to intense shearing and stirring within the extruder chamber, achieving uniform mixing. Furthermore, the shearing action disrupts the material's cellular structure, making it more susceptible to expansion and modification.

3. **Heating and Melting:** The material in the extrusion chamber is heated by friction between the screw and barrel, as well as by external heating devices, gradually increasing its temperature. When the material reaches a certain temperature, its starch, protein, and other components begin to melt, forming a molten mass.

4. **Expansion:** When the molten material is extruded through the die, the sudden change in pressure causes the molten mass to expand rapidly and form a porous structure, thus achieving the expansion effect. During the expansion process, moisture, gas, and other components in the material are rapidly released, resulting in a loose and porous product.

The twin-screw extruder consists of a power system, a power distribution system (gearbox), a heating system, an extrusion system, a rotary cutting system, and a control system. Its unique twin-screw design enables efficient processing of mixed powdered materials including rice, corn, wheat, oats, buckwheat, grains, potatoes, starch, vegetables, dates, and sea buckthorn.



Shandong Loyal Industrial Co., Ltd. occupies a total area of ??100 mu (approximately 166 acres) and serves over 5,000 customer factories worldwide. Its products are sold to 118 countries and regions, and its team boasts over 30 years of industry experience.

The company adheres to the philosophy that quality equals value and strives to create a bright future with its customers. Focusing on the overarching development strategy of "becoming a leading enterprise in

the industry and creating a global brand," Shandong Loyal Industrial Co., Ltd. will seize opportunities and accelerate its development towards innovative, green, and intelligent manufacturing, striving to create a bright future with its customers.



Reference

The following are five authoritative foreign literature websites in the field

of Industrial food machinery:

1. Food Engineering Magazine

Website: <https://www.foodengineeringmag.com/>

2. Food Processing Magazine

Website: <https://www.foodprocessing.com/>

3. Journal of Food Engineering

Website: <https://www.journals.elsevier.com/journal-of-food-engineering>

4. Food Manufacturing Magazine

Website: <https://www.foodmanufacturing.com/>

5. International Journal of Food Science & Technology

Website: <https://onlinelibrary.wiley.com/>