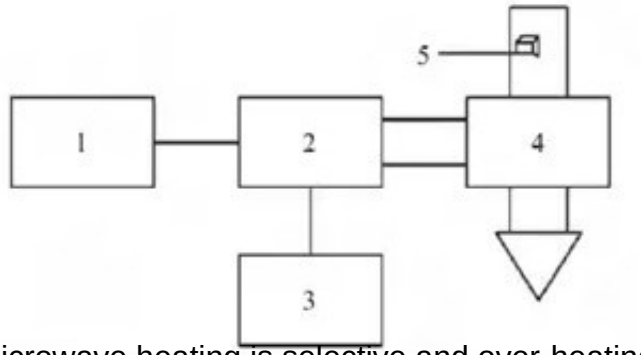
Study on Uniformity of Microwave Drying of Agricultural Products

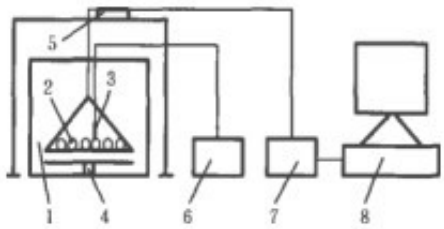
Absrtact: Microwave drying equipment has the characteristics of fast dehydration, high thermal efficiency and easy control, and can keep the pipe nutrient in the material well and has bactericidal effect. However, in the process of microwave drying of agricultural products, Drying Uniformity has always been a bottleneck problem that is difficult to solve.



Microwave heating is selective and over-heating for agricultural products. It is easy to appear some phenomena such as coking of material edges or sharp corners, surface hardening and internalization of products. This paper takes solving the problem of uniformity of microwave drying of agricultural products as an entry point, and makes a comprehensive analysis and summary of the relevant research at home and abroad, so as to provide microwave technology for agricultural production. Application of product drying.

Key words: microwave drying of agricultural products; uniformity

Microwave is a kind of electromagnetic wave. Its wavelength varies from 0.1 M to 1 m. Its frequency range is 300 MHz to 3000GHz. When microwave radiation is applied to wet materials, the orientation of polar molecules will change with the microwave field, because the water in the materials is composed of polar molecules. Through the movement of polar molecules in the materials and the interaction between adjacent molecules, a similar rubbing phenomenon occurs, which makes the water temperature rise and evaporate, and thus dries up. Dry effect.



Generally speaking, microwave can penetrate the material, so its interior is heated at the same time, so that the whole material is heated uniformly and the heating speed is faster. Compared

with the traditional drying method, it is more efficient and easier to control the energy contained in microwave. The material can be heated by coupling the waveguide into the resonator and converting it into an efficient heat source. Its application range is not limited. Often widely used, such as dehydration, drying, sterilization, expansion, extraction and synthesis, with fast drying rate, high thermal efficiency, clean production and other advantages.

In view of these advantages, microwave drying technology has been widely applied to the drying of agricultural products. At present, the main drying equipment for agricultural products are microwave dryer, Cheerwave vacuum dryer, Cheerwave freeze dryer, microwave vacuum freeze dryer and so on.

Although microwave drying has the advantages of fast drying rate and high thermal efficiency, microwave is selective for material heating, poor drying uniformity, easy to overheat material edge or sharp corner partial coking, material surface hardening and internal gelatinization, which is particularly prominent in drying materials with less water content.