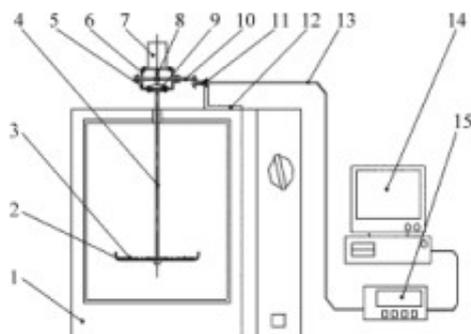




moisture content of germinated brown rice exceeds 30.0% (wet basis), and it should be dried as soon as possible to a moisture content of 15.0% (wet basis) to avoid deterioration of nutrients, deterioration of odor, etc., and to ensure the appearance of germinated brown rice. The color is normal. Microwave drying has the advantages of high efficiency and easy control, but uneven microwave drying is a key issue affecting the drying quality and energy utilization of materials.



The main factors affecting the uniformity of microwave drying are: microwaves are transmitted in such a way that the electric field and the magnetic field are perpendicular to each other. The arrangement of multiple magnetrons in the microwave dryer will cause the electric field to be superimposed, resulting in uneven distribution of electric field on the layer; drying chamber The structure affects the oscillation mode and electric field distribution of the microwave; during the drying process, the dielectric properties of the material change with increasing temperature and water content, resulting in selective microwave heating. The electric field and the uneven heating are present in the microwave dryer, so that the temperature distribution "cold spot" and "hot spot" in the material layer alternately appear, resulting in a large difference in moisture content of the material after drying.

The existing research solves the problem of microwave drying unevenness from two aspects of equipment and process: in the development of microwave drying equipment, optimize the key devices such as magnetron arrangement and drying chamber structure, improve the microwave energy utilization rate and the electromagnetic wave evenly distributed on the material layer. When designing the microwave drying process, according to the microwave drying characteristics of the material, the speed of the material is controlled, the slowing section is added, and the ventilation is introduced to improve the uniformity of temperature and water distribution.

However, in the microwave drying process based on the microwave energy absorption characteristics of the material, the research work lacks systematicity. Therefore, the microwave drying process has problems such as poor adaptability and unstable product quality; in the microwave drying of germinated brown rice, the moisture and temperature uniformity is poor. The problem seriously affects the quality of the product. Due to the lack of research on the theory of microwave energy absorption in germinated brown rice, the basis for solving the problem of microwave drying unevenness of germinated brown rice is insufficient.

In view of the above problems in the microwave drying process and the need to meet the high-quality production of germinated brown rice, the following research contents are proposed:

1) Analysis of the causes of the uniformity of microwave energy distribution on the germinated brown rice material layer in the microwave dryer

2) Study on the effect of ventilation speed on temperature and moisture of germinated brown rice in microwave