

Study on Internal Stress and Quality of Soybean Dried by Microwave

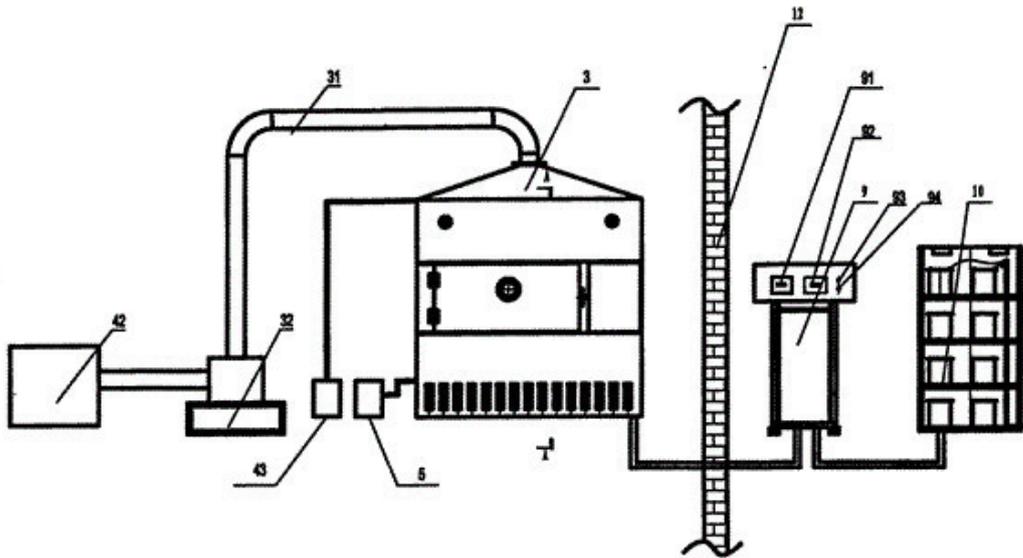
Abstract: In order to solve the problem that [microwave drying equipment](#) is prone to internal overheating and waist quality damage, the moisture content, internal temperature, bursting waist rate and mechanical strength of dry soybean products were studied in a rectangular microwave cavity with microwave absorption efficiency of 41.5%.

The results showed that when the microwave output power density was less than 0.2W/g (effective absorption power density was less than 0.1W/g), the quality of soybean could be guaranteed. The bursting waist rate of soybean could be controlled under the industrial requirement of 5 (2% in this paper); the internal temperature of soybean was lower than the denaturation temperature of protein 60 C, and the extremum pressure of soybean dried products was 101.11N.

Key words: [microwave drying soybean](#), power density, quality, mechanical strength



Soybean is a plant rich in protein, cellulose, B vitamins and cholesterol free. In China, the annual consumption of soybean is 79.5 million tons. At present, China's planting area has a downward trend, from 169.61 million tons in 2010 to 12.2 million tons in 2014, drying is an important link before grain Postharvest storage.



In the process of soybean drying, reducing the cost of drying and improving the quality of drying are important links to compete for the soybean market. At present, the drying methods of soybean include natural drying, hot air drying, desiccant drying, freeze drying, spray drying, ultra drying, microwave drying and so on. Hot air drying is mainly used in foreign countries, while natural air drying is mainly used in our country. It takes a long time and the quality of products can not be guaranteed very well.

Microwave is a kind of penetrating electromagnetic wave with a wavelength of 1 mm~1m and a frequency of 0.3-300 GHz. Microwave heating has the characteristics of fast drying speed, selective heating and avoiding environmental high temperature due to the characteristics of volume heating.

At present, in food heating, microwave is widely used in starch food extrusion drying plus fruit and vegetable dehydration and fresh-keeping processing, meat food ripening and drying processing, food storage and other aspects of microwave drying soybean, in order to speed up the drying speed and improve product quality. The drying time, wet content of soybean, internal temperature of soybean, pressure of soybean and bursting waist rate during microwave drying were studied. The effects of microwave drying conditions on mechanical strength and quality of soybean were investigated.