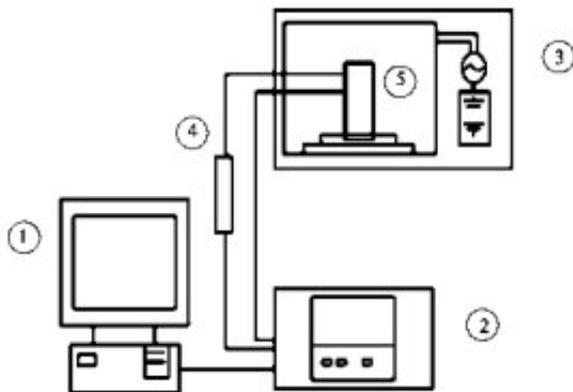


Application of microwave heating in wood processing

Abstract: microwave technology is widely used for its advantages of high efficiency, fast energy saving and so on. Starting with the origin and development of microwave technology and microwave heating, this paper introduces the application of [microwave drying equipment](#) in wood processing.

Key words: microwave; wood drying; wood processing

Microwave is a kind of electromagnetic wave whose frequency is between radio wave and far infrared ray. Its characteristic is high frequency and short wavelength. Its frequency and wavelength range are about 300 MHz to 300 kHz and 1~100 mm. Microwave technology is first applied in the fields of communication, broadcasting and television. It is found that microwave can cause thermal effect in use, and then the application research of microwave heating has begun worldwide. At present, the frequency of microwave heating is 915 MHz and 2450 MHz. Microwave drying originated in the 1940s. By the end of the 1960s, microwave energy had been used in heating, drying, insecticide, sterilization, medical and other industrial projects. The application of microwave drying technology in China began in the early 1970s. At present, microwave technology has been applied in light industry, food industry, chemical industry and agricultural products processing and other fields. This paper introduces the application of microwave heating and drying in wood processing.



1 [microwave drying wood](#)

Scholars in the United States, Japan, Canada, Germany and other countries in twentieth Century.

Microwave drying of wood was studied in the early 1960s. It was considered that microwave drying was the most effective and rapid drying method. In 1974, China began to study the technology of wood drying by microwave. In 1977, a successful wood microwave dryer was developed by the microwave Research Institute of Nanjing Qi72 Factory.

First of all, it is used in Wuxi furniture factory. Because of the uniform heating, fast drying speed, small drying stress and good quality, microwave was once widely used in Beijing, Tianjin, Shanghai, Nanjing, Zhenjiang, Qingdao, Harbin and other places. Later, due to the shortcomings of high investment, large power consumption and high drying cost, to the mid-1980s, the microwave drying of various factories

Stop production successively. Since the 1990s, the microwave drying equipment has been improved and the drying technology has been matured. The application of this drying

technology in China has been restored.

1.1 principles and advantages of microwave drying wood

The principle of microwave drying wood is to use wet wood as dielectric, under the action of microwave electromagnetic field, cause the water molecule polarization in wood, at the same time, because of the frequent alternation of electromagnetic field, make the water molecule swing frequently at high speed, friction heat, thus heating and drying wood. Microwave drying of wood has the following advantages:

1.1.1 When wood is dried by microwave at a fast drying speed, heat is not transferred from the outside of the wood, but directly generated by water molecules and wood friction within the wood, also known as "volume heating". This volume heating allows the dried wood to heat almost simultaneously along the entire thickness, and the time required for heat penetration is independent of the thickness of the wood. The moisture inside the wood rapidly vaporizes, forming the pressure of outward diffusion.