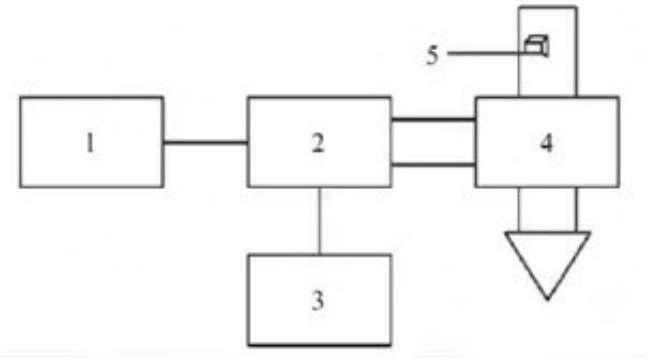
Microwave drying of wood

Among them, the upper foot marker =1,2,3 is obvious to the lower Lake standard.
All the formulas are the same as those in isotropic media, except that the principal values of polarizability tensor and dielectric tensor are different in the direction of each principal axis.

Since the discussion of polarization and dielectric properties in tensor spindle coordinates of microwave drying equipment is similar to that in isotropic media, it is not mentioned here. Generally speaking, the polarization process of microwave drying wood lags behind the action of external electric field, which is called relaxation phenomenon.



The time needed to complete polarization, called ground image time, is often expressed as r, which is the physical quantity that determines the speed of polarization establishment. First, the polarization relaxation law of homogeneous medium in electrostatic field is considered. After a certain period of time in the electrostatic field, when the polarization of the medium is established, the stable value of the polarization intensity is expressed as Ps.

In the process of polarization establishment, the instantaneous value of polarization intensity is expressed in P. The law of polarization relaxation can be written as the following equation When = 0, P = 0, then the integral formula can be obtained. The relaxation law of wood polarization in alternating electric field is now studied. From the wood microwave drying equipment, it is known that the total polarization intensity of wood is composed of four parts (the right and middle of the seven equations are the time of electron polarization, ion polarization, orientation polarization and interface polarization, respectively). Generally speaking, the polarization intensity is a function of time. In the microwave field or high frequency field, the displacement polarization (electron polarization and ion polarization) can be instantaneously completed and the stable P corresponding to the alternating field strength E can be obtained.

The component of P is written as (P,) u=C (E,) ub-6upjeaee) AP is the relative polarization tensor of displacement polarization. The interface polarization time is longer, that is, r>T (microwave period), P 0. The orientation polarization is almost or slightly behind the change of Chang Bo field. Therefore, the formula can be rewritten as follows: Pu= ((E) Uw-6upe Ey+ (P)).

Generally speaking, the polarization relaxation time of wood is not single, but has a certain distribution. Wood chemical structure contains a variety of polar groups, which are dipole groups

in alternating electric field. Among them, alcohols in the non-junction region of cellulose, COOH groups in hemicellulose and CH2OH groups and phenols in lignin play a dominant role in orientation polarization dipole loss.
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