



## Microwave sintering characteristics

A frequency in the microwave is 300MHz-300GHz, the wavelength of the electromagnetic wave 1mm-1m, the frequency used in the application before sintering mainly 2.45GHz. Compared with conventional sintering microwave sintering technology, has the following characteristics.

### 1.1 Volumetric heating

Microwave sintering is the use of materials and the microwave electric or magnetic coupling microwave energy into heat. Because of the speed of light is an electromagnetic wave propagating electromagnetic wave penetration into the material close to the speed of light. Thus can very quickly be transformed into electromagnetic energy molecule substance energy inside and outside at the same time so that the material can be heated so that the material inside the temperature gradient is very small. even without temperature gradient within the material to minimize heat stress. so can effectively alleviate the material during sintering cracking and deformation of the material has better the mechanical properties.

### 1.2 Energy saving

Relative to conventional sintering microwave sintering technology can significantly reduce the sintering temperature; another fast heating rate makes microwave sintering sintering cycle shortened; at the same time, in the microwave field, the material itself is the source of heat. Microwave energy directly interact with the material to avoid contact with those for heating but not directly involved in sintering other member thereby significantly reducing power consumption saving than conventional sintering 70% -90%;... And can microwave sintering faster. significantly reduce the amount of gas using the sintering atmosphere. sintering process makes waste, waste heat emissions are reduced. environmentally friendly.

### 1.3 Grain refinement

Under the effect of microwave electromagnetic energy. Materials will produce a series of "microwave effect", the material inside the molecular kinetic energy increases. Diffusion coefficient increased. Sintering activation energy decreases. Accelerate the sintering process. Shortened sintering cycle. Makes grain grow too late was sintered to obtain a uniform fine grain;. and the porosity of the small pore material is more rounded shape than the conventional sintering of the material having more excellent mechanical properties. Because microwave sintering grain growth inhibiting effect. For the preparation of nanomaterials provides a potentially viable and efficient way.