

# Application of mechatronics technology in production



A large number of [high-temperature sintering equipment](#) are needed in the preparation of alumina powder and block. With the continuous development of science and technology, information technology has been significantly improved compared with before. Mechatronics technology is more and more used in industrial production. [Microwave heating equipment](#) intelligently designed the temperature measurement system of thermocouple used in high temperature sintering equipment in alumina production process. The results show that the temperature control instrument designed by self-compensation method can effectively control the temperature of the whole alumina sintering process.

Alumina is a kind of oxide with very high hardness. Its melting point is over 2000°C and boiling point is close to 3000°C. Alumina has many kinds of homogeneous isomers, but the most widely used is alpha-Al<sub>2</sub>O<sub>3</sub>, commonly known as corundum. Its crystal structure is tripartite system, because of its good physical and chemical properties (high temperature resistance, corrosion resistance, hardness).

Large, usually used as refractories. With the deepening of people's understanding and Research on alumina, its use has been continuously extended. When alumina powder or block sintered at high temperature is transformed into alpha-Al<sub>2</sub>O<sub>3</sub> through phase transformation, the alpha-Al<sub>2</sub>O<sub>3</sub> sintered at high temperature is used in industry (high pressure sodium lamp), medicine (core component of medical impact equipment), military industry.

Aspects (missile window materials) have been well applied to [1-3]. High temperature sintering of alumina is a complicated process, which requires not only excellent technological conditions, but also good equipment conditions.

Due to the sensitivity of alumina to phase transition temperature, there are many errors between the existing high temperature sintering equipment and the actual furnace temperature in temperature measurement and control system, which results in the very unstable performance of alumina products.

There are many kinds of temperature control instruments for high temperature sintering equipment, and the

compensation methods for different kinds of temperature controllers are also different. The traditional compensation methods for temperature controllers are based on the temperature difference caused by the change of external environment. What we usually see is the principle of bimetal compensation.

A bimetal sheet is installed on the transmission mechanism. These two bimetal sheets are two different kinds of metal materials. Moreover, the pre-bending equipment of copper sheet end, which has different requirements for linear expansion and thermal expansion coefficient of the two materials, uses a full-automatic four-roll roll bending system with touch screen mode.