

induction heating in Magnetically Induced Hyperthermia for Cancer

Hengxin Science and Technology Limited

Hengxin is experienced in Induction Heating Machine and Induction Heating Power Supply, induction heating equipments can be used in induction heating service, induction heat treatment, induction brazing, induction hardening, induction welding, induction forging, induction quenching, induction soldering induction melting and induction surface treatment applications
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Induction Heating is a method of non-contact heating for conductive especially metal materials, when an alternating electrical current is applied to the primary of a transformer, an alternating magnetic field is created. According to Faraday's Law, if the secondary of the transformer is located within the magnetic field, an electric current will be induced.

In a basic induction heating setup, a solid state RF power supply sends an AC current through an inductor (often a copper coil), and the part to be heated (the workpiece) is placed inside the inductor. The inductor serves as the transformer primary and the part to be heated becomes a short circuit secondary. When a metal part is placed within the inductor and enters the magnetic field, circulating eddy currents are induced within the part.

These eddy currents flow against the electrical resistivity of the metal, generating precise and localized heat without any direct contact between the part and the inductor. This heating occurs with both magnetic and non-magnetic parts, and is often referred to as the "Joule effect", referring to Joule's first law – a scientific formula expressing the relationship between heat produced by electrical current passed through a conductor.

Secondarily, additional heat is produced within magnetic parts through hysteresis – internal friction that is created when magnetic parts pass through the inductor. Magnetic materials naturally offer electrical resistance to the rapidly changing magnetic fields within the inductor. This resistance produces internal friction which in turn produces heat.

In the process of heating the material, there is therefore no contact between the inductor and the part, and neither are there any combustion gases. The material to be heated can be located in a setting isolated from the power supply; submerged in a liquid, covered by isolated substances, in gaseous atmospheres or even in a vacuum.

Induction Heating now is used for Melting gold, heat treatment, hardening, annealing, forging, melting furnace, brazing, quenching etc.,