J Material Sci Eng 2018, Volume 7
DOI: 10.4172/2169-0022-C8-114

Design and fabrication of portable induction heating

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Induction heat treating involves heating a work piece from room temperature to a higher temperature, such as is required for induction tempering or induction austenitizing. Induction heating is a heating method for electrically conductive materials that takes advantage of the heat generated by the eddy currents originated by means of a varying magnetic field. Inductive heating is a heating process of a conductive material, based on the electromagnetic Induction. Induction heating takes place without physical contact between the work piece and induction coil. This lends it to processes where a high degree of cleanliness is paramount. This section of induction heating using low-voltage DC power supply 12-48V Maximum current 20A, maximum power 1000W. It's a great method for increasing productivity and improved quality. Induction coil consists of (coils, transistors, diodes, thermal resistors, heat sink, and capacitors) Induction heating is a process which is used to bond, harden or soften metals or other conductive materials. For many modern manufacturing processes, induction heating offers an attractive combination of speed, consistency and control. When an alternating electrical current is applied to the primary of a transformer, an alternating magnetic field is created. According to Faraday's Law. In a basic induction heating setup shown in Fig-1-(The work piece) is placed inside the inductor. 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, how? 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. Internal friction that is created when magnetic parts pass through the inductor.

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