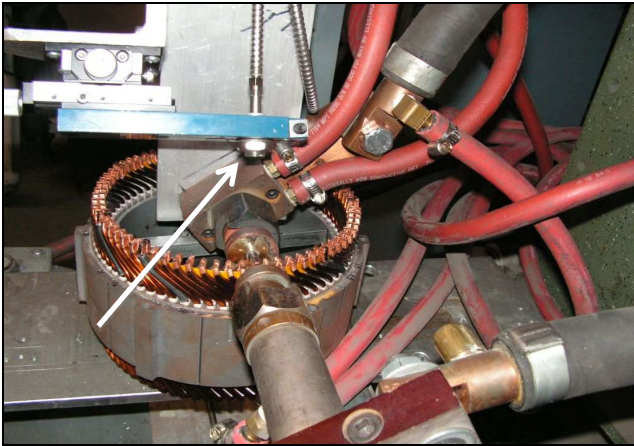


RESISTANCE BRAZING



Photograph courtesy of Unitrol Electronics Inc.

Unitrol Electronics Inc. Instabraz machine with Process Sensors Corp. Metis Model MS09 fiber optic mini lens focused on electric motor stator terminations during brazing.

The Application

Many manufacturing operations involve the permanent joining or attaching of metal components. There are several methods to choose from, including soldering, welding and brazing.

Each has its merits, depending on the product being made, but resistance brazing is preferred when the heated area must be precise; where speed, such as in assemble lines is important, and where a mechanically strong bond is required.

Resistance brazing involves the clamping of two components and a brazing alloy between two electrodes. An electric current is then applied at a controlled rate for a predetermined time while the brazing alloy melts. For many components, a bond can be achieved in 0.25 seconds.

High speed, precisely focused brazing is applicable to automotive parts production, tool making, tube forming, relay and circuit breaker contact bonding, chain link forming and electronic circuit board manufacturing, among many other processes.

Automatic process control

For an optimum bond, the brazing temperature must be precisely controlled to a preset program and predetermined time cycle. The most effective way to achieve this is by measuring the temperature of the braze as it progresses.

A typical sequence starts with a preheat period, followed by heating to the melting temperature of the alloy. It ends with a soak period before the electrodes are retracted.

Contact temperature sensors are clearly unsuitable for resistance brazing applications where the product is in motion, and where thermocouple accuracy will be affected by the brazing current. Non-contact infrared thermometers are therefore ideal. They have a fast response in the millisecond domain, and can be mounted at a distance from the object being measured. In addition, provide outputs that interface easily with automatic control, data acquisition and alarm systems.

Infrared thermometer selection

Process Sensors Inc. Metis Model MS09 Infrared Thermometer incorporates a steel sheathed fiber optic cable that terminates into a miniature lens assembly (Shown in the application photograph).

This allows the IR Thermometer to be mounted away from strong electric currents, and minimizes sight path interruption by solid objects or smoke. A window in the optical assembly protects the lens. A built-in laser simplifies precise aiming on the target.

An analog output of 0/4-20mA, and a digital RS232 signal allow connection to most controller and data acquisition systems. Temperature range and fiber optic cable length are selected according to the application. (Please request Data Sheet MS09 for detailed specification).



Metis MS09 IR Thermometer with fiber optic cable and standard lens assembly

The Market

As will be seen from the foregoing remarks, the resistance brazing market is broad and diverse. Automotive component manufacture, tool making, electric relay and circuit breaker production, electric motor manufacture, heat treating of wire and spring steel are just a few examples.

Hand held, portable thermometer

Process Sensors Corp. portable infrared thermometers and thermal imaging cameras are useful for making spot checks during trouble shooting and machine set-up.

Refer to our Website: processsensorsIR.com