Ircon® System Solutions – *Metals*

Ion Nitriding

Customer
Heat Treating

SIC code
3398

Customer Needs
Machine tools such as drills, shapers and cutter heads are often hardened with a process called Ion Nitriding. The tools are placed in a vacuum furnace. A nitrogen gas is introduced and is exposed to an arc, which heats the nitrogen to 7760°C (14000°F). At this temperature the gas becomes ionized. The ions are aimed at the part and when the nitrogen ion strikes the part it is embedded into the surface. This makes the surface very hard.

The advantage of this process is the part is hardened at low temperatures, sometimes as low as 300°C (600°F). This prevents the part from becoming distorted during the hardening process. In addition the hardening does not change the metallurgical properties of the cutting tool because only the surface is affected. It is also much faster than older processes of hardening.

The part temperatures are best measured with the Modline 5G or 56 series. Do not use a two color or a 1 micron instrument as the plasma will cause these instruments to indicate the wrong temperature. The window for the vacuum furnace should be quartz not Pyrex.

As a side note, infrared thermometers cannot be used to measure the actual plasma temperature. The gas is basically transparent.

Features/Benefits to address

Product

- Modline 5G or 56 Series.

Application

- Infrared thermometers provide an accurate part temperature, thermocouples, which are often used do not provide the actual product temperature
- The thermometer prevents overheating the part which affects the metallurgical properties

Who to talk to?

1. Production Engineer
2. Quality Manager
3. Plant Manager

What to take?

1. Modline 5 Demo and related literature

Application

A gear going through the ion nitriding process

Names of customer
Heat treat companies have begun using Ion Nitriding to supplement traditional annealing and other hardening processes. A great listing of heat treat companies can be found at the following website.

http://www.metaltreat.com/

IRCON®
Fluke Process Instruments