ANNEALING MANUFACTURING PROCESS

Band Heaters mounted to cylindrical shapes create annealing chambers for small parts

Application

A manufacturing company processes small steel alloy parts for the electronics industry. Tungsten rods used as electrodes in crystal processing are a major part of their business and these require annealing as part of their manufacturing. Other small steel parts require heat to add or remove minerals from the chemical composition, or change the grain structure. Test parts are processed one at a time or in small batches. Different soak temperatures and cooling rates will produce different results with regard to the metal grain structure. It is necessary that temperatures are uniform within the chamber to achieve the desired result.

Solution

BriskHeat band heaters provide the heat required for a low temperature annealing process. To save energy and decrease cycle times, small chambers which may be made by the customer, are used as ovens. Cylindrical heating chambers can be made from stainless steel or ceramic materials up to 12 in (305 mm) in diameter. BriskHeat Mica Band Heaters are installed around the circumference of the chamber and secured in place by the integrated clamps. Several heaters of the same diameter can be installed as a group to evenly heat the entire length of the cylinder. Each heater includes an integrated thermocouple for temperature measurement. Cloth insulators may be used to decrease heat loss. Parts to be heat treated are placed inside the chamber and a lid is used to cover the opening to retain heat during the annealing process. A variety of temperature controllers may be used for each heater depending on the size and amp requirements. Benchtop controllers such as the SDX or SDC can be utilized to control heaters rated for 15 amps or less. For larger heaters up to 50 amps or wet-area applications, BriskHeat's TB4000 controllers may be the better choice.

BriskHeat Band Heaters can be used for application temperatures up to 900°F (482°C) and have a high-temperature galvanized sheath to provide oxidation resistance in high-humidity areas. Mica insulation provides electrical insulation at high temperatures. Nickel/chromium resistance wire is evenly wound around the heating surface to produce uniform heat distribution. Band heaters are approximately 1/8 in (3 mm) thick and available in sizes as small as 3-1/2 in (89 mm) diameter x 1 in (25 mm) wide, up to 12 in (305 mm) diameter x 2 in (51 mm) wide. For diameters between 1 in (25 mm) to 3 in (76 mm), BriskHeat offers a line of Nozzle Heaters with similar features and benefits.

Products	
Band Heaters	Custom Cloth Insulators
Nozzle Heaters	SDX, SDC, and TB4000 Controllers

Types of Users	
Lab Managers	Scientists
Process Engineers	Chemists
Manufacturing Engineers	

Industries
General Manufacturing
Analytical Instrumentation/Laboratory