



# PRESSURE CONTROLLED HEAT PIPES

A typical Pressure Controlled Heat Pipe (PCHP) furnace consists of four major components that can be physically detached from each other: annular heat pipe, tube furnace, control cabinet with electronics and pressure monitoring system (not pictured), and computer (not pictured). Unlike a conventional heat pipe that is hermetically sealed, the vapor space of the annular heat pipe in a PCHP furnace is connected to a helium gas reservoir. The control system for the helium pressure consists of a pressure transducer, a helium supply, and a vacuum pump. Constant pressure is maintained by admitting or removing helium. The power input to the furnace is controlled by a temperature controller, whose set point is coupled to the pressure control system. Constant helium pressure translates into constant vapor pressure and temperature inside the heat pipe. Spatial temperature uniformity of better than 10mK has been measured.

## SPECIFICATIONS

- Temperature range: 300 - 1,100°C
- Set point stability:  $\pm 0.01^\circ\text{C}$
- Temperature uniformity:  $\pm 0.01^\circ\text{C}/30\text{cm}$
- Orientation: horizontal and vertical
- Heat pipe fluid: Cs, K, Na

## DESIGN ADVANTAGES

- Precision temperature control to 1100°C
- High product yield
- Turnkey computer controls
- Programmable temperature history
- Precise materials processing

## APPLICATIONS

- Isothermal Processing of Materials
- Thermophysical Properties Characterization
- Temperature Calibration

