

## **ISOTHERMAL FURNACE LINERS (IFLS) FOR MATERIALS PROCESSING**

IFLs are an industry standard for the primary calibration laboratories, providing precise temperature uniformity for freeze point cell calibration and blackbody cavities. Another important application is for isothermalizing furnaces for material processing applications.

Tube furnaces are commonly used for materials processing such as annealing, sintering, crystal growing, brazing and controlled diffusion to develop new materials. These tube furnaces are typically electrically heated through discrete electrical resistance heating elements. These heating elements have slightly different resistances resulting in temperature non-uniformity inside the furnace cavity. Heat losses through the ends are also a source of non-uniformity. These temperature non-uniformities often result in unfavorable product yields and misleading recipe development results, which can lead to product development delays.

Precise temperature control is important for researchers that are developing new materials and thermal processes in energy conversion, nanotechnology and advanced electronics areas. ACT has built a number of turnkey IFL systems and is well positioned to respond to custom applications. These IFL systems have been shown to provide temperature uniformity, stability, and repeatability that is unmatched by conventional electrical resistance heated furnaces and ovens. ACT engineers work with leading edge companies on a daily basis to provide thermal management solutions to challenging and often unique applications. This experience and expertise allows us to design and manufacture turnkey IFL systems at favorable prices.

ACT has designed and manufactured precision temperature IFL systems for the following applications. Many more applications such as annealing, sintering, crystal growing, brazing, and controlled diffusion can also benefit from this technology.

- Specialty Glass Manufacturing
- Elevated Temperature Materials Characterization
- Chemical or Refining Process Temperature Control
- Biomass Reaction Chambers
- Semiconductor Annealing and Processing



**Sodium IFL/Furnace/Controller for Thermal Processing of BioMass at 600 to 800°C**