

Oven Temperature Measurement to 420°C

APPLICATION



Manufacturing processes may require heating a component for a set time at a certain temperature. An oven temperature controller can get the oven temperature in the ballpark but temperature can vary significantly throughout the chamber due to convection and radiation from the heating elements. In order to provide the confidence needed for critical temperature measurements a separate temperature probe placed next to the material being processed is required. Standard RTDs with epoxy seals and plastic insulated cables work well up to 200°C but over that temperature other materials are required to withstand the heat.

CHALLENGE



Industrial strength RTDs are suitable for temperature measurement up to 500°C but the standard lead wire and sealing materials are limited to around 200°C. A proper seal is important to keep moisture and other contaminants, which can cause measurement errors, from entering the probe. Glass seals do an excellent job of this but do not provide much strength and can be damaged by rapid heating and cooling.

200G



▶ Model 200G modified with ceramic seal and high temperature cable

SOLUTION



The Burns engineers developed an alternate sealing design for a standard 200G style probe that incorporates a ceramic potting material that provides a moisture seal suitable for typical room humidity levels. High levels of humidity or liquid water will eventually soak through the seal so some caution has to be used when storing the probe. Heating it for an hour or so will drive the moisture out and restore the insulation resistance. Cable insulation material is fiberglass covered with stainless steel over-braid to protect the fiberglass from abrasion. Fiberglass insulation that does not have any organic binders is very friable and requires additional protection if it is to be moved around and flexed. The final piece was the addition of a stainless steel spring to provide bend relief for the cable.