

High Temperature Thermocouple

APPLICATION



Applications that require temperature measurement up to 1600°C (2912°F) call for a special type of sensor. A recent inquiry called for temperature measurement of a powdered product being heated to over 2000°F in a proprietary process. A type K thermocouple had been tried inside a 316 SS thermowell but the well failed quickly. And I imagine that the thermocouple had drifted badly being rated only to 2152°F. I was called to offer a solution.

CHALLENGE



High temperatures and oxidizing or reducing atmospheres present materials challenges to accurate long term temperature measurement. Protecting the sensor from those conditions requires multiple lines of defense to prevent corrosion and contamination of contact type sensors. Configuration of the process excluded the use of an infra-red or other non-contact types of sensors.

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▶ Type R Thermocouple and Hexoloy® Thermowell

SOLUTION



A type R thermocouple protected by an outer thermowell of Hexoloy® Silicon Carbide ceramic was chosen as the best solution. Type R is a Platinum - Platinum /Rhodium thermocouple rated from 0°C to 1600°C (2912°F). They require protection with typically two or three layers of ceramic tubes. The outer tube of Hexoloy® was chosen for its temperature limit of 3000°F, strength, and nearly universal corrosion resistance. Two inner tubes of alumina provide additional protection. None of this assembly is inexpensive but it should last a long time making the total life cycle cost lower than using multiple less capable sensors.

If you have a challenging temperature measurement application give me a call or send an email. I'll put our engineering team to work to find the best solution.

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