

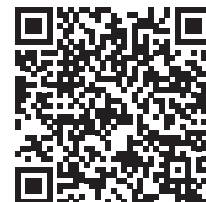
# Case Study: Thermocouples Baghouse Fire Protection



Industry  
POWER PLANTS/STEEL MILLS



HIGH TEMPERATURE  
MONITORING



## CHALLENGE:

Baghouses are part of the process in many industrial plants as fly ash collectors, preventing fine particles from burned fuel like coal, from reaching the environment. The exhaust stream from the furnace passes through filters within the baghouse attracting the fly ash. Thermocouples installed in the baghouse sense the temperature of the fly ash as it enters, ensuring it is not hot enough to cause a fire when contacting the filters. The challenges are that the fly ash stream is both corrosive and erosive, while requiring fast response to protect against a fire. An unprotected thermocouple sheath, designed for faster response, is quickly eroded away and fails, sometimes within weeks. Adding a traditional thermowell can improve the thermocouple's life, but the response time is unacceptable.

## SOLUTION:

The operator replaced the traditional thermocouples with UE thermocouples designed, fit-for-purpose, to eliminate the response lag while protecting against erosion. The new thermocouple design used #446 stainless steel alloy, proven to have excellent corrosion and erosion resistance at high temperature. The end of the protection tube was notched out, exposing the inner sensor assembly. Installing the thermocouple into the flow provided a shield against erosion, while improving response time by 10x and extending the sensor's life from weeks to over a year.



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*The design works perfectly. The particulates in the stream are diffused around the protective tube end while the vortex created pulls in only the gases for temperature measurement into the cut-out where the thermocouple end is positioned. The "open" design allows for rapid delta-T response. I can laud this as an excellent custom design".*

A.S., Operator



Fast Response



Rugged Design



Fire Protection