

Thermocouple Decalibration and Drift – Part 2

Since all thermocouples are subject to calibration drift with use, it is just a matter of how much, and how fast this may happen. Protective sheaths, tubes, and thermowells are employed to try to reduce damage to the thermoelements but drift still occurs. This is a serious problem for many users. So what do users do?

Here are the traditional ways users try to compensate for thermocouple drift and some problems associated with each:

1. Scheduled Replacement – Simply remove and replace them on some regular frequency not knowing whether they have de-calibrated or not.
 - This can be costly both in sensor costs and in process losses if they are not replaced frequently enough.
2. Redundant Sensors – Backups, Multi-points or Bundles of Sensors
 - Which one do you believe?
 - May use sophisticated “voting” systems
 - Like sensors may drift off together
 - Systems can become costly and you’re still not sure
3. Cross-checking against other Sensors in the process - Using Material and Energy balances or a combination to try to decide if the measurement seems correct.
 - Requires computer modeling and good process models
 - Balances are often hard to close in real time
 - Other sensors also de-calibrate, plug and wear out
 - Comes down to deciding which of your measurements is most likely wrong
4. Calibrations and Re-calibrations – Comparison with Traceable Standards
 - Cannot prevent de-calibration
 - Read the “Fine Print” on your certificate*
 - Insertion depth effects normally cannot be reproduced in Cal Lab
 - Can be very labor intensive, time consuming and costly

*“Tolerances indicated in this table are not necessarily an indication of the accuracy of temperature measurement in use after initial heating of the materials.”

Any of the above situations is a dead give-away that the User has drift problems and knows it.

Daniel A. Barberree
AccuTru International
dbarberree@accutru.com
281-358-5600 x 516
Fax 281-358-5605