

Thermocouple Decalibration and Drift – Part 3

What causes Thermocouple Drift?

Thermocouple performance is critically dependent upon absolute uniformity of both physical and chemical properties along the entire length of the wires in the circuit.

Why is this so important? It is because the thermoelectric emf produced by the thermocouple is a summation of the emf produced at every point along its length. This fact is difficult to explain theoretically but has been proven experimentally. If you think about it for a minute, this also makes sense logically. Without a temperature difference, there should be no emf produced. Note: Many thermocouple users are not aware of this phenomenon.

The result is that the emf produced by a thermocouple is generated in the temperature gradient. In other words, it is generated in the section of the thermocouple where the temperature changes. This can be anywhere along its length as it transitions from the temperature at the tip to the temperature at the “cold junction” or measuring end.

Therefore, **anything that affects the uniformity of the thermocouple elements along their length can cause drift.**

Next time we'll discuss some causes of non-uniformity (also called inhomogeneity).

Question to ponder: If both ends of a thermocouple are at the same temperature will there be any emf produced?

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