



## Technical Information

### STABILIZED Type K Reduced Drift Thermocouple Wire

#### THE PROBLEM

Type K\* thermocouples are known to yield accurate temperature measurements in the 1,000F (538C) range for short duration exposures. However, after extended exposure in the 650F (343C) to 1100F (593C) range, Type K material may exhibit a positive drift in readings of up to 6F (3C) at 1,000F (538C) and as much as 9F (5C) at 2,000F (1093C). This drifting could prove disastrous in applications such as heat treating where temperatures must be increased gradually and sustained in the drifting range for as little as one hour.

The change in thermoelectric properties is generally attributed to "atomic ordering". When the Type K thermocouple is used in the drifting range, some of the atoms of the positive thermoelement rearrange themselves from a random state into an ordered state. This atomic rearrangement changes the EMF output of the conductor. Type K EMF drift causes the temperature reading to appear higher than it actually is. Any error caused by non-stabilized Type K drift is in addition to the initial calibration tolerance deviation of the Type K material. For example, a heat treat operation running at 2,000F (1093C) using non-stabilized standard limits Type K material could experience an initial tolerance calibration deviation up to 15F (9C) PLUS another 9F (5C) drift error, meaning that the process could actually be running 24F (14C) lower than the thermocouple EMF output shows. This equates to an error of greater than 1%.

#### THE SOLUTION

TE Wire & Cable offers STABILIZED Type K wire constructions. STABILIZED Type K was developed by TE Wire & Cable through years of experience, and testing. All STABILIZED Type K constructions are engineered around wire that has been manufactured using proprietary processes which essentially "lock in" the high temperature calibration.

This is a characteristic which is not addressed by non-stabilized Type K thermocouple wire. The proprietary process involves many procedures and not just a heat treatment of the conductors. Heat treatment alone does not stabilize the wire.

When long term temperature control accuracy is required or if Type K drift is a problem, STABILIZED Type K from TE Wire & Cable is the answer.

\* Type E thermocouples are similarly affected. Stabilized E constructions are also available.



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