where S(T) is a temperature-dependent material property known as the Seebeck coefficient.

The standard measurement configuration shown in the figure shows four temperature regions and thus four voltage contributions:

1. Change from T meter to T ref, in the lower copper wire.
2. Change from T ref to T sense, in the alumel wire.
3. Change from T sense to Tref, in the chromel wire.
4. Change from T ref to T meter, in the upper copper wire.

The first and fourth contributions cancel out exactly, because these regions involve the same temperature change and an identical material. As a result, T meter, does not influence the measured voltage. The second and third contributions do not cancel, as they involve different materials.