

STRAIGHT FROM THE LAB



Tolerance indications are a perishable commodity so calibrate to know about the uncertainty

The current standard for thermocouples is IEC 60584:2013. [\[Ref 1\]](#).

"It's important to know that the tolerances given in the standard only apply to unused thermocouples," says Lars Grönlund, manager of Pentronic's accredited calibration laboratory. Thermocouples are thus a perishable product in the sense that they alter more or less rapidly depending on their type and measurement environment. For example, in only five minutes at 450 °C the sensitivity of type K thermocouples can change so that the deviation becomes almost +3.5 °C [\[Ref 2\]](#).

IEC 60584 gives tolerances for various thermocouple types. For non-calibrated sensors, these tolerances apply for calculating measurement uncertainty etc. For calibrated sensors, the actual result together with the

associated measurement uncertainty calculation is what applies. Lars Grönlund gives an example for the common thermocouple types, K and N:

"If the IEC standard promises that the tolerance is ± 4 °C at 1 000 °C then we can use calibration to achieve a measurement uncertainty of less than ± 1 °C. Under favourable conditions it is possible to go even lower."

Further examples are available in [\[Ref 3\]](#). These examples prove the value of having critical temperature sensors calibrated often instead of relying on tolerances in accordance

See: www.pentronic.se:

[\[Ref 1\]](#) See: To download > Useful links > Thermocouples: IEC 60584:2013

See: News > Pentronic News > Archive

[\[Ref 2\]](#) Pentronic News 2010-1 page 4.

[\[Ref 3\]](#) Pentronic News 2011-5 page 4.