STRAIGHT FROM THE LAB

Measurement uncertainty increases in used thermocouples

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ISO/IEC 17025

Pentronic's laboratory is accredited since 1988

At 500 °C new thermocouples can be calibrated with a measurement uncertainty that is better than ±0.1 °C. But in future it will not be possible to achieve that level when the same thermocouple is recalibrated after use.

The reason is a revised stipulation from Euromet, the European organisation for national calibration laboratories. The regulation is based on observations that thermocouples' physical properties are altered as a result of use.

Euromet states that an inhomogeneity arises in the material. This causes an increase in the possible error, something that accredited calibration laboratories should factor into their calculations. The recommendation for class 2 thermocouples is to add 20% of the error in accordance with EN-IEC 60584-2, which is the applicable standard for thermocouple tolerances.

The result is that the thermocouples, which according to their calibration certificate remain within ±0.07 °C at 500 °C, cannot be recalibrated after use with a closer measurement uncertainty than ±0.25 °C.

The recommendation is given in the publication EURAMET cg-8, version 2.1. The significance is that it can be better to insert newly manufactured thermocouples than to recalibrate the old ones.