CCPI Europe

Excellence in Temperature Measurement

Temperature Sensors | Thermocouple Wire & Cable | Calibration | On-site Calibration Servicing

INSEVA THERMOCOUPLE

Integrated Self-Validating Thermocouple

Temperature is one of the most important parameters that is often required to be measured. Thermocouples are & have been the main temperature sensor used in industry for over 100 years, particularly in the temperature range above 500 ˚C.

The problem with thermocouples is due to the fact they are exposed to harsh conditions during use, they suffer from DRIFT, a change in output signal with time at temperature. This leads to inaccurate measurement.

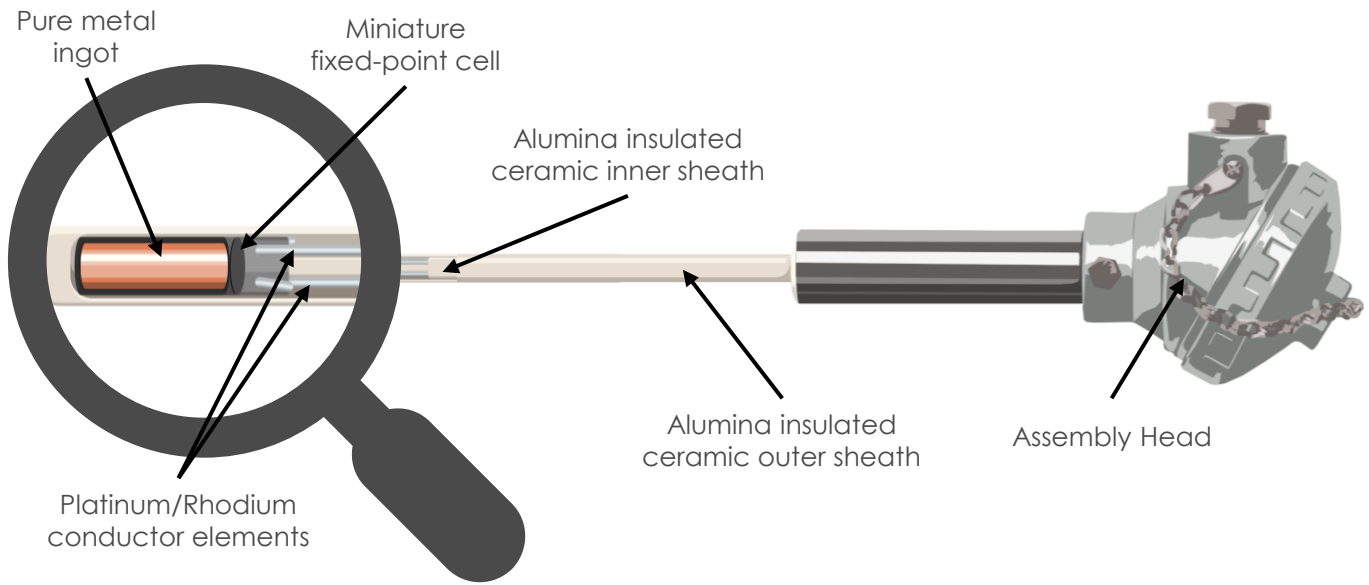
Current methods used to deal with drift in thermocouples range from, replacement at regular intervals, removal for recalibration, in location calibration, This is because the rate of thermocouple drift is difficult to predict.
All these methods work but result in furnace downtime, additional labour & calibration costs.

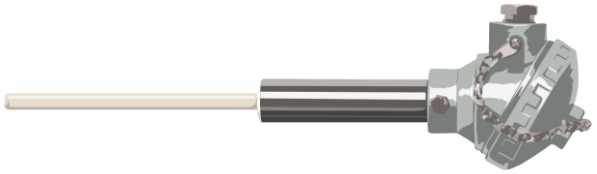
Now we have a new alternative cost & labour saving method… introducing the INSEVA thermocouple!

Originally developed by NPL (National Physical Laboratory), the INSEVA technology is a miniaturised version of the conventional fixed-point cells used in thermal calibration laboratories for the highest level of calibration.

A fixed point is a reproducible physical event that has a defined temperature value assigned on the ITS90.
The reliable melting/freezing point of pure metal, & more recently metal carbide eutectics, are used to calibrate thermocouples at set fixed point temperatures.
An example of a conventional fixed point used in temperature calibrations is the freezing point of a pure metal such as Copper.
Copper, for example, melts (goes through the transition from a solid to a liquid) at 1084.62 °C

This fixed-point method of calibration is operated in National Measurement Institutes & the best calibration laboratories by having large crucibles of a pure material being heated & cooled in specialist stable furnaces. Under these conditions, the tightest of uncertainties of measurement & accuracies possible can be achieved for temperature sensor calibration.





With an outer diameter of just 4mm, the miniaturised fixed-point cell is able to fit in a typical 7mm outer diameter alumina insulated ceramic thermocouple assembly.

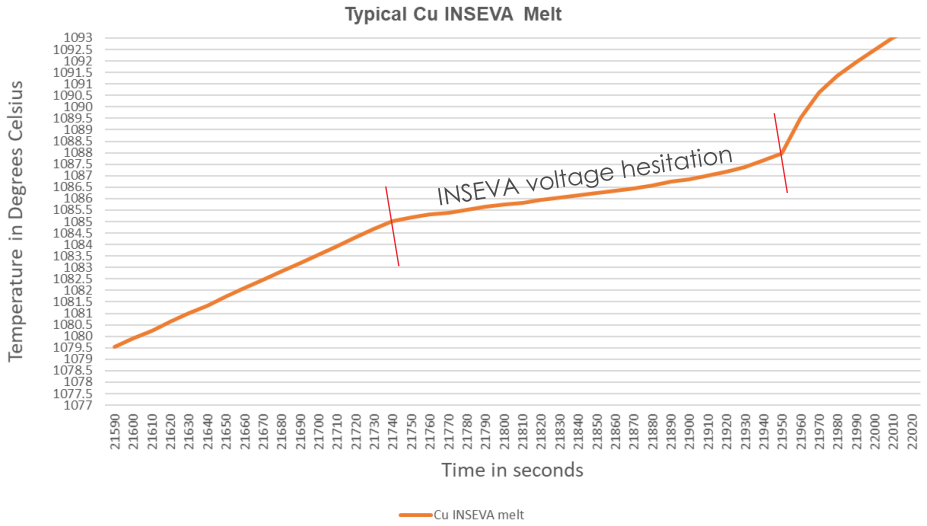
Just like a regular thermocouple assembly, the INSEVA Thermocouple can be highly customised with alternative cold end termination options such as; Tails, Plugs, Sockets & Cables. Additional stainless steel outer sheaths can also be added for protection from the hostile environments they encounter.

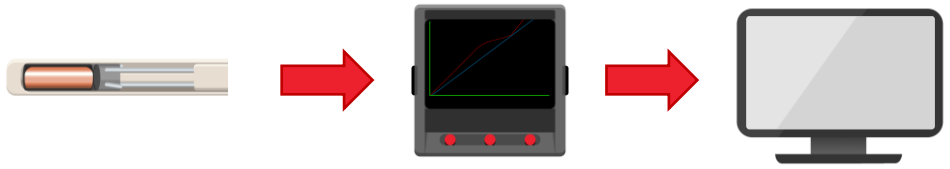
INSEVA Software

Developed in-house by our software team, the INSEVA software detects the thermocouples voltage reading hesitation (or plateau) as the thermal environment transits the melt/freeze point of the chosen cell material.

At this precise & reproducible physical event, the software can compare the performance of other thermocouples within the furnace & triggers customer bespoke automations.

The software provides real-time information to monitor the calibration status of the INSEVA Thermocouple, enables predictive replacement & automates control of thermocouple life & replacements.





INSEVA Thermocouple passing melt/freeze point in thermal environment

Recorder/controller hardware receiving fixed point electrical signal

Customer-bespoke automations triggered

Fixed-point cell variations

A wide range of pure metal ingot (or eutectic metal-carbon alloy) can be used to suit individual requirements including;

- Tin (Sn) 231.928 °C
- Zinc (Zn) 419.527 °C
- Aluminium (Al) 660.323 °C
- Silver (Ag) 961.78 °C
- Gold (Au) 1064.18 °C
- Copper (Cu) 1084.62 °C
- Cobalt Carbon (CoC) 1324.02 °C
- Nickel Carbon (NiC) 1329 °C
- Palladium Carbon (PdC) 1491.16 °C

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