

# Furnace Selection Guide

Isotech offers the widest range of metrology furnaces for the realisation of ITS-90 Fixed Points. All models can give very long plateau, in excess of ten hours as suggested in CCT/2000-13, "Optimal Realization of the Defining Points of the ITS-90..."

## ■ Dual Furnaces - the no compromise choice

These furnaces use heatpipes to provide an essentially gradient free environment to melt and freeze the ITS-90 fixed points. These furnaces meet all the requirement of CCT/2000-13 and allow a uniformity of <10mK over the entire length of the fixed-point sample.

The second independent furnace is used to pre warm and anneal the thermometers being calibrated. This concept of heatpipe and second furnace for pre and post conditioning the thermometers in a single apparatus was developed from a concept of Dr Marcarino of IMGC, Italy.

## ■ Heat Pipe Furnaces

For those laboratories who already have furnaces for pre and post conditioning SPRTs we offer the range of furnaces in single, heatpipe only version.

## ■ Three Zone Furnaces

All heatpipes have a limited operating range, determined by fluid that flows inside the pipe. Furnaces without heatpipes can work over wider temperature ranges. Isotech offer two models of Three Zone Furnaces, one from 50°C to 700°C and one from 200°C to 1200°C. These furnaces use top and bottom guard heaters to minimise temperature gradients and also meet the requirement of "Optimal Realizations".

## ■ Single Zone Furnaces

Finally the range includes an economical single zone furnace for Indium, Tin and Zinc Cells and an Annealing Furnace for pre and post conditioning thermometers.

## ■ Plateau Lengths

CCT/2000-13 says that a plateau length of 10 or more hours is suitable for optimal realizations.

NIST in the US like to work with long plateaus whereas according to our UKAS procedure we should calibrate an SPRT 2 or 3 times using a new plateau each time.

Our apparatus has sufficient performance that the length of the plateau is dictated mainly by how close the set point of the apparatus is to the fixed point being realized.

Plateau lengths at the silver point of over 70 hours (3 days) have been achieved using our furnaces. From a practical point we normally work with one working day long plateaus, remelting the cell overnight ready for a new freeze the next day.

## ■ High Temperature Furnaces

To eliminate problems with noise and electrical safety from high earth leakage currents our high temperature furnaces operate from 110VAC. For operation from 230VAC the furnace can be provided with an internally mounted isolating transformer.

