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 requirements 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 heat-pipe 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.

Heatpipe Furnaces

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

The length of the cell plateau is dictated mainly by how close the set point of the apparatus is to the fixed point being realized.

The controller resolution of our furnaces allow plateau lengths at the silver point of over 70 hours. From a practical point we operate with plateaus that last an entire day, remelting the cell overnight ready for a new freeze the next day.

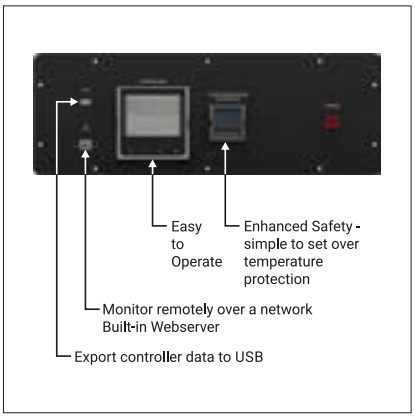
Isotech ITS-90 Fixed Point System have been in use around the world since 1990.

Re-Designed for Convenience

From our own ongoing experience and customer feedback, we have updated the Isotech Furnace Range to deliver the same proven performance and advanced features but with a number of convenience upgrades to make your life easier.

1 Repositioned Controllers

With the most featured and up to date controllers we have repositioned them to make them easier to view.



2 Thermometer Stand Included

Metrologists realise how important it is to safely support SPRTs, especially so at high temperatures.

Our furnaces includes a fully adjustable support to hold your SPRTs.

3 Adjustable Accessories

Our furnaces now feature and include “Accessory Pods” and “Cable Tidies”

Avoid the clutter on top of furnaces and tidy SPRT cables to reduce the risk of a cable getting pulled or caught. Each furnace includes two Accessory Pods and two Cable Tidies (they can be positioned anywhere the user sees fit by way of multi point mountings on either side of the furnace).

Why Isotech Furnaces?

- Isothermal Environments for Long Plateaus
- Safe Convenient Operation
- Four Decades of Proven Operation

Heatpipe Furnaces

Isotech Metrology Furnaces have been in use in world leading National Measurement Institutes, (NMI) since the late 1980's with the widest range of heatpipes covering Indium freeze point (156.5985°C) to Copper freeze point (1084.62°C). Many nations rely on Isotech technology to provide their national standards for temperature.

Dual Furnaces

The no compromise approach, Realise Fixed Points and Maintain Thermometers.
Two furnaces in one, as well as the heatpipe to realise the fixed points there is a separate furnace for annealing SPRTs. A further innovation from Isotech.

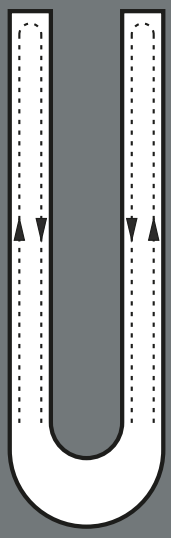
Three Zone Furnaces

Heatpipes provide best performance and operation but have limited temperature ranges, our Three Zone Furnaces have wider temperature ranges and are more cost effective. We use guard heaters at the top and bottom to minimise gradients. Our control systems offer enhanced performance and flexibility.

Why Heatpipes?

" A heatpipe is a self-contained structure which achieves very high thermal conductance by means of two-phase fluid flow with capillary circulation "

- Lower portion of the heatpipe is heated
- Liquid turns to a vapour and travels up the heatpipe
- Vapour condenses and travels down the heatpipe
- Latent heat created a volume of very uniform temperature, radially and axially
- Ideal conditions to realise ITS-90 Fixed Points



TEMPERATURE CONTROL SYSTEMS

Isotech furnaces have the most sophisticated Temperature Control Systems.

In 2016 we updated the control systems to the latest technology with crystal clear colour displays. Advanced gain scheduling that automatically optimizes the stability at each fixed point temperature. Save time with the included programmer - set the furnace to melt or freeze the cells at specific times. An eight point correction curve ensures high accuracy across the fixed point temperatures. Connect via ethernet to allow multiple furnaces to be monitored - export heat up and cool down times to a USB Drive.

- Crystal clear, easy to read display

- Optimise stability and accuracy at each fixed point

- Automatic temperature stepping

- Export to USB

- Remote control and monitoring over a network

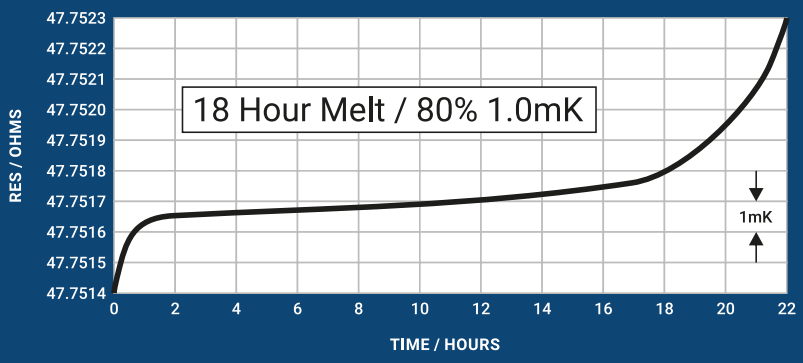
Isotech Furnaces for Optimal Plateaus

Why it matters...

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 a 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.

Long Plateau - Plateau lengths at the silver point of over 70 hours have been achieved using our furnaces



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, re-melting the cell overnight ready for a new freeze the next day.

Isotech for...

- **Heatpipes operating from 150°C to 1100°C to suit Indium to Copper Cells**
- **'Dual' combined Annealing and Fixed Point Furnaces**
- **Ethernet Built in Temperature Programmer**

The world's leading National Metrology Institutes choose Isotech...
Shouldn't you?