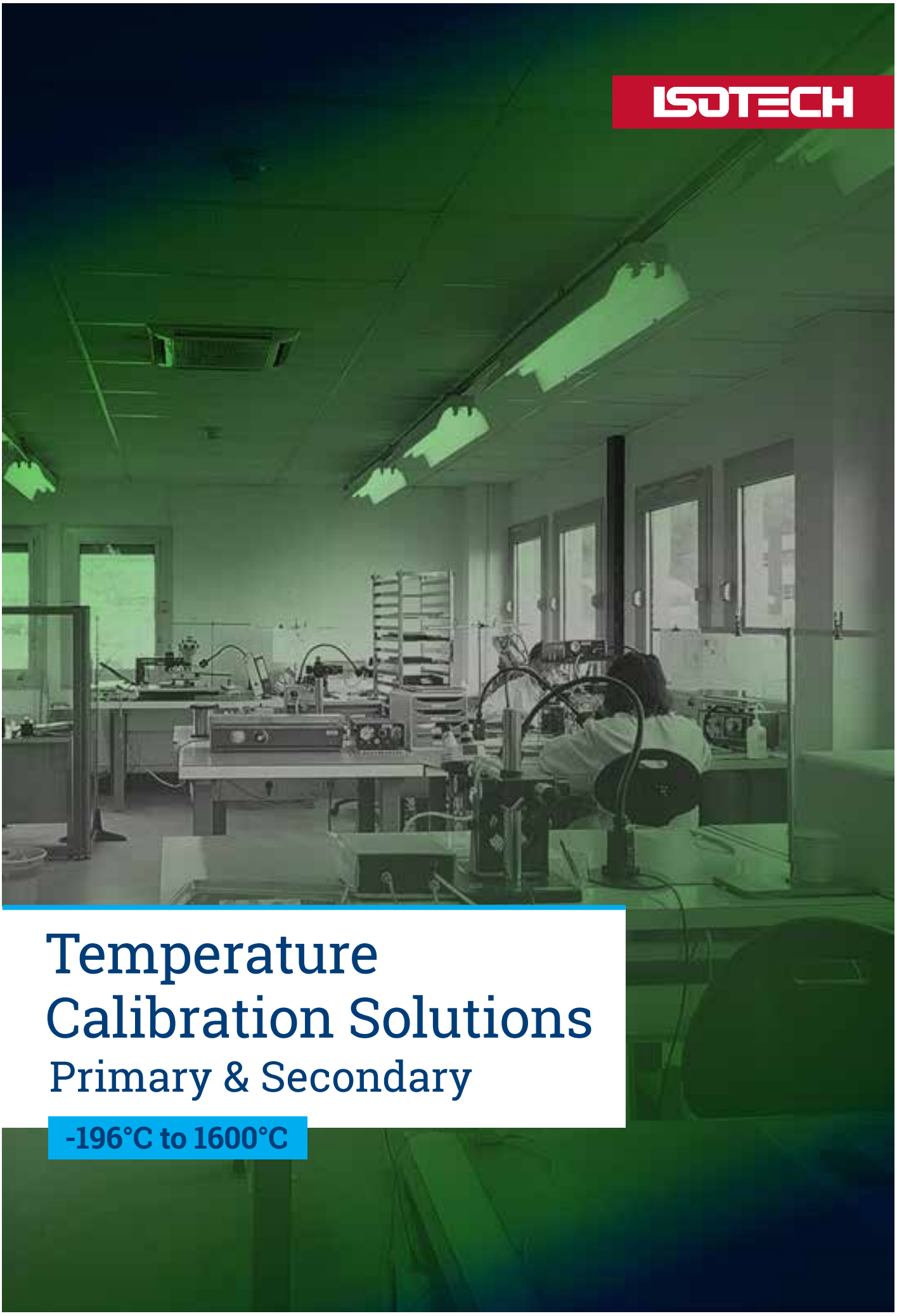


Temperature Calibration Solutions

Primary & Secondary

-196°C to 1600°C

Metrology Furnaces 10

The widest range of metrology furnaces to melt and freeze ITS-90 Fixed Point Cells

The Best Comparison Calibration Equipment 16

Isotech have a range of professionally engineered comparison calibration equipment covering the temperature range -200°C to 1300°C. Isotech have equipment to match the requirements of National Metrology Institutes, Accredited Calibration Laboratories and in house calibration labs

ISOTECH

The world's leading National Metrology Institutes choose Isotech...

Shouldn't you?

Leading the Way in Thermocouple Homogeneity Testing

Dual Heat Pipe Thermocouple Homogeneity Scanner

How does your laboratory identify thermocouple homogeneity effects?

Now there is a solution!

> Fully Automated

> Scans Thermocouples with full control of position and speed

> Identify Uncertainty due to Inhomogeneity

For more details visit:
www.isotech.co.uk

Developed by the Measurement Standard Laboratory, New Zealand - licensed to Isotech

The company is always willing to give technical advice and assistance where appropriate.

Equally because of the program of continual development and improvement, we reserve the right to amend or alter characteristics and design without prior notice.

This publication is for information only.

The Isotech-Jarrett Water Triple Point Cells

Total Confidence - The Internationally Proven Cells

The Isotech-Jarrett cells have been in production since 1958. An independent comparison showed the first cell to be within 0.000006°C of the reference cell. The most recent international study organized by BIPM consistently shows labs using both recent and older Isotech-Jarrett cells tightly grouped, tens of µK around the BIPM reference value.

Performance

> ACCURACY

The equilibrium temperature of the Isotech-Jarrett Triple Point of Water Cell is within ±20µK of the 2005 definition as described in CCT/05-07/ rev(2).

> REPRODUCIBILITY

The equilibrium temperature of a cell will repeat to within ±0.000,02°C of the mean equilibrium temperature.

> STABILITY

After equilibrium is reached, the temperature of the inner melt of an ice mantle will remain constant to within ±0.000,01°C for as long as the mantle can be preserved (up to 90 days in some instances).

> LIFE

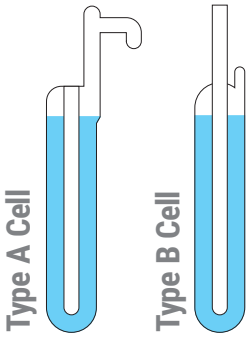
Cells made from Borosilicate Glass may drift lower in temperature by up to 0.1mK after 10 to 20 years. Cells made from Quartz are expected to last 10 times longer.

> ISOTOPIC ANALYSIS REPORT

Isotech-Jarrett Cells use water with an isotopic content essentially similar to Standard Mean Ocean Water. We can provide Isotopic Analysis of the water in our triple point cells; recommended for NMIs.

> INDEPENDENT COMPARISONS - CONFIDENCE IN ISOTECH CELLS

Many Isotech-Jarret cells are compared in the CCT-K7: Key comparison of water triple point cells M Stock et al 2006 Metrologia 43 03001 report.



Wide Range of Sizes

30 - 65 mm Diameter
130 - 270 mm Immersion Depths
Quartz and Borosilicate Glass

Optional

UKAS Calibration to an uncertainty as low as 0.07 mK

Water Triple Point Cell Uncertainties

Cell Type	Immersion Depth	Calibration Options: UKAS *k*=2		
A and B Cells	270 mm	0.07 mK	0.1 mK	0.5 mK
B12 Cells	210 mm		0.1 mK	0.5 mK
B8 Cell (Small)	130 mm			0.5 mK

Apparatus

The Isotech Water Triple Point Maintenance Bath, Model 18233, has more than 35 years of proven use and is widely used by the worlds' leading NMIs. In a recent International study cells from 21 of the world's leading laboratories were inter-compared; the study used two Isotech 18233 Baths to maintain the cells during the inter-comparisons.

> Maintains Four WTP Cells
> Proven Use in Many NMIs
> Safe and Convenient Operation

Choose Isotech for...

- Proven Long Term Performance
- Safe and Convenient Maintenance Equipment
- Wide range of sizes - with calibration uncertainties as low as 0.07mK

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Isotech Liquid Baths and Dry Blocks have options to maintain water triple point cells

Isotech Ice Mantle Maker Model 452

Use Model 452 to quickly create perfect ice mantles. This was originally developed for our own use in the laboratory. It works by using a specially designed anti-gravity heat pipe. The heat pipe exits the cell and exchanges the heat/cool in a small container filled with solid carbon dioxide or preferably liquid nitrogen.

Because of the low temperature gradient along the heat pipe the ice mantle is formed close to 0°C, and so ideal strain free mantles are formed.

The Mantle Maker works equally well when you wish to increase the thickness of ice at the bottom of the cell.

ITS-90 Fixed Point Cells - Argon to Gallium

-189.3°C to 29.7°C

471 Simple Argon Triple Point Apparatus

Technical Feature	Value
Temperature Range	-189.3442°C
Plateau Duration	4 Hours
Calibration Options: UKAS *k* = 2	±0.8 mK

The Isotech Argon Triple Point Apparatus has been upgraded for greater automation, efficiency, and ease of use in realising the argon triple point.

Many laboratories use liquid nitrogen comparators, a low-cost but imperfect method. Liquid nitrogen's boiling point is not on the ITS-90 scale and is below the argon triple point. This presents challenges, as standard platinum resistance thermometers (SPRTs) often contain a mix of argon and oxygen. At -195°C, the gas inside the SPRT can be under partial vacuum, affecting self-heating and increasing calibration uncertainties.

Previously, the high cost and complexity of argon triple point systems were barriers for many laboratories. Isotech has changed that with a simpler, more affordable solution featuring automated temperature control for easier operation.

What's New?

> Automated Pressure Control - Replaces the manual weight system for precise, stable temperature regulation.

> Additional Pre-Cooling Pocket - Improves efficiency and speeds stabilisation.

> Faster Time to Fixed Point Plateau - Reduces wait time for calibration.

> Allows LN_2 Replenishment During Use - Extends the calibration period without disruption.

> Faster Filling Time - Speeds up setup and operation.

Inside the apparatus, 6N pure argon is sealed in a pressure vessel, and liquid nitrogen cools the volume to approximately -195°C. A pressure controller then regulates the nitrogen's boiling temperature to just above the argon triple point, maintaining stable conditions. The argon settles into its triple point for around four hours, providing an accurate, stable reference for SPRT calibration. The temperature is adjustable via a PC-controlled electronic pressure controller (PC not supplied), allowing precise regulation and enhanced flexibility in operation.

With automation, faster setup, and improved usability, the updated Isotech Argon Triple Point Apparatus makes SPRT calibration at the argon triple point more accessible than ever, ensuring greater efficiency and control for calibration laboratories.

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Isotech Mercury Cell and Mercury Triple Point Apparatus

The Isotech Mercury Cell is constructed in a rugged, sealed stainless steel enclosure allowing the triple point of -38.8344°C to be realised both easily and safely.

Total Confidence

The embodiment of the Mercury Triple Point Cell was originally developed in the US with a very close cooperation between Henry Sostmann and Dr. Furukawa of N.B.S. (now NIST) over 40 years ago. The physical size, materials and metal purity are identical to this original design. The mercury is distilled four times leaving impurities of 10 to 15 parts per billion. The cells made by Isotech still use the original design, purity and supplier of mercury.

In international intercomparisons the cells made by Isotech have always been within the National Laboratories uncertainty of calibration and with over 35 years of successful use throughout the world the cell embodies the finest traditions of production and use.

Cell Model	17724	
Temperature	-38.8344°C	
Metal Purity	> 99.99999 7N	
UKAS k = 2 Calibration Options:	Premium	Standard
	±0.22 mK	±1.0 mK
Apparatus Model	17725	

Isotech Gallium Cell and Apparatus

Second only to the water triple point and in many ways, because of its ease of use and purity, superior to it, is the gallium melt point. At 29.7646°C this is a very convenient temperature.

Total Confidence

Confidence is a major requirement in a standard. The Isotech Gallium Cell and Apparatus have a long history and have been successfully used in most National and Primary Laboratories world-wide.

International comparisons prove the quality of the Isotech Cells and are unique in the number, and history of comprehensive evaluations.

Calibration of Isotech's Reference Cell with the Standard at NIST showed an agreement of 4μK, 0.000004°C. The Isotech Gallium Cells contain the highest purity metal, >99.99999% pure (7N) and giving a flat plateau. The cell has a day to day reproducibility of just ±0.000025°C.

Cell Model	17401	
Temperature	29.7646°C	
Metal Purity	> 99.99999 7N	
UKAS k = 2 Calibration Options:	Premium	Standard
	±0.25 mK	±1.0 mK
Apparatus Model	17402B	

ITS-90 Fixed Point Cells - Indium to Copper

156°C to 1084°C

Isotech manufactures a complete range of ITS-90 Fixed Point Cells from the argon triple point to the freezing point of copper. Many nations rely on Isotech for their primary temperature standards. There are a range of metal and quartz clad ITS-90 Fixed Point cells with the lowest of uncertainties. In addition to solutions for the world's leading NMIs there are more cost effective solutions, still with uncertainties to less than 1 mK to suit a wider range of laboratories.

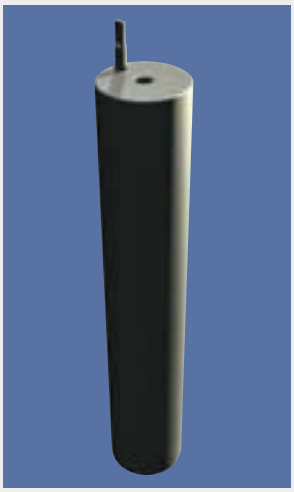
Choose for...

- Lowest Calibration Uncertainties
- Quartz Glass AND Metal Clad Types
- International Confidence

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Sealed Metal



- Convenience
- Protected Against Contamination and Ambient Pressure Effects
- Easily Transportable Between Labs
- Robust

Sealed Quartz

- Convenience
- Protected Against Contamination and Ambient Pressure Effects

Resealable Metal

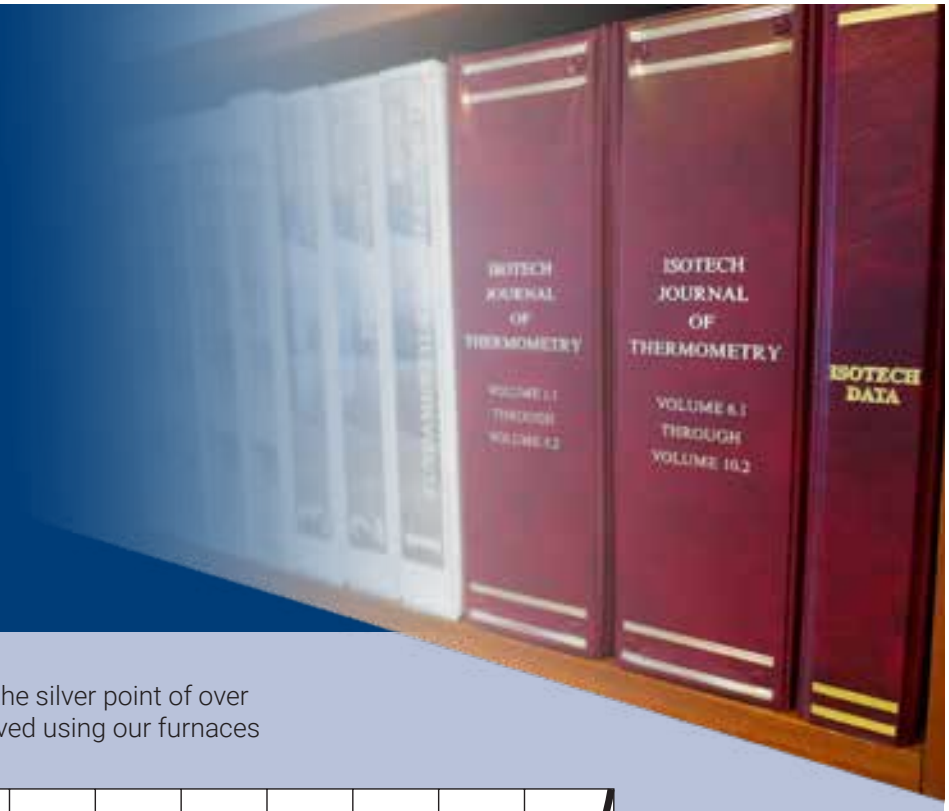
- Pressure can be set by user
- Requires vacuum and gas flow system
- Easily Transportable Between Labs
- Robust
- Thermally Closer to ITS-90 temperature
- Sealed Construction with open port for gas supply

Open Quartz

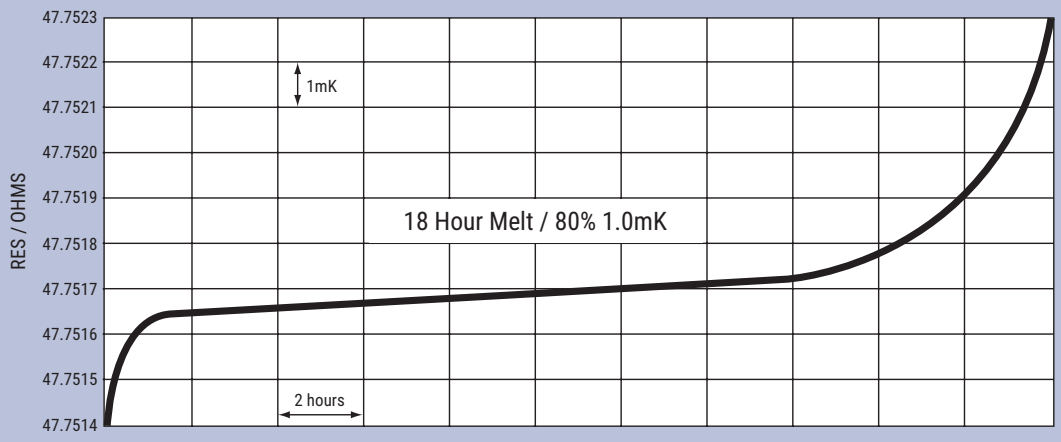
- Pressure can be set by user
- Requires vacuum and gas flow system
- Transportable Between Labs
- Can be disassembled

Experience

- > Open and Sealed Fixed Points
- > Quartz Clad and Robust Metal Clad Fixed Points
- > Lowest Uncertainties



Long Plateau - Plateau lengths at the silver point of over 70 hours (3 days) have been achieved using our furnaces



Isotech UKAS Calibration Uncertainties (*k=2*) - The Best ISO 17025 Uncertainties

Optimal Cell	UKAS Schedule Premium Service	UKAS Schedule Standard Service
Mercury	±0.2 mK	±1 mK
Gallium	±0.25 mK	±1 mK
Indium	±0.45 mK	±2 mK
Tin	±0.60 mK	±2 mK
Zinc	±0.90 mK	±2 mK
Aluminium	±1.1 mK	±6 mK
Silver	±2 mK	±10 mK

0175

The latest schedule can be found on the Isotech website or at www.ukas.org.

Furnace Selection Guide

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

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 heat pipes 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 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.

> Heat Pipe Furnaces

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

> Three Zone Furnaces

All heat pipes have a limited operating range, determined by fluid that flows inside the pipe. Furnaces without heat pipes 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 USA 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 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.

HEAT PIPE FURNACE

- Models for Indium through to Copper Cells
- Best Performance

Model	Temperature Range
17702W	125°C to 250°C
17702P	400°C to 1000°C
17702S	500°C to 1100°C

DUAL FURNACE

- Models for Indium through to Copper Cells
- Best Performance
- Two Furnaces in One - Fixed Point and Annealing Furnace

Model	Temperature Range
17707	125°C to 250°C
17706	400°C to 1000°C
17705	500°C to 1100°C

SINGLE ZONE

- Best Value
- For Indium, Tin and Zinc Cells

Model	Temperature Range
17701	50°C to 500°C

THREE ZONE

- Wide Operating Range
- Central Temperature Zone with top and bottom Guard Heaters

Model	Temperature Range
17703	50°C to 700°C
465	250°C to 1200°C

Choose Isotech for...

- Heat pipes Operating from 125°C to 1100°C to suit Indium to Copper Cells
- 'Dual' Combined Annealing and Fixed Point Furnaces
- Ethernet Built in Temperature Programmer

ITS-90 Isothermal Towers and Slim Cells

These ITS-90 Fixed Point systems that are less expensive, easier to use and more robust than the larger cells used by the international NMIs.

Users in industrial and secondary laboratories benefit from using Slim Cells to calibrate to smaller uncertainties than is possible with dry blocks or liquid baths.

ISOTowers

The ISOTower is a new integrated device combining a furnace, heat siphon and ITS-90 Fixed Point Cell. As well as the novel combination of cell and heat pipe a new immersion compensator is used to fully compensate for the immersion characteristics of the thermometer under test.

Choose Isotech for...

- > Outstanding Performance, from 0.7mK
- > Robust - No Glass Parts
- > Suitable for shorter length SPRTs and Reference Standards
- > Patent Protected

Model	490	491	492	493
ITS-90 Point	Indium	Tin	Zinc	Aluminium
Temperature	156.5985°C	231.928°C	419.527°C	660.323°C
Metal Purity	6N	6N	6N	6N
Plateau Duration	Up to 30 hrs			
Heating Time	2 hrs	2 hrs	2 hrs	2 hrs
Pocket Diameter	8 mm			
Total Immersion Depth	290 mm			
Depth of metal surface to bottom of reentrant tube	180 mm			
PC Interface	Supplied with PC Cable and Software			
Power	900 Watts			
Voltage	110 Vac or 230 Vac 50/60Hz			
Dimensions	H 430 mm x W 310 mm x D 300 mm			
Weight	15kg			
UKAS Uncertainty: Premium Service*	±0.6 mK	±0.8 mK	±1 mK	±2 mK
UKAS Uncertainty: Standard Service*	±2 mK	±2 mK	±2 mK	±6 mK

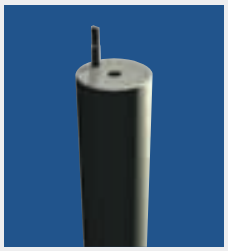
** UKAS Calibration is Optional, Uncertainties apply to whole system, k=2*

For more information: ISOTECH.CO.UK

Isotech Slim Cells

Use Slim Cells in a wide range of equipment including liquid baths and dry blocks

Metal



> Robust
> Protected Against Contamination and Ambient Pressure Effects
> Easily Transportable Between Labs

Quartz

> Silver and Copper points available

Slim Gallium

> Robust
> Fits in Isotech Dry Blocks

Slim Mercury

> Robust
> Fits in Europa-6

Water Triple

> Low cost
> Fits in Dry Blocks

Nominal Dimensions

Cell	Outside Dia.	Inside Dia.	Height	Material Depth
Slim Metal	37 mm	8 mm	220 mm	160 mm
Slim Quartz	38 mm	8 mm	226 mm	160 mm
Slim Mercury	35 mm	9 mm	235 + 140 mm	130 mm
Slim Gallium	35 mm	10 mm	200 + 45 mm	140 mm
Water B8 30 130	30 mm	8 mm	160 mm	130 mm
Water B12 40 210	40 mm	12 mm	365 mm	210 mm
Water B12 46 210	46 mm	12 mm	365 mm	210 mm

Isotech UKAS Calibration Uncertainties (*k*=2)

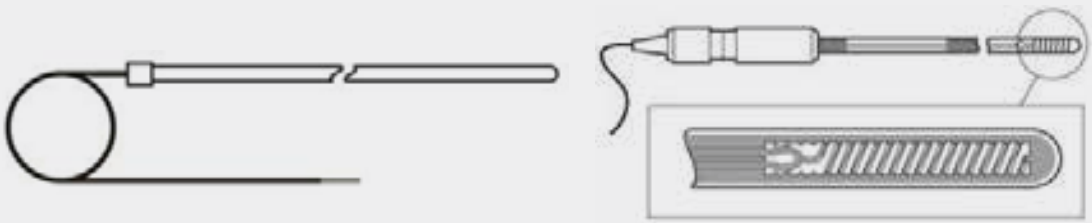
Slim Cell	UKAS Schedule Premium Service	UKAS Schedule Standard Service
Mercury	±0.5 mK	±1 mK
Water	±0.1 mK (B12)	±0.5 mK
Gallium	±0.5 mK	±1 mK
Indium	±0.6 mK	±2 mK
Tin	±0.8 mK	±2 mK
Zinc	±1 mK	±2 mK
Aluminium	±2 mK	±6 mK
Silver		±10 mK

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Standard Thermometers

Isotech manufacture a range of standard thermometers from Standard Platinum Resistance Thermometers (SPRTs) through to industrial standards. Our Standard Thermocouples can be supplied calibrated for use up to 1600°C. Resistance thermometers are available covering the range from -200°C to 1084°C. Isotech manufactures primary standards with uncertainties better than 1mK (0.001°C) to affordable rugged standards for industry and can provide UKAS calibration from our leading laboratory.



Primary SPRT - 670 Family

> Useable Range -200°C to 670°C
> 25.5 Ohm SPRT
> Outstanding Performance

The 670SQ Primary SPRT is specifically designed to give optimum performance up to the aluminium point. Its construction permits the four internal platinum lead wires to expand and contract in the same manner as those of silver-point thermometers. The all-quartz construction of the support members gives the most stable performance with minimal drift, and a unique platinum radiation shield prevents heat radiating up the inside of the sheath.

Silver Point SPRT - Model 96178

> Unique Aspirated Design
> High Stability
> Ultra High Purity Quartz

Endless hours of study at National and International level, plus our own significant work at Isotech, have enabled us to design, build and test a superior silver-point thermometer. This, we feel, is a significant contribution to better high temperature calibration.

Copper Point SPRT - Model 108462

> Novel Design
> Sapphire Mandrel
> Pressurised Sheath

Isotech has a long history of making SPRTs to the silver point (Model 96178) and this experience was combined with new research to produce the new copper point SPRT. Following around 30 years of research, with earlier results formally presented at TEMPMEKO & ISHM 2010 and at the 9th International Temperature Symposium (ITS9); Isotech have commercialised the design to allow other researchers to benefit from the technology and novel design

Working SPRTs - 909 Family

> Three Stem Lengths
> Wide Operating Range
> Proven Design

In addition to our 670 family of primary SPRTs we have the 909 family of working standards with both quartz and metal sheaths. This economically-priced Standard Platinum Resistance Thermometer, Model 909, is the workhorse of calibration laboratories all over the world. During 2007 we reviewed our range of SPRTs and now have new models in the 909 family, the 909L and 909H. The wide temperature ranges and economic pricing make this thermometer ideal for the secondary laboratory. For smaller uncertainties to suit the primary laboratory refer to the Model 670 SPRTs.

Thermocouple Standards

> Standard Thermocouples 0°C - 1600°C

Isotech can offer Platinum / Platinum Rhodium, Platinum / Gold and Platinum / Palladium types. With optional fixed-point calibration uncertainties can be as low as 0.05°C for Platinum / Gold and ±0.2°C from 0°C to 1100°C rising linearly to ±0.55°C at 1330°C (or ±0.7°C at 1500°C) for Platinum / Palladium

The Best Comparison Calibration Equipment

Isotech have a range of professionally engineered comparison calibration equipment covering the temperature range -200°C to 1300°C. Isotech have equipment to match the requirements of National Metrology Institutes, Accredited Calibration Laboratories and In House Calibration Laboratories.

Isotech Comparison Equipment: Isotech products are designed to be deep enough, to be stable enough and to have sufficient uniformity to enable calibration to the smallest of uncertainties. The comparison calibration schedule below is from Isotech's UKAS accredited calibration laboratory. The performances are achieved using Isotech Baths and Reference Thermometers. Evaluation reports describing the performance of Isotech equipment are freely available.

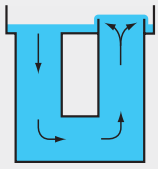
Isotech UKAS Calibration Uncertainties (*k*=2) - Platinum Resistance Thermometers

The table shows the uncertainties that we can offer to our clients from our ISO 17025 Accredited Laboratory. This is using our own Isotech Calibration Baths, SPRTs and thermometry bridges.

Resistance Thermometers Calibration by comparisons *k=2*	-80°C to -40°C	7.0 mK
	-40°C to 50°C	4.0 mK
	50°C to 156°C	5.0 mK
	156°C to 300°C	6.5 mK
	300°C to 420°C	20 mK
	420°C to 660°C	35 mK

Low Temperature Range -80°C to 300°C

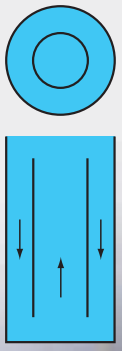
Over this range Isotech Stirred Liquid Baths of parallel tube design provide outstanding temperature uniformity with low filling costs.



PARALLEL TUBE DESIGN

Here the heating, cooling and mixing take place in one of two parallel tubes. The second tube is the calibration volume and again the excellent temperature uniformity gives small calibration uncertainties.

An added benefit of this tube design of bath over large square tank designs is that less liquid is required. For high temperature work it is usual to use Silicone Oils which have both a high cost and finite life.



CONCENTRIC TUBE BATHS

In this design liquid is forced down an outer tube and flows up an inner concentric tube. The heating and cooling takes place in the outer tube leaving the inner tube as the calibration volume into which the thermometers are immersed. This design gives very small axial and radial temperature gradients.

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Isotech Laboratory Bath Selection Guide

Parallel Tube Liquid Bath - Model 915

> Best Performance
> -65°C to 300°C
> Removable Chiller Probe

25 Years of proven use

Parallel Tube Liquid Bath - Model 785

> Best Performance
> -80°C to 300°C
> Integral Cooling
> 485mm Immersion

Updated 915 - recommended for new installations

Stirred Liquid Bath - Model 796

> Good Value
> -80°C to 300°C
> 470mm Immersion

Competitively Priced Laboratory Bath with extended immersion

Stirred Liquid Bath - Model 798 + 798O

> -80°C to 300°C
> Good Value
> 300mm Immersion
> 798O for Oceanographic Probes

Competitively Priced Laboratory Baths with standard immersion

Simple Liquid N2 Apparatus - Model 461 -196°C

> Easily Calibrate Thermometers at -196°C
> Safe to use
> Economical

This model is a simple apparatus open to the atmosphere comprising a stainless steel Dewar flask filled with liquid nitrogen, an insulating layer which houses a metallic equalising block and a thermometer holder. Lastly, a split insulated lid reduces evaporation and permits easy addition of liquid nitrogen. Use with a calibrated standard probe and liquid nitrogen.

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Cryostat - Model 459 -180°C to -80°C

> Extreme Low Temperature Calibration
> High Stability

This cryostat covers temperature much lower than that which can be spanned with stirred liquid baths.

The calibration volume design: Our solution is a heated copper block design using a single, safe surrounding liquid, liquid nitrogen. Our design, using a controller and heater, permits the Cryostat to be set at any temperature above that of liquid nitrogen. The Cryostat comprises an insulated machined copper equalizing block inside an 80mm diameter tube 480mm long that is attached via a flange to a lid giving access for three thermometers, a vacuum port and a lemo connector for the temperature sensor and heater. A cable runs to a controller which sets the desired temperature. Use with a calibrated standard probe and liquid nitrogen

The Cryostat includes an external temperature control system that connects via 2M leads to the Cryostat Assembly.

Recommended Container for Cryostat

Fluidized Calibration Bath - Model 875
50°C to 700°C

> Wide Temperature Range, High Accuracy
> Safe, Sealed Assembly eliminating powder loss into the Laboratory
> Comparison Calibration or use with Fixed Points

The Isotech fluidized calibration bath out performs dangerous salt baths in all respects: wider temperature range, less hazardous and better uncertainties. The bath is the result of 20 years research and development into flow patterns, powder technology and filtration. The safe alternative to salt baths

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Thermocouple Calibration Furnaces
Model 877 & 547

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Isotech's Thermocouple Calibration Furnaces offer precision calibration for laboratory and industrial thermocouples. Model 877 features a spherical design ensuring a stable central zone with uniformity as low as ±0.25°C at 1000°C, making it ideal for high-temperature comparison calibrations. Model 547, designed for both deep and short immersion calibration, operates from 200°C to 1200°C with uniform three-zone control, dynamic heat flow technology for rapid heating and cooling, optional blackbody targets for infrared thermometer calibration. It features a touchscreen control and automation capabilities, delivering reliable, high-accuracy thermocouple calibration solutions.

Model 877 - Saturn

Up to 15 thermocouples can be calibrated simultaniously.

> Uniformity, 1000°C: ±0.25°C
> Central zone of 0 heat flux
> Range: 100°C to 1300°C

Model 547

Designed to accomodate open-ended multi-zone thermocouples.

> Uniformity, 1200°C: ±0.3°C
> 4.5" Touchscreen
> Range: 200°C to 1200°C

microK - Precision Themometry Bridges

The Proven Choice for Primary and Secondary Laboratories.

For more information: ISOTECH.CO.UK

UKAS Calibration Options ISO 17025

Choose microK for...

> The microK family of precision thermometry bridges provides best-in-class accuracy and drift-free performance for SPRTs, PRTs, Thermistors, and Thermocouples.

> Designed for National Metrology Institutes (NMIs), accredited calibration labs, and research applications

> Backed by documented low uncertainty performance, ensuring laboratories can achieve the highest levels of accuracy with confidence

Key Features:

Best-in-Class Accuracy:

> microK² ELITE: <30ppb

> Voltage Accuracy to <0.15nV for precise thermocouple calibration

Zero Drift Ratio Measurements

Fast Efficient Measurements

<1s per channel for voltage
<2s per channel for resistance

Multi-Input Capability:

> microK² models: 4 input channels (expandable to **93** with microsKanner)

> microK models: 3 input channels (expandable to **92** with microsKanner)

Advanced User Interface:

> 10.1" High-Resolution Touchscreen (microK² models)

> Internal Memory & USB Data Logging

Supports All Thermometer Types:

> SPRTs, Industrial PRTs, Thermistors, Thermocouples

Applications:

> ITS-90 Fixed Point Calibration

> Comparison Calibration of Standard Thermometers

> Oceanography, Aerospace, Pharmaceuticals, and Research

> **Accuracy and Stability:** Superior resistance ratio accuracy and zero drift to ensure long-term stability

> **Second Generation:** Improved performance with new features and a 10.1" high-resolution touchscreen for clear visualisation of measurements and data

> **Building on the trusted performance:** The new microK² delivers enhanced accuracy, improved usability, and greater flexibility with new features

milliK - Precision Thermometer -270°C to 1820°C

High accuracy for SPRTs, PRTs, Thermocouples, Thermistors and Current Transmitters with flexible expansion.

Choose milliK for...

> Accuracy: Best in class ±0.003°C (±3mK) at 0°C

> Calibration and precision measurement

> Features: Cycles Isotech Blocks and Baths through a series of calibration temperatures whilst logging the data - all without a PC

> USB: Export logged data - connect a mouse and keyboard for ease of operation

The milliK Precision Thermometer from Isotech sets a new standard for the high accuracy measurement and calibration of Platinum Resistance Thermometers, Thermistors, Thermocouples and Process Instrumentation (4-20mA) over the range -270°C to 1820°C.

The milliK has two input channels for sensors, with an additional third channel for current. It can be expanded to become a measuring system with up to 33 channels reading SPRTs, PRTs, Thermistors, or Thermocouples with the option to control calibration baths and log readings accurately.

Wide Range of Sensors:
SPRTs, PRTs, Thermistors, Thermocouple and 4 - 20mA
The milliK sets a new standard for value, versatility and accuracy - < ±5ppm over range for PRTs, ±2µV for Thermocouples and ±1µA for current transmitters, see Data Sheet.

Supporting a wide range of sensors and functions it replaces individual devices making a cost effective calibration solution.

SPRT/PRT, Thermocouple, & Thermistor Precision Thermometer

> Range: -270°C to 1820°C (3308°F)
> Accuracy: ±0.005°C (±5mK) full range for PRTs
> Resolution: 0.0001°C (0.1mK)
> SPRT/PRT, Thermocouple, Thermistor and 4-20mA Inputs
> Full colour graphical display
> Store up to 180 days of measurements
> Control Isotech calibration baths

For more information: ISOTECH.CO.UK

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RBC: Resistance Bridge Calibrators

Manual and Automatic Models RBC100A/M & RBC400A/M

Isotech have a unique solution to measure the performance of thermometry bridges - the RBC. It is used to verify the performance of all microK models. Developed by D. R. White at the Measurement Standard Laboratory of New Zealand, the RBC allows bridge performance to be fully evaluated.

Confidence

RBC testing of the microK thermometry bridge establishes both confidence and evidence of the instrument's performance. When NMIs have used the RBC to evaluate other bridges, many have been found to be out of specification or have 'small but significant' faults.

" The RBC has allowed both Isotech and leading NMIs to validate microK performance. It has given metrologists evidence of actual performance as well as contributing to the outstanding success of the microK bridge "

Choose RBC for...

- To calibrate both DC and AC Bridges
- Accuracy to 10ppb at 100 Ohms
- Ensure the integrity of your thermometry bridge

Standard Resistors Model SRA 1 to 400 Ohms

Eventually all resistance thermometry refers back to one or more fixed resistors. These are a key element in any laboratory which measures temperature. The resistors need to be very stable with time, temperature and transportation, and they need to have negligible inductance and capacitance. They also need to have a long and successful history of use. Wilkins and Swan at our National Physical Laboratory (NPL) developed a resistor design flexible enough to allow windings with various resistance values to be made available and stable enough to be accepted world-wide as resistance standards.

Particularly important is that the AC/DC characteristics are the same up to about 1000 Hz. Isotech are pleased to be able to offer this design of resistor and we can calibrate the SRA values in our laboratory to the following uncertainties.

Value Ω	Calibration Options: UKAS *k = 2*
1	< 0.09 ppm
10, 25, 100	< 0.08 ppm
400	< 0.15 ppm

Available Values 1, 10, 25 and 100 Ohms and 400 Ohms

Stability	2 ppm/year (0.5 ppm/year to special order)
Temperature coefficient of resistance	2 ppm/°C 0.5 ppm to special order

Standard Resistor Maintenance Bath 15°C - 40°C Model 455

This bath is used to maintain the SRA Resistors at a constant temperature.

Heating and cooling is accomplished by efficient solid-state peltier chilling modules giving optimal control around ambient. Solid state cooling ensures minimal power consumption, silent operation and no vibration.

Stability and temperature differences total less than ±0.015°C when measured directly in the oil of the bath and ±0.003°C when measured inside a Fixed Standard Resistor.

The bath will house several resistors depending on their size and is ideal for measuring the temperature coefficients of Fixed Resistors, as well as maintaining them at a selected temperature.

The control system has been updated and now features a large colour display with crystal clear graphics. An ethernet interface allows the bath temperature to be remotely monitored. For applications where it is necessary to change the bath temperature to determine the resistor temperature coefficient, the bath can be programmed to step through a series of temperatures at a controlled ramp rate. Other features include data logging of the bath temperature along with the air intake temperature - the data can be exported to a USB drive.

Temperature Controlled Fixed Resistors Model 456 10, 25, 100, 1000 and 10,000Ω

These devices have performance close to the superior SRA Models. A highest quality bulk metal film resistor is held in a temperature controlled environment that is heated to 30°C ±0.1°C. Simply connect the Model 456 to a power supply and the resistor will warm up in typically 30 minutes and a LED shows when the temperature has been reached. A test pocket is provided so that the resistor's temperature can be monitored if required

For more information: ISOTECH.CO.UK

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ISOTECH

About Us

The world leader in temperature metrology, with over 40 years' experience.

Our clients include the world's leading laboratories including National Laboratories, leading ISO 17025 Accredited Laboratories and users in all industries.

Why Choose Isotech?

> Isotech has solutions for all calibration needs, from Primary Laboratories maintaining National Standards to the needs of field engineers calibrating industrial sensors on site. Isotech is truly "The Source for Calibration Professionals".

> Global Network - local support. Isotech has over 90 authorised sales agents worldwide! No matter where you are, we can offer local support.

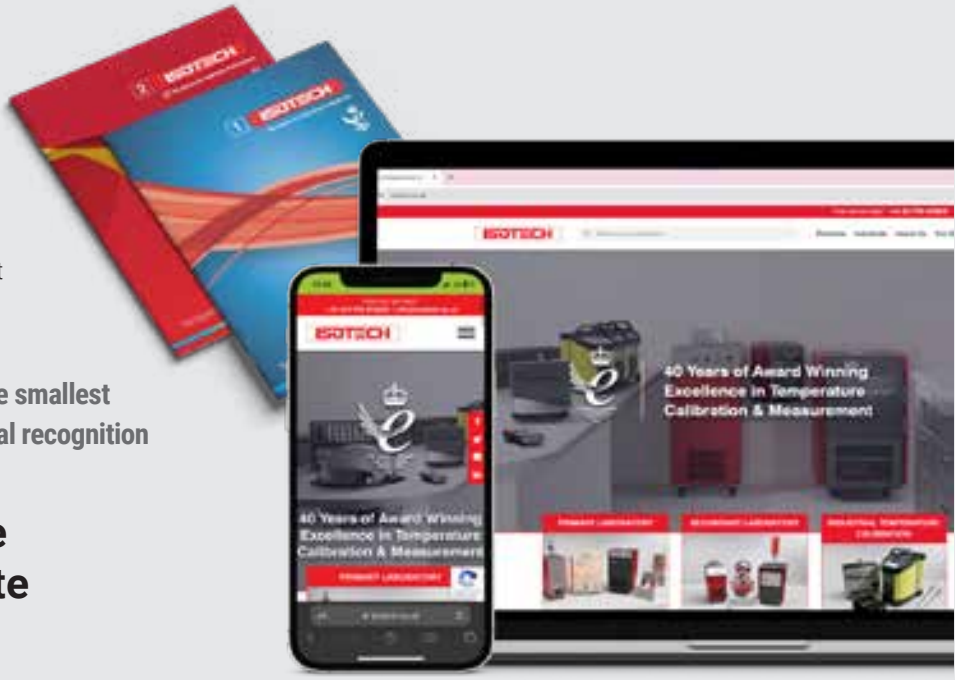
> The world's leading National Metrology Institutes choose Isotech - shouldn't you?

"As a leading thermocouple manufacturer, it's crucial for us to check with the utmost precision. Isotech equipment consistently provides the accurate measurements we rely on. We've partnered with Isotech for over 30 years, appreciating not just their high-accuracy products but also their exceptional customer service, insightful advice, and genuine feedback."

Stephen Holt, Technical & Quality Manager, Scott Precision Wire Ltd

Temperature Metrology Solutions for:

> ITS-90 Primary Standards
> Industrial Sensor Calibration
> Secondary Temperature Calibration
> Infrared Thermometers
> High Accuracy Temperature Measurement
> Thermocouple Referencing Equipment



ISO 17025 Calibration Services to the smallest of uncertainties and with international recognition

Find out more on our Website

For more information: ISOTECH.CO.UK

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