



# The Jarrett-Isotech Water Triple Point Cells

- Uncertainty 0.000070°C
- Fifty Years of Proven Use
- Quartz Glass and Isotopic Analysis Available

The Water Triple Point is the most important fixed point, the only point common to the ITS-90 and the Thermodynamic Temperature Scale. It is an essential reference point for every temperature laboratory.

The Jarrett-Isotech cells are the best standard, all cells are not the same, accept no inferior device.

## Total Confidence – The Internationally Proven Cells

The Jarrett-Isotech cells have been in production since 1958. A independent comparison\* in 1981 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 Jarrett-Isotech cells tightly grouped, tens of  $\mu\text{K}$  around the BIPM reference value.

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

\* *Reproducibility of Some Triple Point of Water Cells* By George T. Furukawa and William R. Bigge. *Temperature - Its Measurement & Control in Science & Industry* Vol. 5 1982.

\*\* *Final Report on CCT-K7: Key comparison of water triple point cells.* M Stock et al 2006 *Metrologia* 43 03001

## Quality

The capability of a triple point of water cell to provide an accurate, stable and reproducible temperature depends upon the purity of the water in the cell. Jarrett-Isotech cells are carefully cleaned and aged by a special procedure. They are then filled with water that has been purified by an elaborate 12 step process designed to eliminate the possibility of contamination while avoiding change in isotope proportions.

## Isotopic Content

Jarrett-Isotech Cells use water with an isotopic content essentially similar to Standard Mean Ocean Water. Following research by the international science community into the make up of Standard Mean Ocean Water, and V-SMOW the BIPM recommended in 2005\* that

“The triple point of water is now defined as the equilibrium temperature of vapour, liquid and solid water, with the liquid water having the isotopic composition defined by the following amount of substance ratios:



0.00015576	mol <sup>2</sup> H per mol <sup>1</sup> H
0.000379	mol <sup>17</sup> O per mol <sup>16</sup> O
0.002005	mol <sup>18</sup> O per mol <sup>16</sup> O”

\* *Technical annex for the International Temperature Scale of 1990 (ITS-90)* Adopted by the CCT on 10 June 2005

Since early in 2000 Jarrett-Isotech Cells have been made to this definition and our cells have been within +10 and -40 $\mu\text{K}$  of it.

During 2005, subsequent to the CCT definition, the water in our triple point cells has been further enriched and our latest cells meet  $\pm 20\mu\text{K}$  of the above definition.

Further we can provide Isotopic Analysis giving the exact composition with an uncertainty of  $\pm 3\mu\text{K}$ . Samples of the actual water used in a particular cell can be supplied for purity analysis.