

# Sostmann - Isotech Gallium Cell

- Uncertainty 0.000070°C
- Thirty Years of Proven Use
- Open and Sealed Models

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.

### Quality

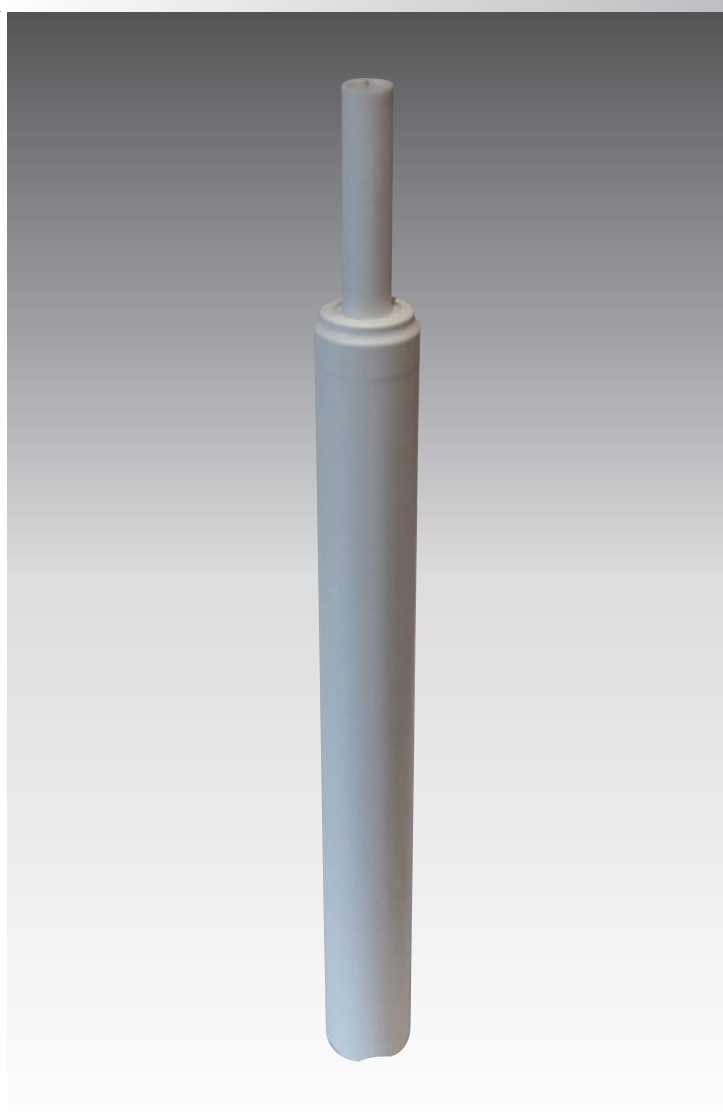
Developed in the 1970s by Henry Sostmann the design is of the highest standard. The metal is contained within a resilient inner housing that ensures no contamination or reaction with the Gallium. The surrounding outer metal sleeve provides longitudinal uniformity of temperature and further mechanical strength. With several hundred cells shipped to all parts of the world all have arrived without damage.

### Sealed Cell

In general we recommend the sealed cell, it has the convenience of the sealed construction along with the sub mK performance.

### Open Cell

A re-sealable or open cell is also available. The cell has a valve and a "Klein" flange fitted at the top allowing connection to a vacuum system and pure gas supply. This permits the pressure to be set to one bar at the melt temperature, or measured in accordance with "Optimal realization of the defining fixed points of the ITS-90... CCT/2000-13". With the Open Cell uncertainties of +/- 100 μK are achievable.



	Sealed Gallium	Open Gallium
Model	ITL-M-17401	ITL-M-17401(O)
Temperature	29.7646°C	29.7646°C
Metal Purity	> 99.99999 7N	> 99.99999 7N
Dimensions		
Outside Diameter	38mm	35mm
Inside Diameter	12mm	12mm
Total Height	420mm	425mm
Metal Depth	230mm	230mm
Uncertainty *	0.25mK	0.07mK

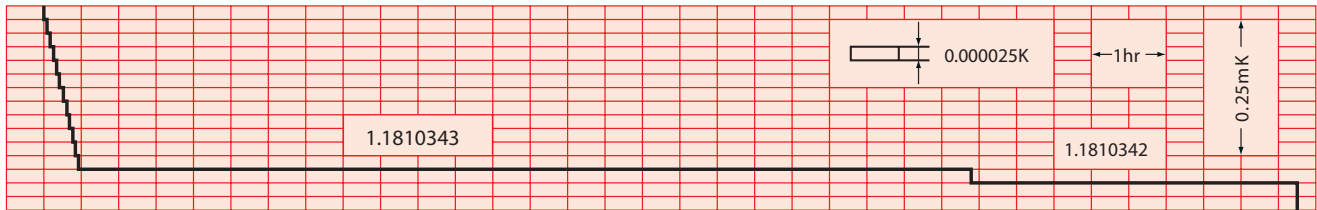
**How to order**  
ITL-M-17401 Gallium Cell - (Specify sealed or open)

The Cell is supplied with a Certificate of Metal Purity

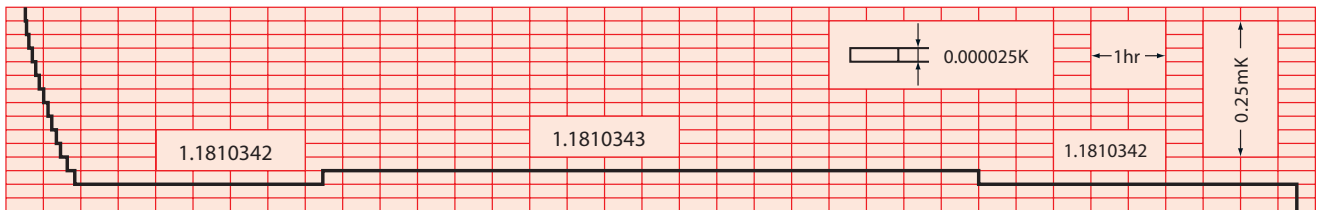
\*We have a choice of UKAS calibration Services, the stated uncertainty figure is for our Premium UKAS Calibration Service

# The Perfect Gallium Point

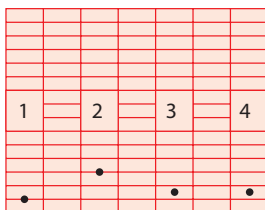
## Melt 1 Day1



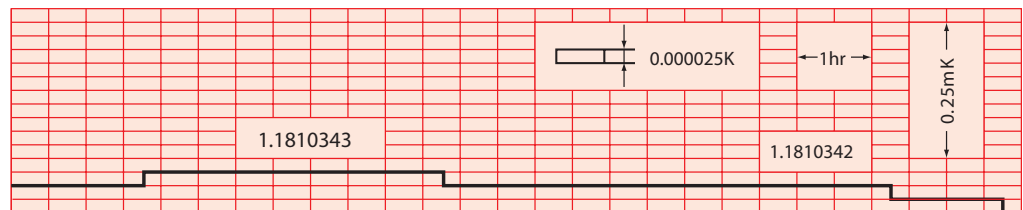
## Melt 2 Day2



Shown on the same scale



## Melt 3 Day3



- 1 Value of 10 years old Cell
- 2 Value of N.P.L.'s Cell
- 3 Value of I.M.G.C.'s Cell
- 4 Value of Cell open for over 3 years

The information below is extracted from  
*The Gallium Point, An Alternative Reference Temperature to the Water Triple Point*  
 by John P. Tavener



Intercomparison of Water and Gallium	Water	Gallium
Impurities	Small	Small
Peritectics	None	None
Variation with Isotopes	Large	None Found
Interoperability	Good	Good
Practical Variation	40μK	40μK
H.H. Uncertainty	Small	10μK
Ruggedness	Poor	Good
Ease of Use	Difficult	Easy
Apparatus	Ice Bath & CO <sub>2</sub>	Warm Water
Price	Low	High
Drift with Time	4μK / year	None Detected
Time before Best Accuracy	10 days	1 to 2 hours