


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <p style="text-align: center;">UKAS CALIBRATION</p> <p style="text-align: center;">0775</p> <p style="text-align: center;">Accredited to ISO/IEC 17025:2005</p>	<h3 style="margin: 0;">Hart European Primary Temperature Laboratory</h3> <p style="margin: 0;">Issue No: 011 Issue date: 15 July 2010</p>	
	<p>Hart Scientific, A Fluke Company Hurricane Way Norwich Norfolk NR6 6JB</p>	<p>Contact: Fluke UK Service Tel: +44 (0)1603 256600 Fax: +44 (0)1603 256777 E-Mail: uk servicedesk@fluke.com Website: www.hartscientific.com</p>
<p>Calibration performed at the above address only</p>		

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k = 2$)	Remarks
TEMPERATURE			
Calibration at fixed points			
4-wire standard platinum resistance thermometers (SPRT)			
See Note 1			
BP Nitrogen	- 196 °C	1.1 mK	Uncertainty in the determination of $W(t_{90})$ used to calculate ITS-90 coefficients. Note: TP = Triple Point FP = Freezing Point MP = Melting Point BP = Boiling Point
TP Mercury	- 38.8344 °C	0.35 mK	
TP Water (See Note 4)	0.01 °C	0.16 mK	
MP Gallium	29.7646 °C	0.35 mK	
FP Indium	156.5985 °C	0.70 mK	
FP Tin	231.928 °C	0.90 mK	
FP Zinc	419.527 °C	1.2 mK	
FP Aluminium	660.323 °C	2.1 mK	
See Note 2			
BP Nitrogen	- 196 °C	2.0 mK	
TP Mercury	- 38.8344 °C	0.8 mK	Note 1: This uncertainty is available to SPRTs exhibiting superior performance only. Measurements are performed at 2 levels of current and extrapolated to zero power. Note 2: This uncertainty uses the same method as that in note 1. The uncertainty is based on routine measurements of SPRTs exhibiting good performance
TP Water (See Note 4)	0.01 °C	0.5 mK	
MP Gallium	29.7646 °C	0.8 mK	
FP Indium	156.5985 °C	1.5 mK	
FP Tin	231.928 °C	1.5 mK	
FP Zinc	419.527 °C	1.8 mK	
FP Aluminium	660.323 °C	3.0 mK	
See Note 3			
BP Nitrogen	- 196 °C	3.0 mK	
TP Mercury	- 38.8344 °C	2.0 mK	
TP Water (See Note 4)	0.01 °C	2.0 mK	
MP Gallium	29.7646 °C	2.0 mK	
FP Indium	156.5985 °C	3.0 mK	
FP Tin	231.928 °C	4.0 mK	
FP Zinc	419.527 °C	6.0 mK	
FP Aluminium	660.323 °C	8.0 mK	



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k = 2$)	Remarks
TEMPERATURE (continued)			
Type R and Type S thermocouples			
FP Indium	156.5985 °C	100 mK	
FP Tin	231.928 °C	110 mK	
FP Zinc	419.527 °C	140 mK	
FP Aluminium	660.323 °C	180 mK	
FP Silver	961.78 °C	250 mK	
Gold/platinum thermocouples			
FP Indium	156.5985 °C	20 mK	
FP Tin	231.928 °C	20 mK	
FP Zinc	419.527 °C	25 mK	
FP Aluminium	660.323 °C	30 mK	
FP Silver	961.78 °C	35 mK	
	1000 °C (extrapolated)	50 mK	
Calibration by comparison			
4-wire platinum resistance thermometers	- 196 °C - 80 °C - 40 °C 0 °C 30 °C 100 °C 156 °C 232 °C 420 °C 500 °C	10 mK 5.5 mK 4.0 mK 3.5 mK 4.0 mK 6.0 mK 7.0 mK 7.5 mK 11 mK 14 mK	Comparison calibrations can also be carried out at other temperatures in the range -80 °C to 500 °C the uncertainties may be calculated on request and will lie between adjacent points.
FP Aluminium	660.323 °C	14 mK	
See Note 5 4-wire platinum resistance thermometers	- 196 °C to 100 °C 100 °C to 300 °C 300 °C to 420 °C 420 °C to 500 °C	25 mK 30 mK 35 mK 45 mK	Note 5: Uncertainty of industrial PRTs exhibiting good performance
Precision thermistors	0 °C to 100 °C	2.1 mK to 2.7 mK	
Temperature indicators and recorders with temperature sensor(s)		as above with an allowance for display resolution and short-term stability.	

END