



THE AMERICAN ASSOCIATION FOR  
LABORATORY ACCREDITATION

## ACCREDITED LABORATORY

A2LA has accredited

### **INNOCAL - DIVISION OF COLE-PARMER INSTRUMENT COMPANY Vernon Hills, IL**

for technical competence in the field of

### **Calibration**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005*).

Presented this 23<sup>rd</sup> day of January 2008.

A handwritten signature in black ink, appearing to read "Peter Abney", written over a horizontal line.

President  
For the Accreditation Council  
Certificate Number 1746.01  
Valid to October 31, 2009



For the calibrations to which this accreditation applies, please refer to the laboratory's Calibration Scope of Accreditation.

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005  
& ANSI/NCSL Z540-1-1994

INNOCAL – DIVISION OF COLE-PARMER INSTRUMENT COMPANY  
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Vernon Hills, IL 60061  
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CALIBRATION

Valid To: October 31, 2009

Certificate Number: 1746.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following calibrations<sup>1</sup>:

I. Time & Frequency

Parameter/Equipment	Range	Best Uncertainty <sup>2</sup> (±)	Comments
Stopwatches – Mechanical Electronic	60 s to 720 hr	0.58 s/day 0.053 s/day	Vibrograf
Stroboscopes	(5 to 75 000) fpm	0.098 fpm	Comparison to counter and detector
Optical Tachometers <sup>3</sup>	(0 to 100 000) rpm	(0.056 + 0.000032 $\omega$ ) rpm	Comparison to function generator and lamp
Contact Tachometers	(150 to 6000) rpm	0.46 rpm	Comparison to counter, motor and controller

II. Mechanical

Parameter/Equipment	Range	Best Uncertainty <sup>2</sup> (±)	Comments
Barometers	(330 to 1060) mBar	0.12 mBar	Chamber and digital manometer
Pressure <sup>4</sup>	(0 to 2) inH <sub>2</sub> O (-10 to 100) psi (2 to 400) psi (100 to 5000) psi	0.02 inH <sub>2</sub> O 0.03 psi (0.005 + 0.00019 <i>P</i> ) psi (0.094 + 0.00021 <i>P</i> ) psi	MicroTector Digital calibrator Deadweight tester Deadweight tester
Vacuum	(0 to 28) inHg	0.04 inHg	Comparison to deadweight tester
Airflow – Mass Flow and Correlated, Direct Read	(0.5 to 80) LPM	0.2 % of reading	Comparison to molbloc-S mass flow standards

III. Electrical – DC & Low Frequency

Parameter/Equipment	Range	Best Uncertainty <sup>2</sup> (±)	Comments
Electrical Calibration of Thermocouple Indicators <sup>5</sup> –			
Type E	-250 °C to 0 °C 0 °C to 1000 °C	(0.21 – 0.0043 <i>T</i> ) °C (0.21 + 0.0001 <i>T</i> ) °C	Ectron calibrator
Type J	-200 °C to 0 °C 0 °C to 1200 °C	(0.23 – 0.0009 <i>T</i> ) °C (0.23 + 0.00016 <i>T</i> ) °C	
Type K	-270 °C to 0 °C 0 °C to 1372 °C	(0.34 – 0.0065 <i>T</i> ) °C (0.35 + 0.00013 <i>T</i> ) °C	
Type T	-200 °C to 0 °C 0 °C to 400 °C	(0.37 – 0.00095 <i>T</i> ) °C (0.34 + 0.00012 <i>T</i> ) °C	

IV. Thermodynamics

Parameter/Equipment	Range	Best Uncertainty <sup>2</sup> ( $\pm$ )	Comments
Bi-metallic Thermometers <sup>6</sup>	-70 °C to 300 °C	0.04 °C + 0.5 <i>R</i>	Liquid bath and SPRT
Temperature Systems	-10 °C to 50 °C -70 °C to 300 °C 23 °C to 660 °C	0.10 °C 0.018 °C 0.019 °C	Chamber and SPRT Liquid bath and SPRT Dry block and SPRT
RTD Systems	-70 °C to 300 °C 23 °C to 660 °C	0.018 °C 0.019 °C	Liquid bath and SPRT Dry block and SPRT
Thermometers – Liquid-in-Glass <sup>6</sup>	-70 °C to 110 °C 28 °C to 300 °C	0.03 °C + 0.25 <i>R</i> 0.04 °C + 0.25 <i>R</i>	Liquid bath and SPRT
Relative Humidity	(0 to 90) % RH	0.59 % RH	Chilled mirror and chamber

<sup>1</sup> This laboratory offers commercial calibration service.

<sup>2</sup> “Best Uncertainty” is the smallest uncertainty of measurement that a laboratory can achieve within its scope of accreditation when performing more or less routine calibrations of nearly ideal measurement standards of nearly ideal measuring equipment. Best uncertainties represent expanded uncertainties expressed at approximately the 95 % level of confidence, usually using a coverage factor of  $k = 2$ . The best uncertainty of a specific calibration performed by the laboratory may be greater than the best uncertainty due to the behavior of the customer’s device and to influences from the circumstances of the specific calibration.

<sup>3</sup>  $\omega$  is the numerical value of the rotational speed in rpm.

<sup>4</sup>  $P$  is the numerical value of the pressure in psi.

<sup>5</sup>  $T$  is the numerical value of the temperature in °C.

<sup>6</sup>  $R$  is the resolution of the UUT in °C.