

# CALIBRATION CERTIFICATE

## BUREAU OF STANDARDS

6 Winchester Road, P.O. Box 113, Kingston 10, Jamaica W.I.  
Tel: (809) 926 3140; Fax: (809) 929 4736

Reference: CC/21/2005/2013/A

Instrument: Liquid-in-glass thermometer

Manufacturer/Brand name: -

Serial #: -

Immersion: Total

Range: -10°C to 110°C

Scale Division: 2°C

Reference Standard: S.P.R.T., S/N: A09531; Probe, S/N: 5614-B

Traceability: National Institute of Standards and Technology (NIST)

Ambient Conditions: 23°C ± 1°C, 55% RH

**Results:**

ACTUAL TEMPERATURE °C	INSTRUMENT READING °C	CORRECTION FACTOR °C	MEASUREMENT UNCERTAINTY °C
10.0	10.0	0.0	± 0.5
25.0	25.0	0.0	± 0.5
40.0	40.0	0.0	± 0.5
60.0	60.0	0.0	± 0.5
80.0	80.0	0.0	± 0.5
100.0	100.0	0.0	± 0.5

Calibration date: 2005-09-14

Recommended recalibration date: ~~2006-09-14~~ not agreed *Shy*

 Signed  
 Approved  
 2005-9-23 Date

This certificate is a correct record of the measurements and observations made. The certificate is intended for the private information of those for whom the work was done and must not be used in whole or in part in any other way except with the written approval of the Director of Standards. Misuse may lead to the penalties provided under the Standards Act, 1968. The Bureau accepts no responsibility for any loss or damage which may be sustained as a result of the use of reliance upon this certificate.

# CALIBRATION CERTIFICATE

## BUREAU OF STANDARDS

6 Winchester Road, P.O. Box 113, Kingston 10, Jamaica W.I.  
Tel: (809) 926 3140; Fax: (809) 929 4736

Reference: CC/21/2005/2013/B  
 Instrument: Dial thermometer  
 Manufacturer/Brand name: Tel-Tru  
 Serial #: -  
 Immersion: Partial  
 Range: 0°C to 200°C  
 Scale Division: 2°C  
 Reference Standard: S.P.R.T., S/N: A09531; Probe, S/N: 5614-B  
 Traceability: National Institute of Standards and Technology (NIST)  
 Ambient Conditions: 23°C ±1°C, 55% RH

**Results before adjustment:**

ACTUAL TEMPERATURE/°C	INSTRUMENT READING/°C	CORRECTION FACTOR/°C	MEASUREMENT UNCERTAINTY/°C
10.0	Off scale, below 0	-	± 0.5
60.0	24.0	36.0	± 0.5
100.0	66.0	34.0	± 0.5

**Results after adjustment:**

ACTUAL TEMPERATURE/°C	INSTRUMENT READING/°C	CORRECTION FACTOR/°C	MEASUREMENT UNCERTAINTY/°C
0.0	0.0	0.0	± 0.5
20.0	19.0	1.0	± 0.5
60.0	60.0	0.0	± 0.5
100.0	100.0	0.0	± 0.5
140.0	142.0	-2.0	± 0.5
160.0	162.0	-2.0	± 0.5

Calibration date: 2005-09-14

Recommended recalibration date: 2006-09-14

  
Signed

  
Approved

2005-09-23  
Date

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## Certificate of Calibration

Certificate No: 1045278QE6080246

Submitted By: ENVIRONMENTAL SOLUTIONS LTD.  
20 WEST KINGS HOUSE ROAD  
KINGSTON, 10, JAMAICA

Serial Number:	QE6080246	Date Received:	3/27/2006
Customer ID:		Date Issued:	4/3/2006
Model:	QC-10	Valid Until:	4/3/2007

**Test Conditions:**

Temperature: 18°C to 29°C  
Humidity: 20% to 80%  
Barometric Pressure: 890 mbar to 1050 mbar

**Model Conditions:**

As Found: IN TOLERANCE  
As Left: IN TOLERANCE

**SubAssemblies:**  
Description:

Serial Number:

Calibrated per Procedure: 56V981

**Reference Standard(s):**

I.D. Number	Device	Last Calibration	Date Calibration Due
ET0000366	B&K ENSEMBLE	10/14/2005	10/14/2006
S00335	FLUKE PM6666	7/21/2005	7/21/2007
T00230	FLUKE 45 MULTIMETER	6/8/2004	6/8/2006

**Measurement Uncertainty:**

+/- 2.4% ACOUSTIC (0.2DB) +/- 1.4% VAC +/- 0.001% HZ  
Estimated at 95% Confidence Level (k=2)

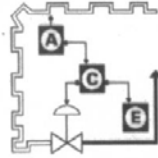
Calibrated By:  4/3/2006  
MICHAEL CHILSON Service Technician

This report certifies that all calibration equipment used in the test is traceable to NIST, and applies only to the unit identified under equipment above. This report must not be reproduced except in its entirety without the written approval of Quest Technologies.

**QUEST**  
TECHNOLOGIES, INC.

1050 CORPORATE CENTER DRIVE • OCONOMOWOC, WISCONSIN 53066-4828  
800-245-0779 • 262-567-9157 • FAX 262-567-4047 • INTERNET ADDRESS: [www.questtechnologies.com](http://www.questtechnologies.com)





## Automatic Control Engineering Limited

**Home Office:**  
 31 DeCarteret Road, P.O. Box 208,  
 Mandeville, Jamaica, W.I.  
 Tel: (876) 962-2773  
 Fax: (876) 962-3731  
 email: acernvill@cwjamaica.com

**Kingston Branch:**  
 Block D, 29 Phoenix Avenue  
 Kingston 10, Jamaica, W.I.  
 Tel: (876) 968-2521  
 Fax: (876) 929-4976  
 email: acekgn@cwjamaica.com

### Calibration Certification Report

**Calibrated For:** *Environmental Solutions Ltd.*  
 20 West Kings House Road  
 Kgn. 10.

**Product:** Spectrophotometer  
 Model: DR 2000  
 Sn. 930800025857  
 Firmware Version: 3.2

**Calibration Date:** May 16, 2006  
 Location: ACE Ltd.

<i>Characteristic</i>	<i>Standard</i>	<i>Actual</i>
Visual Inspection	Pass/Fail	Pass
Keyboard test	Pass/Fail	Pass
Display test	Pass/Fail	Pass
Wavelength accuracy at 810 nm	810 nm +/- 3nm	811 nm
Wavelength accuracy at 633 nm	633 nm +/- 2 nm	633 nm
Wavelength accuracy at 442 nm	442 +/- 2 nm	442 nm
Bandpass at 633 nm	12 nm +/- 2 nm	12.0 nm
Stability at 400 nm	Less than 0.003 Abs driftin 5 minutes period	0.001 Abs
Stray lightest	>2.00 Abs@ 400 nm	Pass
V lamp	3.5-4V at lamp terminals	3.81V

**Calibration Method:** 3 filter calibration (810 nm, 633 nm, 442 nm) and Fluke process calibrator  
**Re-Calibration Date:** 15/05/07

**Calibrator:** Peter Baugh

**Automatic Control Engineering traceable Temperature and process Calibrator.**  
**Fluke Documenting Process Temperature Calibrator Model: 702**  
**Serial #: 6255209**

**Software Version 1.04**

**This calibration complies with MIL-STD-45662A and ANSI/NCSLZ540-1-1994 and ANSI/NCSL Z540.1-1994 (R2002) In accordance with CSS PD 400 revision 102., Calibration report number 935999-6255209:1077354164**



# BUREAU OF STANDARDS JAMAICA

6 Winchester Road, Kingston 10, Jamaica  
Tel: (876) 926-3140-5; Fax: (876) 929-4736  
Website: [www.jbs.org.jm](http://www.jbs.org.jm) Email: [info@jbs.org.jm](mailto:info@jbs.org.jm)

## CALIBRATION CERTIFICATE TEST REPORT NO. 42/2006/1364

Sheet...1..of...2.Sheets

This certificate/report is a correct record of the measurements and observations made. The certificate/report is intended for the private information of those for whom the work was done and must not be used in whole or in part in any other way except with the written approval of the Director of Standards. Misuse may lead to the penalties provided under the Standards Act, 1968. The Bureau accepts no responsibility for any loss or damage, which may be sustained as a result of the use or reliance upon this certificate/report.

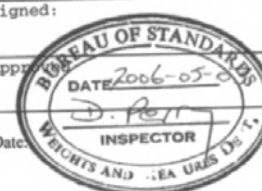
Tested: <b>Environment Solution</b> <b>20 West Kings House Rd.</b> <b>Kingston 10</b>	Reference: Date submitted: <b>2006 02 22</b>
Manufacturer: <b>Scientech</b>	Serial No: <b>SA120</b>
Product: <b>Analytical Balance</b> <b>120 g x 0.1 mg</b>	Specification: <b>OIML R76</b>
Test Method: <b>Use of Standard Masses</b> <b>(OIML Class M1)</b>	Ambient Conditions: Test Uncertainty: <b>± 0.05 mg</b>

Calibration performed in accordance with OIML R76 procedures.

The Standard Masses are traceable to the Bureau's Primary Mass Standards which in turn are traceable to the International Bureau of Weights and Measures (BIPM) through Physikalisch Technische Bundesanstalt (PTB).

CALIBRATION DATE: 2006-02-22

RECALIBRATION DATE: 2006-08-22

Circulation:	Remarks:	Signed:
		

B.S.F. 13

*Making Standards work for you...*



## PRODUCT CERTIFICATION AND DECLARATION OF CONFORMITY

**AANALYST 300 SPECTROMETER**

**SERIAL NO. 041S1110102**

This is to certify that this PerkinElmer product was tested and verified to be in conformance with all applicable quality requirements, including specifications, drawings, calibration, preservation, packing, marking requirements and part identification.

### Declaration of EMC & Safety Code Compliance

This PerkinElmer product conforms to the regulations stipulated in the CE Mark requirements for the EMC Directive (89/335/EEC and 93/68/EEC) and LVD Directive (73/23/EEC and 93/68/EEC):

EN 55011:1991 Group 1, Class B, EMC – RF Characteristics of ISM Equipment  
 EN 61326:1998, EMC – Requirements for Electrical Equipment for Laboratory Use  
 IEC 1000-4-2:1995, EMC – Electrostatic Discharge Requirements  
 EN 61000-4-3:1995, EMC – Radiated Electromagnetic Field Requirements  
 EN 61000-4-4:1995, EMC – Electrical Fast Transient/Burst Requirements  
 EN 61000-4-5:1995, EMC – Surge Immunity Requirements  
 EN 61000-4-6:1996, EMC – Conducted Disturbances (induced by RF fields) Requirements  
 EN 61000-4-11:1994, EMC – Voltage Dips, Short Interruptions, Voltage Variations Requirements  
 EN 61000-3-2:1995 + A1:1997 + A2:1998 + prA14:2000, EMC – Harmonic Current Emissions  
 EN 61000-3-3:1995, EMC – Voltage Fluctuations and Flicker  
 EN 61010-1:1993, Safety Requirements for Electrical Equipment for Laboratory Use  
 IEC 1010-1:1990 + A1:1992 + A2:1995, Safety Requirements for Electrical Equipment for Laboratory Use



CSA C22.2 No. 1010.1:1992 (NRTL and Canada), Safety Requirements for Electrical Equipment for Laboratory Use

*NOTE: The operation of certain types of equipment (e.g. signal generators) may be subject to given restrictions. Please refer to the appropriate information in the respective user documentation.*

### Declaration of System Validation

The product was found to meet its functional and performance specification prior to shipment. To support this declaration, the following Engineering, Assembly and Test documents are held by PerkinElmer and are available for reference upon request in justified cases and to an appropriate extent:

The Product Description  
 The Functional Specification  
 The User Interface Definition

The System Design Documentation  
 The Source Code Documentation  
 The Evaluation Documentation

*NOTE: PerkinElmer will maintain possession of all documents; their reproduction – including parts of them – may require that a nondisclosure agreement be provided by those requiring access to them.*

The existence of these documents and the procedures used in their production are formal requirements of the PerkinElmer Quality System. The integrity of the PerkinElmer Quality System is routinely audited and is certified by the British Standards Institution as meeting the requirements of ISO 9001, the internationally recognized standard for Quality Assurance.



PerkinElmer Inc.  
 710 Bridgeport Ave  
 Shelton, CT  
 06484  
 US

## Bios International Calibration Certificate

**Cert No.** 45119  
**Product** DCL-MH  
**Serial No.** 108178  
**Cal. Date** 23 March 2006  
**Sale Date** 27 March 2006  
Annual Maint. Recommended



### Calibration Standards Used

The calibration standards used to calibrate the product were in force at the time that the product was calibrated. As the DryCal is a true primary standard there are no known drift factors. Bios recommends annual preventative maintenance to help ensure proper instrument function. All units tested in accordance with Bios International Corporation test number PR05-2 Rev B or PR01-10 Rev B using high-purity bottled nitrogen.

Asset Number	Description	Cal Date	Due Date
ML-500-10 101137	ML-500 Low Flow Cell	10/13/2005	10/13/2006
ML-500-44 102677	ML-500 High Flow Cell	10/12/2005	10/12/2006

### As Shipped Test Data

**Technician** Sonia Otero  
**Lab. Pressure** 754.8 mmHg  
**Lab. Temperature** 23 °C

Instrument Reading (ml/min)	Lab Standard Reading (ml/min)	Lab Standard Unit No.	Deviation	Allowable Deviation	Condition Shipped
199.9	200.6	1137	-0.35%	1.00%	in tolerance
4983	5000.5	2677	-0.35%	1.00%	in tolerance
16990	17020	2677	-0.18%	1.00%	in tolerance

The allowable deviation consists of the RSS of the expanded uncertainties of the working standards (0.25%), experimental errors (0.25%), and the error of the device under test (DUT), which is the remainder of the allowable deviation.

Each DryCal flow calibrator is dynamically tested by comparing it to a laboratory standard primary piston prover of much higher accuracy ( $\pm 0.25\%$  or better) but of similar operating principles. Flow generators of  $\pm 0.03\%$  stability are used for the comparison. Use of provers of similar construction to the device under test assures the validity of the flow generator as a transfer standard. The primary laboratory standards are qualified by direct measurement of their dimensions (diameter, length of measured path, time base) against NIST traceable gauges and instruments (NIST numbers available upon request). A rigorous analysis of their accuracy in accordance with the International Guide to Uncertainty in Measurements has been performed, assuring their traceable accuracy. Test procedures ensure temperature matching of the laboratory standards and the device under test.

Harvey Padden, President

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