



**LABORATORY
ACCREDITATION
BUREAU** a division of A-S-B



Certificate of Accreditation

ISO/IEC 17025:2005

Certificate Number L2253.01

Antibus Scales & Systems, Inc.

4310 Technology Drive
South Bend IN 46628

has met the requirements set forth in L-A-B's policies and procedures, all requirements of ISO/IEC 17025:2005 "General Requirements for the competence of Testing and Calibration Laboratories" and ANSI/NCSL Z540-1:1994 (R2002).*

The accredited lab has demonstrated technical competence to a defined "Scope of Accreditation" and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Accreditation valid through: May 11, 2017

R. Douglas Leonard, Jr., President, COO
Laboratory Accreditation Bureau
Presented the 5th of May 2015

*See the laboratory's Scope of Accreditation for details of accredited parameters

**Laboratory Accreditation Bureau is found to be in compliance with ISO/IEC 17011:2004 and recognized by ILAC (International Laboratory Accreditation Cooperation) and NACLA (National Cooperation for Laboratory Accreditation).

Scope of Accreditation

For

Antibus Scales & Systems, Inc.

4310 Technology Drive
South Bend, IN 46628
Henry Meyers
574-233-3160

In recognition of a successful assessment to ISO/IEC 17025:2005 and ANSI/NCSL Z540-1:1994 (R2002) to the following Calibration and Measurement Capabilities, accreditation has been granted to **Antibus Scales & Systems, Inc.** for the following:

Accreditation granted through: **May 11, 2017**

Calibration

Electrical – Current

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Current Measure and Source	4 mA	0.004 mA	Fluke 740 Series Process Calibrator
	10 mA	0.005 mA	
	20 mA	0.006 mA	

Electrical – Resistance

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Resistance Measure and Source	55 Ω	0.087 Ω	Fluke 740 Series Process Calibrator
	250 Ω	0.14 Ω	
	680 Ω	0.33 Ω	
Electrical Simulation of RTD Indicating Devices Pt 385 100 Ω	(-180 to 750) °C	0.62 °C	Fluke 740 Series Process Calibrator

Electrical – Voltage

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
DC Voltage Measure and Source	80 mV	0.009 V	Fluke 740 Series Process Calibrator
	1 V	0.001 3 V	
	15 V	0.002 7 V	
Electrical Simulation of Thermocouple Indicating Devices	Type K	(-200 to 1 300) °C	Fluke 740 Series Process Calibrator
	Type J	(-210 to 1 200) °C	
	Type T	(-250 to 400) °C	

Length – Artifacts and Standards 1D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
End Standards	(Up to 12) in	36 μin	Gage Blocks and Super Mic
Rules and Scales	(0 to 72) in	0.013 in	Gage blocks and magnifier
Plug / Pin Gages	Up to 4 in	28 μin	Super Mic and Gage Blocks
Thread Wires (80 to 6) TPI	(0.007 to 0.097) in	19 uin	Super Mic and Gage Blocks
Gage Blocks	0 to 4 in	6.1 μin	Comparator and Gage Blocks
Torque Arms	0 to 10 in	589 μin	Surface Plate and Height Gage
OD Cylinder Gages	0 to 1 in 1 to 10 in	(10+1.5L) μin (11 + 6L) μin	ID/OD Comparator
ID Cylinder Gages	0.04 to 1 in 1 to 12 in	(10+1.5L) μin (11 + 6L) μin	

Length – Artifacts and Standards 2D

Calibration Parameter/Equipment	Range ²	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Thread Plugs Pitch Diameter Major Diameter	(80 to 6) TPI Up to 4 in	(121 + 0.12L) μin (42 + 0.33L) μin	Super Micrometer Gage Blocks Thread Wires
Root Radius & Minor Diameter	(0.06 to 4) in	(216 + 0.05L) μin	Optical Comparator
Almen Kit Step Blocks Depth Flatness	(0.005 to 0.025) in (0.2 to 0.6) mm (0 to 2) inD	40 μin 1 μm 0.05 μm	Gage Blocks and Electronic Indicator Optical Flat

Length – Hand Tools and Precision Gages 1D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Height Gages	(0 to 24) in 0.000 1 (0 to 24) in 0.001	(57.3 + 0.6L) μin (577 + 0.07L) μin	Gage Blocks
Indicators	(0 to 6) in 0.000 05 (0 to 6) in 0.000 1 (0 to 6) in 0.000 5 (0 to 6) in 0.001	(29 + 0.28L) μin (58 + 0.14L) μin (289 + 0.04L) μin (577 + 0.02L) μin	Gage Blocks
Calipers	(0 to 40) in 0.000 5 (0 to 40) in 0.001	(289 + 0.26L) μin (577 + 0.13L) μin	Gage Blocks
OD Micrometers	(0 to 4) in 0.000 05 (0 to 12) in 0.000 1 (0 to 24) in 0.001	(29.1 + 0.4L) μin (58 + 0.46L) μin (578 + 0.1L) μin	Gage Blocks
Bore Gages	(0.25 to 6) in	586 μin	Master Ring and Gage Blocks

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-) ²	Remarks
Almen Gauges Indicator Accuracy	(0.005 to 0.025) in (0.2 to 0.6) mm	80 μin 2 μm	Step Blocks
Depth Gages	(0 to 12) in @ 0.000 1 in res (0 to 12) @ 0.001 in res	(289 + 0.05L) μin (577 + 0.03L) μin	Depth Standard/Gage Blocks

Length – Hand Tools and Precision Gages 2D

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Optical Comparators Linear Travel Angle	(0 to 10) in (0 to 90) °	141 μin 5.6 °	Gage Blocks/Balls Angle Blocks

Mass – Force

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Force Gages (0.000 1 lbf Resolution) (0.000 2 lbf Resolution) (0.000 5 lbf Resolution) (0.01 lbf Resolution) (0.1 lbf Resolution) (0.2 lbf Resolution) (0.5 lbf Resolution)	(0 to 5) lbf (0 to 11) lbf (0 to 22) lbf (0 to 110) lbf (0 to 300) lbf (0 to 1 000) lbf (0 to 3 000) lbf	0.000 59 lbf 0.002 lbf 0.003 lbf 0.044 lbf 0.15 lbf 0.31 lbf 0.79 lbf	Class 6 Weights
Force – Tension and Compression (1 lbf resolution) (10 lbf resolution) (10 lbf resolution)	(0 to 10 000) lbf (0 to 10 000) lbf (0 to 100 000) lbf	2.3 lbf 18 lbf 60 lbf	Load Cells

Mass – Hardness

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
ASTM D2240-15 Direct Verification of Durometers Types A & D			
Force	(20 to 90) Duro	0.6 Duro	Balance
Indenter Extension Indenter Diameter Indenter Tip Radius	(0 to 0.2) in	190 μin	Optical Comparator
Indenter Tip Angle	(0 to 35) Deg	0.1 Deg	Optical Comparator

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks	
Indirect Verification of Rockwell Hardness Testers				
HRA	High Middle Low	0.9 HRA 0.9 HRA 1.1 HRA	ASTM E18-15 Hardness Test Blocks	
HRBw	High Middle Low	0.98 HRB 1.1 HRB 1.2 HRB		
HRC	High Middle Low	0.95 HRC 0.97 HRC 0.97 HRC		
HR15N	High Middle Low	0.89 HR15N 1.1 HR15N 1.2 HR15N		
HR15Tw	High Middle Low	0.96 HR15T 1.1 HR15T 0.89 HR15T		
HR30N	High Middle Low	0.95 HR30N 0.89 HR30N 1.1 HR30N		
HR30Tw	High Middle Low	1.2 HR30T 1.2 HR30T 1.2 HR30T		
Indirect Verification of Brinell Hardness Tester				
HBW 10/3 000	High	0.05mm 18 HBW		ASTM E10-15
HBW 10/3 000	Low	0.09 mm 9.2 HBW		
HBW 10/1 500	High	0.09 mm 23 HBW		
HBW 10/1 500	Low	0.04mm 3.5 HBW		
HBW 10/500	High	0.06 mm 6.7 HBW		
HBW 10/500	Low	0.06 mm 2.6 HBW		

Mass – Mass Artifacts

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Class F Mass Standards	20 lb	0.000 11 lb	Modified Substitution
	25 lb	0.000 37 lb	
	50 lb	0.000 5 lb	
	500 lb	0.011 lb	
	1 000 lb	0.015 lb	
	10 kg	0.19 g	
	20 kg	0.21 g	
	25 kg	0.21 g	

Mass – Pressure/Low Vacuum

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Hydraulic	(30 to 10 000) psi	0.005% of reading	Deadweight Tester
Pneumatic ¹	(0 to 30) psi	0.04 psi	Pressure Transducer
	(30 to 10 000) psi	12 psi	
Vacuum ¹	(-15 to 0) psi	0.04 psi	Vacuum Transducer

Mass – Scale and Balances

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Lab Balances (0.000 1 g Resolution)	(0 to 310) g	0.7 mg	Class 1 Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
(0.001 g Resolution)	(0 to 510) g	1.8 mg	
(0.01 g Resolution)	(0 to 1 000) g	16 mg	
(0.1 g Resolution)	(0 to 16) kg	0.17 g	
Lab Balances (0.1 g Resolution)	(0 to 8 100) g	0.16 g	Class 2 Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
High Resolution Unmarked Scales (0.000 1 kg Resolution)	(0 to 40) kg	0.000 41 kg	Class 1 and Class 2 Weights with Substitution to Range of use
(0.000 1 kg Resolution)	(40 to 150) kg	0.000 95 kg	
High Resolution Unmarked Scales ³ (0.000 02 lb Resolution)	(0 to 6) lb	0.000 6 lb	Class F Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
(0.000 05 lb Resolution)	(0 to 12) lb	0.001 2 lb	
(0.000 1 lb Resolution)	(0 to 30) lb	0.005 8 lb	
(0.000 2 lb Resolution)	(0 to 70) lb	0.006 9 lb	
(0.000 5 lb Resolution)	(0 to 120) lb	0.012 lb	
(0.001 lb Resolution)	(0 to 200) lb	0.023 lb	
(0.002 lb Resolution)	(0 to 300) lb	0.035 lb	
(0.005 lb Resolution)	(0 to 600) lb	0.07 lb	

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Industrial and Commercial Scales ⁴			Class F Weights and NIST Handbook 44 utilized for the Calibration of Weighing Systems
(0.01 lb Resolution)	(0 to 100) lb	0.016 lb	
(0.02 lb Resolution)	(0 to 200) lb	0.04 lb	
(0.05 lb Resolution)	(0 to 500) lb	0.1 lb	
(0.1 lb Resolution)	(0 to 1 000) lb	0.2 lb	
(0.2 lb Resolution)	(0 to 2 000) lb	0.4 lb	
(0.5 lb Resolution)	(0 to 5 000) lb	1 lb	
(1 lb Resolution)	(0 to 10 000) lb	2 lb	
(2 lb Resolution)	(0 to 20 000) lb	4 lb	
(5 lb Resolution)	(0 to 50 000) lb	11 lb	
(10 lb Resolution)	(0 to 100 000) lb	15 lb	
(20 lb Resolution)	(0 to 200 000) lb	35 lb	
(0.001 kg resolution)	(0 to 10) kg	0.002 kg	
(0.002 kg resolution)	(0 to 20) kg	0.004 kg	
(0.005 kg resolution)	(0 to 50) kg	0.009 kg	
(0.01 kg resolution)	(0 to 100) kg	0.02 kg	
(0.02 kg resolution)	(0 to 200) kg	0.04 kg	
(0.05 kg resolution)	(0 to 500) kg	0.1 kg	
(0.1 kg resolution)	(0 to 1 000) kg	0.2 kg	
(0.2 kg resolution)	(0 to 2 000) kg	0.4 kg	
(0.5 kg resolution)	(0 to 5 000) kg	1 kg	

Mass – Torque

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Torque Analyzers – Fixed Points	1 ozf·in to 50 lbf·in	0.049% of reading	Torque Arm and Class 6 Weights
	(25 to 250) lbf·in	0.048% of reading	
	(100 to 1 000) lbf·in	0.021% of reading	
	(25 to 250) lbf·ft	0.018% of reading	
Torque Wrenches	(1 to 10) ozf·in	1.3 % of reading	Torque Analyzer
	(5 to 50) lbf·in	2.3% of reading	
	(25 to 250) lbf·in		
	(100 to 1 000) lbf·in		
	(25 to 250) lbf·ft		

Thermodynamic – Humidity

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Humidity Indicators	11% RH	0.74% RH	Saturated Salts & Capacitive Probe
	33 % RH	0.65% RH	
	75 % RH	0.94% RH	
	(20 to 90) % RH	1.64 % RH	Thermohygrometer Comparison ¹

Thermodynamic – Thermometers and Probes

Calibration Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Remarks
Temperature Indicators and probe systems	(-30 to 150) °C	0.92 °C	Envirotronics Chamber Temperature Indicator
Environmental Temperature indicators and dataloggers			
Temperature Indicators and probe systems	(35 to 375) °C	1.3 °C	Fluke 9100S Drywell

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and remarks. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 (k=2), corresponding to a confidence level of approximately 95%.

Notes:

- 1) Laboratory offers calibration services at the laboratory's own facilities and at the client or other agreed upon facilities.
- 2) *L* = Length in inches, *D* = Diameter in inches
- 3) High Resolution Unmarked Scales include high resolution scales not complying with the accuracy class parameters of Table 3 of NIST Handbook 44.
- 4) Industrial Scales include but are not limited to lab balances, bench scales, floor scales, tank and hopper scales, and vehicle scales.
- 5) Antibus Scales & Systems, Inc has resident technicians located in Perrysburg OH.

Approved by: _____



R. Douglas Leonard
Chief Technical Officer

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