



# PERRY JOHNSON LABORATORY ACCREDITATION, INC.

## Certificate of Accreditation

*Perry Johnson Laboratory Accreditation, Inc. has assessed the Laboratory of:*

### ***Alternate Systems LLC***

***17440 Dallas Parkway, Suite 210, Dallas, TX 75287***

*(Hereinafter called the Organization) and hereby declares that Organization is accredited in accordance with the recognized International Standard:*

### **ISO/IEC 17025:2017**

This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

***Chemical, Dimensional, Electrical, Mass, Force & Weighing Devices,  
Mechanical, Optical, and Thermodynamic Calibration***  
*(As detailed in the supplement)*

Accreditation claims for such testing and/or calibration services shall only be made from addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation body's duty to observe and comply with the said rules.

For PJLA:

Tracy Szerszen  
President

Perry Johnson Laboratory  
Accreditation, Inc. (PJLA)  
755 W. Big Beaver, Suite 1325  
Troy, Michigan 48084

*Initial Accreditation Date:*

December 4, 2017

*Issue Date:*

January 23, 2022

*Expiration Date:*

April 30, 2024

*Accreditation No.:*

73642

*Certificate No.:*

L22-71

*The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: [www.pjllabs.com](http://www.pjllabs.com)*



# Certificate of Accreditation: Supplement

## Alternate Systems LLC

17440 Dallas Parkway, Suite 210, Dallas, TX 75287  
 Contact Name: Peter W. Wright Phone: 972-964-3124

Accreditation is granted to the facility to perform the following calibrations:

### Acoustic

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Sound Level – Measure (Meters) <sup>FO</sup>	94 dB	0.35 dB	Sound Calibrator, NAVAIR 17-20SA-21

### Chemical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Ferrite Measuring Instruments <sup>FO</sup>	0.1 % to 100 % Ferrite Content 0.1 FN to 180 FN	10 % of Reading	Weldmetal Set ASTM A799/A799M, ASTM E 1004, AltSys P5040, QM-2 ICRP, OIML D20
Ferrite Standards <sup>FO</sup>	0.1 % to 100 % Ferrite Content 0 FN to 180 FN	10.92 % Indicated Value	Weldmetal Set, Fischer MMS ASTM A799/A799M, ASTM E 1004, AltSys P5040, QM-2 ICRP, OIML D20
pH Meters, Fixed Points <sup>FO</sup>	4 pH	0.015 pH	pH solutions, SCP-N-002
	7 pH	0.015 pH	
	10 pH	0.015 pH	
XRF Chemical Composition <sup>FO</sup>	0 to 100 WT %	2.1 WT %	Fischerscope X-Ray System, P6010
Conductivity Meters, Fixed Points <sup>FO</sup>	10 µs/cm	0.75 µs/cm	Conductivity Solutions, SCP-N-002
	100 µs/cm	2.5 µs/cm	
	1,000 µs/cm	5.0 µs/cm	
	1,410 µs/cm	5.0 µs/cm	
	10,000 µs/cm	45.0 µs/cm	
	100,000 µs/cm	400 µs/cm	

### Optical

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY (±)	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Loss <sup>FO</sup>	+10 to -52 dBm at 850 nm	0.3 dB	Fluke Networks SimpliFiber Pro Optical Power Meter, 850/1300 Multimode Source, AltSys P5040, QM-2 ICRP, Operator’s Manual, OIML D20
	+10 to -60 dBm at 1 300 nm		
Power <sup>FO</sup>	+10 to -52 dBm at 850 nm		
	+10 to -60 dBm at 1 300 nm		
Visible light – Measure <sup>FO</sup>	1 fc to 500 fc	6%	Extech 401025, 33K4-4-475-1



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### Mass, Force, & Weighing Devices

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Bench and Floor Scales <sup>FO</sup>	5 lb to 2 500 lb	$(-2.7 \times 10^{-2} + 1.06 \times 10^{-5} \text{ Wt}) \text{ lb}$	Class F Weight Set, AltSys P5040, QM-2 ICRP, NIST Handbook 44, OIML D20
Laboratory Balances <sup>FO</sup>	0.5 g	1 mg	Metric Weight Set Class 1, AltSys P5040, QM-2 ICRP, NISTIR 6919, OIML D20
	1 g		
	100 g		
	200 g		
	4 000 g		

### Dimensional

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE OR NOMINAL DEVICE SIZE AS APPROPRIATE	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Micrometers, Dial Indicators <sup>FO</sup>	0.05 in to 8 in	$(50.1 + 7.57 \times 10^{-2} \text{ L}) \mu\text{in}$	Gage Block Set AltSys P5040, QM-2 ICRP, 33K6-4-15-1, OIML D20
Calipers <sup>FO</sup>	0.05 in to 8 in	$(500 + 7.55 \times 10^{-3} \text{ L}) \mu\text{in}$	
Coating Thickness Standards <sup>FO</sup>	0.000 06 in to 0.5 in	2.4 $\mu\text{in}$	Pratt & Whitney LMS200, AltSys P5040, QM-2 ICRP, 33K6-4-15-1, OIML D20
XRF Instruments, Standards and Samples <sup>FO</sup>	0.1 $\mu\text{in}$ to 3 000 $\mu\text{in}$	3.68 % Indicated Value	X-Ray Standards, Fischer XDL, Hitachi High Technologies FT110A, AltSys P5040, QM-2 ICRP, ASTM B568, OIML D20
Pin Gages <sup>FO</sup>	0.007 8 in to 1.575 in	79.6 $\mu\text{in}$	Keyence LS-5501 Laser Scan Micrometer, AltSys P5040, QM-2 ICRP, A1000180-7, OIML D20
Gage Blocks <sup>FO</sup>	0.005 in to 8 in	$[(+ .5\text{L}) + 0.5] \mu\text{in}$ .	Pratt & Whitney LMS200, AltSys P5040, QM-2 ICRP, T.O. 33K6-4-1-1, OIML D20
Optical Comparators <sup>FO</sup>	0.010 in to 12 in	51 $\mu\text{in}$ .	Quality Vision International 425401 Calibration Slide, AltSys P5040, QM-2 ICRP, NAVAIR 17-20MD-63, OIML D20



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### Electrical

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Equipment for Measuring Alloy Conductivity <sup>FO</sup>	0 % IACS to 104 % IACS	1.2 % Indicated Value	Conductivity Standard Set, AltSys P5040, QM-2 ICRP, ASTM E1004, OIML D20
Alloy Conductivity Standards <sup>F</sup>	0 % IACS to 104 % IACS	1.2 % Indicated Value	Conductivity Standard Set, Fischer MMS, AltSys P5040, QM-2 ICRP, ASTM E1004, OIML D20
Length <sup>FO</sup>	Up to 1 500 ft	3 ft	Fluke Microscanner2 Cable Verifier, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
Equipment to Measure DC Voltage <sup>FO</sup>	2 $\mu$ V to 330 mV	20.3 $\mu$ V/V + 1 $\mu$ V	Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17-20AW-526, OIML D20
	330 mV to 3.3 V	11 $\mu$ V/V + 2 $\mu$ V	
	3.3 V to 33 V	12 $\mu$ V/V + 20 $\mu$ V	
	33 V to 330 V	18 $\mu$ V/V + 150 $\mu$ V	
	330 V to 1 100 V	18 $\mu$ V/V + 1 500 $\mu$ V	
Equipment to Output DC Voltage <sup>FO</sup>	2 $\mu$ V to 100 mV	17 $\mu$ V/V + 0.3 $\mu$ V	Keysight 3458A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
	0.1 V to 1 V	14 $\mu$ V/V + 0.3 $\mu$ V	
	1 V to 10 V	14 $\mu$ V/V + 0.5 $\mu$ V	
	10 V to 100 V	14 $\mu$ V/V + 30 $\mu$ V	
	100 V to 1 000 V	14 $\mu$ V/V + 300 $\mu$ V	
	0.1 kV to 30 kV	2.9 V	Bertan HVD-1, Keysight 3458A
Equipment to Measure DC Current <sup>FO</sup>	2 $\mu$ A to 330 $\mu$ A	150 $\mu$ A/A + 0.02 $\mu$ A	Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17-20AW-526, OIML D20
	330 $\mu$ A to 3.3 mA	105 $\mu$ A/A + 0.05 $\mu$ A	
	3.3 mA to 33 mA	100 $\mu$ A/A + 0.25 $\mu$ A	
	33 mA to 330 mA	100 $\mu$ A/A + 2.5 $\mu$ A	
	330 mA to 1.1 A	200 $\mu$ A/A + 40 $\mu$ A	
	1.1 A to 3 A	380 $\mu$ A/A + 40 $\mu$ A	
	3 A to 11 A	500 $\mu$ A/A + 500 $\mu$ A	
	11 A to 20.5 A	1.0 mA/A + 750 $\mu$ A	
	20 A to 1000 A	0.3 % + 0.5 mA	



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Equipment to Output DC Current <sup>FO</sup>	2 nA to 100 nA	20 nA/A + 40 pA	Keysight 3458A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
	100 nA to 1 $\mu$ A	27 $\mu$ A/A + 45 pA	
	1 $\mu$ A to 10 $\mu$ A	27 $\mu$ A/A + 110 pA	
	10 $\mu$ A to 100 $\mu$ A	27 $\mu$ A/A + 900 pA	
	100 $\mu$ A to 1 mA	27 $\mu$ A/A + 6 nA	
	1 mA to 10 mA	27 $\mu$ A/A + 60 nA	
	10 mA to 100 mA	42 $\mu$ A/A + 0.6 $\mu$ A	
	100 mA to 1 A	117 $\mu$ A/A + 12 $\mu$ A	
	21 A to 2000 A	2% Reading + 15 digits	Fluke 353 Current Clamp
Equipment to Measure Resistance <sup>FO</sup>	0 $\Omega$ to 11 $\Omega$	40 $\mu\Omega/\Omega$ + 1 m $\Omega$	Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ- 387, NA17-20AW-526, OIML D20
	11 $\Omega$ to 33 $\Omega$	30 $\mu\Omega/\Omega$ + 1.5 m $\Omega$	
	33 $\Omega$ to 110 $\Omega$	28 $\mu\Omega/\Omega$ + 1.4 m $\Omega$	
	110 $\Omega$ to 330 $\Omega$	28 $\mu\Omega/\Omega$ + 2 m $\Omega$	
	330 $\Omega$ to 1.1 k $\Omega$	28 $\mu\Omega/\Omega$ + 2 m $\Omega$	
	1.1 k $\Omega$ to 3.3 k $\Omega$	28 $\mu\Omega/z$ + 20 m $\Omega$	
	3.3 k $\Omega$ to 11k $\Omega$	28 $\mu\Omega/\Omega$ + 20 m $\Omega$	
	11 k $\Omega$ to 33 k $\Omega$	28 $\mu\Omega/\Omega$ + 200 m $\Omega$	
	33 k $\Omega$ to 110 k $\Omega$	28 $\mu\Omega/\Omega$ + 200 m $\Omega$	
	110 k $\Omega$ to 330 k $\Omega$	32 $\mu\Omega/\Omega$ + 2 $\Omega$	
	330 k $\Omega$ to 1.1 M $\Omega$	32 $\mu\Omega/\Omega$ + 2 $\Omega$	
	1.1 M $\Omega$ to 3.3 M $\Omega$	60 $\mu\Omega/\Omega$ + 30 $\Omega$	
	3.3 M $\Omega$ to 11 M $\Omega$	130 $\mu\Omega/\Omega$ + 50 $\Omega$	
	11 M $\Omega$ to 33 M $\Omega$	250 $\mu\Omega/\Omega$ + 2.5 k $\Omega$	
	33 M $\Omega$ to 110 M $\Omega$	500 $\mu\Omega/\Omega$ + 3 k $\Omega$	
	110 M $\Omega$ to 330 M $\Omega$	0.3 m $\Omega/\Omega$ + 100 k $\Omega$	
330 M $\Omega$ to 1 100 M $\Omega$	1.5 m $\Omega/\Omega$ + 500 k $\Omega$		



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Equipment to Output Resistance <sup>FO</sup>	1 $\Omega$ to 10 $\Omega$	21 $\mu\Omega/\Omega$ + 60 $\mu\Omega$	Keysight 3458A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
	10 $\Omega$ to 100 $\Omega$	18 $\mu\Omega/\Omega$ + 0.6 m $\Omega$	
	0.1 k $\Omega$ to 1 k $\Omega$	16 $\mu\Omega/\Omega$ + 0.6 m $\Omega$	
	1 k $\Omega$ to 10 k $\Omega$	16 $\mu\Omega/\Omega$ + 6 m $\Omega$	
	10 k $\Omega$ to 100 k $\Omega$	16 $\mu\Omega/\Omega$ + 60 m $\Omega$	
	0.1 M $\Omega$ to 1 M $\Omega$	21 $\mu\Omega/\Omega$ + 3 $\Omega$	
	1 M $\Omega$ to 10 M $\Omega$	73 $\mu\Omega/\Omega$ + 30 $\Omega$	
	10 M $\Omega$ to 100 M $\Omega$	73 $\mu\Omega/\Omega$ + 30 $\Omega$	
	0.1 G $\Omega$ to 1 G $\Omega$	6 m $\Omega/\Omega$ + 3 k $\Omega$	
Equipment to Measure AC Voltage (at the following frequencies) <sup>FO</sup>			Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17-20AW-526, OIML D20
45 Hz to 10 kHz	1 mV to 330 mV	0.018 % + 8 $\mu$ V	
	0.33 V to 3.3 V	0.018 % + 60 $\mu$ V	
	3.3 V to 33 V	0.017 % + 0.6 mV	
45 Hz to 1 kHz	33 V to 330 V	0.023 % + 2 mV	
1 kHz to 10 kHz		0.023 % + 6 mV	
45 Hz to 1 kHz	330 V to 1000 V	0.046 % + 10 mV	
1 kHz to 5 kHz		0.040 % + 10 mV	
Equipment to Output AC Voltage (at the following frequencies) <sup>FO</sup>			Keysight 3458A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17-20AW-526, OIML D20
40 Hz to 1 kHz	100 mV to 10 V	0.007 % Reading + 0.006 % Range	
	10 V to 100 V	0.02 % Reading + 0.002 % Range	
	100 V to 1 000 V	0.04 % Reading + 0.002 % Range	
1 kHz to 20 kHz	100 mV to 10 V	0.014 % Reading + 0.002 % Range	
	10 V to 100 V	0.02 % Reading + 0.002 % Range	
	100 V to 1 000 V	0.06 % Reading + 0.002 % Range	
20 kHz to 50 kHz	100 mV to 10 V	0.03 % Reading + 0.002 % Range	
	10 V to 100 V	0.035 % Reading + 0.002 % Range	
	100 V to 1 000 V	0.12 % Reading + 0.002 % Range	
50 kHz to 100 kHz	100 mV to 10 V	0.08 % Reading + 0.002 % Range	
	10 V to 100 V	0.012 % Reading + 0.002 % Range	
	100 V to 1 000 V	0.3 % Reading + 0.002 % Range	
60 Hz	1000 v to 25 000 V	5.5 % Reading	Fluke HV Probe and 87-IV



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Equipment to Measure AC Current (at the following frequencies) <sup>FO</sup>			Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17-20AW-526, OIML D20
45 Hz to 1 kHz	29 $\mu$ A to 330 $\mu$ A	0.13 % + 0.1 $\mu$ A	
	330 $\mu$ A to 3.3 mA	0.10 % + 0.15 $\mu$ A	
	3.3 mA to 33 mA	0.07 % + 2 $\mu$ A	
	33 mA to 330 mA	0.083 % + 20 $\mu$ A	
	0.33 A to 3 A	0.10 % + 100 $\mu$ A	
	3 A to 10 A	0.21 % + 2 mA	
	10 A to 20 A	0.21 % + 5 mA	
45 Hz to 440 Hz	16 A to 150 A	1 % + 0.25 A	w/ Fluke 50-turn coil
	150 A to 1000 A	1 % + 0.9 A	
Equipment to Output AC Current (at the following frequencies) <sup>FO</sup>			Keysight 3458A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
45 Hz to 5 kHz	100 $\mu$ A to 1 mA	0.3 $\mu$ A	
	1 mA to 10 mA	20 $\mu$ A	
	10 mA to 100 mA	0.2 mA	
	100 mA to 1 A	2.1 mA	
10 Hz to 100 Hz	10 A to 1400 A	2 % Reading + 15 digits	Fluke 353 Current Clamp
100 Hz to 1 kHz		4 % Reading + 15 digits	
Equipment to Output RF Power (at the following frequencies) <sup>FO</sup>			NAVAIR 17-20AF-166
100 kHz to 4.2 GHz	-30 dBm to +20 dBm	1.2 dBm	HP 437B & 8482A
100 MHz to 18 GHz	-70 dBm to -20 dBm	1.2 dBm	HP 437B & 8481D



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Equipment to Measure Capacitance <sup>FO</sup>	0.19 nF to 0.39 nF	5 mF/F + 0.01 nF	Fluke 5522A, AltSys P5040, QM-2 ICRP, NA17-20AQ-387, NA17- 20AW-526, OIML D20
	0.4 nF to 1.09 nF	2 mF/F + 0.01 nF	
	1.1 nF to 3.29 nF	1 mF/F + 0.01 nF	
	3.3 nF to 10.9 nF	1 mF/F + 0.01 nF	
	11 nF to 32.9 nF	1 mF/F + 0.1 nF	
	33 nF to 109.9 nF	1 mF/F + 0.1 nF	
	110 nF to 329.9 nF	1 mF/F + 0.3 nF	
	0.33 $\mu$ F to 1.09 $\mu$ F	1 mF/F + 1 nF	
	1.1 $\mu$ F to 3.29 $\mu$ F	1 mF/F + 3 nF	
	3.3 $\mu$ F to 10.9 $\mu$ F	1 mF/F + 10 nF	
	11 $\mu$ F to 32.9 $\mu$ F	1 mF/F + 30 nF	
	33 $\mu$ F to 109.9 $\mu$ F	1 mF/F + 100 nF	
	110 $\mu$ F to 329.9 $\mu$ F	1 mF/F + 300 nF	
	0.33 mF to 1.09 mF	1 mF/F + 1 $\mu$ F	
	1.1 mF to 3.29 mF	1 mF/F + 3 $\mu$ F	
	3.3 mF to 10.9 mF	1 mF/F + 10 $\mu$ F	
	11 mF to 32.9 mF	1 mF/F + 30 $\mu$ F	
33 mF to 110 mF	1 mF/F + 100 $\mu$ F		





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Temperature Calibration, Indications, and Control Equipment used with Thermocouple <sup>FO</sup>			Fluke 5522A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML G08, OIML D20
Type E	-210 °C to -100 °C	0.5 °C	
	-100 °C to 650 °C	0.16 °C	
	650 °C to 1 000 °C	0.21 °C	
Type J	-210 °C to -100 °C	0.27 °C	
	-100 °C to 760 °C	0.16 °C	
	760 °C to 1 200 °C	0.23 °C	
Type K	-200 °C to -100 °C	0.33 °C	
	-100 °C to 120 °C	0.18 °C	
	120 °C to 1 000 °C	0.26 °C	
	1 000 °C to 1 372 °C	0.40 °C	
Type R	0 °C to 250 °C	0.57 °C	
	250 °C to 1 000 °C	0.35 °C	
	1 000 °C to 1 767 °C	0.40 °C	
Type S	0 °C to 250 °C	0.47 °C	
	250 °C to 1 400 °C	0.37 °C	
	1 400 °C to 1 767 °C	0.46 °C	
Type T	-200 °C to -150 °C	0.63 °C	
	-150 °C to 0 °C	0.24 °C	
	0 °C to 400 °C	0.16 °C	
Temperature Calibration Equipment to Measure RTD Type Pt385, 100 $\Omega$ <sup>FO</sup>	-200 °C to 0 °C	0.05 °C	
	0 °C to 630 °C	0.12 °C	
	630 °C to 800 °C	0.23 °C	
Temperature Calibration Equipment to Measure RTD Type Pt385, 1 000 $\Omega$ <sup>FO</sup>	-200 °C to 0 °C	0.03 °C	
	0 °C to 300 °C	0.06 °C	
	300 °C to 600 °C	0.07 °C	
	600 °C to 630 °C	0.23 °C	



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Pressure Gauges <sup>FO</sup>	-15 psi to 200 psi	0.081 psi	Fluke 743B, Fluke 700PD7, AltSys P5040, QM-2 ICRP, T.O. 33K6-4-427-1, OIML D20
	3 000 psi	0.021 psi	Fluke 750R29, AltSys P5040, QM-2 ICRP, T.O. 33K6-4-427-1, OIML D20
Rockwell Hardness <sup>FO</sup>	25 HRB to 65 HRB	0.8 HRB	Rockwell Blocks, OIML R 39
	30 HRC to 65 HRC	0.7 HRC	
	75 HRE to 105 HRE	0.7 HRE	
Torque – Measure <sup>FO</sup>	0 in-lbf to 100 in-lbf	0.6% Reading	Torque Standard, 33K6-4-3014-1
	25 ft-lbf to 250 ft-lbf	0.6% Reading	Torque Standard, 33K6-4-3014-1
Torque - Source <sup>FO</sup>	4 in-lbf to 100 in-lbf	0.2 in-lbf	Torque Wheel, Weights
Equipment for Measuring Coating Thickness <sup>FO</sup>	0 mils to 10 mils	0.002 4 mils	Coating Thickness Foil Set, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
	10 mils to 600 mils	0.05 mils	

### Thermodynamic

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Thermometers <sup>FO</sup>	-20 °C to 150 °C	0.040 °C	Fluke 1586A, Fluke 9142, AltSys P5040, QM-2 ICRP, NIST SP250-23, T.O. 33K5-4-28-1, NA17-20ST-03, ASTM E2623-14, OIML D20
IR Thermometers <sup>FO</sup>	Ambient – 212 °F	2.05 °F	Fluke 9131 HDRC, Fluke 1586A, AltSys P5040, QM-2 ICRP, Operator's Manual, OIML D20
	212 – 392 °F	4.03 °F	
	392 - 482 °F	4.05 °F	
	482 - 572 °F	6.03 °F	
	572 - 752 °F	6.05 °F	
Relative Humidity <sup>FO</sup>	5 %RH to 90 %RH	1.2%	Rotronic HC2-S, NA 17-20MH-27 NA 17-20MH-33



# Certificate of Accreditation: Supplement

## Alternate Systems LLC

17440 Dallas Parkway, Suite 210, Dallas, TX 75287  
Contact Name: Peter W. Wright Phone: 972-964-3124

Accreditation is granted to the facility to perform the following calibrations:

### Time and Frequency

MEASURED INSTRUMENT, QUANTITY OR GAUGE	RANGE (AND SPECIFICATION WHERE APPROPRIATE)	CALIBRATION AND MEASUREMENT CAPABILITY EXPRESSED AS AN UNCERTAINTY ( $\pm$ )	CALIBRATION EQUIPMENT AND REFERENCE STANDARDS USED
Frequency – Measure <sup>FO</sup>	$\leq$ 2GHz	2.5 parts x $10^8$	GPS Receiver & BK Precision 1823A, NA 17-20GG-188, NA 17-20AF-11
Stopwatch/Timer <sup>FO</sup>	6,000 seconds	0.6 second	BK Precision 1823A , FCP-16
Tachometer <sup>FO</sup>	10 to 10,000 RPM	0.1 % Reading	Monarch PLT200, TO 33 K4-4-475-1

1. The CMC (Calibration and Measurement Capability) stated for calibrations included on this scope of accreditation represents the smallest measurement uncertainty attainable by the laboratory when performing a more or less routine calibration of a nearly ideal device under nearly ideal conditions. It is typically expressed at a confidence level of 95 % using a coverage factor  $k$  (usually equal to 2). The actual measurement uncertainty associated with a specific calibration performed by the laboratory will typically be larger than the CMC for the same calibration since capability and performance of the device being calibrated and the conditions related to the calibration may reasonably be expected to deviate from ideal to some degree.
2. The laboratories range of calibration capability for all disciplines for which they are accredited is the interval from the smallest calibrated standard to the largest calibrated standard used in performing the calibration. The low end of this range must be an attainable value for which the laboratory has or has access to the standard referenced. Verification of an indicated value of zero in the absence of a standard is common practice in the procedure for many calibrations but by its definition it does not constitute calibration of zero capacity.
3. The presence of a superscript F means that the laboratory performs calibration of the indicated parameter at its fixed location. Example: Outside Micrometer<sup>F</sup> would mean that the laboratory performs this calibration at its fixed location.
4. The presence of a superscript FO means that the laboratory performs calibration of the indicated parameter both at its fixed location and onsite at customer locations. Example: Outside Micrometer<sup>FO</sup> would mean that the laboratory performs this calibration at its fixed location and onsite at customer locations.