



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Tru-Cal, Inc.
11001 US 250 North, Unit B-12
Milan OH 44846

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

CALIBRATION

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

A handwritten signature in black ink, appearing to read 'R. Douglas Leonard Jr.', is positioned above a horizontal line.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 12 May 2023
Certificate Number: L2090-1



This laboratory 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 (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Tru-Cal, Inc.

11001 US 250 North, Unit B-12
Milan, OH 44846

Nathan Wright – natewright@tru-cal.com 317-402-0021

Jim Belavich – jimbelavich@tru-cal.com 419-202-1296

CALIBRATION

Valid to: **May 12, 2023**

Certificate Number: **L2090-1**

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Millivolt Temperature Simulation Source & Measure	Type J		Calibrations performed in the Laboratory with a Universal Thermocouple Calibrator or Equivalent and Electronic Thermometer in accordance with AMS 2750F & CQI-9 (rev4)
	(-346 to -292) °F	0.76 °F	
	(-292 to -58) °F	0.68 °F	
	(-58 to 932) °F	0.63 °F	
	(932 to 2 192) °F	0.6 °F	
	Type K		
	(-382 to -148) °F	1 °F	
	(-148 to 1 922) °F	0.9 °F	
	(1 922 to 2 500) °F	0.89 °F	
	Type R		
	(-1 to 482) °F	2.6 °F	
	(482 to 1 382) °F	1.5 °F	
	(1 382 to 2 912) °F	1.5 °F	
	(2 912 to 3 214) °F	1.4 °F	
	Type S		
	(-1 to 212) °F	2.6 °F	
	(212 to 752) °F	1.7 °F	
	(752 to 3 092) °F	1.5 °F	
	(3 092 to 3 214) °F	1.5 °F	
	Type N		
(-382 to -292) °F	2.5 °F		
(-292 to -58) °F	1.2 °F		
(-58 to 2 012) °F	0.7 °F		
(2 012 to 2 372) °F	0.64 °F		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Millivolt Temperature Simulation Source & Measure	Type T		Calibrations performed in the Laboratory with a Universal Thermocouple Calibrator or Equivalent and Electronic Thermometer in accordance with AMS 2750F & CQI-9 (rev4)
	(-436 to -328) °F	2.4 °F	
	(-328 to -58) °F	1.4 °F	
	(-58 to 32) °F	1.4 °F	
	(32 to 752) °F	1.4 °F	
	Type E		
	(-400 to -328) °F	1.2 °F	
	(-328 to -148) °F	1.4 °F	
	(-148 to 1 562) °F	1.4 °F	
	(1 562 to 1 832) °F	1.4 °F	
	Type C		
	(30 to 2372) °F	1.8 °F	
	(2 372 to 3 452) °F	1.8 °F	
	(3 452 to 3 812) °F	1.8 °F	
(3 812 to 4 208) °F	1.8 °F		
Type B			
(600 to 1 022) °F	2 °F		
(1 022 to 1 652) °F	1.2 °F		
(1 652 to 2 102) °F	1.1 °F		
(2 102 to 3 308) °F	1.1 °F		
DC Voltage – Source	(0.000 to 100.000) mV (0.000 to 100.000) V	0.19 mV 0.16 V	Calibrations performed in the Laboratory with an Altek 934 Calibrator with Martel 3001 Calibrator in accordance with AMS 2750F & CQI-9 (rev4)
DC Voltage – Measure	(0.000 to 100.000) V	0.18 V	
Millivolt Temperature Simulation ¹	Type J		Onsite Calibration using Thermocouple Calibrator or Equivalent with reference Thermocouple wire in accordance with AMS 2750F & CQI-9 (rev4)
	(-336 to -292) °F	1.2 °F	
	(-292 to -58) °F	1.1 °F	
	(-58 to 932) °F	0.94 °F	
	(932 to 2 192) °F	0.91 °F	
	Type K		
	(-382 to -148) °F	1.8 °F	
	(-148 to 1 922) °F	1.2 °F	
	(1 922 to 2 500) °F	1.2 °F	
	Type R		
	(-1 to 482) °F	3.1 °F	
	(482 to 1 382) °F	1.8 °F	
(1 382 to 2 912) °F	1.8 °F		
(2 912 to 3 214) °F	1.7 °F		

Electrical – DC/Low Frequency

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment	
Millivolt Temperature Simulation ¹	Type S		Onsite Calibration using Thermocouple Calibrator or Equivalent with reference Thermocouple wire in accordance with AMS 2750F & CQI-9 (rev4)	
		(-1 to 212) °F		3.1 °F
		(212 to 752) °F		2.1 °F
		(752 to 3 092) °F		1.8 °F
		(3 092 to 3 214) °F		2.4 °F
	Type N			
		(-382 to -292) °F		3.6 °F
		(-292 to -58) °F		1.6 °F
		(-58 to 2 012) °F		1 °F
		(2 012 to 2 372) °F		0.97 °F
	Type T			
		(-436 to -328) °F		2.6 °F
		(-328 to -58) °F		1.7 °F
		(-58 to 32) °F		1.6 °F
		(32 to 752) °F		1.6 °F
	Type E			
		(-400 to -328) °F		1.4 °F
		(-328 to -148) °F		1.7 °F
	(-148 to 1 562) °F	1.6 °F		
	(1 562 to 1 832) °F	1.6 °F		
Type C				
	(30 to 2372) °F	3 °F		
	(2 372 to 3 452) °F	3.3 °F		
	(3 452 to 3 812) °F	3.7 °F		
	(3 812 to 4 208) °F	4.3 °F		
Type B				
	(600 to 1 022) °F	7.8 °F		
	(1 022 to 1 652) °F	4.8 °F		
	(1 652 to 2 102) °F	3.3 °F		
	(2 102 to 3 308) °F	2.9 °F		

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature System Accuracy Tests ¹	Type K		Thermocouple Calibrator or Equivalent with reference Thermocouple wire in accordance with AMS 2750F
	(-382 to -148) °F	2.2 °F	
	(-148 to 1 922) °F	2.1 °F	
	(1 922 to 2 500) °F	4.1 °F	

Thermodynamic

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature System Accuracy Tests ¹	Type N		Thermocouple Calibrator or Equivalent with reference Thermocouple wire in accordance with AMS 2750F
	(-382 to -292) °F	3 °F	
	(-292 to -58) °F	2 °F	
	(-58 to 2 012) °F	2 °F	
	(2 012 to 2 372) °F	4.1 °F	
	Type T		
(-436 to -328) °F	3.9 °F		
(-328 to -58) °F	2.5 °F		
(-58 to 32) °F	2.5 °F		
(32 to 752) °F	2.5 °F		
Temperature Uniformity Surveys ¹	Type K		Thermocouple Calibrator or Equivalent with reference Thermocouple wire in accordance with AMS 2750F
	(-382 to -148) °F	1.8 °F	
	(-148 to 1 922) °F	2.1 °F	
	(1 922 to 2 500) °F	4.2 °F	
	Type T		
	(-436 to -328) °F	3.2 °F	
(-328 to -58) °F	2.5 °F		
(-58 to 32) °F	2.5 °F		
(32 to 752) °F	2.5 °F		

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. 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. On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.
2. This scope is formatted as part of a single document including Certificate of Accreditation No. L2090-1.



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