



# CERTIFICATE OF ACCREDITATION

## The ANSI National Accreditation Board

Hereby attests that

**Advanced Mechanical Technology, Inc.**  
**176 Waltham Street**  
**Watertown, MA 02472**

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](http://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: 16 October 2021  
Certificate Number: ACT-2511



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**

**Advanced Mechanical Technology, Inc.**

176 Waltham Street  
Watertown, MA 02472

Brian Price

Phone: 617-926-6700 brianp@amtimail.com

**CALIBRATION**

Valid to: **October 16, 2021**

Certificate Number: **ACT-2511**

**Length – Dimensional Metrology**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AMTI Knee Simulator <sup>1</sup> AP Linear Displacement	(-25 to 25) mm	0.6 mm	Digital Caliper
Internal/External Angular Displacement	(-30 to 30) °	0.3 °	Digital Protractor
Flexion Angular Displacement	(-100 to 100) °	1 °	Digital Protractor
Vertical Position Sensors	(-16.5 to 16.5) mm	0.1 mm	Gage Blocks
AMTI HIP Simulator <sup>1</sup> Abduction/Adduction Angular Displacement	(-20 to 20) °	0.3 °	Digital Protractor
Internal/External Angular Displacement	(-20 to 20) °	0.3 °	Digital Protractor
Flexion Angular Displacement	(-50 to 50) °	0.3 °	Digital Protractor
Vertical Position Sensors	(-16.5 to 16.5) mm	0.1 mm	Gage Blocks

### Length – Dimensional Metrology

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AMTI VIVO Simulator <sup>1</sup> Abduction/Adduction Angular Displacement	(-25 to 25) °	0.4 °	Digital Protractor
AP Linear Displacement	(-24 to 24) mm	33 μm	Digital Indicator
ML Linear Displacement	(-24 to 24) mm	15 μm	Digital Indicator
Vertical Linear Displacement	(-22 to 22) mm	17 μm	Digital Indicator
Flexion/Extension Angular Displacement	(-30 to 150) °	0.3 °	Digital Protractor
Internal/External Rotation	(-40 to 40) °	0.3 °	Digital Protractor

### Mass and Mass Related

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AMTI Knee Simulator <sup>1</sup>			
Forces	F <sub>x</sub> = Up to 600 N F <sub>y</sub> = Up to 600 N F <sub>z</sub> = Up to 4 500 N	1 N 1.7 N 3.5 N	Reference Load Cell
Moments	M <sub>x</sub> = Up to 45.2 N·m M <sub>y</sub> = Up to 45.2 N·m M <sub>z</sub> = Up to 17 N·m	1.1 N·m 1.5 N·m 0.2 N·m	Reference Load Cell, Length Standard Fixture
Vertical Load Actuators	Up to 4 500 N	1.2 N	Reference Load Cell
AMTI HIP Simulator <sup>1</sup>			
Forces	F <sub>x</sub> = Up to 180 N F <sub>y</sub> = Up to 180 N F <sub>z</sub> = Up to 4 500 N	0.1 N 0.1 N 1.9 N	Deadweights Reference Load Cells, Display
Moments – Differential	ΔM <sub>x</sub> = Up to 7.5 N·m ΔM <sub>y</sub> = Up to 7.5 N·m ΔM <sub>z</sub> = Up to 9 N·m	0.1 N·m 0.1 N·m 0.1 N·m	Comparison to Deadweights
Vertical Load Actuators	Up to 4 500 N	1.3 N	Reference Load Cell

**Mass and Mass Related**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
AMTI VIVO Simulator <sup>1</sup>			
Forces	F <sub>x</sub> = (-1 000 to 1 000) N F <sub>y</sub> = (-1 000 to 1 000) N F <sub>z</sub> = (-4 400 to 3 500) N	21 N 21 N 41 N	Comparison to Multi-Axis Reference Load/Torque Cell, Display
Moments	M <sub>x</sub> = (-80 to 80) N·m M <sub>y</sub> = (-30 to 30) N·m M <sub>z</sub> = (-40 to 40) N·m	1.2 N·m 1.2 N·m 0.6 N·m	
6-axis Load Cells Forces	F <sub>x</sub> = Up to 2 224 N F <sub>y</sub> = Up to 2 224 N F <sub>z</sub> = Up to 8 896 N	2.5 N 2.6 N 2.4 N	Comparison to Single-Axis Reference Load Cell, Length Standard
6-axis Load Cells Moments	M <sub>x</sub> = Up to 113 N·m M <sub>y</sub> = Up to 113 N·m M <sub>z</sub> = Up to 56.5 N·m	0.67 N·m 0.66 N·m 0.33 N·m	
6-axis Force Plates Forces	F <sub>x</sub> = Up to 4 448 N F <sub>y</sub> = Up to 4 448 N F <sub>z</sub> = Up to 8 896 N	2.3 N 2.4 N 1.8 N	Single-Axis Reference Load Cell and ASTM F3109-16 utilized in the calibration of this parameter.
6-axis Force Plates Forces	F <sub>z</sub> = Up to 390 N	0.6 N	Deadweights and ASTM F3109-16 utilized in the calibration of this parameter.
6-axis Force Plates Moments	M <sub>x</sub> = Up to 5 423 N·m M <sub>y</sub> = Up to 5 423 N·m M <sub>z</sub> = Up to 2 712 N·m	0.9 N·m 0.3 N·m 0.3 N·m	Single-Axis Reference Load Cell and ASTM F3109-16 utilized in the calibration of this parameter.
6-axis Force Plates Moments	M <sub>x</sub> = Up to 542 N·m M <sub>y</sub> = Up to 542 N·m	0.1 N·m 0.1 N·m	Deadweights and ASTM F3109-16 utilized in the calibration of this parameter.

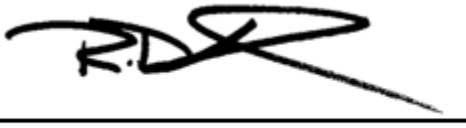
**Thermodynamic**

Parameter/Equipment	Range	Expanded Uncertainty of Measurement (+/-)	Reference Standard, Method, and/or Equipment
Temperature Probes <sup>1</sup>	(20 to 45) °C	0.1 °C	Comparison to Thermoprobe

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. ACT-2511.



R. Douglas Leonard Jr., VP, PILR SBU

