



CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Lucideon M+P
1 Marcus Drive, Building 4
Greenville, SC 29615

Fulfills the requirements of

ISO/IEC 17025:2017

In the field of

TESTING

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: 21 April 2023

Certificate Number: L2287.01



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

Lucideon M+P
1 Marcus Drive, Building 4
Greenville, SC 29615
Joe Beagle
864 297 4417

TESTING

Valid to: **April 21, 2023**

Certificate Number: **L2287.01**

Mechanical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Rockwell and Superficial Hardness	ASTM E18, MCH1006	Metals, Alloys	Scales A, B, C, 15N, and 30N Wilson Rockwell Hardness Tester w/calibrated NIST-traceable hardness blocks
Room Temperature Tensile (Up to 50) kip	ASTM E8 ASTM D638 ASTM D3039 MCH1001; MCH1016 MCH1049; ELM1072	Metals, Alloys Polymers Composites Thermoset Laminates	MTS/ Instron Test Frames w/ Various Load Cells
Elevated Temperature Tensile (Up to 50) kip	ASTM E21 MCH1000	Metals, Alloys Polymers Composites	MTS/ Instron Test Frames w/ Various Load Cells
Charpy Impact (Up to 264) ft-lbs	ASTM E23 MCH1002	Metals, Alloys	Tinius Olsen Charpy Tester
Bend Testing of Welds	ASTM E190 ASME B&PVC, Sect. IX MCH1008		MTS/ Instron Test Frames w/ Various Load Cells
Flexural Testing (Up to 50) kip	ASTM D790 ASTM D6272 ASTM C1161 MCH1012 MCH1063, MCH1064	Metals, Alloys Polymers Ceramics	MTS/ Instron Test Frames w/ Various Load Cells
Compression Testing (Up to 50) kip	ASTM E9 ASTM D695 MCH1004; MCH1042	Metals, Alloys	MTS/ Instron Test Frames w/ Various Load Cells
Shear Testing (Up to 10 000) lbf	ASTM D5379 ASTM D3518 MCH1043	Metals, Alloys Polymers	MTS/ Instron Test Frames w/ Various Load Cells



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Mechanical

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<p>Knee Implant Wear Testing</p> <p>Axial Load: (Up to 1000)lbf Axial Displacement: (+/- 1) in Flexion/Extension: (+/- 100) degrees Flexion/Extension Torque: (Up to 700) in-lbs IE Rotation: (+/- 20)degrees IE Torque: (Up to 350) in-lbs AP Displacement: (+/- 1) in AP Load: (Up to 450) lbf ML Translation: (+/- 6) mm Valgus Rotation: (+/- 7) degrees</p>	<p>BS ISO 14243-1 BS ISO 14243-2 BS ISO 14243-3</p>	<p>Metals, alloys, polymers, ceramics</p>	<p>AMTI ADL Knee Simulators</p>
<p>Hip Implant Wear Testing</p> <p>Axial Load: (Up to 1 000) lbf Axial Displacement: (+/- 0.75) in Flexion/Extension: (+/- 50) degrees Flexion/Extension Torque: (Up to 180) in-lbs IE Rotation: (+/- 20) degrees IE Torque: (Up to 70) in-lbs Abduction/Adduction: (+/- 20) degrees Abduction/Adduction Torque: (Up to 180) in-lbs</p>	<p>ISO 14242-1, -2 MCH1099 MCH1081</p>	<p>Metals, alloys, polymers, ceramics</p>	<p>AMTI ADL Hip Simulators</p>



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Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Endurance Properties of Partial and Total Hip Joint Prostheses (Up to 5 000) lb	ISO 7206-4 MCH1094	Hip stems	AMTI ADL Hip Simulators
Surface Topography Surface Roughness	ASTM F2791 IA1002	Metals, alloys, polymers, ceramics	White Light Interferometry
Digital Image Correlation	MCH1093	Metals, dissimilar bonded structures, polymers, gels, adhesives	DIC computer, software, cameras, lighting, speckle patterning supplies

Mechanical - Metallographic

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Microindentation Hardness Knoop, Vickers	ASTM E384 MLG1008	Metals, Alloys	Mitutoyo Hardness Tester w/calibrated NIST-traceable hardness blocks
Effective Case Depth Knoop, Vickers	SAE J423 MLG1016		Mitutoyo Hardness Tester Leica DM2500M Metallurgical Microscope (25X to 1000X magnification)
Macroetch / Evaluation	ASTM E340 ASTM 381 MLG1025	Metals, Alloys	Leica Trinocular Zoom Stereomicroscope (6X to 150X magnification) and various macroetchants
Metallographic Preparation	ASTM E407 ASTM E3 MLG1003 MLG1049		Various metallographic equipment and microetchants
Microstructural Evaluation	ASTM E407 ASTM E3 SAEJ423 MLG1016		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Grain Size Evaluation	ASTM E112 ASTM E930 ASTM E1181 MLG1017		Leica DM2500M Metallurgical Microscope with calibrated image analysis software) (25X to 1000X magnification)



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Mechanical - Metallographic

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Intergranular Attack/Intergranular Oxidation (IGA/IGO)	P3DAG1 P29TF73 MLG1029	Metals, Alloys	Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Recrystallized (Rx) Grain Evaluation	P3DAG1 P29TF73 MLG1054 MLG1063 MLG1065 MLG1066		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Crack Evaluation	P3DAG1 P29TF73 MLG1054		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Recast Evaluation	P3DAG1 P29TF73 MLG1062 MLG1065 MLG1066		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Copper Contamination	P3DAG1 MLG1067		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Weld Evaluation	AWS D17.1 MLG1058	Metals, Alloys	Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)
Failure Analysis	ASM Metal Handbook, 9th Ed., Vol 11		Leica DM2500M Metallurgical Microscope with calibrated image analysis software (25X to 1000X magnification)



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Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
SEM/Electron Microprobe	MIC1000	Metals, Alloys, Coatings	BRUKER-AXS Energy Dispersive Spectrometer / Model XFlash 4010 in conjunction w/ BRUKER-AXS Electron Imaging System (Microprobe) / Model ARL SEMQ
SEM/EDS/EBSD	ASTM E986 ASTM E1508 SEM1001-GV	Metals, Alloys, Coatings, Ceramics, Polymers	Carl Zeiss LEO 1455 VPSE SEM with EDS (Bruker XFlash® Detector 6j30) and EBSD (Bruker eFlash 1000+®)

Note:

1. This scope is formatted as part of a single document including Certificate of Accreditation No. L2287.01.
2. This laboratory offers commercial testing service.

R. Douglas Leonard Jr., VP, PILR SBU

