



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

Certificate of Accreditation

ISO/IEC 17025:2005

Certificate Number L2167

Knight Mechanical Testing, LLC

3205 Clairmont Court, Suite B
Fort Wayne IN 46808

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".*

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: January 9, 2020

**R. Douglas Leonard, Jr., President, COO
Laboratory Accreditation Bureau
Presented the 6th of January 2017**

*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).
Form 28.1 - Rev 1 7/3/13

Scope of Accreditation For Knight Mechanical Testing LLC

3205 Clairmont Ct., Ste. B
Fort Wayne, IN 46808
Kevin Knight
260-489-1444

In recognition of a successful assessment to ISO/IEC 17025:2005, accreditation is granted to **Knight Mechanical Testing LLC** to perform the following tests:

Accreditation granted through: **January 9, 2020**

Testing - Mechanical

Technology	Range, when necessary	Methods Used	Product Types	Remarks
Tension & Compression Monotonic Testing	(-250 000 to 250 000) N (0 to 150) mm	Customer supplied specifications Laboratory developed specifications approved by the client	Mechanical components: medical, automotive, aerospace, heavy vehicle, agricultural, defense, and consumer products and All Metal Alloys	Elongation and Reduction of Area Included
Force Controlled Cyclic Testing	(-250 000 to 250 000) N (0 to 150) mm (0 to 30) Hz	Customer supplied specifications Laboratory developed specifications approved by the client	Mechanical components: medical, automotive, aerospace, heavy vehicle, agricultural, defense, and consumer products	
Displacement Controlled Cyclic Testing	(-250 000 to 250 000) N (0 to 150) mm (0 to 30) Hz	Customer supplied specifications Laboratory developed specifications approved by the client	Mechanical components: medical, automotive, aerospace, heavy vehicle, agricultural, defense, and consumer products	

Technology	Range, when necessary	Methods Used	Product Types	Remarks
Torsional Monotonic Testing	(-225 to 225) Nm (0 to 15) Revolutions	Customer supplied specifications Laboratory developed specifications approved by the client	Mechanical components: medical, automotive, aerospace, heavy vehicle, agricultural, defense, and consumer products	
Torque Controlled Cyclic Testing	(-225 to 225) Nm (0 to 270) degrees (0 to 5) Hz	Customer supplied specifications Laboratory developed specifications approved by the client	Mechanical components: medical, automotive, aerospace, heavy vehicle, agricultural, defense, and consumer products	
Fracture Toughness Testing	(-250 000 to 250 000) N (Up to 5) in	ASTM E399 ASTM B645 ASTM E1820	All Metal Alloys	
Axial Fatigue Testing (Strain and Stress)	(-250 000 to 250 000) N	ASTM E466 ASTM E606	All Metal Alloys	

Notes:

- 1) This laboratory offers commercial testing service.

Knight Mechanical Testing has demonstrated technical competency to perform ISO/IEC 17025:2005 accredited testing activities per the test technologies identified in the table above and the test methods identified below per the attached annex 1.

Annex 1 – ISO/IEC 17025 Accredited Test Methods
ASTM Test Methods:

- F382 Standard Specification and Test Method for Metallic Bone Plates
- F543 Standard Specification and Test Methods for Metallic Medical Bone Screws
- F564 Standard Specification and Test Methods for Metallic Bone Staples
- F1044 Standard Test Method for Shear Testing of Calcium Phosphate Coatings and Metallic Coatings
- F1147 Standard Test Method for Tension Testing of Calcium Phosphate and Metal Coatings



- F1160 Standard Test Method for Shear and Bending Fatigue Testing of Calcium Phosphate and Metallic Medical and Composite Calcium Phosphate/Metallic Coatings
- F1440 Standard Practice for Cyclic Fatigue Testing of Metallic Stemmed Hip Arthroplasty Femoral Components without Torsion
- F1223 Standard Test Method for Determination of Total Knee Replacement Constraint
- F1264 Standard Specification and Test Methods for Intramedullary Fixation Devices
- F1612 Standard Practice for Cyclic Fatigue Testing of Metallic Stemmed Hip Arthroplasty Femoral Components with Torsion
- F1717 Standard Test Methods for Spinal Implant Constructs in a Vertebrectomy Model
- F1798 Standard Guide for Evaluating the Static and Fatigue Properties of Interconnection Mechanisms and Subassemblies Used in Spinal Arthrodesis Implants
- F1800 Standard Test Method for Cyclic Fatigue Testing of Metal Tibial Tray Components of Total Knee Joint Replacements
- F1820 Standard Test Method for Determining the Axial Disassembly Force of a Modular Acetabular Device
- F2009 Standard Test Method for Determining the Axial Disassembly Force of Taper Connections of Modular Prostheses
- F2028 Standard Test Methods for Dynamic Evaluation of Glenoid Loosening or Disassociation
- F2077 Test Methods for Intervertebral Body Fusion Devices
- F2193 Standard Specifications and Test Methods for Components Used in the Surgical Fixation of the Spinal Skeletal System
- F2267 Standard Test Method for Measuring Load Induced Subsidence of an Intervertebral Body Fusion Device under Static Axial Compression
- F2345 Standard Test Methods for Determination of Static and Cyclic Fatigue Strength of Ceramic Modular Femoral Heads
- F2502 Standard Specification and Test Methods for Bioabsorbable Plates and Screws for Internal Fixation Implants
- F2706 Standard Test Methods for Occipital-Cervical and Occipital-Cervical-Thoracic Spinal Implant Constructs in a Vertebrectomy Model
- F2777 Standard Test Method for Evaluating Knee Bearing (Tibial Insert) Endurance and Deformation Under High Flexion
- E8 Standard Test Methods for Tension Testing of Metallic Materials
- E9 Standard Test Methods of Compression Testing of Metallic Materials at Room Temperature
- E466 Standard Practice for Conducting Force Controlled Constant Amplitude Axial Fatigue Tests of Metallic Materials
- E606 Standard Test Method for Strain-Controlled Fatigue Testing
- E1820 Standard Test Method for Measurement of Fracture Toughness J_{Ic}



- E399 Standard Test Method for Linear-Elastic Plane-Strain Fracture Toughness K_{Ic} of Metallic Materials
- B645 Standard Test Method for Linear-Elastic Plane-Strain Fracture Toughness of Aluminum Alloys

ISO Test Methods:

- 7206-4 Implants for surgery -- Partial and total hip joint prostheses -- Part 4: Determination of endurance properties and performance of stemmed femoral components
- 7206-6 Implants for surgery -- Partial and total hip joint prostheses -- Part 6: Determination of endurance properties of head and neck region of stemmed femoral components
- 7206-10 Implants for surgery -- Partial and total hip-joint prostheses -- Part 10: Determination of resistance to static load of modular femoral heads
- 9585 Determination of bending strength and stiffness of bone plates
- 14801 Dentistry -- Implants -- Dynamic fatigue test for endosseous dental implants

Approved by: _____

R. Douglas Leonard
Chief Technical Officer

Date: January 6, 2017

Re-Issued: 1/6/17