FOURTH SYMPOSIUM ON FATIGUE AND FRACTURE OF METALLIC MEDICAL MATERIALS AND DEVICES

Sponsored by ASTM Committees E08 on Fatigue and Fracture and F04 on Medical and Surgical Materials and Devices

May 22-23, 2018
Sheraton San Diego Hotel and Marina
San Diego, CA, USA

Symposium Chairs: Terry Woods
FDA
Silver Spring, MD

Brian Berg
Boston Scientific Corp.
Maple Grove, MN

M.R. Mitchell
Mechanics & Materials
Flagstaff, AZ

K.L. Jerina
Washington University
University City, MO

ABOUT THE SYMPOSIUM
The intent of this symposium is to provide a set of unique presentations on fatigue and fracture mechanics principles as applied to the fatigue, fracture, durability and life predictive methodologies involved in metallic medical materials and devices. Such materials include Nitinol, 304, 316L, and other stainless steels, MP35N, Ti-6-4, Ti-15Mo, and Co-Cr. Any metallic medical devices with fatigue and fracture issues are of interest, such as pacemaker/defibrillator leads, stents, endovascular grafts, heart valve frames, occlusion devices, prosthetics, and circulatory assist devices.
TUESDAY, MAY 22, 2018

1:00 PM
Opening Remarks
Terry Woods, FDA

SESSION 1: NITINOL

Session Chairman: Terry Woods
FDA
Silver Spring, MD

1:10 PM
The Use of Generation III Nitinol for Fatigue-Critical Medical Devices
Alan Pelton, G.RAU, Inc.

1:35 PM
Deterministic Modeling of Nitinol Fatigue Behavior Based on Inclusion Content and Stressed Volume
Matthew Bowers, Exponent, Inc.

2:00 PM
Effect of Variable Amplitude Loading in Nitinol Fatigue
Brian Choules, Embry-Riddle Aeronautical University

2:25 PM
Material Strain Validation in Fatigue Testing of Superelastic Nitinol
Sakya Tripathy, Edwards Lifesciences

2:50 PM BREAK

SESSION 2: FATIGUE TO FRACTURE

Session Chairman: Kenneth Perry
Echobio
Bainbridge Island, WA

3:20 PM
The Use of Classical Fatigue and Fatigue-to-Fracture Techniques for Very-High-Cycle Life Qualification of Prosthetic Heart Valve Frames
Paul Schmidt, Edwards Lifesciences

3:45 PM
Statistical Practices for Fatigue to Fracture of Cardiovascular Medical Devices
Wayne Falk, Medtronic
A New Approach for Fatigue-to-Fracture Testing of Coronary Stents Manufactured from Non-Superelastic Metal Alloys
Matthias Frotscher, Cortronik GmbH (BIOTRONIK)

First Day Wrap Up
Terry Woods, FDA

ADJOURN FOR THE DAY

WEDNESDAY, MAY 23, 2018

Second Day Opening Remarks
Brian Berg, Boston Scientific

SESSION 3: COCR ALLOYS
Session Chairman: Brian Berg
Boston Scientific
Maple Grove, MN

Fatigue Testing with Surrogate Samples
Kenneth Perry, Echobio

Fatigue Life Prediction for Medical Devices Using a Probabilistic Finite Element Approach
Venkateswaran Shanmugam, Edwards Lifesciences

The Reproducibility of a Proposed Standard Fatigue Test for Cardiac Device Leads
Timothy Quinn, NIST

SESSION 4: NOVEL METHODS AND PROCESSING
Session Chairman: Janet Gbur
Case Western Reserve University
Cleveland, OH
Accelerated Fatigue Testing Using Ultrasonic Vibrations Enabling Faster Selection and Design of Long-Term Implant Materials
Dhiraj Catoor, Medtronic

Effect of Hot Isostatic Pressing on Fatigue Properties and Particle Shedding in Additively Manufactured Ti-6Al-4V-ELI
Julius Bonini, Lucideon M+P

Very High Cycle Fatigue Endurance on Titanium Alloy Ti-6Al-4V, Pre-Corroded With Hydrochloric Acid
Ishvari Zuniga Tello, University of Michoacán de San Nicolás de Hidalgo

Closing Remarks
Brian Berg, Boston Scientific Corp.

SYMPOSIUM ADJOURNS