



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

M.R. Mitchell
Mechanics & Materials
Flagstaff, AZ

Brian Berg
Boston Scientific Corp.
Maple Grove, MN

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

4:10 PM

A New Approach for Fatigue-to-Fracture Testing of Coronary Stents Manufactured from Non-Superelastic Metal Alloys

Matthias Frotscher, Cortronik GmbH (BIOTRONIK)

4:35 PM

First Day Wrap Up

Terry Woods, FDA

4:45 PM ADJOURN FOR THE DAY



WEDNESDAY, MAY 23, 2018

8:00 AM

Second Day Opening Remarks

Brian Berg, Boston Scientific

SESSION 3: COCR ALLOYS

Session Chairman: Brian Berg
 Boston Scientific
 Maple Grove, MN

8:10 AM

Fatigue Testing with Surrogate Samples

Kenneth Perry, Echobio

8:35 AM

Fatigue Life Prediction for Medical Devices Using a Probabilistic Finite Element Approach

Venkateswaran Shanmugam, Edwards Lifesciences

9:00 AM

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

9:25 AM

Accelerated Fatigue Testing Using Ultrasonic Vibrations Enabling Faster Selection and Design of Long-Term Implant Materials

Dhiraj Catoor, Medtronic

9:50 AM BREAK

10:15 AM

Effect of Hot Isostatic Pressing on Fatigue Properties and Particle Shedding in Additively Manufactured Ti-6Al-4V-ELI

Julius Bonini, Lucideon M+P

10:40 AM

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

11:05 AM

Closing Remarks

Brian Berg, Boston Scientific Corp.

11:30 AM SYMPOSIUM ADJOURNS