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Professional Profile

Dr. Neilson specializes in failure analysis, mechanics of materials, materials deformation and processing, and metallurgy. He has extensive experience in mechanical evaluation across multiple length scales, from "nano" to "macro". His expertise lies in determination of the processing/ properties/ microstructure relationship of materials, with a focus on metallic systems. His analytical capabilities include scanning electron microscopy (SEM), electron backscatter diffraction (EBSD), optical microscopy (OM), energy dispersive X-ray spectroscopy (EDS/EDX), x-ray diffraction (XRD) and numerous mechanical test methods. His primary materials of interest are ferrous and non-ferrous alloys, with an emphasis on materials for aerospace and high-performance applications.

Dr. Neilson completed his Ph.D. at Case Western Reserve University in Cleveland, Ohio in 2018. His research focused on examining and modeling the microstructural evolution of a novel aluminum-lithium alloy during high temperature processing. Throughout the course of his thesis work, he performed a variety of mechanical tests and characterization techniques (SEM, EBSD, OM) to evaluate the performance of this alloy. Additionally, he has examined other metallic systems including other aluminum alloys, nickel- and titanium-based alloys, and amorphous alloys (bulk metallic glasses).

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, Case Western Reserve University, 2018

M.S., Materials Science and Engineering, Case Western Reserve University, 2014

B.S., Materials Science and Engineering, Rice University, 2012

Publications

Petersen AS., Cheung AM, Neilson HJ, Poon SJ, Shiflet GJ, Lewandowski JJ. Processing and Properties of Ni-Based Bulk Metallic Glass via Spark Plasma Sintering of Pulverized Amorphous Ribbons. MRS Advances 2017; 1-6.

Neilson HJ, Petersen AS, Cheung AM, Poon SJ, Shiflet GJ, Widom M, Lewandowski JJ. Weibull modulus of hardness, bend strength, and tensile strength of Ni—Ta—Co—X metallic glass ribbons. Materials Science and Engineering A 2015; 634, 176-182.

Neilson HJ, Carter JLW, Lewandowski JJ. An improved method for calculation of elastic constants of metallic glasses. Materials Science and Engineering A 2015; 634, 183-287.

Peng C, Jia Z, Neilson HJ, Li T, Lou J. In Situ Electro-Mechanical Experiments and Mechanics Modeling

of Fracture in Indium Tin Oxide-Based Multilayer Electrodes. Advanced Engineering Materials 2013; 15(4) 250-256.

Neilson HJ, Price gouging versus price reduction in retail gasoline markets during Hurricane Rita. Economics Letters 2009; 105(1), 11-13.

Presentations

Neilson HJ, Lewandowski JJ. Weibull analysis of high strength Ni- and Fe-based bulk metallic glasses. TMS Annual Meeting, Phoenix, AZ, 2018.

Neilson HJ, Schwam D, Lewandowski JJ. Hot Deformation/Forging and Mechanical Behavior of 3rd Generation Al-Li Alloy. Poster presentation: MS&T Annual Meeting, Pittsburgh PA 2017; and Case Western Reserve University Research ShowCASE, Cleveland, OH, 2017.

Neilson HJ, Petersen AS, Cheung AM, Poon SJ, Shiflet GJ, Lewandowski JJ. High Density Ni-based Metallic Glasses Formed by Spark Plasma Sintering. TMS Annual Meeting, Nashville, TN, 2016.

Neilson HJ, Schwam D, Lewandowski JJ. Hot Deformation/Forging Behavior of Al-7075 and 3rd Generation Al-Li Alloy. Poster presentation: Case Western Reserve University Research ShowCASE, Cleveland, OH, 2016.

Neilson HJ, Petersen AS, Cheung AM, Poon SJ, Shiflet GJ, Lewandowski JJ. High Density Ni-based Metallic Glasses. MS&T Annual Meeting, Columbus, OH, 2015.

Neilson HJ, Petersen AS, Cheung AM, Poon SJ, Shiflet GJ, Lewandowski JJ. High Density Ni-based Metallic Glasses Formed by Spark Plasma Sintering. Poster presentation: TMS Annual Meeting, Orlando, FL, 2015; and Case Western Reserve University Research ShowCASE, Cleveland, OH, 2015.

Neilson HJ, Yi J, Booth J, Lewandowski JJ. Novel Manufacturing Techniques of Metallic Glass Fibers. MS&T Annual Meeting, Pittsburgh, PA, 2014.

Neilson HJ, Yi J, Wang W, Lewandowski JJ. Size Effects of Plasticity in Metallic Glasses. MS&T Annual Meeting, Pittsburgh, PA, 2014.

Neilson HJ, Lewandowski JJ. Weibull Modulus of Hardness, Bend Strength, and Tensile Strength of Ni-Ta-Co-X Metallic Glass Ribbons. MS&T Annual Meeting, Pittsburgh, PA, 2014.

Neilson HJ, Lewandowski JJ. Weibull Modulus of Hardness, Bend Strength, and Tensile Strength of Ni-Ta-Co-X Metallic Glass Ribbons. Poster presentation: Case Western Reserve University Research ShowCASE, Cleveland, OH, 2014.

Neilson HJ, Yi J, Lewandowski JJ. Size Effects on Strength and Plasticity of Metallic Glasses. Poster Presentation: Case Western Reserve University Research ShowCASE, Cleveland, OH, 2013.