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Engineering & Scientific Consulting

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Professional Profile

Dr. Chalifoux specializes in failure analysis of structures and components by utilizing her multidisciplinary expertise in corrosion, coatings, fracture mechanics, and materials science. Dr. Chalifoux is NACE CIP Level 2 certified and conducts analyses of various paint and protective-coating systems applied to a wide variety of substrates including steel, aluminum, wood and cementitious structures. Her experience in coating failure analysis includes evaluation and root cause analysis of failure mechanisms involving delamination, cracking, blistering, peeling, and chalking.

Dr. Chalifoux also has experience analyzing corrosion and fracture of ferrous and non-ferrous metals including intergranular corrosion, pitting corrosion, filiform corrosion, corrosion fatigue, stress corrosion cracking, hydrogen embrittlement, hydrogen environmental assisted cracking, and liquid metal embrittlement. Dr. Chalifoux's metallurgical analysis capabilities include mechanical testing, fractography, optical and electron microscopy.

Prior to joining Exponent, Dr. Chalifoux was a graduate research assistant at the University of Virginia, where her research focused on experimental fracture mechanics of Al-Mg alloys. She designed and implemented electrochemical crack tip controlled experiments and hydrogen charging experiments to validate the hypothesized coupled dissolution-hydrogen embrittlement mechanism for intergranular stress corrosion cracking in Al-Mg alloys. Dr. Chalifoux developed her microscopy skill set using a scanning electron microscope (SEM) to analyze and document fracture patterns generated during corrosion fatigue, stress corrosion cracking, and hydrogen embrittlement of Al-Mg alloys in various electrochemical environments. In addition, Dr. Chalifoux studied high temperature fatigue in nickel-based super alloys.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, University of Virginia, 2013

B.S., Physics, Emory University, 2008

Licenses and Certifications

Licensed Professional Engineer, Georgia, #PE045261

NACE CIP Level 2

Professional Affiliations

NACE International

The Minerals, Metals & Materials Society (TMS)

Publications

Crane CB, Gangloff, RP. Stress corrosion cracking of Al-Mg Alloy 5083 sensitized at low temperature. *Corrosion* 2016; 72:221-241.

Crane CB, Kelly R, Gangloff RP. Crack chemistry control of intergranular SCC in sensitized Al-Mg. *Corrosion* 2016; 72:242-263.

Crane CB, Gangloff, RP. Dissolution and hydrogen diffusion control of IGSCC in sensitized Al-Mg alloys. In: *Hydrogen Effects on Materials*. Somerday BP and Sofronis P (eds), ASME, New York, NY, 2012, p. 439-50.

Presentations

Crane CB, Gangloff RP. The effect of applied polarization on stress corrosion cracking in sensitized AA5083. Department of Defense Corrosion Conference 2013, NACE, Houston, TX, 2013. www.corrdefense.com.

Crane CB. Stress corrosion cracking in AA5083. Presented at Naval Research Lab, Washington, D.C., July 2012.

Crane CB, Gangloff RP. Stress corrosion cracking of low temperature sensitized AA5083. Department of Defense 2011 Corrosion Conference, NACE, Houston, TX, 2012. www.corrdefense.com.

Crane CB. Measuring and modeling intergranular corrosion-to-stress corrosion cracking in Al-Mg. Department of Defense Corrosion Conference Student Poster Session, Washington, D.C., August 2009.

Crane CB, Neu RW, Moore ZJ. High temperature fatigue of directionally solidified nickel-based super alloys. Georgia Institute of Technology SURF Poster Session, Atlanta, GA, July 2007.