Exponent®
Engineering & Scientific Consulting

Trevor Ballard, Ph.D., P.E.

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Professional Profile

Dr. Ballard is a metallurgical and materials engineer with broad expertise in multiple alloy systems. He applies his knowledge to help clients solve materials issues across several industries, including oil and gas, power generation, chemical, and transportation.

Dr. Ballard has specific experience performing failure analysis investigations of heat exchanger tubes, natural gas valves, and turbine blades. He has investigated weld failures in process piping at chemical facilities and on liquified natural gas (LNG) pipelines, along with corrosion failures in piping systems and in floating roof crude oil storage tanks. In the course of these investigations, Dr. Ballard routinely applies pertinent industry codes and standards from ASME, ASTM, API, and NACE to help understand potential design, manufacturing, and material issues. He is proficient with a wide range of laboratory equipment and techniques, including fractography, metallography, optical microscopy, scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), and thermomechanical testing.

Prior to joining Exponent, Dr. Ballard completed his Ph.D. at the Colorado School of Mines where he developed a novel testing method using a Gleeble 3500 to study the relationship between recrystallization behavior at various temperatures and changes in carbonitride precipitation in microalloyed steels.

Academic Credentials & Professional Honors

Ph.D., Metallurgical and Materials Engineering, Colorado School of Mines, 2022

B.S., Metallurgical and Materials Engineering, Colorado School of Mines, 2017

Recipient, Jerry Silver Award, Association for Iron and Steel Technology, 2021

Licenses and Certifications

Professional Engineer Metallurgical, California, #2069

Professional Engineer, Colorado, #PE.0066070

Prior Experience

Undergraduate Research Assistant, Colorado School of Mines, 2015-2017

Graduate Teaching Assistant, Colorado School of Mines, 2017-2021

Publications

T. J. Ballard, J. G. Speer, K. O. Findley, and E. De Moor, “Evolution of Austenite Microstructure and Microalloy Precipitation State During Double-Twist Torsion Testing on Nb-Ti-Bearing Steels,” *Materialia*, vol. 31, 2023.

C. Finfrock, D. Bhattacharya, B. McBride, T. Ballard, and A. Clarke, "Decoupling the Impacts of Strain Rate and Temperature on TRIP in Q&P Steel," *JOM*, 2022.

T. Ballard, J. Speer, K. Findley, and E. De Moor, "Double-Twist Torsion Testing to Assess Partial Recrystallization in Microalloyed Steels," *AIST Transactions*, vol. 18, no. 3, pp.240-246, 2021.

C. Finfrock, M. Thrun, D. Bhattacharya, T. Ballard, A. Clarke, and K. Clarke, "Strain Rate Dependent Ductility and Strain Hardening in Q&P Steels," *Metallurgical and Materials Transactions A*, vol. 5, pp. 928-942, 2021.

T. Ballard, J. Speer, K. Findley, and E. De Moor, "Double-Twist Torsion Testing to Determine the Non Recrystallization Temperature," *Scientific Reports*, vol. 11, no. 1495, 2021.

R.Cryderman and T. Ballard, "Short Time Austenitizing Effects on the Hardenability of 0.55 wt pct Carbon Steels," *Metallurgical Research and Technology, vol. 115, no. 403, 2018.*

Presentations

T. Ballard and E. De Moor, “Effect of Alloying Content on Fractional Softening Behavior and Microstructural Evolution During Double-Twist Torsion Testing of Microalloyed Steels,” MS&T21, Columbus, OH, 2021.

T. Ballard, J. Speer, K. Findley, and E. De Moor, “Double-Twist Torsion Testing to Assess Partial Recrystallization in Microalloyed Steels,” MS&T20, virtual, 2020.

T. Ballard and E. De Moor, “Double-Twist Torsion Testing to Determine the Non-Recrystallization Temperature,” 7th International Conference on Recrystallization and Grain Growth, Ghent, Belgium, 2019.