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ERIK A. PFEIF, Ph.D., P.E.
SENIOR CONSULTANT

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Dr. Erik Pfeif is a Senior Consultant at Engineering Systems Inc. (ESi) with over 15 years of experience in applied engineering, materials characterization, and materials processing. Dr. Pfeif specializes in metallurgical failure analysis and prevention, non-destructive evaluation, welding metallurgy, corrosion of materials, and physical metallurgy. Additionally, he has experience in assessment of manufacturing processes, small scale mechanical testing, government proposal writing, and experimental test stand development.

Before joining ESi, Dr. Pfeif spent most of his career conducting applied research and development of materials. He has worked on improving mineral processing technologies at Disa Technologies; additive manufacturing and systems design at 3DSystems; failure analysis, process qualification, and high-temperature superalloy development at Johns Manville; and laser welding and thermophysical property measurement research at the National Institute of Standards and Technology. These experiences have provided Dr. Pfeif with experience in designing, developing, and testing the performance of diverse products, materials, and systems.

Areas of Specialization

Additive Manufacturing
Corrosion of Materials
Failure Analysis
High Temperature Materials
High Energy Density Welding
Lab and Industrial Testing
Manufacturing
Materials Characterization
Materials Selection
Mechanical Testing
Metallurgical Analysis
Metals
Scanning Electron Microscopes (SEM, EDS)
Themophysical property measurements
Welding Metallurgy

Education

Ph.D., Materials Science, Colorado School of the Mines, CO, 2015
M.S., Materials Science, Colorado School of the Mines, CO, 2010
B.S., Metallurgical & Materials Engineering, Colorado School of the Mines, CO, 2008

Licensed Professional Engineer (P.E.)

State of Colorado License No. 0066019

Honors/Awards

ARCS Scholar, Colorado School of Mines (2011-2014)
Materials Bowl Champion, TMS 2009

Professional Affiliations

The American Welding Society (2011-2021)
The Minerals Metals & Materials Society (TMS) Member (2017-2021)
International Institute of Welding (2016-Present)

Positions Held

Engineering Systems Inc., Centennial, Colorado
Senior Consultant, 2024 -present

Disa Technologies, Westminster, Colorado
Senior Materials Engineer, 2024 - 2024

3DSystems, San Diego, California
Senior Materials Engineer, 2020 – 2023

Johns Manville, Littleton, Colorado
Senior Metallurgical Engineer, 2017 - 2020

National Institute of Standards and Technology (NIST), Boulder, Colorado
Materials Research Engineer, 2014 – 2017

Publications/Presentations

"Time-resolved absorptance and melt pool dynamics during intense laser irradiation of a metal." Simonds, B. J., Sowards, J., Hadler, J., **Pfeif, E.**, Wilthan, B., Tanner, J., ... & Lehman, J., Physical review applied, 10(4), 044061, 2018.

"Dynamic and absolute measurements of laser coupling efficiency during laser spot welds" Simonds, B. J., Sowards, J. W., Hadler, J., **Pfeif, E.**, Wilthan, B., Tanner, J., ... & Lehman, J. Procedia CIRP, 74, 632-635, 2018.

"Low-cycle fatigue behavior of fiber-laser welded, corrosion-resistant, high-strength low alloy sheet steel." Sowards, J. W., **Pfeif, E. A.**, Connolly, M. J., McColskey, J. D., Miller, S. L., Simonds, B. J., & Fekete, J. R., Materials & Design, 121, 393-405, 2017.

"ThermoML—An XML Storage and Exchange Standard for Thermophysical and Thermochemical Data" **Pfeif, E. A.,** Kroenlein, K., Wilthan, B., Diky, V. V., presented at the European Thermophysical Properties Conference., Graz, Austria, 2017.

"A free online NIST/TRC Resource for Thermophysical Property Data of Metals and Alloys" Wilthan, B., Diky, V. V., Kazakov, A., **E. A. Pfeif**, S. Townsend, K. Kroenlein, presented at the European Thermophysical Properties Conference, Graz, Austria, 2017.

"Data resources for thermophysical properties of metals and alloys, Part 1: Structured data capture from the archival literature." Wilthan, B., **Pfeif, E. A.,** Diky, V. V., Chirico, R. D., Kattner, U. R., & Kroenlein, K. Calphad, 56, 126-138, 2017.

"Fiber laser welding of dual-phase galvanized sheet steel (DP590): traditional analysis and new quality assessment techniques" Miller, S., **Pfeif, E. A.**, Kazakov, A., Baumann, E., Dowell, M., SPIE LASE, 97410I-12, 2016.

"Welding Solidification Fundamentals" **Pfeif, E. A.,** presented at the AWS Weld the Rockies Symposium, 2016.

"Exploring Methods for Producing Standard Reference Data for Calibration of Numerical Welding Simulations" Sowards, J.W., **Pfeif, E. A.,** Wilthan, B., Kroenlein, K., Simonds, B., presented at the Fabtech Professional Program, Las Vegas, NV, 2016.

"Perspective: Data infrastructure for high throughput materials discovery" **Pfeif, E. A.**, Kroenlein, K., APL Materials, 4(5), 053203, 2016.

"Development of a Dynamically Evaluated Thermodynamic Database for Metallurgical Systems" **Pfeif, E. A.**, Wilthan, B., Diky,V. V., Kroenlein, K., Kazakov, A., presented at Trends in Welding, Tokyo, Japan, 2016.

"Effects of Nitrogen on Strength of Fiber and Electron Beam Weld Metal" **Pfeif**, **E. A.**, Javernick, D., Liu, S., presented at the Trends in Welding Symposium, Tokyo, Japan, 2016.

"Progress on Implementation of Dynamic Thermodynamic Database for Metallic Systems" **Pfeif, E. A.**, Wilthan, B., Diky,V. V., Kroenlein, K., Kazakov, A., presented at the Asian Thermophysical Properties Conference, Tokyo, Japan. 2016.

"Characterization of Nitrogen Effects in High Energy Density Weldments of Nitronic 40 Stainless Steel" **Pfeif, E. A.,** Ph.D. Thesis, Colorado School of Mines, 2015.

"*Comparison of Longitudinal Mechanical Properties of Nitronic 40 Electron Beam Welded and Laser Beam Welds"* Pfeif**, E. A.** Cady, C., Mataya, M., Olson, D. L., Javernick, D., Liu, C., Liu, S., presented at the Fabtech Professional Program, Atlanta, Georgia, 2014.

"The Need for Thermodynamics Databases for Metallurgical Systems" **Pfeif, E. A**. presented at the World Materials Research Institute Forum—Young Scientists Workshop, Boulder, CO, 2014.

"Quantitative assessment of thermal diffusion using NDE." Howard, C. T., **Pfeif, E. A.**, Porter, J. M., Mishra, B., & Olson, D. L. AIP Conference Proceedings (Vol. 1511, No. 1, pp. 1143-1149), 2013.

"*Effect of Mn and N Vaporization during Laser Beam Welding of 12Cr6Ni9Mn Weldment Mechanical Properties"* **Pfeif, E. A.**, Mataya, M, Olson, D. L., Cady,C., Liu, S., presented at presented at the Fabtech Professional Program Chicago, IL., 2013.

"*Use Of Segregation As A Weld Design Opportunity"* **Pfeif, E. A.**, Howard, C., Tate, S., Liu, S., Mishra, B., & Olson, D. L., In Trends in Welding Research 2012: Proceedings of the 9th International Conference. ASM International, 2012.

"Submerged eddy current method of hydrogen content evaluation of Zircaloy-4 fuel cladding" **Pfeif, E. A.**, Jones, Z., Lasseigne, A. N., Koenig, K., Krzywosz, K., Mader, E. V., & Olson, D. L. AIP Conference Proceedings (Vol. 1335, No. 1, pp. 1168-1175), 2011.

"Characterization of hydrogen content in zircaloy-4 nuclear fuel cladding" **Pfeif, E. A.**, Lasseigne, A. N., Krzywosz, K., Mader, E. V., Mishra, B., & Olson, D. L., . I, AIP Conference Proceedings (Vol. 1211, No. 1, pp. 1317-1324), 2010.

"Assessment of the State of Precipitation in Aluminum Casting A356. 2 Alloy Using Nondestructive Microstructure Electronic Property Measurements." Kiattisaksri, P., Gibbs, P. J., Koenig, K., **Pfeif, E. A.**, Lasseigne, A. N., Mendez, P. F., ... & Olson, D. L., AIP Conference Proceedings (Vol. 1211, No. 1, pp. 1285-1292). AIP. 2010.

"Development of submerged in-situ non-destructive evaluation of hydrogen in Zircaloy fuel cladding" **Pfeif, E. A.,** M.S. Thesis, 2010.

"The impact of peak shock stress on the microstructure and shear behavior of 1018 steel" Dougherty, L. M., Cerreta, E. K., **Pfeif, E. A.**, Trujillo, C. P., & Gray, G. T., Acta Materialia, 55(18), 6356-6364, 2007