ICAM25

International Conference on Advanced Manufacturing

Research to Application through Standardization

October 6-10 | Las Vegas, NV

Value Chain: Environmental and Corrosion

Research on additively manufactured alloys has primarily focused on the evaluation of microstructure characterization and mechanical performance with limited emphasis on environmentally induced degradation modes. Material degradation is often a service life limiter. Hence, it is critical to understand environmental effects (e.g., corrosion, environmental assisted cracking, etc.) on AM alloys to enable informed use and accurate lifetime prediction in structural components for engineering applications. Numerous studies have demonstrated significant differences in both microstructure and corrosion properties between AM alloys and conventionally processed alloys. It is important to understand the mechanisms of such phenomena and thus be able to model their linkages and develop lifetime prediction and repair methodologies. It is also reported that post-processing techniques such as heat treatment, surface treatment, or coating may influence the performance of AM alloys against environmental effects. On the characterization side, most studies have utilized legacy standards for corrosion testing. While these legacy standards may be applicable, further considerations may still be required, particularly concerning the influence of novel microstructures and novel materials.

TOPICS OF INTEREST INCLUDE BUT ARE NOT LIMITED TO:

- Quantification and characterization of AM alloys corrosion and environmental cracking behavior (e.g., HE, SCC, corrosion-fatigue, etc.)
- Identification of AM-specific environmental degradation modes by linking microstructural features to damage mechanisms
- Build and post-processing parameter impact on environmental degradation.
- Methods to prolong the life of AM parts against environmental effects (e.g., coatings, etc.)
- AM specific standardization issues and challenges
- Physics based simulations of environmental effects on AM parts
- Incorporation of machine learning/artificial intelligence approaches

Symposium Organizers

- **James Burns**, University of Virginia, USA
- **Tony Fry**, National Physical Laboratory, UK
- **Robert G. Kelly**, University of Virginia, USA
- **Michael Melia**, Sandia National Laboratories, USA
- **Matt Sanders**, Stress Engineering Services, USA
- **Nicole Tailleart**, U.S. Naval Research Laboratory, USA
- **Gary Whelan**, QuesTek Innovations, USA

Submit an abstract

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