Additive Manufacturing Process Simulation of Maraging Steel

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ABSTRACT

The additive manufacturing process presents many challenges for those in industry hoping to use the technology for real part production. The journey of developing and qualifying a part for use in a real assembly can be a long one due to difficulties in identifying a design, support structures, process parameters, and more that will reliably produce a part that meets design specifications. The simulation of these processes can aid in the design and qualification process by identifying issues in the build and allowing designers to try different designs in the digital world. This greatly reduces the need for trial and error on actual machines which is costly and time consuming.

Maraging steel is a material of interest for many manufacturers for its high strength and fracture toughness. However, this material can be difficult to simulate due to its solid state phase transformations between austenite and martensite. This talk will discuss how simulating the additive manufacturing process can help through the qualification process and explore the challenges of handling solid state phase transformations. Progress in modeling of maraging steel is shared with comparisons to experimental data.

BIOGRAPHY

Zack has been with Ansys for the last three years where he has worked on additive manufacturing simulations capabilities. He’s contributed to both structural and thermal solutions, coordinated validation, and worked through challenging customer parts. He currently leads efforts to improve features and accuracy in structural simulations. Prior to joining Ansys, Zack received his PhD in Mechanical Engineering from Carnegie Mellon where he worked on better understanding the effects of process parameters under Jack Beuth.