$750,000 NSF Phase II grant is awarded to Elementum 3D

Elementum 3D, a metal additive manufacturing materials and parameters development company, is thrilled to announce we were awarded a Phase II SBIR grant of $750,000 from the National Science Foundation (NSF) for nickel superalloy development for AM. The award comes as an initiative for the NSF aimed at optimizing the use of additive manufacturing and nanotechnology. The grant will be used to accelerate the development and commercialization of high application temperature nickel superalloy metal matrix composite (superalloy-MMC) feedstock and processing parameters for additive manufacturing.

In Phase I we were able to demonstrate the feasibility of applying our innovative reactive additive manufacturing (RAM) process towards the fabrication of complex nickel superalloy-MMC parts. Importantly, the work found that the RAM process can be used to overcome the obstacles typically faced during development of materials in a laser powder bed fusion 3D printer, such as the ability to print parts with improved microstructures free of microcracking and reduced microporosity. The formation of the reinforcing ceramic particulates resulted in parts that were significantly harder than the base alloys printed without the ceramic particulates which is indicative that the MMC material will have improved strength compared to the base superalloys. In addition, the high thermodynamic stability and high melting temperature of the reinforcing ceramic lends itself to improved high temperature performance compared to the base alloys.

Our Phase II goal with our continued research and development of high temperature nickel superalloy-MMCs for additive manufacturing is to generate baseline material property data relevant to high temperature turbine components and reduce customer risk so turbine manufacturers can justify internal qualification and life testing of the material for applications operating at temperatures above 800˚C.

About America's Seed Fund
America's Seed Fund powered by the National Science Foundation (NSF) awards nearly $190 million annually to startups and small businesses, transforming scientific discovery into products and services with commercial and societal impact. Startups working across almost all areas of science and technology can receive up to $1.5 million in non-dilutive funds to support research and development (R&D), helping de-risk technology for commercial success. America's Seed Fund is congressionally mandated through the Small Business Innovation Research (SBIR) program. The NSF is an independent federal agency with a budget of about $7.5 billion that supports fundamental research and education across all fields of science and engineering. For more information, visit seedfund.nsf.gov.

About Elementum 3D
Erie, CO-based Elementum 3D was founded by Dr. Jacob Nuechterlein in 2014. With a team that has 30 years of collective experience working in powder metallurgy, Elementum 3D's goal is to significantly expand the metal additive manufacturing materials market by introducing advanced metals, composites, and ceramics. Find them on the web at elementum3d.com.