PNNL-developed injection molding process recognized with emerging technologies award

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An injection-molding method that can reduce costs and increase the use of titanium and other durable, lightweight and corrosion-resistant metals has earned a 2013 TechConnect National Innovation Award.

Researchers at the Department of Energy's Pacific Northwest National Laboratory developed an organic binder to reduce the impurities in reactive metals, allowing them to be utilized in a powder injection molding process. Standard binders used to hold metal powders together in high volume molding processes can introduce oxygen, nitrogen or carbon into the metal as impurities, which can result in impacts to their mechanical properties (i.e. potentially making machine parts less structurally sound). But the PNNL-developed method uses a novel binder system that leaves very few impurities when it is completely burned up during a later stage of fabrication.

The innovation also reduces or eliminates the swelling, cracking or other distortions to the component that can result from traditional binders used in powder injection molding processes. The result is faster production time and lower costs.

The TechConnect Innovation awards are given annually to top early-stage innovations from around the world by TechConnect, a global outreach and development organization based in Austin, Texas. TechConnect honors technologies based on the potential impact they will have on specific industrial sectors.

"Titanium is strong and corrosion resistant, making it ideally suited to the automotive, aerospace, chemical production, and biomedical implant or equipment industries," said PNNL commercialization manager Eric Lund. "However, until now, use of injection molding to produce titanium components has been severely limited by the introduction of impurities with the binders, which then degrade the component properties."

Lund noted the PNNL-developed method overcomes this problem by using an organic binder that is cleanly removed during sintering and leaves few or no impurities that can cause degradation in material properties.

PNNL will be recognized at the TechConnect National Innovation Summit in Washington, D.C. later this month. The PNNL research team includes Eric Nyberg, Kevin Simmons and former staff member Scott Weil.

Provided by Pacific Northwest National Laboratory

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