

Additive Manufacture of Al-Ti-C Metal Matrix Composite

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Categories:

- Materials and Manufacturing
- Mechanical Engineering

Keywords:

- Additive Manufacturing
- Aeronautics
- Chemical Engineering
- Chemistry and Chemical Analysis
- Composites
- Grain Refinement
- Graphite
- Materials and Manufacturing
- Mechanical Engineering
- Metallurgical Engineering
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- Surface Finish
- Surface Quality
- Titanium

Researchers at Purdue University have developed a new additive manufacturing technique for creating high-strength aluminum-titanium-carbon (Al-Ti-C) metal matrix composites. Al-Ti-C metal composites offer a lightweight, high-performance advantage in automotive and aerospace applications; however, currently manufacturing methods can lead to loss of ductility and other desired material properties, such as strength. This process allows for smaller composite grain size and implements heat treatment to ensure exceptional product finish with the strengthening phases of TiC and Al₃Sc particles in different sizes.

Advantages:

- Small Grain Size
- Heat Treated Finish
- High-Strength
- Lightweight

Potential Applications:

- Automotive
- Aerospace
- Materials/Metals

Technology Validation:

The strengthening effects of a combination of large and small reinforcing particles have been tested as has the high yield strength and tensile strength of the material, while eproviding a better ductility.

People:

- Wang, Xiaoming (Project leader)

Intellectual Property:

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