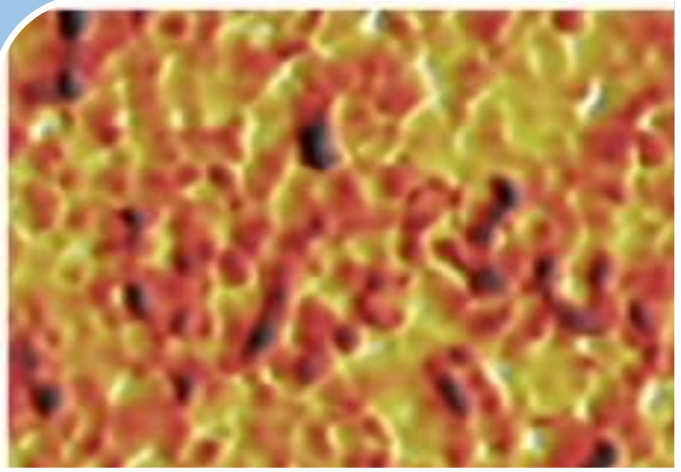
Business from technology

Utilizing nanocarbides to prevent oxidation during thermal spraying



Thermal spraying offers a fast and efficient method for producing conductive structures or coating metallic parts for demanding applications. However, in both cases the oxygen content is a critical factor: if oxygen is present in the coating it dramatically weakens the coating and affects the performance the surface. VTT has developed a method that eliminates oxygen in the coating, reduces corrosion and improves conductivity even in ambient spraying conditions.

The invention

VTT's invention is based on applying nanocarbides on the metallic particles used for thermal spraying. The carbon of nanocarbides such as WC reacts with oxygen forming CO or CO_2 and "eats" up the oxygen. As a result, spraying can be done in ambient conditions.
A suitable nanocarbide composition is selected depending on the application: the composition is tailored based on the thermal spraying method, the metal powder composition, and the functional purpose of the coating. The carbon release rate is dependent on the composition, size and the amount of the carbide.

The benefits

- reduces oxidation during thermal spraying in ambient conditions by 50 %
- reduces corrosion and strengthens the structure of the surface
- improves conductivity of the coating
- allows use of less expensive coating compositions
- no need for vacuum spraying
- suitable for all metallic thermal spray powders

Potential application and market areas

- corrosion prevention coatings for broad industrial use
- thermal barrier coatings for gas turbines
- conductive (thermal and electric) coatings

Why partner with VTT?

5 reasons for technology partnering with VTT

1. Key factor in Finland's success story with a track record to prove it
2. Licensing and co-venturing opportunities
3. Portfolio of more than 1,000 patents and inventions
4. New business and product concepts based on strong IP and world class research
5. Combined experience of more than 2,000 motivated researchers in eight focused areas of technology

Additional information

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Intellectual property

FI20095212 pending