



Mettech Advances Thermal Barrier Coating Technology

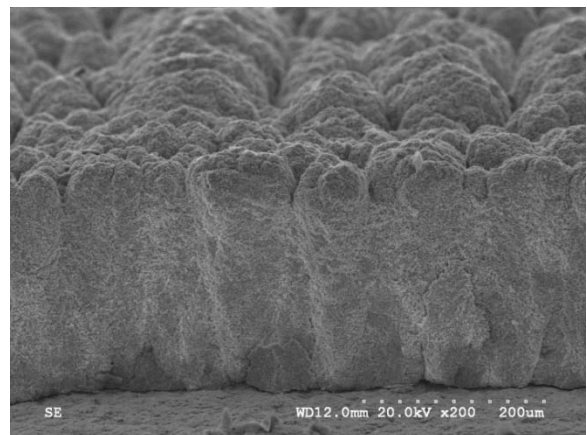
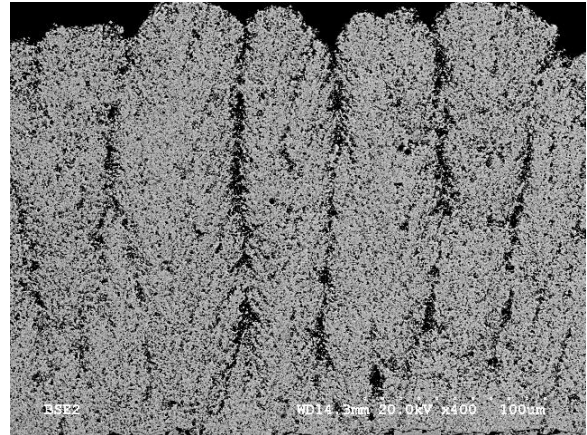
Mettech's acclaimed **Axial III™** plasma torch integrated with its new **NanoFeed™** suspension delivery system is a remarkable combination of technologies that can produce a variety of unique coatings. The NanoFeed delivery system provides an efficient way to precisely control feed rates of ultrafine powder in suspension that, combined with the Axial III torch, produces unique nanostructured coatings with enhanced performance properties.



Axial Suspension Plasma Spray (ASPS) has proven to be a viable alternative to existing technologies in the production of thermal barrier coatings (TBCs) for high temperature turbine components. TBCs insulate superalloy parts allowing higher, more efficient, operating temperatures.

TBCs are generally made by air plasma spraying (APS) or electron beam physical vapor deposition (EB-PVD). In general, EB-PVD TBCs have superior durability due to columnar structure, but it is well understood that capital and operating costs are very high. Mettech's ASPS system provides an economic processing solution to produce high quality TBCs with equivalent or superior properties to that of EB-PVD coatings, but at much lower operating and capital costs using an industry proven and accepted, robust thermal spray process.

Mettech's ASPS process provides higher throughput at much reduced costs and is considered to be a **disruptive technology**.



ASPS Produced TBC Microstructures

Contact Information

Northwest Mettech Corp.

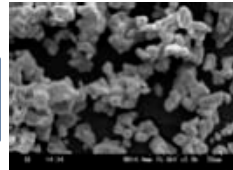
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Precise suspension delivery and injection Critical for coating production



Suspension



CrystalArc™ Powder

- Micro / nano proprietary powder
- Customize composition (low k)

CrystalArc™ Suspension

- Organic or aqueous
- Stable, long shelf life
- Wide range of concentrations



NanoFeed

NanoFeed™ Feeder

- Closed loop PLC control
- Explosion proof design
- Axial III User Interface
- Industry ready Production and R&D models



Axial III

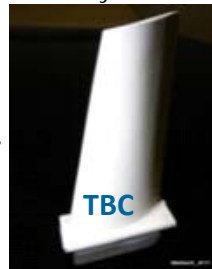
Axial III™ Torch

- Touch screen user interface
- Robust, reliable torch construction
- Axial injection
- High deposition efficiency

Axial Injection:

Enabling Industrial Scale Suspension Plasma Spray Coatings

- Injection is at the convergence of 3 plasmas; No plasma disturbance
- Large process window for uniform coatings on complex geometries
- Accepts a wide range of suspension compositions; aqueous, organic
- High power plasma to accommodate any requirement
- High deposition rate – particles are entrained in plasma
- High Deposition Efficiency; reduces waste
- Robust, industry proven equipment



TBC

ASPS Coating

- Dense and vertically cracked
- Columnar structure
- Excellent adhesion

Technical Contact

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