



ADVANCED DETONATION SPRAY COATING TECHNOLOGY

Centre for Engineered Coatings

International Advanced Research Centre for Powder Metallurgy and New Materials

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Overview

Detonation spray coating (DSC) technology relies on the controlled explosion of oxy-fuel mixture for heating and acceleration of powder particles leading to formation of thicker coatings.

With an objective of enhancing the efficiency, productivity and reliability, the detonation frequency of the existing DSC system has been increased (more than 3Hz). Modification of existing mixing chamber, elimination of numerous mechanically moving parts such as cam, gear, piston, roller, bearings, re-engineering of solenoid valves, flashback arresters, mass flow controller, PLC computer controlled system have been successfully accomplished.

Key Features

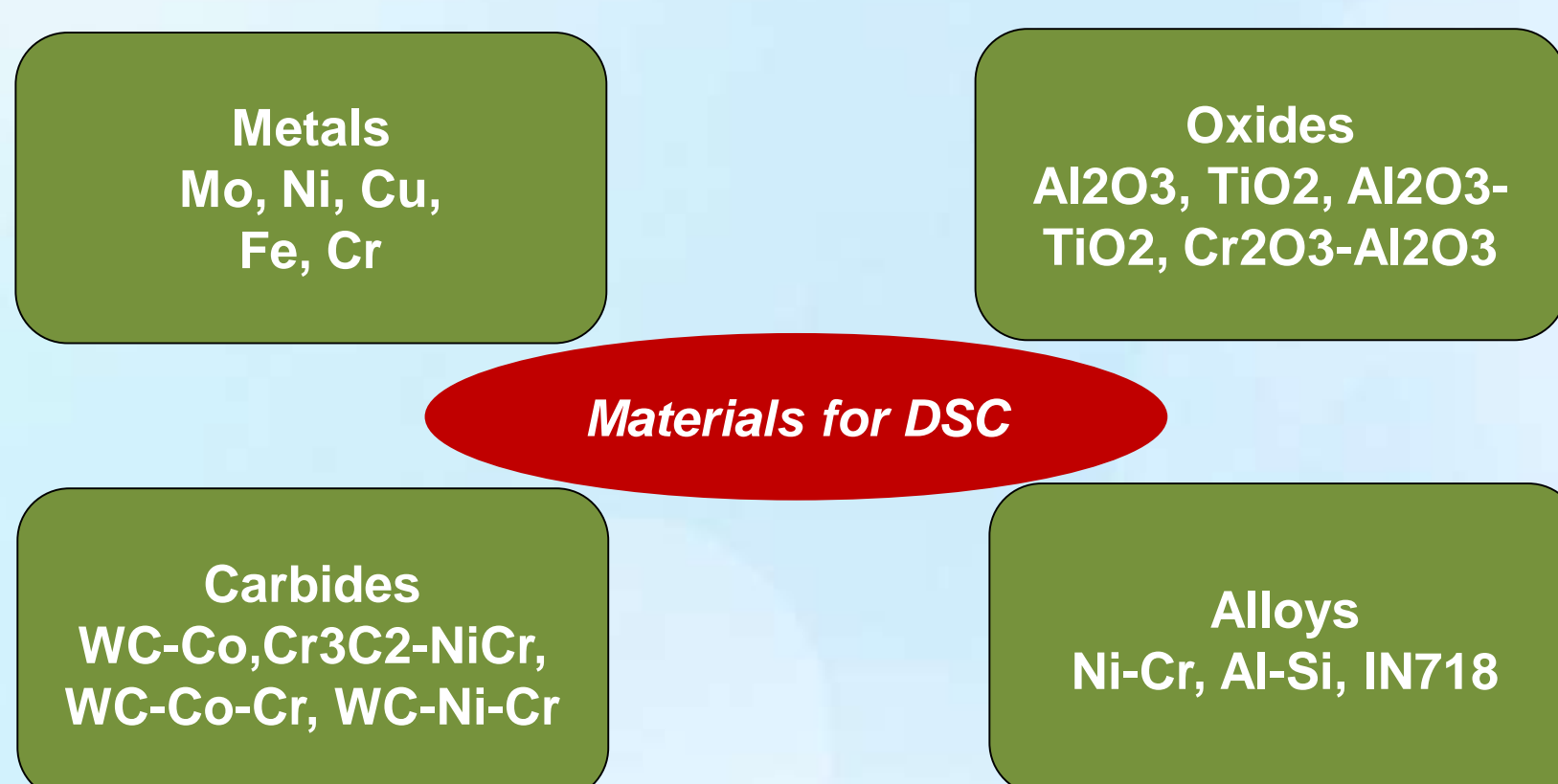
- Less maintenance: absence of mechanically moving parts
- Adhesion strength (>10000 psi) and dense microstructure (< 1%)
- Negligible thermal degradation and excellent tribological properties
- Lower substrate temperature & low oxide content
- Coatings with 50-2000 microns thickness can be produced



Detonation Spray System

Applications

- Steel industry application such as Bridle rolls
- Textile & paper industry applications - wire passing pulleys, plungers, steeped cone pulleys etc.
- Gas compressor applications such as spindle valve, compressor disc or shaft
- Strategic applications like HP & LP turbine blades, compressor discs, LCA nozzles, thrust bearing sleeves, propeller shaft seals.
- Power and energy applications such as guide vanes, hydro turbine blades.



Detonation Spray Coated LPC III Modules for Naval Aircraft



DSC Coated Industrial Components

Technology Status

- Commercially proven, successfully transferred & implemented technology
- Completed necessary tests for evaluating the equipment performance
- R&D was carried out for deposition of advanced materials for new strategic & industrial applications
- Technology is ready for transfer

*Intellectual Property Development Indices

IPDI	1	2	3	4	5	6	7	8	9	10
Activities	Basic concepts and understanding of underlying scientific principles	Shortlisting possible applications	Research to prove technical feasibility for targeted application	Coupon level testing in stimulated conditions	Check repeatability/consistency at coupon level	Prototype testing in real-life conditions	Check repeatability/consistency at prototype level	Reassessing feasibility (IP, competition technology, commercial)	Initiate technology transfer	Support in stabilizing production
Status										