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NASA TECH BRIEF



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Intergranular Metal Phase Increases Thermal Shock Resistance of Ceramic Coating

The problem:

To increase the thermal shock resistance of a plasma-arc-sprayed coating of zirconia used as a heat barrier on a metal substrate.

The solution:

Deposit a small amount of copper on the granules of the zirconia powder before arc-spraying the resultant powder composite onto the substrate. The thermal shock resistance of the finished coating is increased by the dispersed copper phase between the boundaries of the zirconia granules. A composite powder consisting of zirconia with a dispersion of iridium can be plasma-arc-sprayed to provide a coating that maintains its structural integrity at temperatures up to 4000°F in an oxidizing atmosphere.

Notes:

1. Development and evaluation of the composite powders are still at a laboratory level.

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B66-10651

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: H. W. Carpenter
of North American Aviation, Inc.
under contract to
Marshall Space Flight Center

(M-FS-1862 and 1865)

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