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NASA TECH BRIEF



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Undercoat Prevents Blistering of Silver Plating at Elevated Temperatures

The problem:

In certain applications, Inconel 718 seals are exposed to elevated temperatures and gas pressures that require they be silver plated in order to maintain their seal integrity. Difficulty has been encountered in these applications due to blistering in the silver plating resulting from the formation of steam by a hydrogen-air mix at elevated temperatures.

The solution:

A gold undercoat that is diffused into the surface of the parent metal prior to silver plating.

How it's done:

The basic seal is diffusion coated with gold by baking at a temperature of 960°-1000°F in a vacuum or in a nitrogen or argon atmosphere for 1 hour. This baking causes hydrogen, entrapped in the Inconel 718 during surface preparation for plating, to outgas, the gold diffusing into the Inconel 718 surface to form a new alloy to receive the silver plating. Silver is plated over this new alloy at a current density that avoids

hydrogen-producing overvoltage. A final baking operation in air for 1 hour at 940°-960°F simulates operating parameters to determine the integrity of the gold undercoat in protecting the silver plating from blistering.

Note:

Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10096

Patent status:

No patent action is contemplated by NASA.

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