Overview of U.S. HCAT Technology Insertion Program On Qualification of Thermal Spray Coatings As Replacement for Hard Chromium Plating on Aircraft Components

Bruce D. Sartwell, Naval Research Laboratory, Washington, DC

The U.S. Hard Chromium Alternatives Team (HCAT) is currently executing projects to qualify HVOF thermal spray coatings (principally WC/Co) as a technologically superior, cost-effective alternative to electrolytic hard chromium (EHC) plating that is extensively used in manufacturing and repair of aircraft components. There are five projects, each relating to specific types of components: Landing Gear, Propeller Hubs, Hydraulic Actuators, Helicopter Dynamic Components, and Gas Turbine Engine Components. For the latter, several types of plasma-sprayed coatings are also being investigated. Using recommentations from aircraft/component manufacturers and military engineers, Joint Test Protocols (JTP) have been established that delineate all of the materials and component testing required to qualify HVOF coatings. Standards and specifications for deposition, grinding and stripping of the thermal spray coatings are also being developed. This presentation will provide a summary of each of the JTPs and the results obtained to date for testing/evaluation of the coatings, plus the status of actual technology insertion at U.S. military aircraft repair depots. In general, thermal spray coatings have demonstrated superior fatigue, corrosion and wear properties to the EHC coatings, with a few exceptions that will be described.

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For more information, contact: Bruce D. Sartwell Naval Research Lab Code 6170 Washington, DC 20375 Phone: 202-767-0722