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Non-line-of-sight Hard Chromium Alternatives Update

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The National Defense Center for Environmental Excellence (NDCEE) , operated by CTC, is teaming with the U.S. Air Force Research Laboratory to investigate potential alternatives to hexavalent chromium electroplating. This investigation is identifying alternatives that provide wear-resistant finishes on parts with complex geometries and internal diameters. Our focus on non-line-of-sight applications is in response to recent investigations conducted at Air Force Air Logistics Centers (ALCs) that determined that 20 to 40 percent of the chromium-plated parts have this requirement. Based on the requirements identified at the ALCs, chemical and electrochemical methods are being sought to replace hard chromium plating. The alternatives are categorized into three states of readiness: commercially available, engineering development, and research and development. Most commercially available alternatives identified use nickel-based alloys. A decision tool is being used to select the most appropriate alternatives based on user-defined preferences. Using this decision tool, a subset of the identified alternatives will be selected for bench-scale testing. We are currently characterizing some of the selected alternatives in terms of adhesion, corrosion resistance, wear resistance, hardness and coating uniformity. This paper will represent the results to date and describe implementation plans.

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