

# FACT SHEET

## Validation of electroplated Nickel Molybdenum (NiMo) as an alternative to hard chrome plating for aerospace use

### PROJECT OVERVIEW

Hard chrome plating utilizes hexavalent chromium as the source of chrome during electroplating. Hexavalent chromium is a highly regulated carcinogen is being phased out of industry. The hard chrome plating process is energy intensive, inefficient, and requires anodes made from lead. Maxterial has invented and commercialized a safe replacement for hard chrome plating called H-Max, which is an electroplated nickel molybdenum alloy with better corrosion and wear performance. This project aims to qualify H-Max for use in aerospace applications.

### BENEFITS OF H-MAX

Switching from chrome plating to H-Max will eliminate hexavalent chromium and lead from the electroplating shops in the Army, Navy, and USAF Depots. H-Max is 3-4x more energy efficient and plates twice as fast (reducing part plating times from 10 hours down to 5 hours or less). The H-Max process requires low capital cost to implement at the Depots and will avoid potential shutdown if an alternative is not identified.

### PATH FORWARD

Perform the fatigue testing that is required to prove that H-Max is a suitable alternative to hard chrome plating for aerospace use. Leverage this effort with Army funded ESTCP testing to progress H-Max from a TRL 5 to a TRL 8. Install Dem/Val capability at the Navy's FRCSW facility and apply H-Max to test landing gear components.



**H-Max being applied to steel rollers which gave twice the wear resistance compared to hard chrome**



**H-Max chrome free coating applied to a race car shock absorber**

### DoD Executive Agent

Office of the Assistant Secretary of the Army for Installations, Energy, and Environment

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### FOR FURTHER INFORMATION

National Defense Center for Energy and Environment

<http://www.denix.osd.mil/ndcee/home>

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