



**UNITED STATES ARMY AVIATION AND MISSILE
COMMAND
Lifecycle Management Command**



Processing of Tagnite Coated Magnesium Housings

Current Status
February 2008

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Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE FEB 2008		2. REPORT TYPE		3. DATES COVERED 00-00-2008 to 00-00-2008	
4. TITLE AND SUBTITLE Processing of Tagnite Coated Magnesium Housings Current Status				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Army Aviation and Missile Life Cycle Management Command ,Redstone Arsenal,AL,35898				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES Surface Finishing and Repair Issues for Sustaining New Military Aircraft Workshop, February 26-28, 2008, Tempe, AZ. Sponsored by SERDP/ESTCP.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 14	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



UNITED STATES ARMY AVIATION AND MISSILE COMMAND Lifecycle Management Command Overview



- Who we are
- Current process at the Corpus Christi Army Depot (CCAD) for magnesium housings
- Tagnite goals
- Tagnite overview
- Current status of Army Aviation Tagnite programs supporting depot maintenance operations
- Summary and conclusions



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Who We Are

**Army Aviation and Missile Command
(AMCOM)**

**AMCOM G-4 Logistics
Environmental Division**

**Environmental Technology
Integration Group (ETIG)**



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Current Process at CCAD



- CCAD is the primary depot maintenance facility for a variety of Army aviation assets
 - Aviation assets that have seen service are sent to CCAD for overhaul and repair
- Helicopter assemblies containing mag housings are removed, disassembled, visually inspected, and based on the amount of damage:
 - stripped to substrate, inspected, and conversion coated per SAE-AMS-M-3171C, Type III or Type IV prior to the application of organic coatings.
 - Spot-stripped, non-destructively inspected, and spot-treated as necessary (Type VI, Chromic Acid Touch-up) prior to the application of organic coatings.
- Both pretreatment processes utilize hexavalent chrome containing materials



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Goals



- **Eliminate processes that utilize hexavalent chrome during depot maintenance on magnesium housings**
- **Reduce attrition of magnesium housings due to corrosion.**
 - Monetary savings from one main transmission housing each from AH-64, CH-47 and UH-60 will total approximately one million dollars in parts cost.



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Tagnite Overview



What is tagnite?

- Tagnite is a magnesium oxide coating formed in an electrolytic cell and is classified as an anodize coating
- The coating system consists of Tagnite, followed by a layer of furnace cured epoxy known as Rockhard, and then primers and topcoats
- Replacement for the Dow class of hexavalent chrome-based surface treatments
- Generally regarded as providing superior corrosion resistance compared to hex-chrome coatings and also helps prevent galvanic attack





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Tagnite Overview



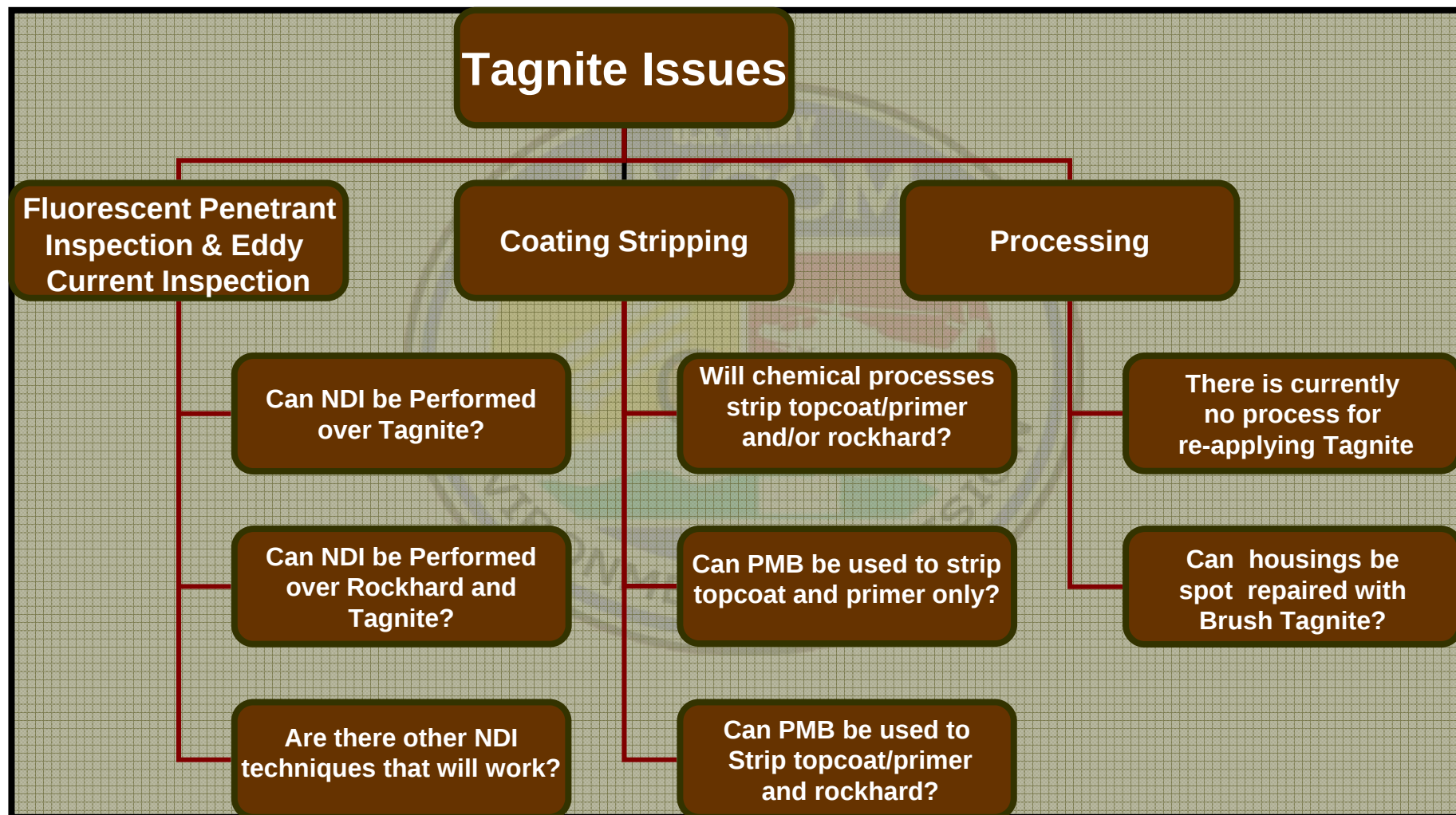
- **Use of Tagnite coated magnesium housings has been endorsed by the Aviation Engineering Directorate (AED)**
- **Tagnite coated aviation parts are currently being evaluated and in some cases being provisioned by the Army Aviation Community**
 - **Tagnite coated parts will eventually arrive at CCAD for overhaul and repair**



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Depot Maintenance Operational Issues





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Lifecycle Management Command Demonstration/Validation Projects



- Two projects have been submitted by ETIG to address the Tagnite processing issues at the depot:
 - The first project is “Demonstration/Validation of Processing Tagnite Coated Magnesium Housings”
 - This project was submitted to the National Defense Center for Environmental Excellence (NDCEE). It has now been funded and work is currently underway.
 - Demonstrate the following:
 - Strip magnesium housings of topcoat and primer while preserving the Rockhard and Tagnite
 - Strip of topcoat, primer and Rockhard while preserving only the anodized coating (Tagnite)



UNITED STATES ARMY AVIATION AND MISSILE COMMAND Lifecycle Management Command Demonstration/Validation Projects



- **The second related project is “NDI Techniques for Rockhard/Tagnite and Tagnite Coated Magnesium Housings”**
 - **Submitted to the Army Environmental Quality Technology Program (EQT) and has now been funded**
 - **The project will evaluate Non Destructive Inspection (NDI) techniques to determine if component flaws to can be detected under Rockhard and Tagnite coatings overlaying magnesium" (leverage project from NDCEE)**



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Current Status-Brush Tagnite (Touch Up)



- **Brush Tagnite**
- The Brush Tagnite spot-repair procedure has also been approved by AED Engineering for specific part numbers
 - further approvals are anticipated
 - procedure has been licensed for use at CCAD and equipment has been purchased.
 - CCAD operators will commence training shortly





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- Although some issues remain regarding processing of Tagnite coated housings at the depot, it appears that the Aviation PMs are transitioning to this coating to enhance longevity of the magnesium components.
- Technical issues associated with processing Tagnite coated housings during depot maintenance operations must be resolved.
- Projects are now underway to address technical issues and identify a process for refurbishing Tagnite coated housings at the depot



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UNITED STATES ARMY AVIATION AND MISSILE COMMAND Lifecycle Management Command Special Thanks



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- **Mrs. Nancy Whitmire – Aviation and Missile Research Development and Engineering Center (AMRDEC) Investigator**
- **Mr. Mark Feathers, Stanley Associates – ETIG Contractor Team Leader**
- **Mr. Jim Smitherman, Stanley Associates – Chemical Engineer**