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CONSOLIDATED PERFORMANCE-BASED CLEANING SPECIFICATION

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ABSTRACT

Proper cleaning with materials approved for an intended application and substrate is a key element in any Corrosion Prevention and Control Program. The Air Force Corrosion Prevention and Control Office (AFCPCO) has a mandate to stay involved in the development and standardization of corrosion-related maintenance practices, materials and procedures for all weapon systems, platforms, non-real property equipment mobile and fixed communication equipment, munitions, support equipment, and vehicles.

Over the past several years the AFCPCO has conducted a review of cleaning specifications used in the USAF. In many cases the specifications were based on specific formulae not necessarily addressing the end-item application. The AFCPCO is working with the Aeronautical Systems Center (ASC) to develop a performance-based cleaning specification that will consolidate aerospace cleaning requirements in one document. A draft series outline of performance-based specifications was recently reviewed and enthusiastically received by ASC managers. When completed, the performance-based cleaning specifications will significantly reduce the numbers and types of cleaning materials for the Air Force providing for better quality control of the cleaning materials and processes. This paper provides the current status of the specification development project.

Keywords: Cleaning, Compound, Performance-Based, Military Specification, Equipment Cleaning

INTRODUCTION

Performance-based specifications can, when properly developed and managed, provide clearer guidance for material selection, reduce cost of maintaining multiple specifications, reduce duplication in material specifications, and provide better products/services. A performance-based specification process doesn't direct the manufacturer how to make a product but rather focuses on the material performance outcomes or results.

Developing a performance-based specification consists of a number of key steps such as defining the functional requirements, determining the performance acceptability and compliance; establishing the how the acceptable performance will be measured.

The Air Force has a number of cleaning specifications that, performance-wise, have overlapping requirements. This redundancy, in many cases, generates a confusion factor for system program managers attempting to select materials needed for a specific process or attempting to transition approved cleaning material performance requirements into new acquisitions and technical data. The redundancy also generates requirements for both the government and manufacturer to maintain unnecessarily high stocks levels of cleaning materials.

Proper cleaning with approved materials is a key element in any Corrosion Prevention and Control Program. The Air Force Corrosion Prevention and Control Office (AFCPCO) has a mandate to stay involved in the development and standardization of corrosion-related maintenance practices, materials and procedures for all weapon systems, platforms, non-real property equipment mobile and fixed communication equipment, munitions, support equipment, and vehicles. The AFCPCO has the engineering and technical responsibilities for ensuring proper cleaning materials are implemented in new acquisitions. The AFCPCO also has engineering and technical authority for six general purposed technical orders that contain cleaning material requirements and processes on which new and existing system specific manuals base their requirements.

RESULTS

As a part of our office charter, the AFCPCO conducts, or participates in, Command Corrosion Program Surveys (CCPS), Corrosion Prevention Advisory Boards (CPAB), Southwest Asia Equipment Assessment Surveys (SWAAS), Staff Assistance Visits (SAV), etc. As part of the normal non-attribution technical interchange with the local maintenance personnel during these visits, the AFCPCO team members identified several common issues/findings related to authorized cleaning compounds. One common problem area in all of the technical interchange meeting (TIM) discussions was the multitude of general cleaning specifications/national stock numbered materials in use despite the fact that only a few materials and products were approved for the specific cleaning function.

While there are a limited number of authorized cleaning materials tested and approved for use on aerospace equipment, the materials that are approved are readily available. However, many materials in use and identified in the aforementioned CCPS, CPAB, SWAAS, or SAV and other venues were not approved for use on any aerospace equipment. When queried, the

common responses were: “we have limited storage space on the wash rack/washing areas and that limits what could be ordered”; “the limited deployment footprint and the limited shipping/availability limits what we can have”; “too many specs in varied T.O.s that accomplish the same job, we pick one that does the best job”; “if it is stocklisted it must be approved”; “aircraft cleaning compounds work on AGE and Vehicles so vice versa must be true”. When the AFCPCO approached the ASC Specifications and Standards group many of the concerns expressed by the field were also expressed by the system managers who are tasked with identifying cleaning materials for new acquisitions.

In an effort to streamline and improve the efficiency of the cleaning specifications, the AFCPCO developed an action plan to resolve the problems through consolidation of the various specifications. The initial step was to develop a draft series of consolidated cleaning specifications based on performance rather than formulations. This grouping outline and sample content was reviewed by the Aeronautical Systems Center (ASC) Specifications and Standards office. The concept was enthusiastically received by ASC managers.

The current performance-based specification outline takes 73 current existing military, federal, commercial and SAE cleaner specifications and consolidates them into seven groups in one document.

- a. Group I: Cleaning Compounds, Degreasing, Military (4)
- b. Group II: Cleaning Compounds – Aircraft Exterior/Interior (21)
- c. Group III: Cleaning Compounds – Aircraft Components (5)
- d. Group IV: Cleaning Compounds – Turbine Engine Gas Path (7)
- e. Group V: Cleaning Compounds – Detergents (4)
- f. Group VI: Cleaning Compounds – Avionics (3)
- g. Group VII: Miscellaneous Cleaning Materials, Chemicals and Solvents (30+)

The objectives of the proposed multi-process, performance-based cleaning specifications are designed to:

- a. Encompass all existing processes and materials for aircraft, support equipment, munitions, mobile and fixed communication equipment, and vehicles.
- b. Enable/facilitate qualification of effective new environmentally compliant processes and materials.
- c. Evaluate and compare existing requirements data to develop prototype consolidated cleaning specifications.
- d. Collect, analyze and group existing Military, Federal, Commercial, ASTM, ANSI and SAE (AMS) cleaner specifications.
- e. Retain/insert valid environmental/performance/ESOH requirements.
- f. Eliminate obsolete and/or formulation-based requirements.
- g. Consolidate specifications based on common requirements.
- h. Collect, analyze and group existing Military, Federal, Commercial, ASTM, ANSI and SAE (AMS) cleaner specifications.
- i. Retain/insert valid environmental/performance/ESOH requirements.
- j. Eliminate obsolete and/or formulation-based requirements.
- k. Consolidate specifications based on common requirements.

There are other combined cleaning specifications being developed in DOD. However, it was the desire of the Air Force Specification and Standards office that the AFCPCO proceed with the development of the combined performance-based cleaning specification. As a result, the performance-based specification and resulting quality product database entries would be managed and maintained by the AFCPCO.

SUMMARY

The goals of the consolidated performance-based cleaning specification are to maintain the cleanability and material compatibility requirements while significantly reducing the requirement to test, qualify, maintain, and track vast numbers and types of cleaning materials. The implementation of the new performance-based specification will further result in reductions in document support requirements and corresponding costs.

The transition plan would ensure provisions would be in place for older specifications referenced in existing technical data documents that would be superseded. The team proposed that after the specification has been approved and materials identified in the Quality Products Database (QPD), a letter of supercession would be issued to the appropriate technical data managers. Additionally, the change would be initiated in Acquisition Streamlining and Standardization Information System (ASSIST) that reflected the old specification would be replaced or superseded by the new performance-based specification.

The combined performance-based cleaning specification will provide the Air Force with a streamlined list of effective cleaning materials designed for performance rather than product formulation.