

Chromium Alternatives Qualification Testing

Final Report



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Executive Summary

Air Force Plant (AFP) 44 is a Government-owned, Contractor-operated (GOCO) facility in Tucson, Arizona, which is owned by the US Air Force and operated by Raytheon Missile Systems Company. As part of the highly successful Pollution Prevention (P2) Program at this facility, a project was initiated to identify and qualify alternative materials or processes that would eliminate the use of hexavalent chromium (Cr^{+6}) in missile manufacturing and depot level repair operations. An additional driver that became incorporated into this hexavalent chromium elimination effort was EPA Rule 1910.1026, which went into effect on 27 November 2006. This rule lowered the Permissible Exposure Limit (PEL) for Cr^{+6} from 52 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to $5 \mu\text{g}/\text{m}^3$ and also set an action limit for medical surveillance and Industrial Health (IH) monitoring at $2.5 \mu\text{g}/\text{m}^3$.

The main sources of Cr^{+6} at AFP 44 are from conversion coating of aluminum alloys per MIL-DTL-5541 and application of Cr^{+6} (Cr^{+3}) containing paint primers per MIL-PRF-85582 (waterborne) and MIL-PRF-23377 (solvent, high solids). The rationale for the addition of Cr^{+6} to conversion coatings and primers is to provide corrosion protection for aluminum alloys.

A Qualification Test Plan was developed that would assess the required performance aspects of non-chromium and trivalent chromium pretreatment (TCP) conversion coatings and the performance of these products in a complete paint system. Raytheon selected seven non-hexavalent chromium conversion coating (NCCC) products to subject to qualification testing. The pretreatments that were selected for evaluation were: Henkel Alodine T5900 TCP, Metalast TCP-HF, SurTec 650 ChromitAL TCP, Luster-On Aluminescent TCP, Pantheon PreKote, Henkel Alodine 5200, and Ransohoff Primorph.

The first phase or screening portion of testing established performance requirements for the conversion coating alternatives alone, without application of a paint system. This testing was conducted because all of the aluminum based, internal missile components at Raytheon are only chromate conversion coating, that is, never painted. As a result, these components must be capable of passing the bare corrosion requirements of MIL-DTL-5541. The screening tests used for evaluation included appearance, dry tape adhesion, and 168 hour salt fog corrosion resistance. Candidate conversion coatings that met the testing requirements then advanced to qualifying tests with wet spray and powder paint systems.

In the screening tests, the baseline chromate conversion coat performed the best, followed by the Alodine T5900 TCP. The T5900 product was the only product to meet the salt fog pitting requirements associated with MIL-DTL-5541 but, because three of the TCP products had been added to the Qualified Products List (QPL) for MIL-DTL-5541 (QPL-81706) by the time this portion of the testing was complete, it was decided that all four TCP products should continue to the qualifying testing. The three non-chromate conversion coats evaluated, Pantheon PreKote, Alodine 5200, and Ransohoff Primorph, were eliminated from further evaluation due to excessive pitting during the salt fog testing. This does not imply that these coatings are not effective pretreatments for aluminum directly prior to painting, but the project requirements specified considering only products that could also impart some corrosion protection to aluminum without painting.

For qualifying testing, the baseline and candidate conversion coatings were applied to 2024-T3 aluminum alloy panels and then coated with the baseline wet spray coatings currently in use at AFP 44 (MIL-PRF-85582, Type 1, Class C1 and MIL-PRF-23377, Type I, Class C), as well as the non-chromium-containing candidate primers. All combinations of baseline and candidate conversion coatings and wet spray coatings were evaluated to ensure maximum compatibility. The test methods involved in the qualifying testing of the wet spray/conversion coat combinations included wet tape adhesion, 2000 hour salt fog corrosion resistance, water resistance, and filiform corrosion.

In addition to the wet spray coatings, the candidate conversion coatings were also evaluated with a powder coat in use at AFP 44. Testing involved in the powder coat performance evaluation included wet tape adhesion, dry tape adhesion, humidity, accelerated weathering, heat resistance, thermal shock resistance, and 2000 hour sulfur dioxide (SO₂) corrosion resistance.

The results of the testing of all of the conversion coated panels (TCP and baseline) painted with baseline hexavalent chromium primer, non-chromated primer, or powder coating, all met the specified requirements, derived from MIL-PRF-85582 and Hughes Specification Control Drawing 6500168, "Coating, Powder Epoxy". For the TCP conversion coats with the non-chromated primers (completely Cr⁺⁶-free system), the 2000 hour salt fog rating in the scribed area was "8" or "9" as compared to "10" ratings for the TCP with chromated primer. Otherwise, all results were equivalent.

All four TCP products have now been added, via certification letters, to the QPL for MIL-DTL-5541, the specification for conversion coatings on aluminum alloys. These products are designated as Type II, which are compositions containing no Cr⁺⁶. Trivalent chromium is not a carcinogen and has OSHA Permissible Exposure Limits (PELs) that are ten times higher than Cr⁺⁶.

Deft 44GN098 is on the QPL-85582 for use with MIL-PRF-85582 as a waterborne, non-chromated paint primer and designated as Class "N" (Non-Chromate).

Deft 02GN084 and Deft 02GN083 are on the QPL-23377 for use with MIL-PRF-23377 as high solids (solvent), non-chromated paint primers and designated as Class "N" (Non-Chromate).

The results of this validation testing are summarized in this Final Report. This report includes coating application information, the testing methods, a description of all equipment that was used during validation testing (including its calibration status), and an analysis of the test results.

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LIST OF ACRONYMS

°C	Degrees Celsius
°F	Degrees Fahrenheit
AFP	Air Force Plant
CCC	Chromate Conversion Coating
Cr ⁺⁶	Hexavalent Chromium
CTC	Concurrent Technologies Corporation
DOD	Department of Defense
DFT	Dry Film Thickness
EPA	Environmental Protection Agency
ETF	Environmental Technology Facility
GOCO	Government Owned and Contractor Operated
IH	Industrial Health
NCCC	Non-Chromate Conversion Coating
NCP	Non-Chromate Primer
P2	Pollution Prevention
PEL	Permissible Exposure Limit
QPL	Qualified Product List
RoHS	Restriction of Hazardous Substances Directive
SO ₂	Sulfur Dioxide
TCP	Trivalent Chromium Pretreatment
TNTC	Too Numerous To Count

1.0 Introduction and Background

Air Force Plant (AFP) 44 is a Government Owned and Contractor Operated (GOCO) facility and forms a portion of the Tucson operations of Raytheon Missile Systems where a wide variety of missile and space defense systems are manufactured.

AFP 44 has a highly successful Pollution Prevention (P2) Program, whose charter is to reduce the use of hazardous materials on site. As part of this program a project was initiated to identify and qualify alternative materials or processes that would eliminate the use of hexavalent chromium (Cr^{+6}) in missile manufacturing and depot level processes. This effort aligns with the gradual shift to Cr^{+6} alternatives that is underway at a number of facilities within the Department of Defense (DoD). Additionally, the European Union has taken an even more aggressive stand via their restriction of the use of certain hazardous substances (RoHS) initiative. Military equipment has been exempted from RoHS but, due to the increasing availability of suitable alternatives for Cr^{+6} containing materials, it cannot be assumed that this exemption will not last beyond 2009.

One additional driver to eliminate Cr^{+6} at AFP 44 surfaced after the project was underway via Environmental Protection Agency (EPA) Rule 1910.1026. This rule, which went into effect 27 Nov 06, lowered the Permissible Exposure Limit (PEL) for Cr^{+6} from 52 micrograms per cubic meter (ug/m^3) to $5 \text{ ug}/\text{m}^3$. In addition, the action level was set at $2.5 \text{ ug}/\text{m}^3$ with medical surveillance and Industrial Health (IH) monitoring triggered at the action level. Still other requirements are triggered at the PEL. It was immediately realized that spraying of Cr^{+6} based paint primers and sanding operations where Cr^{+6} primer coatings were made airborne placed the manufacturing and depot level repair areas well above the PEL.

As a starting point for this Cr^{+6} elimination effort, Raytheon commissioned a survey of the Cr^{+6} alternatives that were commercially available and currently being utilized (or at least approved for use) within the DoD. Raytheon tasked Concurrent Technologies Corporation (CTC) to perform this survey and to identify qualified non-chromate conversion coating (NCCC) products, as well as those NCCC products that are “already in use within the Department of Defense,” for aluminum and aluminum alloys as either new coating operations or repair processes. Further, in an effort to qualify a completely hexavalent chromium-free system, CTC was asked to identify non-chromate based paint primers (NCP).

CTC identified a number of non-chromated options currently available to reduce the safety and hazardous waste impacts associated with the use of hexavalent chromium-containing paint systems. NCCC and surface pretreatments have been extensively tested through a number of military programs and are being integrated into repair and maintenance processes. Several of these NCCC pretreatments have been qualified to the conversion coating specification, MIL-DTL-81706B, and have been added to the Qualified Products List (QPL). In addition, some major weapon systems have adopted or are using NCP to help reduce the compliance burden of their operations. However, only two totally non-hexavalent chromium systems have been identified as being actively used on a weapons

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system. The first is NASA, who has implemented the use of Alodine 5700/5200 as the pretreatment for their solid rocket boosters, which are then coated with Hentzen's primer qualified to MIL-PRF-23377J, Class N. The second system currently in use is AMRDEC's approval for the use of trivalent chromium pretreatment (TCP) as the conversion coat for the CH-47, H-60, and other aluminum processing, followed by coating with either primer (Deft or Hentzen) that is qualified to MIL-PRF-23377J, Class N.

Based on the assessment findings, Raytheon selected seven NCCC products to subject to qualification testing. The products that were selected are:

- Henkel Alodine T5900
- Metalast TCP-HF
- SurTec 650 ChromitAL TCP
- Luster-On Aluminescent
- Pantheon PreKote
- Henkel Alodine 5200
- Ransohoff Primorph

2.0 Pretreatment Application

CTC coordinated with the manufacturers of the various alternative surface preparations and the baseline chromate conversion coating to have multiple test panels treated. The manufacturers, surface preparations, and number and types of test panels that were processed are detailed in the following subsections. In addition, representative photos of each pretreatment can be viewed in Section 3.0, Screening Testing.

All panels were subjected to Raytheon's standard procedure for cleaning of aluminum prior to application of the surface treatment. This procedure includes the following steps:

1. Solvent based degreasing
2. Alkaline cleaning
3. Non-chromate deoxidizer
4. Water break free surface.

2.1 Preparation of Baseline Chromate Conversion Coating Panels

Currently, Raytheon uses a chromate conversion coating as the standard pretreatment for aluminum parts. Baseline testing of the standard pretreatment is necessary in order to properly evaluate the test results of the alternative pretreatment products.

Test panels were prepared using the baseline chromate conversion coating Alodine 1200S from Henkel Surface Technologies per Military Specification MIL-C-5541, Class IA. Several sizes and types of panels are required to perform the qualification testing. Specifically, the baseline panels that were prepared are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 10 - 6061-T6 per QQ-A-250/11 sized 0.030" x 3.0" x 10.0" panels
3. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
4. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

These test panels were prepared by *CTC* due to a problem with the surface preparation at Henkel Surface Technologies, with the exception of the 6061-T6 3"x10" panels. Once the issues with the surface preparation were resolved, Henkel proceeded to supply this set of ten panels. For the panels coated at *CTC*, each panel was first wiped with acetone, then alkaline cleaned with Turco 4215 LNC at 60°C (140°F) for 5 minutes and rinsed. Following cleaning, the panels were immersed for 5 minutes at room temperature in Turco Smut-Go NC nonchromated deoxidizer. The test panels were then double rinsed, immersed in Alodine 1200S for 30 seconds at room temperature, double rinsed again, and then dried with a stream of compressed air. The test panels were air-dried for at least 24 hours before testing was initiated.

2.2 Preparation of Trivalent Chromium Pretreatment Panels

Four different trivalent chromium pretreatments (TCP) were evaluated as potential alternatives to the chromate conversion coating. The TCPs all have similar surface preparation procedures prior to pretreatment, which is also very similar to the chromate conversion coating preparation.

2.2.1 Henkel Alodine T5900

Henkel Alodine T5900 is a complex trivalent chromium product that is applied by immersion or spray procedures and imparts a light blue to blue iridescent coating on the aluminum surface. A series of test panels, listed as follows, was provided to Henkel Surface Technologies for application of the pretreatment:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

According to representatives from Henkel Surface Technologies, panels were alkaline cleaned using a mild, non-etching alkaline cleaner, rinsed with cold tap water, then deoxidized with a standard MIL-C-5541 chemistry. The panels were then rinsed once again, and finally immersed in Alodine T5900 for five minutes at room temperature. These panels were then rinsed and air dried. A few of these panels were also damaged during alkaline cleaning and Henkel replaced the panels with panels of the same alloy. The pretreated panels were then packaged and returned to CTC for testing and painting.

2.2.2 Metalast TCP-HF

Metalast TCP-HF is a trivalent chromium product that was developed to provide a corrosion resistant, protective coating on aluminum with improved bonding for paints. This product leaves a clear coating on the surface. The manufacturer of this product prepared the required test panels. The test panels that were prepared with this product are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

The preparation of these panels included alkaline cleaning with a non-silicated cleaner followed by room temperature immersion in a non-chromated, fluoride-free nitric acid-based deoxidizer, and then immersion in TCP-HF for ten minutes in order to apply the pretreatment. This pretreatment was also applied at room temperature.

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2.2.3 SurTec 650 ChromitAL TCP

SurTec 650 is another trivalent chromium product that produces a surface coating that is iridescent and slightly blue to tan. The manufacturer of this product did not have the ability to coat the test panels; therefore these specimens were coated in CTC's laboratories. The test panels that were prepared with this product are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

The manufacturer, CST SurTec, provided an alkaline cleaner, deoxidizer, the 650 product, and instructions on surface preparation and panel pretreatment. The panels were first exposed to the alkaline cleaner, CST-SurTec 133, at 50° C (122°F) for five minutes. Following a rinse after cleaning, the test panels were deoxidized with CST DeoxAL 77 Acidic Aluminum Desmutter for five minutes at room temperature. After rinsing, the panels were immersed in 650 ChromitAL for two minutes at 40°C (104°F), then double rinsed and dried with compressed air.

2.2.4 Luster-On Aluminescent

Luster-On Aluminescent is the final trivalent chromium product that was evaluated. This product leaves a clear, slightly iridescent coating on the surface. The manufacturer of this product prepared the required test panels. The test panels that were prepared with this product are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

According to the manufacturer, the panels were prepared in the following manner: 1. immersion in Luster-On 401, a non-etch alkaline cleaner for 5 minutes at 60°C (140°F); 2. rinse; 3. immerse in deoxidizer, which was composed of 75% nitric acid and four ounces per gallon hydrofluoric acid, for two minutes at room temperature; 4. rinse; 5. immerse in Luster-On Aluminescent for four to five minutes at room temperature; 6. double rinse; 7. dry.

2.3 Preparation of Non Chromium Pretreatment Panels

Two non-chrome pretreatments were evaluated as potential alternatives to the currently used chromate conversion coating. Each of these pretreatments was applied to specified sizes and types of panels. One of the pretreatments, Henkel 5200, utilizes the same surface preparation procedure as the TCPs and Raytheon's

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standard procedure. The second pretreatment, PreKote, has an entirely unique preparation and application procedure.

2.3.1 Pantheon PreKote

Pantheon PreKote is a chromium free surface preparation that promotes paint adhesion and flexibility. A representative of the manufacturer of this coating applied PreKote to the test panels at CTC's Environmental Technology Facility (ETF) Laboratory. The test panels that were prepared with this product are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

The representative prepared the test panels by completely spraying each test panel with PreKote, then scrubbing the entire panel in a circular motion with a fine grit (180-240) aluminum oxide Scot-brite pad. The representative then let the panel air dry. After the coating had dried onto the surface of the test panel, the vendor representative then sprayed fresh coating onto the panel, and scrubbed again with the Scotch-brite pad, then rinsed the test panel with water. The test panels were then ready for painting/testing.

2.3.2 Henkel Alodine 5200

Henkel Alodine 5200 is a chromium free surface preparation that promotes bonding with organic materials. The manufacturer of this product prepared the required test panels. The test panels that were prepared with this product are:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels

As with the previous pretreatments supplied by Henkel Surface Technologies, surface preparation issues that resulted in pitting of the aluminum panels was encountered. Henkel believed that this problem was caused by the deoxidizer and Henkel replaced all pitted panels after they resolved the surface preparation problem. As mentioned above, these panels received the same surface preparation as the Henkel T5900 panels. After surface preparation, the panels were immersed in Alodine 5200 for up to three minutes at room temperature conditions, then rinsed with deionized water and air dried. Also, from a review of the technical literature, there is a seal that can be added, TD-3095-Y, for bare corrosion resistance only. This seal was not added to these test panels.

2.3.3 Ransohoff Primorph

Ransohoff Primorph is a recently developed non-hexavalent chromium surface pretreatment applied by Brighton Technologies to the following test panels:

1. 10 - 2024-T3 per QQ-A-250/4 sized 0.030" x 3.0" x 10.0" panels
2. 120 - 2024-T3 per QQ-A-250/4 sized 0.020" x 3.0" x 6.0" panels
3. 35 - 6061-T6 per QQ-A-250/11 sized 0.020" x 3.0" x 6.0" panels.

3.0 Screening Testing

A Screening Test Matrix was developed for testing of the pretreated-only panels to eliminate any products that could not meet minimum performance requirements prior to advancing to a more elaborate and higher cost test matrix involving the painted and powder coated test panels. The screening tests used for evaluation were 168 hour salt spray corrosion resistance, tape adhesion, and appearance tests. The screening test matrix and performance requirements are shown in Table 1.

Table 1. Screening Test Matrix

Test	Test Method	Requirement
Appearance	MIL-DTL-5541, Section 3.5	Uniform, continuous, free from powdery or loose coating, voids, flaws, etc.
Corrosion Resistance	MIL-DTL-5541, Section 3.6 and Section 4.5.1 (ASTM B117)	5% Salt Spray for 168 Hours; No more than 5 isolated spots or pits, none larger than 0.031 inch in diameter. No more than 15 pits, none larger than 0.031 inch in diameter on the combined surface area of all 5 specimens (150 square inches).
Tape Adhesion	ASTM D 3359, Method A	No coating separation from base metal substrate

3.1 Screening Test Results

The following tables show a summary of the results for each of the screening tests performed on the Alodine 1200S baseline coating and the alternatives to chromate conversion coatings. The individual results for each panel tested are provided in the Laboratory Test Reports for each product, located in Appendix A.

3.1.1 Appearance

The results of visual examination of the panels after pretreatment in-house at *CTC* or upon receipt of the panels from the vendors are listed in Table 2. These observations are generally for information only, but all coatings should at least meet the test matrix requirements listed above, which indicate that the coating should be uniform and continuous in appearance, without any loose or powdery residue. These results are the average

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observations made on all ten panels prior to additional testing. Please see the representative photographs of the tape adhesion panels in Section 3.1.2 to view the appearance of the pretreatment.

Table 2. Appearance Results – Pretreatment Only

Pretreatment	Average Appearance
Alodine 1200S-2024 Al	Shiny finish, gold on outside, iridescent in middle, uneven coating, a few scratches, a few scuff marks
Alodine 1200S – 6061 Al	Shiny finish; slight yellowish color; uneven coating; fine scratches
Alodine T5900 – 2024 Al	Shiny, matte finish; yellowish / brown coating; uneven coating; a few scratches
Metalast TCP-HF – 2024 Al	Shiny, iridescent, even coating; a few scratches
650 ChromitAL TCP – 2024 Al	Shiny, matte finish; iridescent coating; generally even coverage; pretreatment appears to be heavier on top of panel
Aluminescent TCP – 2024 Al	Shiny, iridescent coating; coating appears to be light along edge opposite the hanging hole; a few scratches
PreKote NCP – 2024 Al	Shiny, scuff-sanded appearance
Alodine 5200 – 2024 Al	Shiny, matte finish; iridescent coating; generally even coating; scratches
PRIMORPH NCP – 2024 Al	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a few scratches and pits

The results of the visual examination showed that all pretreatments, for discussion purposes, met the performance requirements of being even and continuous in appearance with no contamination or powdery residue on the surface.

3.1.2 Dry Tape Adhesion

The second test method utilized during the screening testing was dry tape adhesion. The purpose of this test was to determine how well the pretreatment adhered to the aluminum substrate by scribing an “X” through the pretreatment and into the substrate, then applying pressure sensitive tape over the “X” scribe, pressing firmly, and peeling back quickly. Table 3 lists the averaged results of five panels for this testing.

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Table 3. Dry Tape Adhesion

Pretreatment	Average Adhesion Measurement	Pass/Fail
Alodine 1200S – 2024 Al	5A	Pass
Alodine 1200S – 6061 Al	5A	Pass
Alodine T5900 – 2024 Al	5A	Pass
Metalast TCP-HF – 2024 Al	5A	Pass
650 ChromitAl TCP – 2024 Al	5A	Pass
Aluminescent TCP – 2024 Al	5A	Pass
PreKote NCP – 2024 Al	5A	Pass
Alodine 5200 – 2024 Al	5A	Pass
PRIMORPH NCP – 2024 Al	5A	Pass

As shown in Table 3, all pretreatments received a 5A rating, indicating that no removal of the pretreatment occurred during this test. Figure 1 contains representative photos of each of these pretreatments.

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Pretreatment	Representative Panel	Pretreatment	Representative Panel
Alodine 1200S		Aluminescent	
Alodine T5900		PreKote	
Metalast TCP-HF		Alodine 5200	
650 ChromitAL			

Figure 1: Representative Photos of Dry Tape Adhesion Results

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3.1.3 Corrosion Resistance Testing – 168 Hours of Exposure

Five panels of each pretreatment plus five additional baseline panels on 6061 Al were subjected to salt fog testing according to ASTM B117 for 168 hours. Panels were visually observed every 24 hours and removed from the chamber prior to 168 hours of exposure if they no longer met the performance requirements. Table 4 lists the averaged results for each pretreatment.

Table 4. Corrosion Resistance – 168 Hours

Pretreatment	Corrosion Rating	Corrosion Description/Interval of Noticeable Corrosion	Pass/Fail
Alodine 1200S – 2024 Al	10	No Corrosion	Pass
Alodine 1200S – 6061 Al	9	7 Pits Total	Pass
Metalast TCP-HF – 2024 Al	8	93 Pits, White Corrosion Product	Fail
Alodine T5900 – 2024 Al	9	14 Pits, White Corrosion Product	Pass
650 ChromitAl TCP – 2024 Al	9	65 Pits, White Corrosion Product	Fail
Alodine 5200 – 2024 Al	3	Too Numerous To Count (TNTC) Pits, White Corrosion Product	Fail
Aluminescent TCP – 2024 Al	8	356 Pits, White Corrosion Product	Fail
PRIMORPH NCP – 2024 Al	5	TNTC Pits, Black Corrosion Product, White Corrosion Product	Fail
PreKote NCP – 2024 Al	0	TNTC Pits, Black Corrosion Product, White Corrosion Product	Fail

As expected, the Alodine 1200S was exceptional. The Alodine T5900 was the only TCP product that met the pitting requirements associated with MIL-DTL-5541 but, because three of the TCP products had been added to the Qualified Products List (QPL-81706) for MIL-DTL-5541 by the time this testing was completed, it was decided that all TCP products should continue to full testing. The qualifying agency, the U.S. Navy (NAVAIR), suggested that the excessive pitting on the panels may have been due to the fact that the TCP chemistries,

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unlike the hexavalent chromium based conversion coatings, were more sensitive to the cleaning and deoxidizing steps as well as the actual operating parameters of the TCP solution.

The Pantheon Prekote, Henkel Alodine 5200, and Ransohoff Primorph failed salt spray and were eliminated from further testing. This does not imply that these three coatings would not be effective as pretreatments on aluminum prior to painting but the project requirements were only to consider non Cr⁺⁶ systems that could pass both on their own and with subsequent chromated and non chromated paint primers or with direct powder coat. Please see Figure 2 for representative photos of the corrosion resistance testing.

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Pretreatment	Representative Panel	Pretreatment	Representative Panel
Alodine 1200S		Aluminescent	
Alodine T5900		PreKote	
Metalast TCP-HF		Alodine 5200	
650 ChromitAL			

Figure 2: Representative Photos of Corrosion Resistance Results

4.0 Paint Application

This section describes the coating systems applied to the pretreatments that passed the screening testing portion of this program. These pretreatments included the baseline Alodine 1200S chromate conversion coat and the four TCP products: Metalast TCP-HF, Luster-On Aluminescent, Alodine T5900, and SurTec 650 ChromitAL. A description of the coating as well as application information and coating thickness results are presented in this section.

4.1 Application of Wet Spray Coatings

Several different primers were used for the testing of the chromium alternatives. These primers are coatings currently utilized at Raytheon and throughout the Air Force on flight critical components. These primers include the military specification-approved chromate-containing primers and the non-chromate versions of these primers that have all recently been added to the same military specifications, only as Class N products. These primers were evaluated on the 0.020" x 3.0" x 6.0" 2024-T3 test panels that were pretreated with the various chromate and alternative pretreatments. All primers were applied at the organic finishing line in CTC's ETF Building. The primers that were applied to the test panels are:

1. **Chromate Solvent Based Primer** - MIL-PRF-23377H, Type I, Class C, Product of PRC-DeSoto (513X390)
2. **Non-Chromate Solvent Based Primer** - MIL-PRF-23377H, Type I, Class N, Product of Deft, Inc. (02GN084)
3. **Non-Chromate Solvent Based Primer** - MIL-PRF-23377H, Type I, Class N, Product of Deft, Inc. (02GN083)
4. **Chromate Waterborne Primer** - MIL-PRF-85582C, Type I, Class C1, Product of Deft, Inc. (44GN007)
5. **Non-Chromate Waterborne Primer** - MIL-PRF-85582C, Type I, Class "N", Product of Deft, Inc. (44GN098)

Additionally, a topcoat was applied over the primer on some of these test panels. The topcoat that was used is MIL-PRF-85285C, Type I, Color White per FED-STD-595, Color #17925, Product of Deft, Inc. (03W127A). The following tables, numbered Table 5 and Table 6, list the environmental application conditions for each primer and topcoat application and the dry film thickness averages for each set of test panels.

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Table 5. Environmental Conditions During Wet Spray Application

Coating System	Pretreatment	Relative Humidity	Temperature
MIL-PRF-23377, Class C	Alodine 1200S, Alodine T5900, Metalast TCP-HF, Aluminescent, 650 ChromitAL	52.2%	73.0°F
MIL-PRF-23377, Class N (02GN084)	Alodine 1200S, Alodine T5900, Metalast TCP-HF, Aluminescent, 650 ChromitAL	35.5%	72.0°F
MIL-PRF-23377, Class N (02GN083)	Alodine 1200S	51.8%	73.2°F
MIL-PRF-85582, Class C	Metalast TCP-HF, Aluminescent, 650 ChromitAL	50.5%	73.4°F
MIL-PRF-85582, Class C	Alodine T5900	52.5%	71.6°F
MIL-PRF-85582, Class C	Alodine 1200S	18.9%	71.4°F
MIL-PRF-85582, Class N	Alodine T5900, Metalast TCP-HF, Aluminescent	50.5%	71.8°F
MIL-PRF-85582, Class N	Alodine 1200S, 650 ChromitAL	18.6%	70.8°F
MIL-PRF-85285 topcoat	Various (pretreatments & primers)	56.3%	72.3°F
MIL-PRF-85285 topcoat	Various (pretreatments & primers)	40.0%	72.5°F
MIL-PRF-85285 topcoat	Various (pretreatments & primers)	37.0%	71.2°F
MIL-PRF-85285 topcoat	Various (pretreatments & primers)	33.6%	71.0°F

Table 6 contains the average dry film thickness (DFT) results for each coating application. For all of the primers, the DFT should average between 0.6 and 0.9 mil, with the exception of the MIL-PRF-23377, Class C primer, which has a DFT range of 0.5 to 0.9 mil. The topcoat DFT should be 2.0 ± 0.3 mils, with the total coating system, primer and topcoat, totaling 2.6 to 3.2 mils.

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Table 6. Average Dry Film Thickness Results

Pretreatment	Primer	Primer Average Thickness	Topcoat Average Thickness	Total System Thickness
Alodine 1200S	MIL-PRF-23377, Class C	0.83	2.15	2.98
	MIL-PRF-23377, Class N (02GN084)	0.81	2.22	3.03
	MIL-PRF-23377, Class N (02GN083)	0.79	2.11	2.90
	MIL-PRF-85582, Class C	0.67	2.19	2.86
	MIL-PRF-85582, Class N	0.81	1.96	2.77
Alodine T5900	MIL-PRF-23377, Class C	0.89	2.42	3.41
	MIL-PRF-23377, Class N	0.89	2.30	3.19
	MIL-PRF-85582, Class C	0.51	2.24	2.75
	MIL-PRF-85582, Class N	0.70	2.40	3.10
Metalast TCP-HF	MIL-PRF-23377, Class C	1.06	2.34	3.40
	MIL-PRF-23377, Class N	0.86	2.23	3.09
	MIL-PRF-85582, Class C	0.55	2.26	2.81
	MIL-PRF-85582, Class N	0.75	1.83	2.58
650 ChromitAL	MIL-PRF-23377, Class C	0.64	2.46	3.10
	MIL-PRF-23377, Class N	0.86	2.44	3.30
	MIL-PRF-85582, Class C	0.56	2.47	3.03
	MIL-PRF-85582, Class N	0.70	2.24	2.94
Aluminescent	MIL-PRF-23377, Class C	0.77	2.31	3.08
	MIL-PRF-23377, Class N	0.80	2.06	2.86
	MIL-PRF-85582, Class C	0.55	1.98	2.53
	MIL-PRF-85582, Class N	0.74	1.94	2.68

The DFT results show that most average results fall within the ranges identified for the primer and topcoat. The MIL-PRF-85582, Class C primer averaged slightly below the recommended 0.6-0.9 mil range. In addition, a few of the topcoat DFT averages were slightly higher than the recommended range, which likewise caused the total coating system averages for these few coatings to also slightly exceed the recommended range. The following photo, Figure 3, shows wet spray application at the CTC ETF organic finishing line facility.



Figure 3: Wet Spray Application at CTC

4.2 Application of Powder Coatings

The interaction of the various pretreatments with the powder coating that is used on various Raytheon parts was also evaluated. All 245 of the 0.020" x 3.0" x 6.0" 6061-T6 test panels that were pretreated with the various chromate and alternative pretreatments were powder coated using Spraylat Corporation Gray powder, FED-STD-595, Color #36375 (Product Number 1655V). This powder coating was performed at CTC's Organic Finishing Line. In order to determine the correct settings for the powder coat oven, a series of tests were conducted with the DataPaq unit, which is a data logging system and series of thermocouples that collects data on oven temperature and panel surface temperature changes. The data collected from this monitoring system allows for time and temperature adjustment to allow for temperature ramping and lag time for the test panels to reach the recommended powder cure temperature of 300°F for 15 minutes. The following chart, labeled Figure 4, is an example of one of these test runs.

Chromium Alternatives Qualification Testing

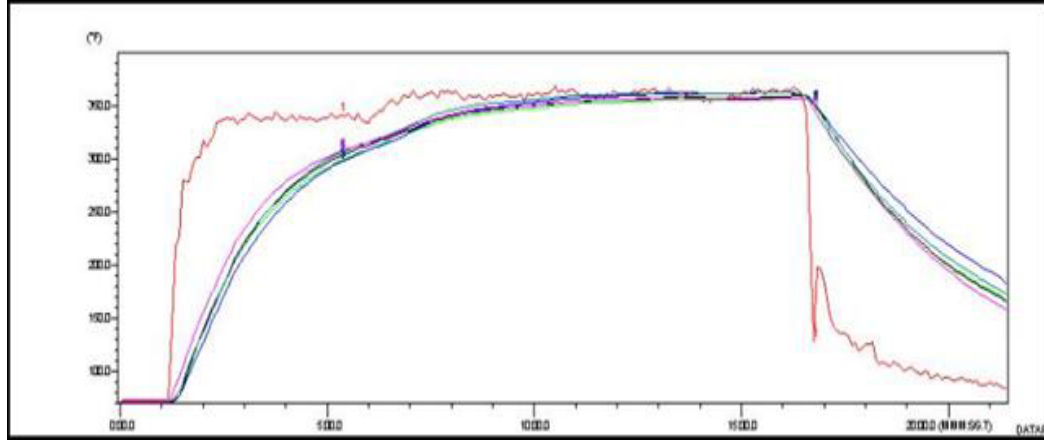


Figure 4: Example of DataPac Results

Based on the results of the DataPac test runs, the oven was set at 325°F for 20 minutes. The panels were painted with gun settings at 24 fluidizing and 16 atomizing and the temperature was 71.6°F at 33.4% relative humidity. Table 7 lists the DFT results for the powder coating, with the vendor-recommended range being 2.5 ± 0.5 mils.

Table 7. DFT Results for Powder Coated Panels

Pretreatment	Dry Film Thickness
Alodine 1200S	2.08 mils
Alodine T5900	2.13 mils
Metalast TCP-HF	2.10 mils
650 ChromitAL	1.97 mils
Aluminescent	2.48 mils

5.0 Primer and Topcoat Testing

During the writing of the test plan in early 2006, none of the selected alternatives to chromate conversion coating were certified for use with the MIL-DTL-5541 specification. Additionally, the non chrome paint primers were not certified for use with MIL-PRF-85582 (waterborne) or MIL-PRF-QPL-23377 (solvent borne). As a result, it was necessary to qualify the chrome based and non chrome based paint primer candidates with both the baseline Alodine 1200S as well as with the alternatives to chromate conversion coat to assure maximum compatibility.

The waterborne paint primer selected for baseline testing was the Deft two-component, chromated primer 44GN007 with its catalyst 44GN007CAT. This product was in daily use at AFP 44 and is listed on QPL-85582, which is the QPL for MIL-PRF-85582, Type I, Class C1 (Barium Chromate) primers. The waterborne, non chromated primer candidate selected for testing was the Deft two component system identified as 44GN098 with its catalyst 44GN098CAT. This product was expected to soon be on the QPL-85582 for use as a MIL-PRF-85582, Class I, Class “N” (Non-Chromate) primer.

The high solids (solvent) primer selected for baseline testing was PRC-DeSoto chromated epoxy resin (513x390) with catalyst (910x624) which was in daily use at AFP 44 and listed on the QPL-23377 for MIL-PRF-23377, Type I, Class “C” (Strontium Chromate) primers.

The non-chromated candidate primer originally selected for testing was the Deft two component system, 02GN084 with its catalyst 02GN084CAT. This product was expected to soon be on the QPL-23377 for use as a MIL-PRF-23377, Type I, Class “N” (Non- Chromate) primer. However, until April 2007, the Deft high solids, non-chromated 02GN084, while passing all of the tests, had not been added to the QPL for MIL-PRF-23377 due to an induction (mixing) time issue. Deft reformulated the two part primer mix to eliminate the induction issue completely and the product was recently added to the QPL, but not until after testing has commenced on another Deft high solids, non-chromated product called 02GN083, which had been on QPL-23377 via letter since 27 Jan 05. This product was not originally selected for testing because it’s brochure identified it as being for touch up applications. However, it has been tested, certified and added to the QPL for full scale use.

It was lastly decided to paint with a topcoat that was already being utilized in daily production at AFP 44. The topcoat selected was Deft 03W127A “Pigmented Component A” (Base), with 03W127ACAT “Component B” (Catalyst) qualified to MIL-PRF-85285C, Type I, Color White per FED-STD-595, Color #17925.

These coatings were applied to each of the pretreatments and tested in accordance with the Primer and Topcoat Test Matrix provided in Table 9. This matrix includes wet tape adhesion, 2000 hour corrosion resistance, water resistance and filiform corrosion. The following subsections describe each of the testing procedures and results.

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Table 8. Primer and Topcoat Test Matrix

Test	Test Method	Requirement (Pass/Fail Criteria)
Wet Tape Adhesion	MIL-C-5541, Section 4.3.3.1.1 and PRF-85582, Section 3.6.4 IAW Section 4.5.42 (FED Test STD 141 Method 6301)	No loss of adhesion
Water Resistance	MIL-PRF-85582, Section 3.7.1 IAW Section 4.5.7; 4-day Water Immersion Test	No wrinkling, blistering, or any coating deficiency
Corrosion Resistance	MIL-PRF-85582, Section 3.7.2.1 IAW Section 4.5.8.1; 5% Salt Spray for 2000 hours, Test with scribe marks	No blistering, lifting of either coating, or substrate pitting
Filiform Corrosion	MIL-PRF-85582, Section 3.7.2.2 IAW Section 4.5.8.2; Exposure to 12 N HCl followed by 1000 hrs in humidity cabinet	No filiform corrosion extending beyond 0.25 inch from scribe, majority of filaments shall be less than 0.125 inch

5.1 Wet Tape Adhesion

Wet tape adhesion testing was conducted on both primer only and primer-topcoat system panels. Panels were immersed in distilled water for 24 hours at room temperature. The panels were wiped dry with a lint-free cloth and scribed with two parallel lines, one inch apart, within one minute after removal from the distilled water. The masking tape was then applied over the scribe and rolled with a 4½ - pound roller eight times. The tape was then removed in one quick motion and the scribes were examined for adhesion failure. The loss of adhesion was then ranked on the standard 1 – 5 scale, with 5 showing no loss of adhesion. Table 9 lists the results of the adhesion testing and if the panels met the pass/fail criteria.

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Table 9. Wet Tape Adhesion

Pretreatment	Primer	Topcoat	Average Adhesion Rating	Notes	Pass/Fail
Alodine 1200S	MIL-PRF-23377C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-23377N	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
MIL-PRF-85582N	N/A	5	No Loss of Adhesion	Pass	
	MIL-PRF-85285	5	No Loss of Adhesion	Pass	
Metalast TCP-HF	MIL-PRF-23377C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	4	Trace Peeling along Scribe	Pass
	MIL-PRF-23377N	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
MIL-PRF-85582N	N/A	5	No Loss of Adhesion	Pass	
	MIL-PRF-85285	5	No Loss of Adhesion	Pass	
Alodine T5900	MIL-PRF-23377C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-23377N	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
MIL-PRF-85582N	N/A	5	No Loss of Adhesion	Pass	
	MIL-PRF-85285	5	No Loss of Adhesion	Pass	
650 ChromitAl TCP	MIL-PRF-23377C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	4	Trace Removal along Scribe	Pass
	MIL-PRF-23377N	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	N/A	5	No Loss of Adhesion	Pass
		MIL-PRF-85285	5	No Loss of Adhesion	Pass
MIL-PRF-85582N	N/A	5	No Loss of Adhesion	Pass	
	MIL-PRF-85285	5	No Loss of Adhesion	Pass	

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Table 9. Wet Tape Adhesion (continued)

Pretreatment	Primer	Topcoat	Average Adhesion Rating	Notes	Pass/Fail
Aluminescent TCP	MIL-PRF-23377C	N/A	5	No Loss of Adhesion	Pass
	MIL-PRF-23377C	MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-23377N	N/A	5	No Loss of Adhesion	Pass
	MIL-PRF-23377N	MIL-PRF-85285	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	N/A	5	No Loss of Adhesion	Pass
	MIL-PRF-85582C	MIL-PRF-85285	4	Trace Peeling along Scribe	Pass
	MIL-PRF-85582N	N/A	5	No Loss of Adhesion	Pass
	MIL-PRF-85582N	MIL-PRF-85285	5	No Loss of Adhesion	Pass

All panels, with the exception of three sets, were rated as “5”, with no noticeable adhesion loss. Of the three sets that has trace peeling along the scribe, two of the sets had the MIL-PRF-23377C primer and MIL-PRF-85285 topcoat and the other set also had topcoat applied. None of the primer-only panels had any adhesion loss. The following photos in Figure 5 are representative photos of the trace adhesion losses.



Figure 5: Representative Photos of Trace Adhesion Loss

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5.2 Water Resistance

The water resistance testing was conducted on both primer only and primer-topcoat panels. The test was performed by immersing the test panels in distilled water for four days at $49 \pm 3^\circ\text{C}$ ($120 \pm 5^\circ\text{F}$). Two hours after removing the panels from the water, the test panels were visually examined for any sign of defect. The water resistance results are listed in Table 10. The only observation was a color change to the primer only panels, so all panels passed the performance requirements for this test. In addition, a few representative photos of the color changes to each of the primers are located in Figure 6, following the results table.

Table 10. Water Resistance – 4 Day Immersion

Pretreatment	Primer	Topcoat	Average Observations
Alodine 1200S	MIL-PRF-23377C	N/A	Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-23377N	N/A	Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582C	N/A	Color Change
		MIL-PRF-85285	No Change
MIL-PRF-85582N	N/A	Color Change	
	MIL-PRF-85285	No Change	
Metalast TCP-HF	MIL-PRF-23377C	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-23377N	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582C	N/A	Color Change
		MIL-PRF-85285	No Change
MIL-PRF-85582N	N/A	Slight Color Change	
	MIL-PRF-85285	No Change	
Alodine T5900	MIL-PRF-23377C	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-23377N	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582C	N/A	Color Change
		MIL-PRF-85285	No Change
MIL-PRF-85582N	N/A	Slight Color Change	
	MIL-PRF-85285	No Change	
650 ChromitAl TCP	MIL-PRF-23377C	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-23377N	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582C	N/A	Slight Color Change
		MIL-PRF-85285	No Change
MIL-PRF-85582N	N/A	Slight Color Change	
	MIL-PRF-85285	No Change	

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Table 10. Water Resistance – 4 Day Immersion (continued)

Pretreatment	Primer	Topcoat	Average Observations
Aluminescent TCP	MIL-PRF-23377C	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-23377N	N/A	Slight Color Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582C	N/A	No Change
		MIL-PRF-85285	No Change
	MIL-PRF-85582N	N/A	Slight Color Change
		MIL-PRF-85285	No Change

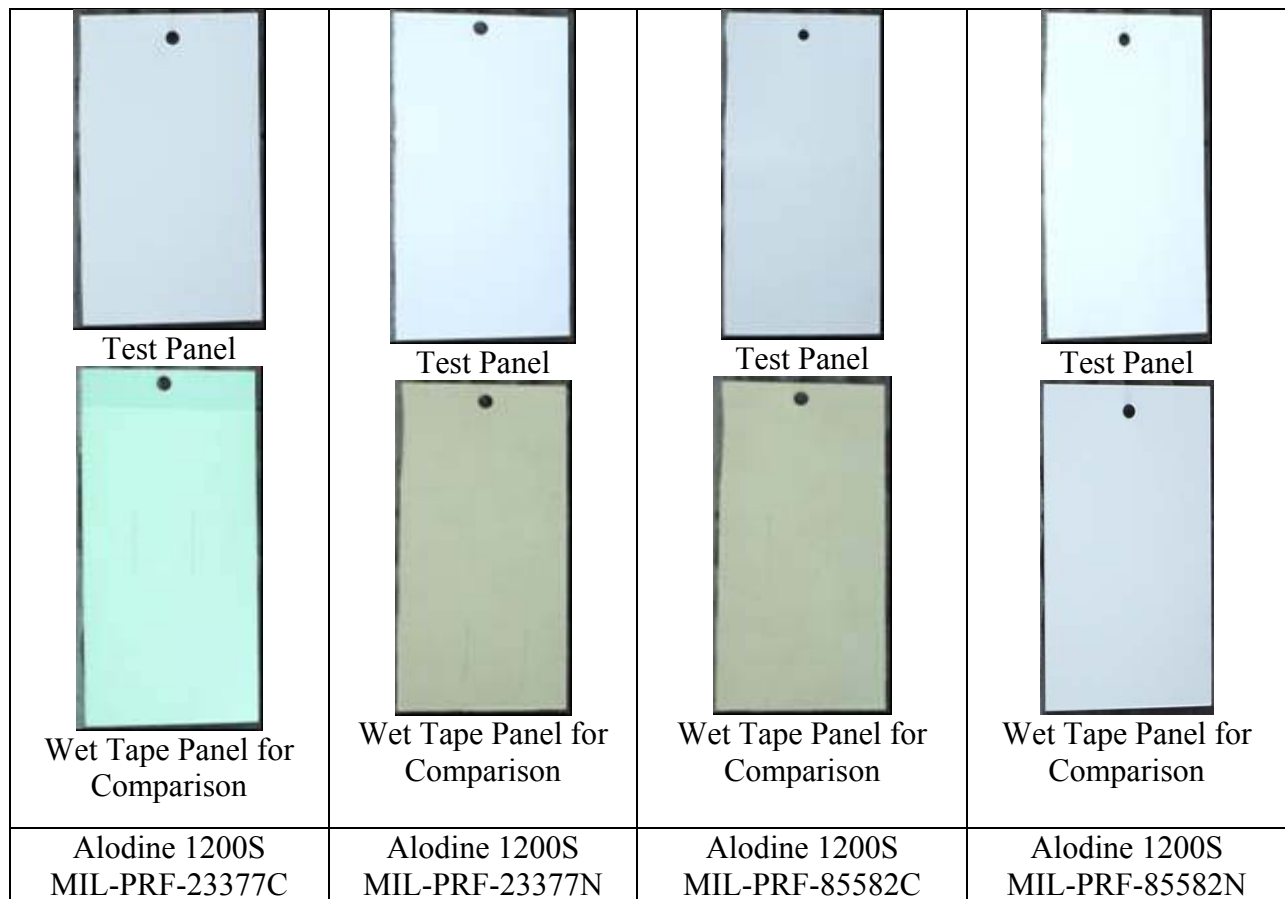


Figure 6: Representative Water Resistance Test Panels

5.3 Corrosion Resistance – 2000 Hour Salt Fog

Corrosion resistance testing was conducted on all primer-topcoat panels only. These panels were taped along the edges and scribed with an “X” through the coating system and into the substrate. The panels were then exposed to a 5% salt solution for 2000 hours, with weekly evaluations of the performance of the

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coatings. The performance requirement for all of the primers was to show no blistering or lifting of the coating as well as no substrate pitting. An additional requirement for the chromated primers was that there should be no corrosion in the scribe as well. Table 11 contains the results of the corrosion resistance testing.

Table 11. Corrosion Resistance – 2000 Hours

Pretreatment	Primer	Average Scribe Rating	Corrosion Description / Interval of Noticeable Appearance	Average Unscribed Area Rating	Corrosion Description / Interval of Noticeable Appearance	Pass/Fail
Alodine 1200S	MIL-PRF-23377C	10	No Corrosion	8	Blisters / 1176-1344 Hours	Fail
	MIL-PRF-23377N	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-23377N (02GN083)	9	1172-1848	10	No Corrosion	Pass
	MIL-PRF-85582C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-85582N	9	Blisters / 504-1344 Hours	10	No Corrosion	Pass
Metalast TCP-HF	MIL-PRF-23377C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-23377N	9	Blisters / 336-1704 Hours	10	No Corrosion	Pass
	MIL-PRF-85582C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-85582N	8	Blisters / 138-1344 Hours	10	No Corrosion	Pass
Alodine T5900	MIL-PRF-23377C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-23377N	9	Blisters / 0-672 Hours	10	No Corrosion	Pass
	MIL-PRF-85582C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-85582N	8	Blisters / 0-168 Hours	10	No Corrosion	Pass
650 ChromitAl TCP	MIL-PRF-23377C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-23377N	9	Blisters / 1008-2016 Hours	10	No Corrosion	Pass
	MIL-PRF-85582C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-85582N	8	Blisters / 336-672 Hours	10	No Corrosion	Pass
Aluminescent TCP	MIL-PRF-23377C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-23377N	8	Blisters / 672-1008 Hours	10	No Corrosion	Pass
	MIL-PRF-85582C	10	No Corrosion	10	No Corrosion	Pass
	MIL-PRF-85582N	8	Blisters / 504-840 Hours	10	No Corrosion	Pass

Based on the performance requirements specified by Raytheon, as listed in MIL-PRF-85582, all panels, with the exception of one baseline set of panels, passed corrosion resistance. Most of the sets of non-chromated primers had some quantity of corrosion in

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the scribe, but the scribe is not evaluated for the non-chromated primers under MIL-PRF-85582. Therefore, all TCPs with chromated and non-chromated primers have passed 2000 hours of salt fog exposure. Figure 7 contains some representative photos of the salt fog results, comparing panels before and after exposure.









Pretreatment	Primer	Before Exposure	After Exposure
Metalast TCP-HF	MIL-PRF-23377C		
	MIL-PRF-23377N		
	MIL-PRF-85582N		
Alodine T5900	MIL-PRF-23377N		

Figure 7: Photos of Non-chromated Primer Corrosion Along Scribe

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	MIL-PRF-85582N		
Aluminescent	MIL-PRF-23377N		
	MIL-PRF-85582N		

Figure 7: Photos of Non-chromated Primer Corrosion Along Scribe (continued)

5.4 Filiform Corrosion

Filiform corrosion testing was conducted on the primer-topcoat panels only. The test panels were prepared by first taping the edges of the panels and scribing an “X” through the coating and into the substrate. The test panels were then exposed for one hour to vapors of a 12 N hydrochloric acid solution and, within five minutes of removal from the hydrochloric acid, were placed in a humidity chamber maintained at 80% relative humidity and 40± 2°C (104 ± 3°F) for 1000 hours. After exposure, the panels were examined for filiform growth, which are filament-like lines extending from the scribe. The performance requirements indicate that no filament should be longer than 0.25 inch and the majority should be less than 0.125 inch. Table 12 contains the results of the filiform corrosion evaluation.

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Table 12. Filiform Corrosion Resistance – 1000 Hours

Pretreatment	Primer	Average Number of Filaments	Average Length of Filaments	Pass/Fail
Alodine 1200S	MIL-PRF-23377C	0	N/A	Pass
	MIL-PRF-23377N	110	1/32"-1/16"	Pass
	MIL-PRF-23377N (02GN083)	128	1/32"-3/32"	Pass
	MIL-PRF-85582C	TNTC	1/32"-3/32"	Pass
	MIL-PRF-85582N	79	1/32"-1/16"	Pass
Metalast TCP-HF	MIL-PRF-23377C	25	1/32"-3/16"	Pass
	MIL-PRF-23377N	119	1/32"-3/32"	Pass
	MIL-PRF-85582C	TNTC	1/32"-3/16"	Pass
	MIL-PRF-85582N	132	1/32"-1/8"	Pass
Alodine T5900	MIL-PRF-23377C	35	1/32"-1/8"	Pass
	MIL-PRF-23377N	98	1/32"-3/32"	Pass
	MIL-PRF-85582C	TNTC	1/32"-3/16"	Pass
	MIL-PRF-85582N	110	1/32"-1/8"	Pass
650 ChromitAl TCP	MIL-PRF-23377C	10	1/32"-1/32"	Pass
	MIL-PRF-23377N	95	1/32"-3/32"	Pass
	MIL-PRF-85582C	TNTC	1/32"-1/8"	Pass
	MIL-PRF-85582N	64	1/32"-1/16"	Pass
Aluminescent TCP	MIL-PRF-23377C	11	1/32"-1/32"	Pass
	MIL-PRF-23377N	102	1/32"-3/32"	Pass
	MIL-PRF-85582C	TNTC	1/32"-1/8"	Pass
	MIL-PRF-85582N	90	1/32"-3/32"	Pass

The results listed in Table 12 show that all combinations of pretreatments and primers passed filiform corrosion. All filaments were less than 0.25 inch and most were less than 0.125 inch. Figure 8 shows some representative photos of filiform corrosion, specifically MIL-PRF-85582C primer, which produced the most filiform corrosion with each pretreatment.

Chromium Alternatives Qualification Testing

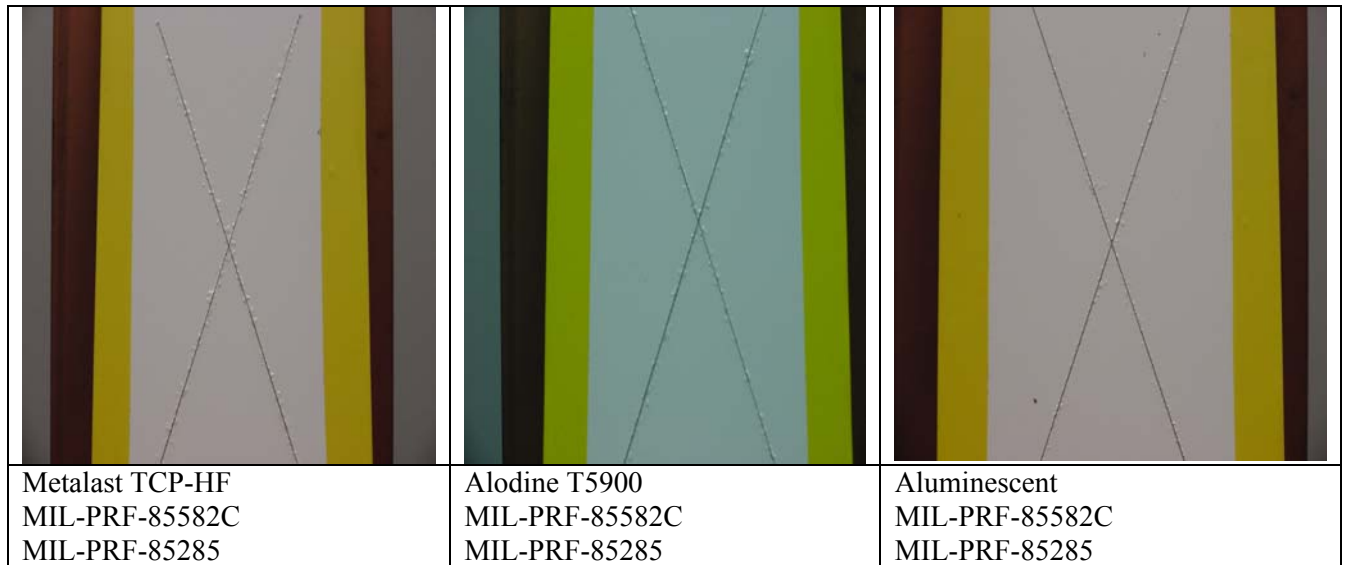


Figure 8: Representative Photos of Filiform Corrosion

Overall, the results of the TCP products with the chromated and non-chromated primers all performed equivalently and met the performance requirements as listed in Table 8 of this Test Report. In addition, as of this report date, all TCP products and non-chromated primers have been added to their respective QPLs. The certification letters for these products is located in Appendix B.

Chromium Alternatives Qualification Testing

6.0 Powder Coating Testing

Testing was required to qualify the alternative conversion coatings that passed the screening testing for use with powder coatings. The powder coat used was Spraylat PEL1655V which met Hughes Specification Control Drawing 654948, Color Gray per FED-STD-595, Color #36375. Table 13 summarizes the Powder Coat Test Matrix, which includes wet tape adhesion, dry tape adhesion, humidity, accelerated weathering, heat resistance, thermal shock resistance and 2000 hour sulfur dioxide (SO₂) corrosion resistance.

Table 13. Powder Coat Test Matrix

Test	Test Method	Requirement
Wet Tape Adhesion	FED-STD-141A, Method 6301.3	No loss of adhesion
Dry Tape Adhesion	ASTM D 3359, Method A	No coating removal, cracking, or flaking.
Humidity	FTMS No. 141A, Method 6201	400 hrs hum. @ 100° F ±5° F, no loss adhesion, blistering, film softening, discoloration.
Accelerated Weathering	ASTM-D-5894	Pass 2000 hrs.
Heat Resistance	FED-STD-141, Method 6051	Pass 24 hrs @ 300° F ±10° F, no blistering, loss of adhesion.
Thermal Shock Resistance	SCD 6500168, 4.4.2.7; 24 ±1 hrs @ 300° F ±10° F & immersion in ice water @ 34° F ±2° F	No loss of adhesion.
Corrosion Resistance	SCD 6500168, 4.4.2.10; 5% salt spray per ASTM 117 except sulfur dioxide (SO ₂) shall be injected at a flow rate of 1.0±0.2 cm ³ /min/ft ³ , 6° angle from vertical.	Corrosion within 3mm from scribe shall not be considered a failure

The following tables provide a summary of the results for the testing of the Spraylat powder coating over the pretreatments that passed the screening testing discussed in Section 3. The individual results for each panel tested are provided in Appendix A.

6.1 Wet Tape Adhesion

Wet tape adhesion for the powder coatings was conducted in the same manner as the

Chromium Alternatives Qualification Testing

wet spray coatings. Briefly, panels were immersed in distilled water for 24 hours at room temperature and then tested. All pretreatments passed with a 5A rating, indicating that no loss of adhesion had occurred. The results are listed in Table 14.

Table 14. Wet Tape Adhesion Results

Pretreatment	Average Adhesion Measurement	Pass/Fail
Alodine 1200S	5	Pass
Metalast TCP-HF	5	Pass
Alodine T5900	5	Pass
650 ChromitAl	5	Pass
Aluminescent	5	Pass

6.2 Dry Tape Adhesion

The dry tape adhesion test was conducted by scribing an “X” through the coating and into the substrate, applying tape, rolling the tape, and removing the tape in a swift motion as close to 180° as possible. The scribe was then inspected for any loss of adhesion. All pretreatments passed with a 5A rating, indicating no loss of adhesion. The results are listed in Table 15 and a representative photo is located in Figure 9.

Table 15. Dry Tape Adhesion Results

Pretreatment	Average Adhesion Measurement	Pass/Fail
Alodine 1200S	5A	Pass
Metalast TCP-HF	5A	Pass
Alodine T5900	5A	Pass
650 ChromitAl TCP	5A	Pass
Aluminescent TCP	5A	Pass



Figure 9: Dry Tape Adhesion Test Panel

6.3 Humidity Resistance

Humidity Resistance testing was performed by exposing the test panels to 95% humidity at 100 ± 5°F. The panels were to have no loss of adhesion, blistering, cracking or other defect upon visual exam after exposure. The results of the testing are

Chromium Alternatives Qualification Testing

located in Table 16, which show that all pretreatments passed with a corrosion rating of 10, based on the salt fog corrosion scale, indicating that no corrosion or defects were observed.

Table 16. Humidity Resistance – 400 Hours

Pretreatment	Average Corrosion Rating	Average Corrosion Description	Pass/Fail
Alodine 1200S	10	No Corrosion	Pass
Metalast TCP-HF	10	No Corrosion	Pass
Alodine T5900	10	No Corrosion	Pass
650 ChromitAl	10	No Corrosion	Pass
Aluminescent	10	No Corrosion	Pass

6.4 Accelerated Weathering

The accelerated weathering test was conducted by Q-Lab Weathering Research Service in Florida. The panels were taped and prepped at CTC’s ETF Laboratory, then sent to Q-Lab for exposure. Panels were exposed for 2000 hours with visual examinations reported every 500 hours. There was some color change noted during exposure as well as some chalking, but the coating remained intact, with no cracking, blistering, or flaking noted for any of the test panels. In addition, panels with the non-chromate pretreatments Alodine 5200 and Pantheon PreKote that had been powder coated were also sent for testing since there was no additional charge to include these panels. Test results are listed in Table 17.

Table 17. Accelerated Weathering Results

Pretreatment	Average Color Changes	Average Chalking	Average Additional Observations	Pass/Fail
Alodine 1200S	Slight-Moderate Yellowing	Slight	No cracking, blistering or flaking	Pass
Metalast TCP-HF	Slight-Moderate Yellowing	Slight	No cracking, blistering or flaking	Pass
Alodine T5900	Slight-Moderate Yellowing	Slight	No cracking, blistering or flaking	Pass
650 ChromitAl	Slight-Moderate Yellowing	Slight	No cracking, blistering or flaking	Pass
Alodine 5200	Slight-Moderate Yellowing	Slight	No cracking, blistering or flaking	Pass
Aluminescent TCP	Slight-Moderate Yellowing	No Chalking	No cracking, blistering or flaking	Pass
PreKote NCP	Slight-Moderate Yellowing	Slight Spotting	No cracking, blistering or flaking	Pass

Chromium Alternatives Qualification Testing

6.5 Heat Resistance

Heat resistance testing was conducted by exposing the panels to a temperature of $300 \pm 10^\circ\text{F}$ for 24 hours, then visually examining the panels for any defects or loss of adhesion. All panels had no change. The results are listed in Table 18.

Table 18. Heat Resistance Results

Pretreatment	Average Observations	Pass/Fail
Alodine 1200S	No Change	Pass
Metalast TCP-HF	No Change	Pass
Alodine T5900	No Change	Pass
650 ChromitAl	No Change	Pass
Aluminescent	No Change	Pass

6.6 Thermal Shock Resistance

Thermal shock resistance was performed by performing the heat resistance test of exposing panels for 24 ± 1 hours to $300 \pm 10^\circ\text{F}$. Following heating, the panels are quickly immersed in an ice water bath held at $34 \pm 2^\circ\text{F}$. Results are listed in Table 19 with no noticeable change to the coatings.

Table 19. Thermal Shock

Pretreatment	Average Observations	Pass/Fail
Alodine 1200S	No Change	Pass
Metalast TCP-HF	No Change	Pass
Alodine T5900	No Change	Pass
650 ChromitAl TCP	No Change	Pass
Aluminescent TCP	No Change	Pass

6.7 Sulfur Dioxide Corrosion Resistance

For the SO_2 corrosion resistance procedure, test panels were prepared at *CTC*, then sent to Touchstone Labs for 400 hours of exposure. After exposure, the panels were returned to *CTC* for evaluation. The performance specification states that corrosion along the scribe (3 mm) should not be considered failure, therefore, all panels passed this evaluation. Table 20 contains the test results and some representative photos are located in Figure 10.

Chromium Alternatives Qualification Testing

Table 20. SO₂ Corrosion Resistance – 400 Hours

Pretreatment	Average Scribe Rating	Average Unscribed Area Rating	Average Description of Corrosion In Unscribed Area	Pass/Fail
Alodine 1200S	9 (0-1.0 mm avg. creepage from scribe)	10	No Corrosion	Pass
Metalast TCP-HF	7 (1.0-2.0 mm avg. creepage from scribe)	10	No Corrosion	Pass
Alodine T5900	7 (1.0-2.0 mm avg. creepage from scribe)	10	No Corrosion	Pass
650 ChromitAl	8 (0.5-1.0 mm avg. creepage from scribe)	10	No Corrosion	Pass
Aluminescent	8 (0.5-2.0 mm avg. creepage from scribe)	10	No Corrosion	Pass

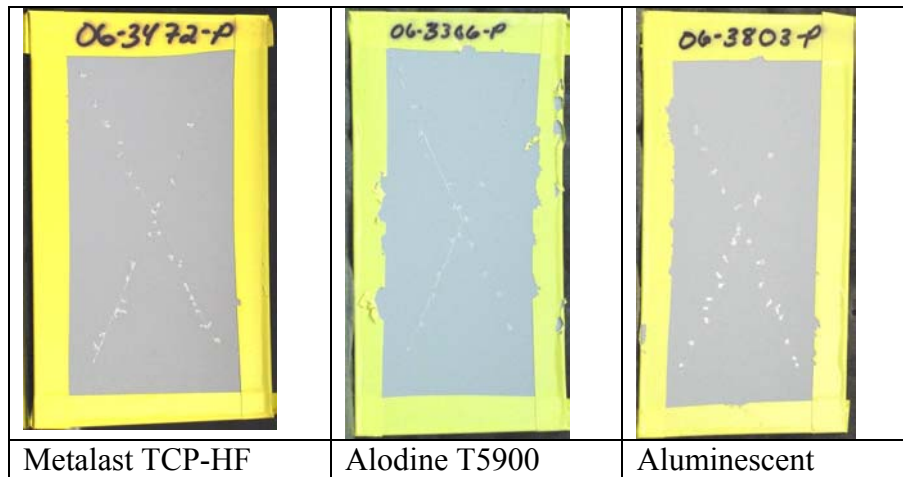


Figure 10: SO₂ Corrosion Resistance Panels

Chromium Alternatives Qualification Testing

7.0 Laboratory Equipment

Several pieces of test equipment were used during execution of the testing. Table 21 details the equipment that was used, calibration status, and the tests that required the test apparatus.

Table 21. Laboratory Test Equipment

Equipment Name	Model #	Gov't Tag/ Serial #	Calibration Requirements	Test Performed
PosiTector Dry Film Thickness Gauge	6000	13378/ 13775	Verify with calibrated thickness shims before each use	Coating Thickness
Singleton Salt Fog Cabinet	23	3499/ 23-29011	Annual calibration; daily verification of salt fog production and pH	Corrosion Resistance
VWRbrand SympHony pH Meter	SP21	C2356/ 00001686	Calibrate with each use with NIST standards	Corrosion Resistance
Singleton Cyclic Humidity Chamber	CCT-10P	13632/ NA	Semi-annual calibration	Filiform Corrosion; Humidity Resistance
Lindberg Blue M Oven	NA	3490/ 11127	Semi-annual calibration	Heat Resistance, Thermal Shock

8.0 Conclusions

It is now possible to have a Cr⁺⁶ free conversion coat and paint system (solvent based or powder) for aluminum based missile components that meet the requirements of MIL-DTL-5541, MIL-PRF-85582, MIL-PRF-23377, and MIL-PRF-85285.

All four of the TCP products tested (Metalast TCP-HF, SurTec ChromitAL TCP, Henkel Alodine 5900, Luster-On Luminescent) have been added, via certification letter, to QPL-81706 for use with MIL-DTL-5541 and designated as Type II (compositions containing no Cr⁺⁶) chemical conversion materials.










Deft 44GN098 is on the QPL-85582 for use with MIL-PRF-85582 as a waterborne, non-chromated paint primer and designated as Class “N” (Non-Chromate).

Deft 02GN084 and Deft 02GN083 have successfully passed all of the qualification tests and are on the QPL-23377 for use with MIL-PRF-23377 as a high solids (solvent), non-chromated paint primer and designated as Class “N” (Non-Chromate).

Now that it has been established that a Cr⁺⁶-free coating system, qualified to MIL-DTL-5541 and MIL-PRF-85582 or MIL-PRF-23377, can be used for aluminum missile components, AFP 44 is working to perform a Single Process Initiative (SPI) that would provide a block change to all painting system documents. This would allow the use of the Cr⁺⁶-free conversion coats and primers over the current paint systems.

APPENDIX A

LABORATORY TEST REPORTS

Pretreatment	Laboratory Report
Alodine 1200S	 Alodine 1200S.doc
Alodine T5900	 Alodine T5900.doc
Metalast TCP-HF	 Metalast.doc
SurTec 650 Chromital	 Chromital.doc
Aluminescent	 Aluminescent.doc
Alodine 5200	 Alodine 5200.doc
PreKote	 PreKote.doc
PRIMORPH	 PRIMORPH.doc
Alodine 1200S with 02GN083	 02GN083-85582N.D OC

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2806-P	Alodine 1200S, 2024 Al, no coating, #1	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2807-P	Alodine 1200S, 2024 Al, no coating, #2	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2808-P	Alodine 1200S, 2024 Al, no coating, #3	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2809-P	Alodine 1200S, 2024 Al, no coating, #4	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few small scuff marks	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2810-P	Alodine 1200S, 2024 Al, no coating, #5	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches and scuff marks	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2811-P	Alodine 1200S, 2024 Al, no coating, #6	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No Corrosion	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2812-P	Alodine 1200S, 2024 Al, no coating, #7	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches and scuff marks; a few raised spots near bottom of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No Corrosion	ASTM B117	10/3/06 / TH
06-2813-P	Alodine 1200S, 2024 Al, no coating, #8	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scuff marks	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No Corrosion	ASTM B117	10/3/06 / TH
06-2814-P	Alodine 1200S, 2024 Al, no coating, #9	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches and scuff marks; a few raised spots near bottom of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No Corrosion	ASTM B117	10/3/06 / TH
06-2815-P	Alodine 1200S, 2024 Al, no coating, #10	Appearance	Shiny finish, gold on outside, iridescent in middle, uneven coating; a few scratches and scuff marks; a few raised spots near bottom of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No Corrosion	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2816-P	Alodine 1200S, 6061 Al, no coating, #1	Appearance	Shiny finish; yellowish brown coating; uneven coating – coating appears lighter in the middle; a few fine scratches	MIL-C-5541	11/13/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	12/1/06 / DB
06-2817-P	Alodine 1200S, 6061 Al, no coating, #2	Appearance	Shiny finish; yellowish brown coating; uneven coating – coating appears lighter in the middle; a few fine scratches	MIL-C-5541	11/13/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	12/1/06 / DB
06-2818-P	Alodine 1200S, 6061 Al, no coating, #3	Appearance	Shiny finish; yellowish brown coating; uneven coating – coating appears heavier in the middle; a few fine scratches	MIL-C-5541	11/13/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	12/1/06 / DB
06-2819-P	Alodine 1200S, 6061 Al, no coating, #4	Appearance	Shiny finish; yellowish brown coating; uneven coating – coating appears heavier in the along the edges; a few fine scratches	MIL-C-5541	11/13/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	12/1/06 / DB
06-2820-P	Alodine 1200S, 6061 Al, no coating, #5	Appearance	Shiny finish; slight yellowish color; a few fine scratches	MIL-C-5541	11/13/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	12/1/06 / DB

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2821-P	Alodine 1200S, 6061 Al, no coating, #6	Appearance	Shiny finish; slight yellowish color; fairly even coating; numerous fine scratches	MIL-C-5541	11/13/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 1 Pit No noticeable adhesion loss (blistering)	ASTM B117	11/27/06 / TH
06-2822-P	Alodine 1200S, 6061 Al, no coating, #7	Appearance	Shiny finish; slight yellowish color; fairly even coating; numerous fine scratches	MIL-C-5541	11/13/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 1 Pit 1 st corrosion @ 144 – 168 hours	ASTM B117	11/27/06 / TH
06-2823-P	Alodine 1200S, 6061 Al, no coating, #8	Appearance	Shiny finish; slight yellowish color; uneven coating – a few streaks; numerous scratches	MIL-C-5541	11/13/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 5 Pits 1 st corrosion @ 24 – 48 hours	ASTM B117	11/27/06 / TH
06-2824-P	Alodine 1200S, 6061 Al, no coating, #9	Appearance	Shiny finish; slight yellowish color; uneven coating – a few streaks; numerous scratches	MIL-C-5541	11/13/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No corrosion	ASTM B117	11/27/06 / TH
06-2825-P	Alodine 1200S, 6061 Al, no coating, #10	Appearance	Shiny finish; slight yellowish color; uneven coating – a few streaks; numerous scratches	MIL-C-5541	11/13/06 / SH
		Corrosion resistance - 168 hrs	Rating = 10 No corrosion	ASTM B117	11/27/06 / TH
06-2826-P	Alodine 1200S, 2024 Al, 23377C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2827-P	Alodine 1200S, 2024 Al, 23377C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2828-P	Alodine 1200S, 2024 Al, 23377C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2829-P	Alodine 1200S, 2024 Al, 23377C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2830-P	Alodine 1200S, 2024 Al, 23377C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2831-P	Alodine 1200S, 2024 Al, 23377C, #6	Water resistance - 4 day test	Color change – light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2832-P	Alodine 1200S, 2024 Al, 23377C, #7	Water resistance - 4 day test	Color change – light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2833-P	Alodine 1200S, 2024 Al, 23377C, #8	Water resistance - 4 day test	Color change – light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2834-P	Alodine 1200S, 2024 Al, 23377C, #9	Water resistance - 4 day test	Color change – light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2835-P	Alodine 1200S, 2024 Al, 23377C, #10	Water resistance - 4 day test	Color change – light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2836-P	Alodine 1200S, 2024 Al, 23377N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2837-P	Alodine 1200S, 2024 Al, 23377N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2838-P	Alodine 1200S, 2024 Al, 23377N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2839-P	Alodine 1200S, 2024 Al, 23377N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2840-P	Alodine 1200S, 2024 Al, 23377N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2841-P	Alodine 1200S, 2024 Al, 23377N, #6	Water resistance - 4 day test	Color change – light olive green with small mint green spots	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2842-P	Alodine 1200S, 2024 Al, 23377N, #7	Water resistance - 4 day test	Color change – light olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2843-P	Alodine 1200S, 2024 Al, 23377N, #8	Water resistance - 4 day test	Color change – light olive green with small mint green spots	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2844-P	Alodine 1200S, 2024 Al, 23377N, #9	Water resistance - 4 day test	Color change – light mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2845-P	Alodine 1200S, 2024 Al, 23377N, #10	Water resistance - 4 day test	Color change – light mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2846-P	Alodine 1200S, 2024 Al, 85582C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2847-P	Alodine 1200S, 2024 Al, 85582C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2848-P	Alodine 1200S, 2024 Al, 85582C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2849-P	Alodine 1200S, 2024 Al, 85582C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2850-P	Alodine 1200S, 2024 Al, 85582C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2851-P	Alodine 1200S, 2024 Al, 85582C, #6	Water resistance - 4 day test	Color change – to a darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2852-P	Alodine 1200S, 2024 Al, 85582C, #7	Water resistance - 4 day test	Color change – to a darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2853-P	Alodine 1200S, 2024 Al, 85582C, #8	Water resistance - 4 day test	Color change – to a darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2854-P	Alodine 1200S, 2024 Al, 85582C, #9	Water resistance - 4 day test	Color change – to a darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2855-P	Alodine 1200S, 2024 Al, 85582C, #10	Water resistance - 4 day test	Color change – to a darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2856-P	Alodine 1200S, 2024 Al, 85582N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2857-P	Alodine 1200S, 2024 Al, 85582N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2858-P	Alodine 1200S, 2024 Al, 85582N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2859-P	Alodine 1200S, 2024 Al, 85582N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2860-P	Alodine 1200S, 2024 Al, 85582N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2861-P	Alodine 1200S, 2024 Al, 85582N, #6	Water resistance - 4 day test	Color change – dull mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2862-P	Alodine 1200S, 2024 Al, 85582N, #7	Water resistance - 4 day test	Color change – dull mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2863-P	Alodine 1200S, 2024 Al, 85582N, #8	Water resistance - 4 day test	Color change – dull mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2864-P	Alodine 1200S, 2024 Al, 85582N, #9	Water resistance - 4 day test	Color change – dull mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2865-P	Alodine 1200S, 2024 Al, 85582N, #10	Water resistance - 4 day test	Color change – dull mint green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2866-P	Alodine 1200S, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 3/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2867-P	Alodine 1200S, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 3/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2868-P	Alodine 1200S, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 3/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2869-P	Alodine 1200S, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/8” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2870-P	Alodine 1200S, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/8” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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06-2871-P	Alodine 1200S, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2872-P	Alodine 1200S, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2873-P	Alodine 1200S, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2874-P	Alodine 1200S, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2875-P	Alodine 1200S, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2876-P	Alodine 1200S, 2024 Al, 23377C + 85285, #11	Corrosion resistance - 2000 hrs	Scribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area - Rating = 5 1 st Corrosion @ 1176-1344 hours Blisters	ASTM B117	3/12/07 / TH
06-2877-P	Alodine 1200S, 2024 Al, 23377C + 85285, #12	Corrosion resistance - 2000 hrs	Scribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area - Rating = 9 1 st Corrosion @ 1176-1344 hours Blisters	ASTM B117	3/12/07 / TH
06-2878-P	Alodine 1200S, 2024 Al, 23377C + 85285, #13	Corrosion resistance - 2000 hrs	Scribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2879-P	Alodine 1200S, 2024 Al, 23377C + 85285, #14	Corrosion resistance - 2000 hrs	Scribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area - Rating = 8 1 st Corrosion @ 1176-1344 hours Blisters	ASTM B117	3/12/07 / TH
06-2880-P	Alodine 1200S, 2024 Al, 23377C + 85285, #15	Corrosion resistance - 2000 hrs	Scribed Area - Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area - Rating = 8 1 st Corrosion @ 1176-1344 hours Blisters	ASTM B117	3/12/07 / TH
06-2881-P	Alodine 1200S, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	O - Filaments	ASTM D2803	1/24/07 / TH
06-2882-P	Alodine 1200S, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	O - Filaments	ASTM D2803	1/24/07 / TH
06-2883-P	Alodine 1200S, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	O - Filaments	ASTM D2803	1/24/07 / TH
06-2884-P	Alodine 1200S, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	4 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2885-P	Alodine 1200S, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	O - Filaments	ASTM D2803	1/24/07 / TH
06-2886-P	Alodine 1200S, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2887-P	Alodine 1200S, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2888-P	Alodine 1200S, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2889-P	Alodine 1200S, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2890-P	Alodine 1200S, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2891-P	Alodine 1200S, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2892-P	Alodine 1200S, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2893-P	Alodine 1200S, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2894-P	Alodine 1200S, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2895-P	Alodine 1200S, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2896-P	Alodine 1200S, 2024 Al, 23377N + 85285, #11	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2897-P	Alodine 1200S, 2024 Al, 23377N + 85285, #12	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2898-P	Alodine 1200S, 2024 Al, 23377N + 85285, #13	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2899-P	Alodine 1200S, 2024 Al, 23377N + 85285, #14	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 No Noticeable adhesion loss (blistering)	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2900-P	Alodine 1200S, 2024 Al, 23377N + 85285, #15	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2901-P	Alodine 1200S, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	135 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2902-P	Alodine 1200S, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	104 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2903-P	Alodine 1200S, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	74 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/24/07 / TH
06-2904-P	Alodine 1200S, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	114 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2905-P	Alodine 1200S, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	124 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH

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06-2906-P	Alodine 1200S, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2907-P	Alodine 1200S, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/8” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2908-P	Alodine 1200S, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/8” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2909-P	Alodine 1200S, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 3/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2910-P	Alodine 1200S, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 3/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2911-P	Alodine 1200S, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2912-P	Alodine 1200S, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2913-P	Alodine 1200S, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2914-P	Alodine 1200S, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2915-P	Alodine 1200S, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2916-P	Alodine 1200S, 2024 Al, 85582C + 85285, #11	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH

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06-2917-P	Alodine 1200S, 2024 Al, 85582C + 85285, #12	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2918-P	Alodine 1200S, 2024 Al, 85582C + 85285, #13	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2919-P	Alodine 1200S, 2024 Al, 85582C + 85285, #14	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2920-P	Alodine 1200S, 2024 Al, 85582C + 85285, #15	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2921-P	Alodine 1200S, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/32”	ASTM D2803	1/24/07 / TH
06-2922-P	Alodine 1200S, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 1/8”	ASTM D2803	1/24/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2923-P	Alodine 1200S, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/32”	ASTM D2803	1/24/07 / TH
06-2924-P	Alodine 1200S, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/32”	ASTM D2803	1/24/07 / TH
06-2925-P	Alodine 1200S, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/32”	ASTM D2803	1/24/07 / TH
06-2926-P	Alodine 1200S, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/8” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2927-P	Alodine 1200S, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2928-P	Alodine 1200S, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2929-P	Alodine 1200S, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2930-P	Alodine 1200S, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2931-P	Alodine 1200S, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2932-P	Alodine 1200S, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2933-P	Alodine 1200S, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2934-P	Alodine 1200S, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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06-2935-P	Alodine 1200S, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-2936-P	Alodine 1200S, 2024 Al, 85582N + 85285, #11	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 1176-1344 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2937-P	Alodine 1200S, 2024 Al, 85582N + 85285, #12	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 1176-1344 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2938-P	Alodine 1200S, 2024 Al, 85582N + 85285, #13	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 840-1008 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2939-P	Alodine 1200S, 2024 Al, 85582N + 85285, #14	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 504-672 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH

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06-2940-P	Alodine 1200S, 2024 Al, 85582N + 85285, #15	Corrosion resistance - 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 1008-1176 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-2941-P	Alodine 1200S, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	94 - Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/24/07 / TH
06-2942-P	Alodine 1200S, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	102 - Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/24/07 / TH
06-2943-P	Alodine 1200S, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	80 - Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2944-P	Alodine 1200S, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	54 - Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2945-P	Alodine 1200S, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	67 - Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-2946-P	Alodine 1200S, 6061 Al, Powder, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2947-P	Alodine 1200S, 6061 Al, Powder, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2948-P	Alodine 1200S, 6061 Al, Powder, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2949-P	Alodine 1200S, 6061 Al, Powder, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2950-P	Alodine 1200S, 6061 Al, Powder, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-2951-P	Alodine 1200S, 6061 Al, Powder, #6	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-2952-P	Alodine 1200S, 6061 Al, Powder, #7	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD

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06-2953-P	Alodine 1200S, 6061 Al, Powder, #8	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-2954-P	Alodine 1200S, 6061 Al, Powder, #9	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-2955-P	Alodine 1200S, 6061 Al, Powder, #10	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-2956-P	Alodine 1200S, 6061 Al, Powder, #11	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-2957-P	Alodine 1200S, 6061 Al, Powder, #12	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-2958-P	Alodine 1200S, 6061 Al, Powder, #13	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-2959-P	Alodine 1200S, 6061 Al, Powder, #14	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-2960-P	Alodine 1200S, 6061 Al, Powder, #15	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-2961-P	Alodine 1200S, 6061 Al, Powder, #16	Accelerated weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-2962-P	Alodine 1200S, 6061 Al, Powder, #17	Accelerated weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-2963-P	Alodine 1200S, 6061 Al, Powder, #18	Accelerated weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2964-P	Alodine 1200S, 6061 Al, Powder, #19	Accelerated weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-2965-P	Alodine 1200S, 6061 Al, Powder, #20	Accelerated weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-2966-P	Alodine 1200S, 6061 Al, Powder, #21	Heat resistance	No Change	FED-STD 141 Method 6051	10/23/06 / BD
06-2967-P	Alodine 1200S, 6061 Al, Powder, #22	Heat resistance	No Change	FED-STD 141 Method 6051	10/23/06 / BD
06-2968-P	Alodine 1200S, 6061 Al, Powder, #23	Heat resistance	No Change	FED-STD 141 Method 6051	10/23/06 / BD
06-2969-P	Alodine 1200S, 6061 Al, Powder, #24	Heat resistance	No Change	FED-STD 141 Method 6051	10/23/06 / BD
06-2970-P	Alodine 1200S, 6061 Al, Powder, #25	Heat resistance	No Change	FED-STD 141 Method 6051	10/23/06 / BD
06-2971-P	Alodine 1200S, 6061 Al, Powder, #26	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-2972-P	Alodine 1200S, 6061 Al, Powder, #27	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-2973-P	Alodine 1200S, 6061 Al, Powder, #28	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-2974-P	Alodine 1200S, 6061 Al, Powder, #29	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-2975-P	Alodine 1200S, 6061 Al, Powder, #30	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-2976-P	Alodine 1200S, 6061 Al, Powder, #31	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2977-P	Alodine 1200S, 6061 Al, Powder, #32	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-2978-P	Alodine 1200S, 6061 Al, Powder, #33	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-2979-P	Alodine 1200S, 6061 Al, Powder, #34	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-2980-P	Alodine 1200S, 6061 Al, Powder, #35	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH

Reviewed By: Lynn Summerson	Date: 4/10/07
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Notes:

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3146-P	Alodine T5900, 2024 Al, no coating, #1	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3147-P	Alodine T5900, 2024 Al, no coating, #2	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3148-P	Alodine T5900, 2024 Al, no coating, #3	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; 1 scratch that runs from the top to bottom of panel (along the long edge)	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3149-P	Alodine T5900, 2024 Al, no coating, #4	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; numerous scratches in center of panel; faint stamp marks	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3150-P	Alodine T5900, 2024 Al, no coating, #5	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; numerous scratches in center of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3151-P	Alodine T5900, 2024 Al, no coating, #6	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; coating appears to be heavier from center to bottom of panel; a few scratches and scuff marks	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 6 Pits No noticeable adhesion lost Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3152-P	Alodine T5900, 2024 Al, no coating, #7	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; coating appears to be heavier from center to bottom of panel; a few scratches and scuff marks	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 8 2 Pits No noticeable adhesion lost Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3153-P	Alodine T5900, 2024 Al, no coating, #8	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 3 Pits No noticeable adhesion lost Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3154-P	Alodine T5900, 2024 Al, no coating, #9	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; coating appears to be heavier from center to bottom of panel; a few scratches and scuff marks	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 No noticeable adhesion lost White Corrosion Product	ASTM B117	10/3/06 / TH
06-3155-P	Alodine T5900, 2024 Al, no coating, #10	Appearance	Shiny, matte finish; yellowish / brown coating; uneven coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 9 3 Pits No noticeable adhesion lost Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3156-P	Alodine T5900, 2024 Al, 23377C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3157-P	Alodine T5900, 2024 Al, 23377C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3158-P	Alodine T5900, 2024 Al, 23377C, #3	Wet tape adhesion	Rating 4 – trace removal along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3159-P	Alodine T5900, 2024 Al, 23377C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3160-P	Alodine T5900, 2024 Al, 23377C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3161-P	Alodine T5900, 2024 Al, 23377C, #6	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3162-P	Alodine T5900, 2024 Al, 23377C, #7	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3163-P	Alodine T5900, 2024 Al, 23377C, #8	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3164-P	Alodine T5900, 2024 Al, 23377C, #9	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3165-P	Alodine T5900, 2024 Al, 23377C, #10	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3166-P	Alodine T5900, 2024 Al, 23377N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3167-P	Alodine T5900, 2024 Al, 23377N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3168-P	Alodine T5900, 2024 Al, 23377N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3169-P	Alodine T5900, 2024 Al, 23377N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3170-P	Alodine T5900, 2024 Al, 23377N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3171-P	Alodine T5900, 2024 Al, 23377N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3172-P	Alodine T5900, 2024 Al, 23377N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3173-P	Alodine T5900, 2024 Al, 23377N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3174-P	Alodine T5900, 2024 Al, 23377N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3175-P	Alodine T5900, 2024 Al, 23377N, #10	Water resistance - 4 day test	Slight color change – light olive green with mint green spots	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3176-P	Alodine T5900, 2024 Al, 85582C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3177-P	Alodine T5900, 2024 Al, 85582C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3178-P	Alodine T5900, 2024 Al, 85582C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3179-P	Alodine T5900, 2024 Al, 85582C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3180-P	Alodine T5900, 2024 Al, 85582C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3181-P	Alodine T5900, 2024 Al, 85582C, #6	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3182-P	Alodine T5900, 2024 Al, 85582C, #7	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3183-P	Alodine T5900, 2024 Al, 85582C, #8	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3184-P	Alodine T5900, 2024 Al, 85582C, #9	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3185-P	Alodine T5900, 2024 Al, 85582C, #10	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3186-P	Alodine T5900, 2024 Al, 85582N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3187-P	Alodine T5900, 2024 Al, 85582N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3188-P	Alodine T5900, 2024 Al, 85582N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3189-P	Alodine T5900, 2024 Al, 85582N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3190-P	Alodine T5900, 2024 Al, 85582N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3191-P	Alodine T5900, 2024 Al, 85582N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3192-P	Alodine T5900, 2024 Al, 85582N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3193-P	Alodine T5900, 2024 Al, 85582N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3194-P	Alodine T5900, 2024 Al, 85582N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3195-P	Alodine T5900, 2024 Al, 85582N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3196-P	Alodine T5900, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3197-P	Alodine T5900, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3198-P	Alodine T5900, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3199-P	Alodine T5900, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3200-P	Alodine T5900, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3201-P	Alodine T5900, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3202-P	Alodine T5900, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3203-P	Alodine T5900, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3204-P	Alodine T5900, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3205-P	Alodine T5900, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3206-P	Alodine T5900, 2024 Al, 23377C + 85285, #11	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3207-P	Alodine T5900, 2024 Al, 23377C + 85285, #12	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3208-P	Alodine T5900, 2024 Al, 23377C + 85285, #13	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3209-P	Alodine T5900, 2024 Al, 23377C + 85285, #14	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3210-P	Alodine T5900, 2024 Al, 23377C + 85285, #15	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3211-P	Alodine T5900, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	38 filaments Length from 1/32” to 1/4”	ASTM D2803	1/2/07 / TH
06-3212-P	Alodine T5900, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	34 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3213-P	Alodine T5900, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	39 filaments Length from 1/32” to 5/16”	ASTM D2803	1/2/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3214-P	Alodine T5900, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	34 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3215-P	Alodine T5900, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	32 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3216-P	Alodine T5900, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3217-P	Alodine T5900, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3218-P	Alodine T5900, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3219-P	Alodine T5900, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3220-P	Alodine T5900, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3221-P	Alodine T5900, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3222-P	Alodine T5900, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3223-P	Alodine T5900, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3224-P	Alodine T5900, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3225-P	Alodine T5900, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3226-P	Alodine T5900, 2024 Al, 23377N + 85285, #11	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3227-P	Alodine T5900, 2024 Al, 23377N + 85285, #12	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 168-336 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3228-P	Alodine T5900, 2024 Al, 23377N + 85285, #13	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 504-672 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3229-P	Alodine T5900, 2024 Al, 23377N + 85285, #14	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 504-672 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3230-P	Alodine T5900, 2024 Al, 23377N + 85285, #15	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 7 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3231-P	Alodine T5900, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	107 filaments Length from 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3232-P	Alodine T5900, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	105 filaments Length from 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3233-P	Alodine T5900, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	112 filaments Length from 1/32” to 1/16”	ASTM D2803	1/2/07 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3234-P	Alodine T5900, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	77 filaments Length from 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3235-P	Alodine T5900, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	90 filaments Length from 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3236-P	Alodine T5900, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3237-P	Alodine T5900, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3238-P	Alodine T5900, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3239-P	Alodine T5900, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3240-P	Alodine T5900, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3241-P	Alodine T5900, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3242-P	Alodine T5900, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3243-P	Alodine T5900, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3244-P	Alodine T5900, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3245-P	Alodine T5900, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3246-P	Alodine T5900, 2024 Al, 85582C + 85285, #11	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3247-P	Alodine T5900, 2024 Al, 85582C + 85285, #12	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3248-P	Alodine T5900, 2024 Al, 85582C + 85285, #13	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3249-P	Alodine T5900, 2024 Al, 85582C + 85285, #14	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3250-P	Alodine T5900, 2024 Al, 85582C + 85285, #15	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3251-P	Alodine T5900, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Filaments - too numerous to count Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3252-P	Alodine T5900, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Filaments - too numerous to count Length from 1/32” to 1/4”	ASTM D2803	1/2/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3253-P	Alodine T5900, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Filaments - too numerous to count Length from 1/32" to 1/4"	ASTM D2803	1/2/07 / TH
06-3254-P	Alodine T5900, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Filaments - too numerous to count Length from 1/32" to 1/8"	ASTM D2803	1/2/07 / TH
06-3255-P	Alodine T5900, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Filaments - too numerous to count Length from 1/32" to 3/16"	ASTM D2803	1/2/07 / TH
06-3256-P	Alodine T5900, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3257-P	Alodine T5900, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3258-P	Alodine T5900, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3259-P	Alodine T5900, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3260-P	Alodine T5900, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3261-P	Alodine T5900, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3262-P	Alodine T5900, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3263-P	Alodine T5900, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3264-P	Alodine T5900, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3265-P	Alodine T5900, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3266-P	Alodine T5900, 2024 Al, 85582N + 85285, #11	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3267-P	Alodine T5900, 2024 Al, 85582N + 85285, #12	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3268-P	Alodine T5900, 2024 Al, 85582N + 85285, #13	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3269-P	Alodine T5900, 2024 Al, 85582N + 85285, #14	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3270-P	Alodine T5900, 2024 Al, 85582N + 85285, #15	Corrosion Resistance - 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 0-168 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3271-P	Alodine T5900, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	117 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3272-P	Alodine T5900, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	108 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3273-P	Alodine T5900, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	106 filaments Length from 1/32” to 5/32”	ASTM D2803	1/2/07 / TH
06-3274-P	Alodine T5900, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	104 filaments Length from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3275-P	Alodine T5900, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	115 filaments Length from 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3276-P	Alodine T5900, 6061 Al, Powder, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3277-P	Alodine T5900, 6061 Al, Powder, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3278-P	Alodine T5900, 6061 Al, Powder, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3279-P	Alodine T5900, 6061 Al, Powder, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3280-P	Alodine T5900, 6061 Al, Powder, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3281-P	Alodine T5900, 6061 Al, Powder, #6	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3282-P	Alodine T5900, 6061 Al, Powder, #7	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3283-P	Alodine T5900, 6061 Al, Powder, #8	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3284-P	Alodine T5900, 6061 Al, Powder, #9	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3285-P	Alodine T5900, 6061 Al, Powder, #10	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3286-P	Alodine T5900, 6061 Al, Powder, #11	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-3287-P	Alodine T5900, 6061 Al, Powder, #12	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-3288-P	Alodine T5900, 6061 Al, Powder, #13	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-3289-P	Alodine T5900, 6061 Al, Powder, #14	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-3290-P	Alodine T5900, 6061 Al, Powder, #15	Humidity - 400 hrs	Rating = 10 No Corrosion	FTMS No. 141A, Method 6201	12/12/06 / TH
06-3291-P	Alodine T5900, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3292-P	Alodine T5900, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3293-P	Alodine T5900, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3294-P	Alodine T5900, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3295-P	Alodine T5900, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3296-P	Alodine T5900, 6061 Al, Powder, #21	Heat resistance	No Change	FED-STD-141 Method 6051	10/23/06 / BD
06-3297-P	Alodine T5900, 6061 Al, Powder, #22	Heat resistance	No Change	FED-STD-141 Method 6051	10/23/06 / BD
06-3298-P	Alodine T5900, 6061 Al, Powder, #23	Heat resistance	No Change	FED-STD-141 Method 6051	10/23/06 / BD
06-3299-P	Alodine T5900, 6061 Al, Powder, #24	Heat resistance	No Change	FED-STD-141 Method 6051	10/23/06 / BD
06-3300-P	Alodine T5900, 6061 Al, Powder, #25	Heat resistance	No Change	FED-STD-141 Method 6051	10/23/06 / BD
06-3301-P	Alodine T5900, 6061 Al, Powder, #26	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3302-P	Alodine T5900, 6061 Al, Powder, #27	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3303-P	Alodine T5900, 6061 Al, Powder, #28	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3304-P	Alodine T5900, 6061 Al, Powder, #29	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3305-P	Alodine T5900, 6061 Al, Powder, #30	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3306-P	Alodine T5900, 6061 Al, Powder, #31	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3307-P	Alodine T5900, 6061 Al, Powder, #32	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3308-P	Alodine T5900, 6061 Al, Powder, #33	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3309-P	Alodine T5900, 6061 Al, Powder, #34	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06 Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3310-P	Alodine T5900, 6061 Al, Powder, #35	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH

Reviewed By: Lynn Summerson	Date: 4/19/07
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Notes:

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3311-P	Metalast TCP-HF, 2024 Al, no coating, #1	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3312-P	Metalast TCP-HF, 2024 Al, no coating, #2	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3313-P	Metalast TCP-HF, 2024 Al, no coating, #3	Appearance	Shiny, iridescent coating; coating appears to be light on edge near hole and along bottom of panel; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3314-P	Metalast TCP-HF, 2024 Al, no coating, #4	Appearance	Shiny, iridescent coating; coating appears to be light along bottom of panel; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3315-P	Metalast TCP-HF, 2024 Al, no coating, #5	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3316-P	Metalast TCP-HF, 2024 Al, no coating, #6	Appearance	Shiny, iridescent, even coating; a few scratches in the middle of panel	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 No Noticeable adhesion loss 12 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3317-P	Metalast TCP-HF, 2024 Al, no coating, #7	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 Corrosion @ 72-96 hours 20 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3318-P	Metalast TCP-HF, 2024 Al, no coating, #8	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 Corrosion @ 48-72 hours 18 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3319-P	Metalast TCP-HF, 2024 Al, no coating, #9	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 No Noticeable adhesion loss 13 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3320-P	Metalast TCP-HF, 2024 Al, no coating, #10	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 Corrosion @ 48-72 hours 30 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3321-P	Metalast TCP-HF, 2024 Al, 23377C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3322-P	Metalast TCP-HF, 2024 Al, 23377C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3323-P	Metalast TCP-HF, 2024 Al, 23377C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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06-3324-P	Metalast TCP-HF, 2024 Al, 23377C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3325-P	Metalast TCP-HF, 2024 Al, 23377C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3326-P	Metalast TCP-HF, 2024 Al, 23377C, #6	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3327-P	Metalast TCP-HF, 2024 Al, 23377C, #7	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3328-P	Metalast TCP-HF, 2024 Al, 23377C, #8	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3329-P	Metalast TCP-HF, 2024 Al, 23377C, #9	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3330-P	Metalast TCP-HF, 2024 Al, 23377C, #10	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3331-P	Metalast TCP-HF, 2024 Al, 23377N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3332-P	Metalast TCP-HF, 2024 Al, 23377N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3333-P	Metalast TCP-HF, 2024 Al, 23377N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3334-P	Metalast TCP-HF, 2024 Al, 23377N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3335-P	Metalast TCP-HF, 2024 Al, 23377N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3336-P	Metalast TCP-HF, 2024 Al, 23377N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3337-P	Metalast TCP-HF, 2024 Al, 23377N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3338-P	Metalast TCP-HF, 2024 Al, 23377N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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06-3339-P	Metalast TCP-HF, 2024 Al, 23377N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3340-P	Metalast TCP-HF, 2024 Al, 23377N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3341-P	Metalast TCP-HF, 2024 Al, 85582C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3342-P	Metalast TCP-HF, 2024 Al, 85582C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3343-P	Metalast TCP-HF, 2024 Al, 85582C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3344-P	Metalast TCP-HF, 2024 Al, 85582C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3345-P	Metalast TCP-HF, 2024 Al, 85582C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3346-P	Metalast TCP-HF, 2024 Al, 85582C, #6	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3347-P	Metalast TCP-HF, 2024 Al, 85582C, #7	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3348-P	Metalast TCP-HF, 2024 Al, 85582C, #8	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3349-P	Metalast TCP-HF, 2024 Al, 85582C, #9	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3350-P	Metalast TCP-HF, 2024 Al, 85582C, #10	Water resistance - 4 day test	Color change to darker olive green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3351-P	Metalast TCP-HF, 2024 Al, 85582N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3352-P	Metalast TCP-HF, 2024 Al, 85582N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3353-P	Metalast TCP-HF, 2024 Al, 85582N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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06-3354-P	Metalast TCP-HF, 2024 Al, 85582N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3355-P	Metalast TCP-HF, 2024 Al, 85582N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3356-P	Metalast TCP-HF, 2024 Al, 85582N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3357-P	Metalast TCP-HF, 2024 Al, 85582N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3358-P	Metalast TCP-HF, 2024 Al, 85582N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3359-P	Metalast TCP-HF, 2024 Al, 85582N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3360-P	Metalast TCP-HF, 2024 Al, 85582N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3361-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3362-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3363-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Rating 3 – jagged removal along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3364-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3365-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3366-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3367-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3368-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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06-3369-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3370-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3371-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3372-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3373-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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06-3374-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3375-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3376-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	18 filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3377-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	21 filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3378-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	12 filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3379-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	27 filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3380-P	Metalast TCP-HF, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	47 filaments Length from – 1/32” to 3/16”	ASTM D2803	1/2/07 / TH
06-3381-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3382-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3383-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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06-3384-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3385-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3386-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3387-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3388-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3389-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3390-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3391-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3392-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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06-3393-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 840-1008 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3394-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 336-504 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3395-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 1560-1704 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3396-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	105 filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3397-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	130 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3398-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	137 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3399-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	124 filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3400-P	Metalast TCP-HF, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	99 filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3401-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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06-3402-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3403-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3404-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3405-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3406-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3407-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3408-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3409-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3410-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3411-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3412-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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06-3413-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3414-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3415-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3416-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3417-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/16”	ASTM D2803	1/2/07 / TH
06-3418-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/16”	ASTM D2803	1/2/07 / TH
06-3419-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 5/32”	ASTM D2803	1/2/07 / TH
06-3420-P	Metalast TCP-HF, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3421-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3422-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3423-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3424-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3425-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3426-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3427-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3428-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3429-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3430-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3431-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 168-336 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3432-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 504-672 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3433-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 504-672 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3434-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 840-1008 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3435-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 1176-1344 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3436-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	132 filaments Length from – 1/32” to 3/16”	ASTM D2803	1/2/07 / TH
06-3437-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	153 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3438-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	139 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3439-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	113 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3440-P	Metalast TCP-HF, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	125 filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3441-P	Metalast TCP-HF, 6061 Al, Powder, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3442-P	Metalast TCP-HF, 6061 Al, Powder, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3443-P	Metalast TCP-HF, 6061 Al, Powder, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3444-P	Metalast TCP-HF, 6061 Al, Powder, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3445-P	Metalast TCP-HF, 6061 Al, Powder, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3446-P	Metalast TCP-HF, 6061 Al, Powder, #6	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / DB
06-3447-P	Metalast TCP-HF, 6061 Al, Powder, #7	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / DB
06-3448-P	Metalast TCP-HF, 6061 Al, Powder, #8	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / DB
06-3449-P	Metalast TCP-HF, 6061 Al, Powder, #9	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / DB
06-3450-P	Metalast TCP-HF, 6061 Al, Powder, #10	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / DB
06-3451-P	Metalast TCP-HF, 6061 Al, Powder, #11	Humidity – 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3452-P	Metalast TCP-HF, 6061 Al, Powder, #12	Humidity – 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3453-P	Metalast TCP-HF, 6061 Al, Powder, #13	Humidity – 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3454-P	Metalast TCP-HF, 6061 Al, Powder, #14	Humidity – 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3455-P	Metalast TCP-HF, 6061 Al, Powder, #15	Humidity – 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3456-P	Metalast TCP-HF, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3457-P	Metalast TCP-HF, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3458-P	Metalast TCP-HF, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3459-P	Metalast TCP-HF, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3460-P	Metalast TCP-HF, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3461-P	Metalast TCP-HF, 6061 Al, Powder, #21	Heat resistance	No Change	FED-STD-141, Method 6051	10/23/06 / TH
06-3462-P	Metalast TCP-HF, 6061 Al, Powder, #22	Heat resistance	No Change	FED-STD-141, Method 6051	10/23/06 / TH
06-3463-P	Metalast TCP-HF, 6061 Al, Powder, #23	Heat resistance	No Change	FED-STD-141, Method 6051	10/23/06 / TH
06-3464-P	Metalast TCP-HF, 6061 Al, Powder, #24	Heat resistance	No Change	FED-STD-141, Method 6051	10/23/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/27/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3465-P	Metalast TCP-HF, 6061 Al, Powder, #25	Heat resistance	No Change	FED-STD-141, Method 6051	10/23/06 / TH
06-3466-P	Metalast TCP-HF, 6061 Al, Powder, #26	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3467-P	Metalast TCP-HF, 6061 Al, Powder, #27	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3468-P	Metalast TCP-HF, 6061 Al, Powder, #28	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3469-P	Metalast TCP-HF, 6061 Al, Powder, #29	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3470-P	Metalast TCP-HF, 6061 Al, Powder, #30	Thermal shock	Failed	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3471-P	Metalast TCP-HF, 6061 Al, Powder, #31	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3472-P	Metalast TCP-HF, 6061 Al, Powder, #32	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3473-P	Metalast TCP-HF, 6061 Al, Powder, #33	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3474-P	Metalast TCP-HF, 6061 Al, Powder, #34	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3475-P	Metalast TCP-HF, 6061 Al, Powder, #35	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH

Reviewed By: Lynn Summerson	Date: 4/19/07
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Notes:

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3476-P	650 ChromitAL TCP, 2024 Al, no coating, #1	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a line ~2 inches from top of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3477-P	650 ChromitAL TCP, 2024 Al, no coating, #2	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 2 lines ~1 & 2 inches from top of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top and bottom of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3478-P	650 Chromital TCP, 2024 Al, no coating, #3	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 2 lines ~1 inch from top and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top and bottom of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3479-P	650 Chromital TCP, 2024 Al, no coating, #4	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 1 line ~1 inch from top of panel from pretreatment not totally covering the panel; panel appears to have a few streaks of pretreatment at bottom of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3480-P	650 ChromitAL TCP, 2024 Al, no coating, #5	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 2 lines ~1 inch from top and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3481-P	650 ChromitAL TCP, 2024 Al, no coating, #6	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 2 lines ~1 inch from top and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 1 st Corrosion @ 48-72 hours 11 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3482-P	650 ChromitAL TCP, 2024 Al, no coating, #7	Appearance	Shiny, matte finish, iridescent coating; panel appears to have some streaking; 1 line ~1 inch from top of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on edges of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 1 st Corrosion @ 48-72 hours 10 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3483-P	650 ChromitAL TCP, 2024 Al, no coating, #8	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; a few scratches; 2 lines ~1 inch from top and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on top and bottom of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 1 st Corrosion @ 48-72 hours 9 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3484-P	650 ChromitAL TCP, 2024 Al, no coating, #9	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; 2 lines ~1 inch and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on edges of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance – 168 hrs	Rating = 9 1 st Corrosion @ 48-72 hours 8 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3485-P	650 ChromitAL TCP, 2024 Al, no coating, #10	Appearance	Shiny, matte finish, iridescent coating; generally even coverage; 2 lines ~1 inch from top and ~1 inch from bottom of panel from pretreatment not totally covering the panel; pretreatment appears to be heavier on edges of panel	MIL-C-5541	9/19/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 1 st Corrosion @ 48-72 hours 27 Pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3486-P	650 ChromitAL TCP, 2024 Al, 23377C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3487-P	650 ChromitAL TCP, 2024 Al, 23377C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3488-P	650 ChromitAL TCP, 2024 Al, 23377C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3489-P	650 ChromitAL TCP, 2024 Al, 23377C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3490-P	650 ChromitAL TCP, 2024 Al, 23377C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3491-P	650 ChromitAL TCP, 2024 Al, 23377C, #6	Water resistance - 4 day test	Slight color change – dull light yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3492-P	650 ChromitAL TCP, 2024 Al, 23377C, #7	Water resistance - 4 day test	Slight color change – dull yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3493-P	650 ChromitAL TCP, 2024 Al, 23377C, #8	Water resistance - 4 day test	Slight color change – dull yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3494-P	650 ChromitAL TCP, 2024 Al, 23377C, #9	Water resistance - 4 day test	Slight color change – dull yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3495-P	650 ChromitAL TCP, 2024 Al, 23377C, #10	Water resistance - 4 day test	Slight color change – dull yellow green	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3496-P	650 ChromitAL TCP, 2024 Al, 23377N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3497-P	650 ChromitAL TCP, 2024 Al, 23377N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3498-P	650 ChromitAL TCP, 2024 Al, 23377N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3499-P	650 ChromitAL TCP, 2024 Al, 23377N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3500-P	650 ChromitAL TCP, 2024 Al, 23377N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3501-P	650 ChromitAL TCP, 2024 Al, 23377N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3502-P	650 ChromitAL TCP, 2024 Al, 23377N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3503-P	650 ChromitAL TCP, 2024 Al, 23377N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3504-P	650 ChromitAL TCP, 2024 Al, 23377N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3505-P	650 ChromitAL TCP, 2024 Al, 23377N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3506-P	650 ChromitAL TCP, 2024 Al, 85582C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3507-P	650 ChromitAL TCP, 2024 Al, 85582C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3508-P	650 ChromitAL TCP, 2024 Al, 85582C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3509-P	650 ChromitAL TCP, 2024 Al, 85582C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3510-P	650 ChromitAL TCP, 2024 Al, 85582C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3511-P	650 ChromitAL TCP, 2024 Al, 85582C, #6	Water resistance - 4 day test	Slight color change – darker olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3512-P	650 ChromitAL TCP, 2024 Al, 85582C, #7	Water resistance - 4 day test	Slight color change – darker olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3513-P	650 ChromitAL TCP, 2024 Al, 85582C, #8	Water resistance - 4 day test	Slight color change – darker olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3514-P	650 ChromitAL TCP, 2024 Al, 85582C, #9	Water resistance - 4 day test	Slight color change – darker olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3515-P	650 ChromitAL TCP, 2024 Al, 85582C, #10	Water resistance - 4 day test	Slight color change – darker olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3516-P	650 ChromitAL TCP, 2024 Al, 85582N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3517-P	650 ChromitAL TCP, 2024 Al, 85582N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3518-P	650 ChromitAL TCP, 2024 Al, 85582N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3519-P	650 ChromitAL TCP, 2024 Al, 85582N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3520-P	650 ChromitAL TCP, 2024 Al, 85582N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3521-P	650 ChromitAL TCP, 2024 Al, 85582N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3522-P	650 ChromitAL TCP, 2024 Al, 85582N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3523-P	650 ChromitAL TCP, 2024 Al, 85582N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3524-P	650 ChromitAL TCP, 2024 Al, 85582N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3525-P	650 ChromitAL TCP, 2024 Al, 85582N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3526-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/8” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3527-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/8” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3528-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/2” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3529-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/2” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3530-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3531-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3532-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3533-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3534-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3535-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3536-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3537-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3538-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3539-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3540-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3541-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	9 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3542-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	6 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3543-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	13 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3544-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	7 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3545-P	650 ChromitAL TCP, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	14 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3546-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/16” area	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3547-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/16” area	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3548-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3549-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3550-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3551-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3552-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3553-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3554-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3555-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3556-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 1848-2016 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3557-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 1848-2016 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3558-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 1008-1176 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3559-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 No Noticeable adhesion loss (blistering)	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3560-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3561-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	114 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3562-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	86 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3563-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	99 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3564-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	97 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3565-P	650 ChromitAL TCP, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	80 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3566-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3567-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3568-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3569-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3570-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Rating 3 – jagged removal along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3571-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3572-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3573-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3574-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3575-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3576-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3577-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 No Noticeable adhesion loss (blistering)	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3578-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3579-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3580-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3581-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3582-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 5/32”	ASTM D2803	1/2/07 / TH

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06-3583-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3584-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3585-P	650 ChromitAL TCP, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Length from – 1/32” to 5/32”	ASTM D2803	1/2/07 / TH
06-3586-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal; ~ 1/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3587-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3588-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3589-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3590-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3591-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3592-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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06-3593-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3594-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3595-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3596-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 504-672 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-3597-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1 st Corrosion @ 504-672 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-3598-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1 st Corrosion @ 336-504 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH

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06-3599-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1 st Corrosion @ 504-672 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-3600-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1 st Corrosion @ 336-504 hours	ASTM B117	3/12/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	3/12/07 / TH
06-3601-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	73 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-3602-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	56 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-3603-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	86 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/24/07 / TH
06-3604-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	58 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/24/07 / TH
06-3605-P	650 ChromitAL TCP, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	49 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/24/07 / TH
06-3606-P	650 ChromitAL TCP, 6061 Al, Powder, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3607-P	650 ChromitAL TCP, 6061 Al, Powder, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3608-P	650 ChromitAL TCP, 6061 Al, Powder, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3609-P	650 ChromitAL TCP, 6061 Al, Powder, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3610-P	650 ChromitAL TCP, 6061 Al, Powder, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3611-P	650 ChromitAL TCP, 6061 Al, Powder, #6	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-3612-P	650 ChromitAL TCP, 6061 Al, Powder, #7	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-3613-P	650 ChromitAL TCP, 6061 Al, Powder, #8	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-3614-P	650 ChromitAL TCP, 6061 Al, Powder, #9	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-3615-P	650 ChromitAL TCP, 6061 Al, Powder, #10	Dry tape adhesion	5A – Pass	ASTM D3359	11/1/06 / BD
06-3616-P	650 ChromitAL TCP, 6061 Al, Powder, #11	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3617-P	650 ChromitAL TCP, 6061 Al, Powder, #12	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3618-P	650 ChromitAL TCP, 6061 Al, Powder, #13	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3619-P	650 ChromitAL TCP, 6061 Al, Powder, #14	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3620-P	650 ChromitAL TCP, 6061 Al, Powder, #15	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3621-P	650 ChromitAL TCP, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3622-P	650 ChromitAL TCP, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3623-P	650 ChromitAL TCP, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3624-P	650 ChromitAL TCP, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3625-P	650 ChromitAL TCP, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3626-P	650 ChromitAL TCP, 6061 Al, Powder, #21	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3627-P	650 ChromitAL TCP, 6061 Al, Powder, #22	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3628-P	650 ChromitAL TCP, 6061 Al, Powder, #23	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3629-P	650 ChromitAL TCP, 6061 Al, Powder, #24	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3630-P	650 ChromitAL TCP, 6061 Al, Powder, #25	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3631-P	650 ChromitAL TCP, 6061 Al, Powder, #26	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3632-P	650 ChromitAL TCP, 6061 Al, Powder, #27	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3633-P	650 ChromitAL TCP, 6061 Al, Powder, #28	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3634-P	650 ChromitAL TCP, 6061 Al, Powder, #29	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3635-P	650 ChromitAL TCP, 6061 Al, Powder, #30	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3636-P	650 ChromitAL TCP, 6061 Al, Powder, #31	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3637-P	650 ChromitAL TCP, 6061 Al, Powder, #32	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3638-P	650 ChromitAL TCP, 6061 Al, Powder, #33	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3639-P	650 ChromitAL TCP, 6061 Al, Powder, #34	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH
06-3640-P	650 ChromitAL TCP, 6061 Al, Powder, #35	SO2 corrosion	Rating = 10 No Corrosion	ASTM D1654	1/9/07 / TH

Reviewed By: Lynn Summerson	Date: 4/19/07
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Notes:

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3641-P	Aluminescent TCP, 2024 Al, no coating, #1	Appearance	Shiny, iridescent, even coating; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3642-P	Aluminescent TCP, 2024 Al, no coating, #2	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3643-P	Aluminescent TCP, 2024 Al, no coating, #3	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3644-P	Aluminescent TCP, 2024 Al, no coating, #4	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3645-P	Aluminescent TCP, 2024 Al, no coating, #5	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3646-P	Aluminescent TCP, 2024 Al, no coating, #6	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 1 st corrosion @72-96 hours 76 pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3647-P	Aluminescent TCP, 2024 Al, no coating, #7	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 1 st corrosion @48-72 hours ~100 pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3648-P	Aluminescent TCP, 2024 Al, no coating, #8	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; numerous scratches in the middle of the panel	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 7 1 st corrosion @48-72 hours 79 pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3649-P	Aluminescent TCP, 2024 Al, no coating, #9	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; numerous scratches in the middle of the panel	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 8 1 st corrosion @48-72 hours 42 pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3650-P	Aluminescent TCP, 2024 Al, no coating, #10	Appearance	Shiny, iridescent coating; coating appears to be light along edge opposite the hole; numerous scratches in the middle of the panel	MIL-C-5541	9/11/06 / SH
		Corrosion resistance – 168 hrs	Rating = 7 1 st corrosion @24-48 hours 59 pits Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-3651-P	Aluminescent TCP, 2024 Al, 23377C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3652-P	Aluminescent TCP, 2024 Al, 23377C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3653-P	Aluminescent TCP, 2024 Al, 23377C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3654-P	Aluminescent TCP, 2024 Al, 23377C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3655-P	Aluminescent TCP, 2024 Al, 23377C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3656-P	Aluminescent TCP, 2024 Al, 23377C, #6	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3657-P	Aluminescent TCP, 2024 Al, 23377C, #7	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3658-P	Aluminescent TCP, 2024 Al, 23377C, #8	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3659-P	Aluminescent TCP, 2024 Al, 23377C, #9	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3660-P	Aluminescent TCP, 2024 Al, 23377C, #10	Water resistance - 4 day test	Slight color change – dull light yellow green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3661-P	Aluminescent TCP, 2024 Al, 23377N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3662-P	Aluminescent TCP, 2024 Al, 23377N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3663-P	Aluminescent TCP, 2024 Al, 23377N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3664-P	Aluminescent TCP, 2024 Al, 23377N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3665-P	Aluminescent TCP, 2024 Al, 23377N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3666-P	Aluminescent TCP, 2024 Al, 23377N, #6	Water resistance - 4 day test	Color changed to a faded light olive green color with small mint color spots	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3667-P	Aluminescent TCP, 2024 Al, 23377N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3668-P	Aluminescent TCP, 2024 Al, 23377N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3669-P	Aluminescent TCP, 2024 Al, 23377N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3670-P	Aluminescent TCP, 2024 Al, 23377N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3671-P	Aluminescent TCP, 2024 Al, 85582C, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3672-P	Aluminescent TCP, 2024 Al, 85582C, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3673-P	Aluminescent TCP, 2024 Al, 85582C, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3674-P	Aluminescent TCP, 2024 Al, 85582C, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3675-P	Aluminescent TCP, 2024 Al, 85582C, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3676-P	Aluminescent TCP, 2024 Al, 85582C, #6	Water resistance - 4 day test	No changes – dull light olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3677-P	Aluminescent TCP, 2024 Al, 85582C, #7	Water resistance - 4 day test	No changes – dull light olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3678-P	Aluminescent TCP, 2024 Al, 85582C, #8	Water resistance - 4 day test	No changes – dull light olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3679-P	Aluminescent TCP, 2024 Al, 85582C, #9	Water resistance - 4 day test	No changes – dull light olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3680-P	Aluminescent TCP, 2024 Al, 85582C, #10	Water resistance - 4 day test	No changes – dull light olive green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3681-P	Aluminescent TCP, 2024 Al, 85582N, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3682-P	Aluminescent TCP, 2024 Al, 85582N, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3683-P	Aluminescent TCP, 2024 Al, 85582N, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3684-P	Aluminescent TCP, 2024 Al, 85582N, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3685-P	Aluminescent TCP, 2024 Al, 85582N, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3686-P	Aluminescent TCP, 2024 Al, 85582N, #6	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3687-P	Aluminescent TCP, 2024 Al, 85582N, #7	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3688-P	Aluminescent TCP, 2024 Al, 85582N, #8	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3689-P	Aluminescent TCP, 2024 Al, 85582N, #9	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3690-P	Aluminescent TCP, 2024 Al, 85582N, #10	Water resistance - 4 day test	Slight color change – dull mint green color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3691-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal with tape; 3/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3692-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3693-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3694-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal with tape; 3/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3695-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal with tape; 3/16” area removed during scribing	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3696-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3697-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3698-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3699-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3700-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3701-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3702-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3703-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3704-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3705-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3706-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	7 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3707-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	5 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3708-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	16 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3709-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	13 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3710-P	Aluminescent TCP, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	14 Filaments Length from – 1/32” to 1/32”	ASTM D2803	1/2/07 / TH
06-3711-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3712-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3713-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3714-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3715-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3716-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3717-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3718-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3719-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3720-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3721-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 840-1008 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3722-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 840-1008 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3723-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 9 1st Corrosion @ 840-1008 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3724-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3725-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3726-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	98 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3727-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	107 Filaments Length from – 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3728-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	107 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3729-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	93 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3730-P	Aluminescent TCP, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	103 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3731-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Rating 4 – trace peeling along scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3732-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3733-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3734-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3735-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3736-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3737-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3738-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3739-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3740-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3741-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3742-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3743-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3744-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3745-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3746-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Lengths from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3747-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Lengths from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3748-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Lengths from 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3749-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Lengths from 1/32” to 1/8”	ASTM D2803	1/2/07 / TH
06-3750-P	Aluminescent TCP, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Filaments – too numerous to count Lengths from 1/32” to 1/4”	ASTM D2803	1/2/07 / TH
06-3751-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3752-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3753-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3754-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Rating 4 – trace peeling along scribe; ~ 1/16” area removed during scribe	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3755-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3756-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3757-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3758-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3759-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3760-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	No change – shiny white color	MIL-PRF-85582D	10/20/06 to 12/15/06 / SH
06-3761-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #11	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3762-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #12	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3763-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #13	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 504-672 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3764-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #14	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3765-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #15	Corrosion Resistance – 2000 hrs	Scribed Area – Rating = 8 1st Corrosion @ 672-840 hours	ASTM B117	1/16/07 / TH
			Unscribed Area – Rating = 10 No Corrosion	ASTM B117	1/16/07 / TH
06-3766-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	86 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3767-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	73 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3768-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	87 Filaments Length from – 1/32” to 1/16”	ASTM D2803	1/2/07 / TH
06-3769-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	95 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3770-P	Aluminescent TCP, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	110 Filaments Length from – 1/32” to 3/32”	ASTM D2803	1/2/07 / TH
06-3771-P	Aluminescent TCP, 6061 Al, Powder, #1	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3772-P	Aluminescent TCP, 6061 Al, Powder, #2	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3773-P	Aluminescent TCP, 6061 Al, Powder, #3	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3774-P	Aluminescent TCP, 6061 Al, Powder, #4	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3775-P	Aluminescent TCP, 6061 Al, Powder, #5	Wet tape adhesion	Rating 5 – no peeling or removal	MIL-PRF-85582D	10/24/06 to 12/20/06 / SH
06-3776-P	Aluminescent TCP, 6061 Al, Powder, #6	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3777-P	Aluminescent TCP, 6061 Al, Powder, #7	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3778-P	Aluminescent TCP, 6061 Al, Powder, #8	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3779-P	Aluminescent TCP, 6061 Al, Powder, #9	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3780-P	Aluminescent TCP, 6061 Al, Powder, #10	Dry tape adhesion	5A – Pass	ASTM D3359	10/17/06 / BD
06-3781-P	Aluminescent TCP, 6061 Al, Powder, #11	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3782-P	Aluminescent TCP, 6061 Al, Powder, #12	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3783-P	Aluminescent TCP, 6061 Al, Powder, #13	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3784-P	Aluminescent TCP, 6061 Al, Powder, #14	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3785-P	Aluminescent TCP, 6061 Al, Powder, #15	Humidity - 400 hrs	Rating = 10 No Corrosion	ASTM B117	12/12/06 / TH
06-3786-P	Aluminescent TCP, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing No chalking, cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3787-P	Aluminescent TCP, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing No chalking, cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3788-P	Aluminescent TCP, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing No chalking, cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3789-P	Aluminescent TCP, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing No chalking, cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3790-P	Aluminescent TCP, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing No chalking, cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3791-P	Aluminescent TCP, 6061 Al, Powder, #21	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3792-P	Aluminescent TCP, 6061 Al, Powder, #22	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3793-P	Aluminescent TCP, 6061 Al, Powder, #23	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3794-P	Aluminescent TCP, 6061 Al, Powder, #24	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3795-P	Aluminescent TCP, 6061 Al, Powder, #25	Heat resistance	No Change	FED-STD-141 – Method 6051	10/23/06 / BD
06-3796-P	Aluminescent TCP, 6061 Al, Powder, #26	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3797-P	Aluminescent TCP, 6061 Al, Powder, #27	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3798-P	Aluminescent TCP, 6061 Al, Powder, #28	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3799-P	Aluminescent TCP, 6061 Al, Powder, #29	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3800-P	Aluminescent TCP, 6061 Al, Powder, #30	Thermal shock	No Change	SCD 6500168, 4.4.2.7	10/24/06 / BD
06-3801-P	Aluminescent TCP, 6061 Al, Powder, #31	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3802-P	Aluminescent TCP, 6061 Al, Powder, #32	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3803-P	Aluminescent TCP, 6061 Al, Powder, #33	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH
06-3804-P	Aluminescent TCP, 6061 Al, Powder, #34	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH

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Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06 Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3805-P	Aluminescent TCP, 6061 Al, Powder, #35	SO2 corrosion	Rating = 10 No corrosion	ASTM D1654	1/9/07 / TH

Reviewed By: Lynn Summerson	Date: 4/19/07
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Notes:

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2981-P	Alodine 5200, 2024 Al, no coating, #1	Appearance	Shiny, matte finish; panel appears to have a yellowish streak from center to bottom of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2982-P	Alodine 5200, 2024 Al, no coating, #2	Appearance	Shiny, matte finish; panel appears to have a yellowish streak from center to bottom of panel; a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2983-P	Alodine 5200, 2024 Al, no coating, #3	Appearance	Shiny, matte finish, iridescent coating; generally even coating; a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2984-P	Alodine 5200, 2024 Al, no coating, #4	Appearance	Shiny, matte finish, iridescent coating; generally even coating; numerous scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-2985-P	Alodine 5200, 2024 Al, no coating, #5	Appearance	Shiny, matte finish, iridescent coating; generally even coating; coating appears to be heavier at bottom of panel, a few scratches	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

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Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2986-P	Alodine 5200, 2024 Al, no coating, #6	Appearance	Shiny, matte finish, iridescent coating; generally even coating; coating appears to be heavier at bottom of panel, a few scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 3 1 st corrosion @ 0-24 hours Pits – Too numerous to count Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-2987-P	Alodine 5200, 2024 Al, no coating, #7	Appearance	Shiny, matte finish, iridescent coating; generally even coating; coating appears to be heavier at bottom of panel, a few scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 3 1 st corrosion @ 0-24 hours Pits – Too numerous to count Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-2988-P	Alodine 5200, 2024 Al, no coating, #8	Appearance	Shiny, matte finish, iridescent coating; generally even coating; numerous scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 4 1 st corrosion @ 0-24 hours Pits – Too numerous to count Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH

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Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2989-P	Alodine 5200, 2024 Al, no coating, #9	Appearance	Shiny, matte finish, iridescent coating; generally even coating; numerous scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 3 1 st corrosion @ 0-24 hours Pits – Too numerous to count Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-2990-P	Alodine 5200, 2024 Al, no coating, #10	Appearance	Shiny, matte finish, iridescent coating; generally even coating; numerous scratches	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 3 1 st corrosion @ 0-24 hours Pits – Too numerous to count Pitting / White Corrosion Product	ASTM B117	10/3/06 / TH
06-2991-P	Alodine 5200, 2024 Al, 23377C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-2992-P	Alodine 5200, 2024 Al, 23377C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-2993-P	Alodine 5200, 2024 Al, 23377C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-2994-P	Alodine 5200, 2024 Al, 23377C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-2995-P	Alodine 5200, 2024 Al, 23377C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-2996-P	Alodine 5200, 2024 Al, 23377C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-2997-P	Alodine 5200, 2024 Al, 23377C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-2998-P	Alodine 5200, 2024 Al, 23377C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-2999-P	Alodine 5200, 2024 Al, 23377C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3000-P	Alodine 5200, 2024 Al, 23377C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3001-P	Alodine 5200, 2024 Al, 23377N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3002-P	Alodine 5200, 2024 Al, 23377N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3003-P	Alodine 5200, 2024 Al, 23377N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3004-P	Alodine 5200, 2024 Al, 23377N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3005-P	Alodine 5200, 2024 Al, 23377N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3006-P	Alodine 5200, 2024 Al, 23377N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3007-P	Alodine 5200, 2024 Al, 23377N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3008-P	Alodine 5200, 2024 Al, 23377N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3009-P	Alodine 5200, 2024 Al, 23377N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3010-P	Alodine 5200, 2024 Al, 23377N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3011-P	Alodine 5200, 2024 Al, 85582C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3012-P	Alodine 5200, 2024 Al, 85582C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3013-P	Alodine 5200, 2024 Al, 85582C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3014-P	Alodine 5200, 2024 Al, 85582C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3015-P	Alodine 5200, 2024 Al, 85582C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3016-P	Alodine 5200, 2024 Al, 85582C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3017-P	Alodine 5200, 2024 Al, 85582C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3018-P	Alodine 5200, 2024 Al, 85582C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3019-P	Alodine 5200, 2024 Al, 85582C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3020-P	Alodine 5200, 2024 Al, 85582C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3021-P	Alodine 5200, 2024 Al, 85582N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3022-P	Alodine 5200, 2024 Al, 85582N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3023-P	Alodine 5200, 2024 Al, 85582N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3024-P	Alodine 5200, 2024 Al, 85582N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3025-P	Alodine 5200, 2024 Al, 85582N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3026-P	Alodine 5200, 2024 Al, 85582N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3027-P	Alodine 5200, 2024 Al, 85582N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3028-P	Alodine 5200, 2024 Al, 85582N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3029-P	Alodine 5200, 2024 Al, 85582N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3030-P	Alodine 5200, 2024 Al, 85582N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3031-P	Alodine 5200, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3032-P	Alodine 5200, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3033-P	Alodine 5200, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3034-P	Alodine 5200, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3035-P	Alodine 5200, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3036-P	Alodine 5200, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3037-P	Alodine 5200, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3038-P	Alodine 5200, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3039-P	Alodine 5200, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3040-P	Alodine 5200, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3041-P	Alodine 5200, 2024 Al, 23377C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3042-P	Alodine 5200, 2024 Al, 23377C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3043-P	Alodine 5200, 2024 Al, 23377C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3044-P	Alodine 5200, 2024 Al, 23377C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3045-P	Alodine 5200, 2024 Al, 23377C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3046-P	Alodine 5200, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3047-P	Alodine 5200, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3048-P	Alodine 5200, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3049-P	Alodine 5200, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3050-P	Alodine 5200, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3051-P	Alodine 5200, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3052-P	Alodine 5200, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3053-P	Alodine 5200, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3054-P	Alodine 5200, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3055-P	Alodine 5200, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3056-P	Alodine 5200, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3057-P	Alodine 5200, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3058-P	Alodine 5200, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3059-P	Alodine 5200, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3060-P	Alodine 5200, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3061-P	Alodine 5200, 2024 Al, 23377N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3062-P	Alodine 5200, 2024 Al, 23377N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3063-P	Alodine 5200, 2024 Al, 23377N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3064-P	Alodine 5200, 2024 Al, 23377N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3065-P	Alodine 5200, 2024 Al, 23377N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3066-P	Alodine 5200, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3067-P	Alodine 5200, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3068-P	Alodine 5200, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3069-P	Alodine 5200, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3070-P	Alodine 5200, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3071-P	Alodine 5200, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3072-P	Alodine 5200, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3073-P	Alodine 5200, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3074-P	Alodine 5200, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3075-P	Alodine 5200, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3076-P	Alodine 5200, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3077-P	Alodine 5200, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3078-P	Alodine 5200, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3079-P	Alodine 5200, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3080-P	Alodine 5200, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3081-P	Alodine 5200, 2024 Al, 85582C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3082-P	Alodine 5200, 2024 Al, 85582C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3083-P	Alodine 5200, 2024 Al, 85582C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3084-P	Alodine 5200, 2024 Al, 85582C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3085-P	Alodine 5200, 2024 Al, 85582C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3086-P	Alodine 5200, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3087-P	Alodine 5200, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

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Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3088-P	Alodine 5200, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3089-P	Alodine 5200, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3090-P	Alodine 5200, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3091-P	Alodine 5200, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3092-P	Alodine 5200, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3093-P	Alodine 5200, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3094-P	Alodine 5200, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3095-P	Alodine 5200, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3096-P	Alodine 5200, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3097-P	Alodine 5200, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3098-P	Alodine 5200, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3099-P	Alodine 5200, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3100-P	Alodine 5200, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3101-P	Alodine 5200, 2024 Al, 85582N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3102-P	Alodine 5200, 2024 Al, 85582N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		

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06-3103-P	Alodine 5200, 2024 Al, 85582N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3104-P	Alodine 5200, 2024 Al, 85582N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3105-P	Alodine 5200, 2024 Al, 85582N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3106-P	Alodine 5200, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3107-P	Alodine 5200, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3108-P	Alodine 5200, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3109-P	Alodine 5200, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3110-P	Alodine 5200, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3111-P	Alodine 5200, 6061 Al, Powder, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3112-P	Alodine 5200, 6061 Al, Powder, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3113-P	Alodine 5200, 6061 Al, Powder, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3114-P	Alodine 5200, 6061 Al, Powder, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3115-P	Alodine 5200, 6061 Al, Powder, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3116-P	Alodine 5200, 6061 Al, Powder, #6	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3117-P	Alodine 5200, 6061 Al, Powder, #7	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3118-P	Alodine 5200, 6061 Al, Powder, #8	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3119-P	Alodine 5200, 6061 Al, Powder, #9	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3120-P	Alodine 5200, 6061 Al, Powder, #10	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3121-P	Alodine 5200, 6061 Al, Powder, #11	Humidity - 400 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3122-P	Alodine 5200, 6061 Al, Powder, #12	Humidity - 400 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3123-P	Alodine 5200, 6061 Al, Powder, #13	Humidity - 400 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3124-P	Alodine 5200, 6061 Al, Powder, #14	Humidity - 400 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3125-P	Alodine 5200, 6061 Al, Powder, #15	Humidity - 400 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3126-P	Alodine 5200, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3127-P	Alodine 5200, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3128-P	Alodine 5200, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3129-P	Alodine 5200, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3130-P	Alodine 5200, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight chalking No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3131-P	Alodine 5200, 6061 Al, Powder, #21	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3132-P	Alodine 5200, 6061 Al, Powder, #22	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3133-P	Alodine 5200, 6061 Al, Powder, #23	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3134-P	Alodine 5200, 6061 Al, Powder, #24	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3135-P	Alodine 5200, 6061 Al, Powder, #25	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3136-P	Alodine 5200, 6061 Al, Powder, #26	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3137-P	Alodine 5200, 6061 Al, Powder, #27	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3138-P	Alodine 5200, 6061 Al, Powder, #28	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3139-P	Alodine 5200, 6061 Al, Powder, #29	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3140-P	Alodine 5200, 6061 Al, Powder, #30	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3141-P	Alodine 5200, 6061 Al, Powder, #31	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3142-P	Alodine 5200, 6061 Al, Powder, #32	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3143-P	Alodine 5200, 6061 Al, Powder, #33	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3144-P	Alodine 5200, 6061 Al, Powder, #34	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3145-P	Alodine 5200, 6061 Al, Powder, #35	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		

Reviewed By: Lynn Summerson	Date: 4/4/07
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Notes:

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3806-P	PreKote NCP, 2024 Al, no coating, #1	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3807-P	PreKote NCP, 2024 Al, no coating, #2	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3808-P	PreKote NCP, 2024 Al, no coating, #3	Appearance	Shiny, scuff-sanded appearance; coating is streaked along bottom half of panel	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3809-P	PreKote NCP, 2024 Al, no coating, #4	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3810-P	PreKote NCP, 2024 Al, no coating, #5	Appearance	Shiny, scuff-sanded appearance; coating is streaked along length of the panel (to the right of hole)	MIL-C-5541	9/19/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3811-P	PreKote NCP, 2024 Al, no coating, #6	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 0 1 st corrosion @ 0-24 hours Pits – To Numerous to Count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3812-P	PreKote NCP, 2024 Al, no coating, #7	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 0 1 st corrosion @ 0-24 hours Pits – To Numerous to Count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3813-P	PreKote NCP, 2024 Al, no coating, #8	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 0 1 st corrosion @ 0-24 hours Pits – To Numerous to Count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3814-P	PreKote NCP, 2024 Al, no coating, #9	Appearance	Shiny, scuff-sanded appearance; coating is streaked along length of panel (left of hole) and the bottom edge	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 0 1 st corrosion @ 0-24 hours Pits – To Numerous to Count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3815-P	PreKote NCP, 2024 Al, no coating, #10	Appearance	Shiny, scuff-sanded appearance	MIL-C-5541	9/19/06 / SH
		Corrosion resistance - 168 hrs	Rating = 0 1 st corrosion @ 0-24 hours Pits – To Numerous to Count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3816-P	PreKote NCP, 2024 Al, 23377C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3817-P	PreKote NCP, 2024 Al, 23377C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3818-P	PreKote NCP, 2024 Al, 23377C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3819-P	PreKote NCP, 2024 Al, 23377C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3820-P	PreKote NCP, 2024 Al, 23377C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3821-P	PreKote NCP, 2024 Al, 23377C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3822-P	PreKote NCP, 2024 Al, 23377C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3823-P	PreKote NCP, 2024 Al, 23377C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3824-P	PreKote NCP, 2024 Al, 23377C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3825-P	PreKote NCP, 2024 Al, 23377C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3826-P	PreKote NCP, 2024 Al, 23377N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3827-P	PreKote NCP, 2024 Al, 23377N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3828-P	PreKote NCP, 2024 Al, 23377N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3829-P	PreKote NCP, 2024 Al, 23377N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3830-P	PreKote NCP, 2024 Al, 23377N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3831-P	PreKote NCP, 2024 Al, 23377N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3832-P	PreKote NCP, 2024 Al, 23377N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3833-P	PreKote NCP, 2024 Al, 23377N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3834-P	PreKote NCP, 2024 Al, 23377N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3835-P	PreKote NCP, 2024 Al, 23377N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3836-P	PreKote NCP, 2024 Al, 85582C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3837-P	PreKote NCP, 2024 Al, 85582C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3838-P	PreKote NCP, 2024 Al, 85582C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3839-P	PreKote NCP, 2024 Al, 85582C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3840-P	PreKote NCP, 2024 Al, 85582C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3841-P	PreKote NCP, 2024 Al, 85582C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3842-P	PreKote NCP, 2024 Al, 85582C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3843-P	PreKote NCP, 2024 Al, 85582C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3844-P	PreKote NCP, 2024 Al, 85582C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3845-P	PreKote NCP, 2024 Al, 85582C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3846-P	PreKote NCP, 2024 Al, 85582N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3847-P	PreKote NCP, 2024 Al, 85582N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3848-P	PreKote NCP, 2024 Al, 85582N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3849-P	PreKote NCP, 2024 Al, 85582N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3850-P	PreKote NCP, 2024 Al, 85582N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3851-P	PreKote NCP, 2024 Al, 85582N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3852-P	PreKote NCP, 2024 Al, 85582N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3853-P	PreKote NCP, 2024 Al, 85582N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3854-P	PreKote NCP, 2024 Al, 85582N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3855-P	PreKote NCP, 2024 Al, 85582N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3856-P	PreKote NCP, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3857-P	PreKote NCP, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3858-P	PreKote NCP, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3859-P	PreKote NCP, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3860-P	PreKote NCP, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3861-P	PreKote NCP, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3862-P	PreKote NCP, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3863-P	PreKote NCP, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3864-P	PreKote NCP, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3865-P	PreKote NCP, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3866-P	PreKote NCP, 2024 Al, 23377C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts	01616.1.10
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3867-P	PreKote NCP, 2024 Al, 23377C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3868-P	PreKote NCP, 2024 Al, 23377C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3869-P	PreKote NCP, 2024 Al, 23377C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3870-P	PreKote NCP, 2024 Al, 23377C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3871-P	PreKote NCP, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3872-P	PreKote NCP, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3873-P	PreKote NCP, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3874-P	PreKote NCP, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3875-P	PreKote NCP, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3876-P	PreKote NCP, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3877-P	PreKote NCP, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3878-P	PreKote NCP, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3879-P	PreKote NCP, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3880-P	PreKote NCP, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3881-P	PreKote NCP, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3882-P	PreKote NCP, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3883-P	PreKote NCP, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3884-P	PreKote NCP, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3885-P	PreKote NCP, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3886-P	PreKote NCP, 2024 Al, 23377N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3887-P	PreKote NCP, 2024 Al, 23377N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3888-P	PreKote NCP, 2024 Al, 23377N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3889-P	PreKote NCP, 2024 Al, 23377N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3890-P	PreKote NCP, 2024 Al, 23377N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3891-P	PreKote NCP, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3892-P	PreKote NCP, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3893-P	PreKote NCP, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3894-P	PreKote NCP, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3895-P	PreKote NCP, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3896-P	PreKote NCP, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3897-P	PreKote NCP, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3898-P	PreKote NCP, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3899-P	PreKote NCP, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3900-P	PreKote NCP, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3901-P	PreKote NCP, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3902-P	PreKote NCP, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3903-P	PreKote NCP, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3904-P	PreKote NCP, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3905-P	PreKote NCP, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3906-P	PreKote NCP, 2024 Al, 85582C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3907-P	PreKote NCP, 2024 Al, 85582C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3908-P	PreKote NCP, 2024 Al, 85582C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3909-P	PreKote NCP, 2024 Al, 85582C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3910-P	PreKote NCP, 2024 Al, 85582C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3911-P	PreKote NCP, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3912-P	PreKote NCP, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3913-P	PreKote NCP, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3914-P	PreKote NCP, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3915-P	PreKote NCP, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3916-P	PreKote NCP, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3917-P	PreKote NCP, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3918-P	PreKote NCP, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3919-P	PreKote NCP, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3920-P	PreKote NCP, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3921-P	PreKote NCP, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3922-P	PreKote NCP, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3923-P	PreKote NCP, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3924-P	PreKote NCP, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3925-P	PreKote NCP, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3926-P	PreKote NCP, 2024 Al, 85582N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3927-P	PreKote NCP, 2024 Al, 85582N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3928-P	PreKote NCP, 2024 Al, 85582N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3929-P	PreKote NCP, 2024 Al, 85582N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3930-P	PreKote NCP, 2024 Al, 85582N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3931-P	PreKote NCP, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3932-P	PreKote NCP, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3933-P	PreKote NCP, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3934-P	PreKote NCP, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3935-P	PreKote NCP, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3936-P	PreKote NCP, 6061 Al, Powder, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3937-P	PreKote NCP, 6061 Al, Powder, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3938-P	PreKote NCP, 6061 Al, Powder, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3939-P	PreKote NCP, 6061 Al, Powder, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3940-P	PreKote NCP, 6061 Al, Powder, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3941-P	PreKote NCP, 6061 Al, Powder, #6	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3942-P	PreKote NCP, 6061 Al, Powder, #7	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3943-P	PreKote NCP, 6061 Al, Powder, #8	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3944-P	PreKote NCP, 6061 Al, Powder, #9	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3945-P	PreKote NCP, 6061 Al, Powder, #10	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3946-P	PreKote NCP, 6061 Al, Powder, #11	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3947-P	PreKote NCP, 6061 Al, Powder, #12	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3948-P	PreKote NCP, 6061 Al, Powder, #13	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3949-P	PreKote NCP, 6061 Al, Powder, #14	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3950-P	PreKote NCP, 6061 Al, Powder, #15	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-3951-P	PreKote NCP, 6061 Al, Powder, #16	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight spotting No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3952-P	PreKote NCP, 6061 Al, Powder, #17	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight spotting No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3953-P	PreKote NCP, 6061 Al, Powder, #18	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight spotting No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3954-P	PreKote NCP, 6061 Al, Powder, #19	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight spotting; slight orange peel No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3955-P	PreKote NCP, 6061 Al, Powder, #20	Accelerated Weathering	Color = slight to moderate yellowing Chalking = slight spotting No cracking, blistering or flaking	ASTM D714 / ASTM D4214 / ASTM D1729 / ASTM D661	3/26/07 / Q -Lab
06-3956-P	PreKote NCP, 6061 Al, Powder, #21	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3957-P	PreKote NCP, 6061 Al, Powder, #22	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3958-P	PreKote NCP, 6061 Al, Powder, #23	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3959-P	PreKote NCP, 6061 Al, Powder, #24	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3960-P	PreKote NCP, 6061 Al, Powder, #25	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-3961-P	PreKote NCP, 6061 Al, Powder, #26	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3962-P	PreKote NCP, 6061 Al, Powder, #27	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3963-P	PreKote NCP, 6061 Al,	Thermal shock	Panels pulled 10/2/06 no		

PRODUCT ANALYSIS REPORT

	Powder, #28		further testing per PMt		
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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 3/28/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3964-P	PreKote NCP, 6061 Al, Powder, #29	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3965-P	PreKote NCP, 6061 Al, Powder, #30	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-3966-P	PreKote NCP, 6061 Al, Powder, #31	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3967-P	PreKote NCP, 6061 Al, Powder, #32	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3968-P	PreKote NCP, 6061 Al, Powder, #33	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
6-3969-P	PreKote NCP, 6061 Al, Powder, #34	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-3970-P	PreKote NCP, 6061 Al, Powder, #35	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		

Reviewed By: Lynn Summerson	Date: 4/4/07
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Notes:

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3971-P	PRIMORPH NCP, 2024 Al, no coating, #1	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3972-P	PRIMORPH NCP, 2024 Al, no coating, #2	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3973-P	PRIMORPH NCP, 2024 Al, no coating, #3	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3974-P	PRIMORPH NCP, 2024 Al, no coating, #4	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3975-P	PRIMORPH NCP, 2024 Al, no coating, #5	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a numerous deep scratches	MIL-C-5541	9/11/06 / SH
		Tape Adhesion (dry - Method A)	5A – Pass	ASTM D3359	9/22/06 / BD
06-3976-P	PRIMORPH NCP, 2024 Al, no coating, #6	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Corrosion resistance - 168 hrs	Rating = 5 1 st corrosion @ 24-48 hours Pits – Too numerous to count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3977-P	PRIMORPH NCP, 2024 Al, no coating, #7	Appearance	Shiny, iridescent coating; rainbow effect along edges and top of panel; coating appears to be light along bottom edge; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Corrosion resistance - 168 hrs	Rating = 5 1 st corrosion @ 24-48 hours Pits – Too numerous to count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3978-P	PRIMORPH NCP, 2024 Al, no coating, #8	Appearance	Shiny, iridescent coating; rainbow effect along edges and top of panel; coating appears to be light along bottom edge; a few scratches and pits	MIL-C-5541	9/11/06 / SH
		Corrosion resistance - 168 hrs	Rating = 5 1 st corrosion @ 24-48 hours Pits – Too numerous to count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3979-P	PRIMORPH NCP, 2024 Al, no coating, #9	Appearance	Shiny, iridescent coating; rainbow effect along edges and bottom of panel; coating appears to be light on top of panel; a numerous deep scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance - 168 hrs	Rating = 3 1 st corrosion @ 24-48 hours Pits – Too numerous to count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3980-P	PRIMORPH NCP, 2024 Al, no coating, #10	Appearance	Shiny, iridescent coating; rainbow effect over ¾ of panel,; a few scratches	MIL-C-5541	9/11/06 / SH
		Corrosion resistance - 168 hrs	Rating = 6 1 st corrosion @ 48-72 hours Pits – Too numerous to count Black Corrosion Product / White Corrosion Product / Pitting	ASTM B117	10/3/06 / TH
06-3981-P	PRIMORPH NCP, 2024 Al, 23377C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3982-P	PRIMORPH NCP, 2024 Al, 23377C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3983-P	PRIMORPH NCP, 2024 Al, 23377C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3984-P	PRIMORPH NCP, 2024 Al, 23377C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3985-P	PRIMORPH NCP, 2024 Al, 23377C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3986-P	PRIMORPH NCP, 2024 Al, 23377C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3987-P	PRIMORPH NCP, 2024 Al, 23377C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3988-P	PRIMORPH NCP, 2024 Al, 23377C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3989-P	PRIMORPH NCP, 2024 Al, 23377C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3990-P	PRIMORPH NCP, 2024 Al, 23377C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

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Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts	01616.1.10
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-3991-P	PRIMORPH NCP, 2024 Al, 23377N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3992-P	PRIMORPH NCP, 2024 Al, 23377N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3993-P	PRIMORPH NCP, 2024 Al, 23377N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3994-P	PRIMORPH NCP, 2024 Al, 23377N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3995-P	PRIMORPH NCP, 2024 Al, 23377N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-3996-P	PRIMORPH NCP, 2024 Al, 23377N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3997-P	PRIMORPH NCP, 2024 Al, 23377N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3998-P	PRIMORPH NCP, 2024 Al, 23377N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-3999-P	PRIMORPH NCP, 2024 Al, 23377N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4000-P	PRIMORPH NCP, 2024 Al, 23377N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4001-P	PRIMORPH NCP, 2024 Al, 85582C, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4002-P	PRIMORPH NCP, 2024 Al, 85582C, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4003-P	PRIMORPH NCP, 2024 Al, 85582C, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4004-P	PRIMORPH NCP, 2024 Al, 85582C, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4005-P	PRIMORPH NCP, 2024 Al, 85582C, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4006-P	PRIMORPH NCP, 2024 Al, 85582C, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4007-P	PRIMORPH NCP, 2024 Al, 85582C, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4008-P	PRIMORPH NCP, 2024 Al, 85582C, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4009-P	PRIMORPH NCP, 2024 Al, 85582C, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4010-P	PRIMORPH NCP, 2024 Al, 85582C, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4011-P	PRIMORPH NCP, 2024 Al, 85582N, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4012-P	PRIMORPH NCP, 2024 Al, 85582N, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4013-P	PRIMORPH NCP, 2024 Al, 85582N, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4014-P	PRIMORPH NCP, 2024 Al, 85582N, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4015-P	PRIMORPH NCP, 2024 Al, 85582N, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4016-P	PRIMORPH NCP, 2024 Al, 85582N, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4017-P	PRIMORPH NCP, 2024 Al, 85582N, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4018-P	PRIMORPH NCP, 2024 Al, 85582N, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4019-P	PRIMORPH NCP, 2024 Al, 85582N, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4020-P	PRIMORPH NCP, 2024 Al, 85582N, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4021-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4022-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4023-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4024-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4025-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4026-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4027-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4028-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4029-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4030-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4031-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4032-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4033-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4034-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4035-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4036-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4037-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4038-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4039-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4040-P	PRIMORPH NCP, 2024 Al, 23377C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4041-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4042-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4043-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4044-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4045-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4046-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4047-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4048-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4049-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4050-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4051-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4052-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4053-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4054-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4055-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4056-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4057-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4058-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4059-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4060-P	PRIMORPH NCP, 2024 Al, 23377N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4061-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4062-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4063-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4064-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4065-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4066-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4067-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4068-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4069-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4070-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4071-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4072-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4073-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4074-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4075-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4076-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4077-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4078-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4079-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4080-P	PRIMORPH NCP, 2024 Al, 85582C + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4081-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4082-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4083-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4084-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4085-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4086-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #6	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4087-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #7	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4088-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #8	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4089-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #9	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		
06-4090-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #10	Water resistance - 4 day test	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4091-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #11	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4092-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #12	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4093-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #13	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4094-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #14	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4095-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #15	Corrosion Resistance - 2000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4096-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #16	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4097-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #17	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4098-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #18	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4099-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #19	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4100-P	PRIMORPH NCP, 2024 Al, 85582N + 85285, #20	Filiform corrosion - 1000 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4101-P	PRIMORPH NCP, 6061 Al, Powder, #1	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4102-P	PRIMORPH NCP, 6061 Al, Powder, #2	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4103-P	PRIMORPH NCP, 6061 Al, Powder, #3	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4104-P	PRIMORPH NCP, 6061 Al, Powder, #4	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4105-P	PRIMORPH NCP, 6061 Al, Powder, #5	Wet tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4106-P	PRIMORPH NCP, 6061 Al, Powder, #6	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4107-P	PRIMORPH NCP, 6061 Al, Powder, #7	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4108-P	PRIMORPH NCP, 6061 Al, Powder, #8	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4109-P	PRIMORPH NCP, 6061 Al, Powder, #9	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4110-P	PRIMORPH NCP, 6061 Al, Powder, #10	Dry tape adhesion	Panels pulled 10/2/06 no further testing per PMt		
06-4111-P	PRIMORPH NCP, 6061 Al, Powder, #11	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4112-P	PRIMORPH NCP, 6061 Al, Powder, #12	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4113-P	PRIMORPH NCP, 6061 Al, Powder, #13	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4114-P	PRIMORPH NCP, 6061 Al, Powder, #14	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		
06-4115-P	PRIMORPH NCP, 6061 Al, Powder, #15	Humidity - 40 hrs	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4116-P	PRIMORPH NCP, 6061 Al, Powder, #16	Accelerated Weathering	Panels pulled 10/2/06 no further testing per PMt		
06-4117-P	PRIMORPH NCP, 6061 Al, Powder, #17	Accelerated Weathering	Panels pulled 10/2/06 no further testing per PMt		
06-4118-P	PRIMORPH NCP, 6061 Al, Powder, #18	Accelerated Weathering	Panels pulled 10/2/06 no further testing per PMt		
06-4119-P	PRIMORPH NCP, 6061 Al, Powder, #19	Accelerated Weathering	Panels pulled 10/2/06 no further testing per PMt		
06-4120-P	PRIMORPH NCP, 6061 Al, Powder, #20	Accelerated Weathering	Panels pulled 10/2/06 no further testing per PMt		
06-4121-P	PRIMORPH NCP, 6061 Al, Powder, #21	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-4122-P	PRIMORPH NCP, 6061 Al, Powder, #22	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-4123-P	PRIMORPH NCP, 6061 Al, Powder, #23	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-4124-P	PRIMORPH NCP, 6061 Al, Powder, #24	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-4125-P	PRIMORPH NCP, 6061 Al, Powder, #25	Heat resistance	Panels pulled 10/2/06 no further testing per PMt		
06-4126-P	PRIMORPH NCP, 6061 Al, Powder, #26	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-4127-P	PRIMORPH NCP, 6061 Al, Powder, #27	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-4128-P	PRIMORPH NCP, 6061 Al, Powder, #28	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-4129-P	PRIMORPH NCP, 6061 Al, Powder, #29	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		
06-4130-P	PRIMORPH NCP, 6061 Al, Powder, #30	Thermal shock	Panels pulled 10/2/06 no further testing per PMt		

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon – Chrome Alts 01616.1.10	
Requested By: L. Debias	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 12/29/06

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
06-4131-P	PRIMORPH NCP, 6061 Al, Powder, #31	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-4132-P	PRIMORPH NCP, 6061 Al, Powder, #32	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-4133-P	PRIMORPH NCP, 6061 Al, Powder, #33	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-4134-P	PRIMORPH NCP, 6061 Al, Powder, #34	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		
06-4135-P	PRIMORPH NCP, 6061 Al, Powder, #35	SO2 corrosion	Panels pulled 10/2/06 no further testing per PMt		

Reviewed By: Lynn Summerson	Date: 1/3/07
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Notes:

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon Missile Systems 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 9/19/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
07-2854-P	RA-CH-01 - 23377N primer (02GN083)	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2855-P	RA-CH-02 - 23377N primer (02GN083)	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2856-P	RA-CH-03 - 23377N primer (02GN083)	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2857-P	RA-CH-04 - 23377N primer (02GN083)	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2858-P	RA-CH-05 - 23377N primer (02GN083)	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2859-P	RA-CH-06 - 23377N primer (02GN083)	Water resistance	No change – shiny white color	MIL-PRF-85582D	6/25/07 / SH
07-2860-P	RA-CH-07 - 23377N primer (02GN083)	Water resistance	No change – shiny white color	MIL-PRF-85582D	6/25/07 / SH
07-2861-P	RA-CH-08 - 23377N primer (02GN083)	Water resistance	No change – shiny white color	MIL-PRF-85582D	6/25/07 / SH
07-2862-P	RA-CH-09 - 23377N primer (02GN083)	Water resistance	No change – shiny white color	MIL-PRF-85582D	6/25/07 / SH
07-2863-P	RA-CH-10 - 23377N primer (02GN083)	Water resistance	No change – shiny white color	MIL-PRF-85582D	6/25/07 / SH
07-2864-P	RA-CH-11 - 23377N (02GN083) + 85285 topcoat	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2865-P	RA-CH-12 - 23377N (02GN083) + 85285 topcoat	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2866-P	RA-CH-13 - 23377N (02GN083) + 85285 topcoat	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2867-P	RA-CH-14 - 23377N (02GN083) + 85285 topcoat	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon Missile Systems 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 9/19/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
07-2868-P	RA-CH-15 - 23377N (02GN083) + 85285 topcoat	Wet tape adhesion	Rating 5A – no peeling or removal	MIL-PRF-85582D	6/22/07 / SH
07-2869-P	RA-CH-16 - 23377N (02GN083) + 85285 topcoat	Water resistance	No change – dull gray color	MIL-PRF-85582D	6/25/07 / SH
07-2870-P	RA-CH-17 - 23377N (02GN083) + 85285 topcoat	Water resistance	No change – dull gray color	MIL-PRF-85582D	6/25/07 / SH
07-2871-P	RA-CH-18 - 23377N (02GN083) + 85285 topcoat	Water resistance	No change – dull gray color	MIL-PRF-85582D	6/25/07 / SH
07-2872-P	RA-CH-19 - 23377N (02GN083) + 85285 topcoat	Water resistance	No change – dull gray color	MIL-PRF-85582D	6/25/07 / SH
07-2873-P	RA-CH-20 - 23377N (02GN083) + 85285 topcoat	Water resistance	No change – dull gray color	MIL-PRF-85582D	6/25/07 / SH
07-2874-P	RA-CH-21 - 23377N (02GN083) + 85285 topcoat	2000 hr corrosion resistance Scribed Area	Rating = 9 1 st corrosion @ 1680-1848 hours	ASTM B117	9/13/07 / TH
		2000 hr corrosion resistance Unscribed Area	Rating = 10 No corrosion in the unscribed area	ASTM B117	9/13/07 / TH
07-2875-P	RA-CH-22 - 23377N (02GN083) + 85285 topcoat	2000 hr corrosion resistance Scribed Area	Rating = 9 1 st corrosion @ 1680-1848 hours	ASTM B117	9/13/07 / TH
		2000 hr corrosion resistance Unscribed Area	Rating = 10 No corrosion in the unscribed area	ASTM B117	9/13/07 / TH

PRODUCT ANALYSIS REPORT

Technology: Organic Finishing	Project Description: Raytheon Missile Systems 01616.1.10
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06 Report Date: 9/19/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
07-2876-P	RA-CH-23 - 23377N (02GN083) + 85285 topcoat	2000 hr corrosion resistance Scribed Area	Rating = 9 1 st corrosion @ 1680-1848 hours	ASTM B117	9/13/07 / TH
		2000 hr corrosion resistance Unscribed Area	Rating = 10 No corrosion in the unscribed area	ASTM B117	9/13/07 / TH
07-2877-P	RA-CH-24 - 23377N (02GN083) + 85285 topcoat	2000 hr corrosion resistance Scribed Area	Rating = 9 1 st corrosion @ 1172-1344 hours	ASTM B117	9/13/07 / TH
		2000 hr corrosion resistance Unscribed Area	Rating = 10 No corrosion in the unscribed area	ASTM B117	9/13/07 / TH
07-2878-P	RA-CH-25 - 23377N (02GN083) + 85285 topcoat	2000 hr corrosion resistance Scribed Area	Rating = 9 1 st corrosion @ 1680-1848 hours	ASTM B117	9/13/07 / TH
		2000 hr corrosion resistance Unscribed Area	Rating = 10 No corrosion in the unscribed area	ASTM B117	9/13/07 / TH
07-2879-P	RA-CH-26 - 23377N (02GN083) + 85285 topcoat	Filiform corrosion	116 filaments Length from – 1/32” to 3/32”	ASTM D2803	8/7/07 / TH
07-2880-P	RA-CH-27 - 23377N (02GN083) + 85285 topcoat	Filiform corrosion	135 filaments Length from – 1/32” to 1/8”	ASTM D2803	8/7/07 / TH
07-2881-P	RA-CH-28 - 23377N (02GN083) + 85285 topcoat	Filiform corrosion	117 filaments Length from – 1/32” to 5/32”	ASTM D2803	8/7/07 / TH

PRODUCT ANALYSIS REPORT








Technology: Organic Finishing	Project Description: Raytheon Missile Systems 01616.1.10	
Requested By: J. Arthur	Demonstration Plan ID/Work Order No.: WO-264-06	Report Date: 9/19/07

Lab Sample ID	Customer Sample Description/ID	Test Parameter	Test Result	Test Method	Date/Initials Lab Analyst/Scientist
07-2882-P	RA-CH-29 - 23377N (02GN083) + 85285 topcoat	Filiform corrosion	137 filaments Length from – 1/32” to 3/32”	ASTM D2803	8/7/07 / TH
07-2883-P	RA-CH-30 - 23377N (02GN083) + 85285 topcoat	Filiform corrosion	136 filaments Length from – 1/32” to 3/32”	ASTM D2803	8/7/07 / TH

Reviewed By: Lynn Summerson	Date: 9/24/07
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Notes:

APPENDIX B
CERTIFICATION LETTERS

Product	Certification Letter
Alodine T5900	 Henkel 5900 QPL Letter.pdf
Metalast TCP-HF	 Metalast - QPL Letter B.pdf
SurTec 650 ChromitAL	 SurTec - QPL Letter B.pdf
Luster-On Aluminiscent	 Adobe Acrobat 7.0 Document
MIL-PRF-85582, Class N (Deft)	 44GN098Letter.pdf
MIL-PRF-23377, Class N (Deft – 02GN083)	 02GN083Letter.pdf
MIL-PRF-23377, Class N (Deft – 02GN084)	 02GN084Letter.pdf



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
47123 BUSE ROAD, UNIT # _____
PATUXENT RIVER, MD 20670-1547

IN REPLY REFER TO

4123
Ser 497200A/7.4922
31 OCT 2006

Henkel Surface Technologies
Attn: Mr. Walter Opdycke
32100 Stephenson Highway
Madison Heights, MI 48071

Dear Mr. Opdycke:

This letter is to inform you that Alodine T 5900 has met the qualification requirements for specification MIL-DTL-81706B, Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type 2 A 1 C Type 2 B 1 C Type 2 A 1 A Type 2 B 1 A Type 2 A 1 B Type 2 B 1 B	Alodine T 5900	This letter	Henkel Surface Technologies 32100 Stephenson Highway Madison Heights, MI 48071 <u>Plants:</u> Henkel Surface Technologies 23343 Sherwood Warren, MI 48091

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.
- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
- e. This listing applies to amendments or revisions of the specification unless otherwise notified.

- f. This listing applies only to products identical to that qualified. There shall be no change in formulation or manufacturing procedure unless the material is re-examined for compliance with the requirements of the specification by the qualifying activity. Failure to notify the qualifying activity of a change in formulation is cause for removal from the QPL. The manufacturer is cautioned not to change type or grade of ingredients because of possible change in performance characteristics.
- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Ms. Amy Hilgeman at (301) 342-0986. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Ms. Amy Hilgeman, Code 4.9.7.2, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1906.

Sincerely,



KEVIN J. KOVALESKI

Head, Industrial and Operational Chemicals Branch

Copy to:

DSCR (FAEAA/Myers)

NAWCAD LAKEHURST (Code 4.9.1 B120-3)

NADEP CHERRY POINT NC (Code 4.9.7)

NADEP NORTH ISLAND CA (Code 4.9.7)

NADEP JACKSONVILLE FL (Code 4.9.7)

NAWCWD CHINALAKE CA (Code 4.9.7)

AFRL/MLS-OLR (S&KT)



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
47123 BUSE ROAD, UNIT # _____
PATUXENT RIVER, MD 20670-1547

IN REPLY REFER TO

4123
Ser 497200A/7.4908
04 August 2006

Metalast International
Attn: Mr. Joe Radzvilovicz
2241 Park Place, Suite C
Minden, NV 89423

Dear Mr. Radzvilovicz:

This letter is to inform you that TCP-HF has met the qualification requirements for specification MIL-DTL-81706B, Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type 2 A 1 B Type 2 B 1 B	TCP-HF	This letter	Metalast International, Inc. 2241 Park Place, Suite C Minden, NV 89423 <u>Plants:</u> PAVCO 501 South Basinger Road Pandora, OH 45877

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.
- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
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- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Ms. Amy Hilgeman at (301) 342-0986. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Ms. Amy Hilgeman, Code 4.9.7.2, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1906.

Sincerely,



KEVIN J. KOVALESKI
Head, Industrial & Operational Chemicals Branch

Enclosure (1) Lab Report

Copy to:

- DSCR (FAEAA/Myers)
- NAWCAD LAKEHURST (Code 4.9.1 B120-3)
- NADEP CHERRY POINT NC (Code 4.9.7)
- NADEP NORTH ISLAND CA (Code 4.9.7)
- NADEP JACKSONVILLE FL (Code 4.9.7)
- NAWCWD CHINALAKE CA (Code 4.9.7)
- AFRL/MLS-OLR (S&KT)



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
47123 BUSE ROAD, UNIT # _____
PATUXENT RIVER, MD 20670-1547

IN REPLY REFER TO

4123
Ser 497200A/7.4910
04 August 2006

SurTec International, GmbH
Attn: Mr. Nabil Zaki
9 Skyline Drive
West Orange, NJ 07052

Dear Mr. Zaki:

This letter is to inform you that SurTec 650 – ChromitAL TCP has met the new qualification requirements for specification MIL-DTL-81706B, Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type 2 A 1 B Type 2 B 1 B	SurTec 650 – ChromitAL TCP	This letter	SurTec International, GmbH 9 Skyline Drive West Orange, NJ 07052 <u>Plants:</u> SurTec International, GmbH CST – SurTec, Inc. 4639 Van Epps Road Brooklyn Heights, OH 44131

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.

- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
- e. This listing applies to amendments or revisions of the specification unless otherwise notified.
- f. This listing applies only to products identical to that qualified. There shall be no change in formulation or manufacturing procedure unless the material is re-examined for compliance with the requirements of the specification by the qualifying activity. Failure to notify the qualifying activity of a change in formulation is cause for removal from the QPL. The manufacturer is cautioned not to change type or grade of ingredients because of possible change in performance characteristics.
- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Ms. Amy Hilgeman at (301) 342-0986. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Ms. Amy Hilgeman, Code 4.9.7.2, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1906.

Sincerely,



KEVIN J. KOVALESKI
Head, Industrial & Operational Chemicals Branch

Enclosure: (1) Lab Report

Copy to:

DSCR (FAEAA/Myers)
NAWCAD LAKEHURST (Code 4.9.1 B120-3)
NADEP CHERRY POINT NC (Code 4.9.7)
NADEP NORTH ISLAND CA (Code 4.9.7)
NADEP JACKSONVILLE FL (Code 4.9.7)
NAWCWD CHINALAKE CA (Code 4.9.7)
AFRL/MLS-OLR (S&KT)



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
47123 BUSE ROAD, UNIT # _____
PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO

4123
Ser 434200A/7.4950
29 Mar 07

Luster-On Products, Inc.
Attn: Mr. Paul R. Lane
54 Waltham Avenue
P.O. Box 90247
Springfield, MA 01139

Dear Mr. Lane:

This letter supersedes the letter dated 21 Mar 07 Ser 434200A/7.4946 and is to inform you that Aluminescent, has met the qualification requirements for specification MIL-DTL-81706B, Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type 2 A 2 C Type 2 B 2 C Type 2 A 2 A Type 2 B 2 A	Aluminescent	This letter	Luster-On Products, Inc. P.O. Box 90247 Springfield, MA 01139 <u>Plants:</u> Luster-On Products, Inc. 54 Waltham Avenue Springfield, MA 01139

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.
- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
- e. This listing applies to amendments or revisions of the specification unless otherwise notified.

- f. This listing applies only to products identical to that qualified. There shall be no change in formulation or manufacturing procedure unless the material is re-examined for compliance with the requirements of the specification by the qualifying activity. Failure to notify the qualifying activity of a change in formulation is cause for removal from the QPL. The manufacturer is cautioned not to change type or grade of ingredients because of possible change in performance characteristics.
- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Ms. Amy Hilgeman at (301) 342-0986. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Ms. Amy Hilgeman, Code 4.3.4.2, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1906.

Sincerely,



KEVIN J. KOVALESKI
Head, Industrial and Chemical Operations Branch

Copy to:
DSCR (FAEAA/Myers)
NAWCAD LAKEHURST (Code 4.3 B120-3)
NADEP CHERRY POINT NC (Code 4.3.4)
NADEP NORTH ISLAND CA (Code 4.3.4)
NADEP JACKSONVILLE FL (Code 4.3.4)
NAWCWD CHINALAKE CA (Code 4.3.4)
AFRL/MLS-OLR (S&KT)



DEPARTMENT OF THE NAVY
 NAVAL AIR SYSTEMS COMMAND
 NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
 47123 BUSE ROAD, UNIT # _____
 PATUXENT RIVER, MD 20670-1547

IN REPLY REFER TO

4123
 Ser 497200A/7.4931
 19 Dec 2006

Deft Coatings, Inc.
 Attn: Mr. Randall J. Brady
 Director of Sales and Marketing
 17451 Von Karman Ave.
 Irvine, CA 92614

Dear Mr. Brady:

This letter is to inform you that the 44-GN-098 has met the qualification requirements for specification MIL-PRF-85582, Primer Coatings: Epoxy, Waterborne. Please see the attached Organic Coatings Laboratory Report for qualification testing results.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

Government Designation	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type I, Class N	44GN098	This letter, & OCT LR349_07	Deft Coatings, Inc. 17451 Von Karman Ave. Irvine, CA 92614 <u>Plants:</u> Deft Coatings, Inc. 17451 Von Karman Ave. Irvine, CA 92614

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.
- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
- e. This listing applies to amendments or revisions of the specification unless otherwise notified.

- f. This listing applies only to products identical to that qualified. There shall be no change in formulation or manufacturing procedure unless the material is re-examined for compliance with the requirements of the specification by the qualifying activity. Failure to notify the qualifying activity of a change in formulation is cause for removal from the QPL. The manufacturer is cautioned not to change type or grade of ingredients because of possible change in performance characteristics.
- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Mr. Bill C. Nickerson at (301) 342-8864. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Mr. Bill C. Nickerson, Code 4.3.4, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1908.

Sincerely,



KEVIN J. KOVALESKI

Head, Industrial and Operational Chemicals Branch

Copy to:

DSCR (FAEAA/Myers)
NAWCAD LAKEHURST (Code 4.9.1 B120-3)
NADEP CHERRY POINT NC (Code 4.3.4)
NADEP NORTH ISLAND CA (Code 4.3.4)
NADEP JACKSONVILLE FL (Code 4.3.4)
NAWCWD CHINALAKE CA (Code 4.3.4)
AFRL/MLS-OLR (S&KT)



DEPARTMENT OF THE NAVY
NAVAL AIR SYSTEMS COMMAND
RADM WILLIAM A. MOFFETT BUILDING
47123 BUSE ROAD, BLDG 2272
PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO

4123
Ser 497000A/7.4790
January 27, 2005

Mr. Chris Athanasopoulos
Deft, Inc.
17451 Von Karman Avenue
Irvine, CA 92714

Dear Mr. Athanasopoulos:

Your product, listed below, has met the qualification requirements of specification MIL-PRF-23377H.

<u>Government Designation</u>	<u>Manufacturer's Designation</u>	<u>Qualification Reference</u>	<u>Manufacturer's Name and Address</u>
Type I Class N	02GN083	This letter	Deft, Inc. 17451 Von Karman Avenue Irvine, CA 92714
			<u>Plant:</u> Same address

Non-chromate (Class N) primers are intended for use where federal, state, or local regulations restrict the use of chromate compounds. NAVAIR letter Ser AIR-4.3.4/7.4629 of 18 April 2002 authorizes Class N primers for depot applications involving scuff-sand and overpaint of existing coating systems on aircraft exterior surfaces. All other exterior applications must be approved on a case-by-case basis by the engineering authority for the system or item to which the coating is to be applied. Class N primers are not authorized for use on aircraft interior surfaces, landing gear, wheel wells, or wing-fold areas.

The product will be included on the next issue of the Qualified Products List (QPL) for the specification. To insure correct listing, please advise us of any discrepancy within ten days from the date of this letter. The following provisions are binding upon the manufacturer per Defense Standardization Manual 4120.3M:

1. This listing applies only to products produced at the specified plant(s) and is effective as of the date of this letter. A written request is required to extend qualification approval to any other plants.
2. This listing does not guarantee acceptance of the product in any future purchase. It does not constitute a waiver of any requirements in the specification or the provisions of any contract.
3. Any use of this listing for publicity, advertising, or sales shall not state or imply that the product is the only one so qualified or that the government in any way recommends or endorses it.
4. This listing applies only to products identical to that qualified. There shall be no change in formulation or manufacturing procedure, unless the material is re-examined per the requirements of the specification. The latest revision and amendment to the specification shall apply.



DEPARTMENT OF THE NAVY
 NAVAL AIR SYSTEMS COMMAND
 NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
 47123 BUSE ROAD, UNIT # _____
 PATUXENT RIVER, MARYLAND 20670-1547

IN REPLY REFER TO

4123
 Ser 434200A/7.4958
 13 April 2007

Deft Coatings, Inc.
 Attn: Mr. Randall J. Brady
 Director of Sales and Marketing
 17451 Von Karman Ave.
 Irvine, CA 92614

Dear Mr. Brady:

This letter is to inform you that the 02GN084 has met the qualification requirements for specification MIL-PRF-23377J, Primer Coatings; Epoxy, High Solids.

Listing on the Qualified Products List (QPL) will appear as indicated below. To ensure correct listing, please advise us within 14 days from the date of this letter of any discrepancy.

	Manufacturer's Designation	Test or Qualification Reference	Manufacturer's Name and Address
Type I, Class N	02GN084	This letter & OCT LR438_07	Deft Coatings, Inc. 17451 Von Karman Ave. Irvine, CA 92614 <u>Plants:</u> Deft Coatings, Inc. 17451 Von Karman Ave. Irvine, CA 92614

The following statements are binding upon the manufacturer per the Defense Standardization Manual 4120.24-M:

- a. This listing does not guarantee acceptance of the product in any future purchase.
- b. This listing does not constitute a waiver of any requirements of the specification or of the provisions of any contract.
- c. Any use of such listing for publicity, advertising, or sales shall not state or imply that the product is the only one of that type so qualified, or that the Government in any way recommends or endorses the manufacturer's product. Violation is cause for removal of the product from the list by the Government activity concerned.
- d. This listing applies only to products produced in the plants specified in this letter of notification and is effective at 8:00 am local time as of the date of this letter. If extension of qualification to any of your other plants is desired, please request such extension through this office.
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requirements of the specification by the qualifying activity. Failure to notify the qualifying activity of a change in formulation is cause for removal from the QPL. The manufacturer is cautioned not to change type or grade of ingredients because of possible change in performance characteristics.

- g. To retain this listing, manufacturers must comply with retention of qualification requirements. Failure to comply will be sufficient cause for removal from the QPL.

For clarification or further information, please contact Mr. Bill C. Nickerson at (301) 342-8864. Address written correspondence to: Naval Air Warfare Center Aircraft Division, Attn: Mr. Bill C. Nickerson, Code 4.9.7, Building 2188, 48066 Shaw Road, Patuxent River, MD 20670-1906.

Sincerely,



KEVIN J. KOVALESKI
Head, Industrial & Operational Chemicals

Copy to:

DSCR (FAEAA/Myers)
NAWCAD LAKEHURST (Code 4.9.1 B120-3)
NADEP CHERRY POINT NC (Code 4.3.4)
NADEP NORTH ISLAND CA (Code 4.3.4)
NADEP JACKSONVILLE FL (Code 4.3.4)
NAWCWD CHINALAKE CA (Code 4.3.4)
AFRL/MLS-OLR (S&KT)