

November 21, 2018

UPDATE: CLEANING COMPRESSED GAS EQUIPMENT WITH SIMPLE GREEN® BRAND PRODUCTS

Many entities involved in cleaning compressed gas equipment, from dive oxygen tanks, lines masks and ancillary equipment, to industrial gas equipment such as freon lines, to military outfits cleaning hyperbaric chambers and more, have used Simple Green products for over thirty years. Some have chosen the scented and green colored formula of Simple Green All-Purpose, and some have used unscented and uncolored Crystal Simple Green. We have historically had data to support such use.

However, in 2012 the formulations of **Simple Green All-Purpose** and **Crystal Simple Green** changed in order to comply with air quality legislation in the United States. Therefore, **prior test data supporting the use of cleaning compressed gas equipment with these products is no longer valid.**

In order to continue supporting these industries and their compressed gas equipment cleaning needs, we have chosen to provide test data on our product **Extreme Simple Green Aircraft & Precision Cleaner** (aka Extreme Simple Green Aviation Heavy Duty Cleaner and Degreaser,) to confirm safe and effective use of this formula for this application.

Documentation provided (attached) supports this product on three levels: Efficacy, Non-Corrosion, and Residue-free Rinsability.

- 1) ASTM G 12/122 Evaluating the Effectiveness of Cleaning Agents: We diluted Extreme Simple Green with 10 parts water for this test (1:10). This dilution ratio was chosen because it is most often recommended for lighter cleaning that remains within the non-corrosive range of this product. This test shows several things: At 1:10, Extreme reaches an 85% Cleaning Effectiveness Factor with no agitation. The test also shows that a 10-minute immersion in the 1:10 solution with no agitation and then a 5-minute soak in water does not cause the stainless steel alloy coupons to corrode. We would recommend a stronger solution or repeat application if the equipment being cleaned is significantly dirty, or no heat is being utilized in the application. Any dilutions such as 1:8, 1:6, 1:4, etc. will be stronger cleaners yet still remain in the non-corrosive “zone” for this product.
- 2) Boeing D6-17487revP ; MIL-PRF 87937D Exterior and General Cleaners ; Cleaning Compound Aerospace Equipment (both Type IV Heavy Duty Water Dilutable Cleaning Compound): While these tests cover a broad range of surface compatibility, they also show that Extreme Simple Green is non-damaging to multiple types of metals, acrylic, painted surfaces, etc. and also that it rinses residue-free, even at the stronger solution of 25%. This residue-free quality is particularly important for cleaning compressed gas equipment because residues can cause fire or explosion in certain compressed gas applications. Extreme rinses easily and cleanly without residue.

We hope that this information assists you in choosing Extreme Simple Green for your O₂ or other compressed gas equipment cleaning applications. If there are any questions, please contact us directly at 800-228-0709 – and ask for our Technical Department.

SMI, Inc.

12219 SW 131 Avenue
Miami, Florida 33186-6401 USA

Phone: (305) 971-7047
Fax: (305) 971-7048

Attn: Brenda Stephens
Sunshine Makers, Inc. dba Simple Green
15922 Pacific Coast Highway #300
Huntington Harbour, CA 92649

Date: 09-Nov-2018
SMI/REF: 1810-177

Product: **EXTREME SIMPLE GREEN** (received 17-Oct-2018)

Dilution: 1:10 (1 part cleaner added to 10 parts water) Page 1 of 2

Testing of Cleaning Agents per
**ASTM G 121 Preparation of Contaminated Test Coupons
for Evaluation of Cleaning Agents and
ASTM G 122 Evaluating the Effectiveness of Cleaning Agents**
with modifications incorporated per CGA (Compressed Gas Association)
For Aqueous-Based Cleaners

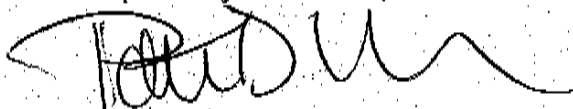
Average Cleaning Effectiveness Factor: 0.85 (uncorrected)

Average Cleaning Effectiveness Factor: 0.85 (corrected)

Summary of results:

(Cleaning Effectiveness Factor of 0.85 means 85% of the contaminant was removed during cleaning).

Respectfully submitted,



Patricia D. Viani, SMI Inc.

Client: Sunshine Makers, Inc. dba Simple Green Date: 09-Nov-2018
Product: **EXTREME SIMPLE GREEN** SMI/REF: 1810-177
Dilution: 1:10 (1 part cleaner added to 10 parts water)
CGA ASTM G121 / 122 Page 2 of 2

TEST PARAMETERS

Test coupons: Five replicates plus one control, made of 304 Stainless Steel alloy, No additional surface treatment. Cleaned with 1:1:1 Trichloroethane before use. Control coupon is uncontaminated and is subjected to the identical cleaning procedure as the contaminated coupons and serves to evaluate corrosion/erosion of the test coupons.

Contaminant: Mobil 600 applied to one side only

Contaminant Area: 1615 ± 538 mg/cm²

Temperature: 150 ±5 degrees F

Immersion: Coupons immersed in individual beakers of 500 mls each. To avoid any possibility of cross-contamination, especially with the control coupon, separate 500 ml beakers are used with each coupon.

Immersion Time: 10 minutes – (static immersion: no agitation).

Rinse: 5 minute "soak" with ASTM Type II water by immersing in a beaker (no flow) ambient

Dry: Hang to dry

Calculation: CEF (Cleaning Effectiveness Factor) = $\frac{MX2 - MX3}{MX2 - MX1}$

MXy indicates the masses of coupons in grams, where X is the coupon designation (number, letter, or name) and

y = 1 indicates a clean coupon

y = 2 indicates a contaminated coupon

y = 3 indicates a coupon after cleaning

Control: There was no change in the control coupon's mass to within the measurement error of the balance.

SMI, Inc.

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Attn: Carol Chapin
Simple Green
15922 Pacific Coast Highway
Huntington Harbour, CA 92649

Date: 06-May-2004

SMI/REF: 03DEC886

Product: **Extreme Simple Green Aircraft Cleaner**
Batch #090403 (received 03-Dec-2003)

This data also applies to formulas labeled as:
Extreme Simple Green Aviation Cleaner &
Heavy Duty Degreaser
and Simple Green Supreme High
Performance Cleaner/Degreaser/Concentrate

Dilution: As received and 10%

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BOEING D6-17487 REVISION P

Exterior and General Cleaners and Liquid Waxes,
Polishes and Polishing Compounds

Sandwich Corrosion Test

Conforms

Acrylic Crazing Test

Conforms

Paint Softening Test

Conforms

Hydrogen Embrittlement Test

Conforms

Respectfully submitted,



Patricia D. Viani, SMI, Inc.

Sandwich Corrosion Test : Specimen preparation, testing, and interpretation shall be in accordance with ASTM F1110 using the following materials and with the following exceptions:

1. Reagents and materials exception:
- (1). Clad 7075-T6 aluminum alloy in accordance with QQ-A-250/13 (AMS 4049 or AMS-QQ-A-250/13 optional) (2024-T3 Alclad specimens are neither required nor optional.)

(2) Bare 7075-T6 aluminum alloy in accordance with QQ-A-250/12 (AMS 4045 or AMS-Q-A-250/12 optional) anodized in accordance with BAC 5019 or MIL-A-8625, Type I. Anodize shall be sealed. (2024-T3 nonclad specimens are neither required nor optional).

(3) Distilled or deionized water may be used in place of ASTM F1193, Type IV reagent grade water for control specimens.

(4) The filter paper may be Whatman No. 5 or equivalent in place of Whatman GFA glass fiber paper.
2. Procedure exceptions:
- (1) The filter paper strips shall be 1 by 3 inches and shall be placed in the center of the sandwiched specimens.

(2) Each sandwich specimen shall be held together with waterproof tape, with no more than 1 piece of tape (maximum width 0.75 inch) on each of two opposite edges.
3. Interpretation of result exceptions:
- (1) Leaching or lightening of the chromate sealed anodize coating shall not be cause for rejection.

(2) Deposits or residues from the material being tested that are not products of corrosion of the test panel surface shall not be cause for rejection.

(3) Special procedure for evaluation of fire extinguishing foams and liquids.

(4) Panels shall have a rating of 1 (no more than 5 percent of the surface area shall be corroded) or better in accordance with ASTM F 1110. The preferred method of determining the corroded area is by using image analysis. Other means approved by the purchaser may be substituted.

(5) Any corrosion in excess of that shown by the control group shall be cause for rejection.

	Bare 7075-T6 (AMS 4045) Anodized per MIL-A-8625 Type 1	Clad 7075-T6 Aluminum (AMS 4049)
Concentrate	1	1
Dilute	1	1
Control	1	1

Acrylic Crazing Test:

The material being tested shall not craze, crack, or etch acrylic test specimens when tested in accordance with ASTM F 484 using Type C (stretched acrylic plastic in accordance with MIL-P-25690) stressed to an outer fiber stress of 4500 psi.

Type C (MIL-P-25690) Concentrate: No crazing, cracking or etching.

Dilute: No crazing, cracking, or etching.

Result Conforms

Paint Softening Test:

a. Testing shall be in accordance with ASTM F502 using the following coating systems.

Paint system 1: BMS 10-79, Type II primer applied in accordance with BAC 5882 plus BMS 10-60, Type II enamel in accordance with BAC 5845.

Paint system 2: BMS 10-79, Type III primer applied in accordance with BAC 5882, plus BMS 10-100 coating in accordance with BAC 5795.

b. Three specimens conforming to Section 13a.(1) and three specimens conforming to Section 13a(2) shall be used for each test condition.

c. The material being tested shall not produce a decrease in film hardness greater than two pencils, or any discoloration or staining.

NOTE: Slight darkening of the BMS 10-100 surface is acceptable.

Concentrate: Paint system 1: 0 pencil hardness change after 24 hour post-exposure dry time.

Paint system 2: 0 pencil hardness change after 24 hour post-exposure dry time.

Dilute: Paint system 1: 0 pencil hardness change after 24 hour post-exposure dry time.

Paint system 2: 0 pencil hardness change after 24 hour post-exposure dry time.

Result Conforms

Hydrogen Embrittlement Test:

Hydrogen Embrittlement testing shall be in accordance with ASTM F 519-93, using cadmium plated Type 1a, 1c, or 2a specimens. All requirements of ASTM F519-93 for specimens, preparation, testing, and reporting shall apply. Type 1a specimens shall meet the requirements of D6-4307.

Specimens: Type 1c, cadmium plated per Treatment B of ASTM F519

Concentrate: No failures occurred within 150 hours.

Dilute: No failures occurred within 150 hours.

Result Conforms

NOTE:

These two tests combined constitute conformance to Boeing D6-17487 Revision P, Exterior and General Cleaners and Liquid Waxes, Polishes and Polishing Compounds.

Any of the following tests that show non-conformance with Mil-Prf, have conformed to the Boeing spec as noted on the prior three pages.

SMI, Inc.

12219 SW 131 Avenue
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Phone: (305) 971-7047
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Attn: Carol Chapin
Simple Green
15922 Pacific Coast Highway
Huntington Harbour, CA 92649

Date: 19-Jan-2004

SMI/REF: 03DEC886

Product: **Extreme Simple Green Aircraft Cleaner** [Batch #: 090403]
(received 04-Dec-2003) aka **Extreme Simple Green Aviation Cleaner & Heavy Duty Degreaser**

Dilution: Per specification

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MIL-PRF-87937D (24 Sep 2001)

CLEANING COMPOUND, AEROSPACE EQUIPMENT
Type IV - Heavy Duty, Water Dilutable Cleaning Compound

3.3	Toxicity	Not performed
3.3.4	Biodegradability	Not performed
3.4	Compositional assurance	Informational
3.5	Chemical properties	
3.5.1	Chemical requirements	
	Insoluble matter	Conforms
	Flash point	Conforms
	Emulsion characteristics	Conforms
	Wet adhesion tape test	Conforms
	% Cleaning efficiency	Conforms
	Terpene hydrocarbons	Not applicable
3.5.2	Residue rinsibility	Conforms
3.6	Physical properties	
3.6.1	Heat stability	Conforms
3.6.2	Cold stability	Conforms
3.6.3	Rheology	
	3.6.3.1 Consistency	Not applicable
	3.6.3.2 Sprayability	Not applicable

Client: Simple Green
Product: **Extreme Simple Green Aircraft Cleaner**
Dilution: Per Specification **Aviation Cleaner**
MIL-PRF-87937D (Type IV)

Date: 19-Jan-2004
SMI/REF: 03DEC886

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3.7	Effect on metals	
3.7.1	Hydrogen embrittlement	Conforms
3.7.2	Total immersion corrosion	Conforms
3.7.3	Low-embrittling cadmium plate corrosion	Does not conform
3.7.4	Effects on unpainted metal surfaces	Conforms
3.7.5	Sandwich corrosion	Conforms
3.7.6	Wet adhesion tape test	Conforms
3.8	Effect on painted surfaces	Conforms
3.9	Stress crazing of MIL-PRF-5425 and MIL-PRF-25690 (Type A and C) acrylic plastics	Conforms
3.10	Stress crazing of polycarbonate plastic	Conforms
3.11	Long-term storage stability	Not performed
3.12	Hot dip galvanizing corrosion	Conforms
3.13	Workmanship	To be Cert. by Mfr.
3.14	Effect on polysulfide sealants	Conforms
3.15	Rubber compatibility	Conforms
3.16	Effect on polyimide insulated wire	Does not conform

Respectfully submitted,



Patricia D. Viani, SMI Inc.

3.1.1 Qualification (Initial): The cleaning compound furnished under this specification shall be a product which has been tested and has passed the qualification tests specified herein and has been listed or approved for listing on the applicable Qualified Products List (QPL).

3.3 Toxicity: The cleaning compound shall have no adverse effect on the health of personnel or the environment when used for its intended purpose and with proper personal protective equipment (when required). The product shall be evaluated for aquatic toxicity with a 96-hour Fathead minnow (*Pimephales promelas*) bioassay and a 48-hour *Ceriodaphnia dubia* bioassay in accordance with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA/600/4-90/027. The percent survival at 1, 10, 50, and 100 ppm shall be reported for both organisms.

% of Fathead Minnows (<i>Pimephales promelas</i>) Surviving			
Concentration	After 24 hours	After 48 hours	After 96 hours
1 ppm			
10 ppm			
50 ppm			
100 ppm			

% of Cladoceran (<i>Ceriodaphnia dubia</i>) Surviving		
Concentration	After 24 hours	After 48 hours
1 ppm		
10 ppm		
50 ppm		
100 ppm		

3.3.4 Biodegradability: The supplier of the cleaning compound shall furnish certification from the surfactant manufacturers that the surfactants are readily biodegradable in accordance with 40 CFR, Part 796, Subpart D. Biodegradability testing shall be accomplished as specified in paragraph 4.5.22 on the finished product by an independent laboratory approved by the qualifying activity. Biodegradability on the finished product shall be determined over 28 days by the Shake Flask Method monitored by analysis of Total Organic Carbon (TOC). The Type I compound shall meet the requirement of a minimum of 75% biodegradable and Types II, III, and IV compounds shall meet the requirement of a minimum of 85 % biodegradable at the end of the 28-day period.

Result _____ Not performed _____

3.4 Compositional assurance: The cleaning compound shall be tested for nonvolatile matter as specified in paragraph 4.5.1. The concentrated cleaning compound and a 10% solution of the cleaning compound in distilled water shall be tested for pH as specified in paragraph 4.5.3. Results of these tests as well as an infrared spectrogram of the nonvolatile matter (see 4.8.2) and a gas chromatogram (see 4.8.1 for Type I only) shall be recorded by the qualifying activity for use in conformance inspections (see 4.3). Conformance inspection results for nonvolatile matter shall not differ by more than 2 percent absolute from the recorded value. Conformance inspection results for pH shall not differ by more than 1 pH unit from the recorded value. Conformance inspection infrared spectrograms and gas chromatograms shall show no significant difference when compared to the original qualifying spectrogram.

PROPERTY	RESULT
Nonvolatile matter	4.7%
pH (undiluted)	11.6
pH (10%)	10.3
Infrared spectrogram	attached

Result _____ Informational _____

3.5 Chemical properties.

3.5.1 Chemical requirements: The cleaning compound shall meet the requirements listed in Table I.

3.5.1 Chemical requirements (continued):

TABLE I

Requirement	Type IV		Test Method
	Min.	Max.	
Insoluble Matter (WT%)	—	0.05	4.5.2
Flash Point (°F) 10 % solution concentrate	None ¹ None ¹	— ---	4.5.7
Emulsion Characteristics (mls free water)			
5 minutes	—	5.0	4.5.8
8 hours	—	—	
24 hours	11.0	—	
Wet Adhesion Tape Test	Pass		4.5.27
% Cleaning Efficiency	90 %	---	4.5.21
Terpene Hydrocarbons (% WT)	—	None	4.5.23

^{1/} No flash point should be observed up to the boiling point of the compound.

4.5.2 Insoluble matter The percent insolubles shall be calculated as follows:

$$I = \frac{A-B}{W} \times 100$$

Where:

A = Final filter paper weight
B = Initial filter paper weight
W = Weight of sample
I = % wt. insoluble matter

Insoluble matter = < 0.01 %

Result _____ Conforms _____

4.5.7 Flash point: The flash point of the concentrated cleaning compound (Type I, II, III and IV) shall be determined in accordance with ASTM D 56 (Tag Closed Cup) and for materials that have a tendency to form a surface film under the test conditions, use ASTM D 93. The flash point of the 10% solution in distilled water (Type I only) shall be determined in accordance with ASTM D 92.

No flash point observed to initial boiling point.

Result _____ Conforms _____

3.5.1 Chemical requirements (continued):

4.5.8 Emulsion characteristics: Twenty ml of a 25% by volume solution (Types I and II) of the cleaning compound (12.5% by volume solution for Types III and IV) shall be placed in a 50 ml glass stoppered graduated cylinder. Twenty ml of lubricating oil conforming to MIL-PRF-2104, grade 10W, shall be added. An emulsion shall be formed by 10 inversions of the graduated cylinder followed by a vigorous 15-second shake. After the emulsion has stood for 5 minutes, the 15-second shake shall be repeated. At 5 minutes and 8 hours for the Type I and at 5 minutes and 24 hours for the Types II, III and IV cleaners, the amount of free water and cleaner which separates from the lubricating oil shall conform to the requirements of Table I.

Amount of free water remaining:

After 5 minutes fewer than 5 mls

After 24 hours: 17 mls

Result Conforms

4.5.21 Cleaning Efficiency: The cleaning efficiency of the cleaning compound shall be reported as the average of three test results and shall conform to the requirements of Table I.

Cleaning Efficiency: 93%

Result Conforms

4.5.23 Terpene hydrocarbons (Type I only): An approved test procedure shall be used.

Result Not applicable

3.5.2 Residue Rinsibility: When a freshly prepared solution of the cleaning compound is tested in accordance with 4.5.4, it shall not leave any residue or stains. A freshly prepared solution is defined as one being prepared no longer than 30 minutes prior to testing. The weight change shall be not greater than that obtained with standard hard water tested under the same conditions.

Result Conforms

3.6 Physical properties (All types unless otherwise noted).

3.6.1 Heat stability: The concentrated cleaning compound, when tested in accordance with 4.5.5, shall show no marked color change or precipitation and shall not corrode or stain the AMS 5046 (SAE 1020) steel strip (a slight darkening of the steel strip shall not be objectionable). Layering or separation shall constitute failure if it does not return to its original homogeneous state upon cooling.

No corrosion of steel strip; no precipitation; no layering nor separation

Result Conforms

3.6.2 Cold stability: The concentrated cleaning compound shall return to its original homogeneous condition when tested in accordance with 4.5.6.

Compound returned to original homogeneous condition after 5 cycles

Result Conforms

3.6.3 Rheology (Type III only).

3.6.3.1 Consistency: When tested as specified in 4.5.24, the concentrated cleaning compound shall flow between 10 and 20 centimeters in 10 seconds. The product shall also exhibit rheology, which enables it to meet the sprayability requirement.

Result Not applicable

3.6.3.2 Sprayability: The concentrated cleaning compound, when dispensed at 45 psig and tested in accordance with 4.5.25, shall give satisfactory spray characteristics and deposit a uniform layer on a vertical surface 3 feet away from the nozzle.

Result Not applicable

3.7 Effect on metals (All types unless otherwise noted).

3.7.1 Hydrogen embrittlement: When tested in accordance with 4.5.9, the concentrated cleaner (all types) and a 10% solution of the cleaner (Types I, II, and IV only) in distilled water shall not cause hydrogen embrittlement of cadmium plated or IVD aluminum coated AISI 4340 steel.

Specimens: Type 1c, cadmium plated in accordance with Treatment B of ASTM F519

As received: No failures within 150 hours.

Dilute (10 %): No failures within 150 hours.

Result Conforms

Specimens: Type 1c, grit blasted, IVD Aluminum plated per MIL-DTL-83488D, Cl 2, Ty I.

As received: No failures within 150 hours.

Dilute (10 %): No failures within 150 hours.

Result Conforms

3.7.2 Total immersion corrosion: When tested in accordance with 4.5.10 (ASTM F 483), the concentrated cleaning compound (all types) and a 10% solution of the cleaning compound (Types I, II and IV only) in distilled water shall not show any indication of staining, etching, pitting, or localized attack on any of the panels, or cause a weight change of an average of three (3) test panels greater than that shown in Table II. A slight discoloration of the panels shall not be objectionable. The cleaning compound shall not layer or separate for the duration of the test.

Table II Total Immersion Corrosion Requirements

Alloy	Weight Loss (mg/cm ² /168hrs)		
	Maximum allowed	As received	10 %
Magnesium (AZ 31B-H24) AMS 4377 surface treatment per SAE AMS-M-3171, Ty III	0.50	+ 0.01	0.05
Aluminum, SAE AMS-QQ-A-250/4, T3 surface treatment per MIL-A-8625, Type I, Class I	0.15	+ 0.01	+ 0.03
Aluminum, SAE AMS-QQ-A-250/4, Bare T3 Alloy	0.15	+ 0.03	0.02
Aluminum, SAE AMS-QQ-A-250/12, Bare T6 Alloy	0.15	+ 0.03	0.03
Titanium, SAE AMS-T-9046, 6Al-4V Cl III, Comp. C	0.10	< 0.01	0.02
Steel, AMS 5046, Grade 1020	0.25	0.01	< 0.01
Steel, 410 SS, Silver Plated per SAE AMS 2410	0.10	0.01	< 0.01

Result Conforms

3.7.3 Low-embrittling cadmium plate corrosion: Steel panels coated with low-embrittling cadmium plate immersed in the concentrated cleaning compound (all types) and a 10% solution of the cleaning compound (Types I, II and IV only) in distilled water shall not show a weight change greater than 0.14 mg/cm² for 24 hours when tested in accordance with 4.5.11.

As received: **0.04 mg/cm²/24hrs**
Dilute (10 %): **0.37 mg/cm²/24hrs***

Result *Does not conform

3.7.4 Effects on unpainted metal surfaces: The concentrated cleaning compound (Type III only) and a 10% solution (Types I, II and IV only) of the cleaning compound in distilled water shall not cause streaking, stains or other deposits that cannot be easily removed with water when tested in accordance with 4.5.12.

Result Conforms

3.7.5 Sandwich corrosion: When tested in accordance with 4.5.16, the concentrated cleaner (all types) and a 10% solution (Types I, II and IV only) shall show no corrosion in excess of that shown by control test coupons in ASTM D 1193, Type IV, reagent water.

	2024-T3 Bare Anodized	2024-T3 Alclad	7075-T6 Bare Anodized	7075-T6 Alclad
As received	1	1	1	1
Dilute (10%)	1	1	1	1
Control	1	1	1	1

Result Conforms

3.7.6 Wet adhesion tape test (Types II and IV): A ten (10) percent solution of the cleaning compound, when used as directed, shall remove soil from a painted surface in preparation fro repainting such that paint applied after cleaning with the compound shall adhere to the surface when tested in accordance with 4.5.27.

COATING SYSTEM	OBSERVATIONS
SET 1: Primer: MIL-PRF-85582, Type I, Class 1B Waterborne Epoxy Topcoat: MIL-PRF-85285 Type I High Solids Polyurethane, Color # 34092	Coating system showed no sign of damage.
SET 2: Primer: MIL-PRF-23377, Type I, Class C High Solids Epoxy Topcoat: MIL-PRF-85285 Type I High Solids Polyurethane, Color # 34092	Coating system showed no sign of damage.
SET 3: Primer: TT-P-2760, Type I, Class C High Solids Elastomeric, Polyurethane Topcoat: MIL-C-85285 Type I High Solids Polyurethane, Color # 34092	Coating system showed no sign of damage.

Result Conforms

Client: Simple Green
Product: **Extreme Simple Green Aircraft Cleaner**
Dilution: Per Specification **Aviation Cleaner**
MIL-PRF-87937D (Type IV)

Date: 19-Jan-2004
SMI/REF: 03DEC886

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- 3.8 Effect on painted surfaces: The concentrated cleaning compound (Type III only) and a 25% solution (Types I, II and IV) of the cleaning compound in distilled water shall not cause streaking, blistering, discoloration or a permanent decrease in film hardness of more than one (1) pencil hardness level when tested in accordance with 4.5.13. The Type I material shall be tested using only the (H) Polyurethane paint systems.

PANEL SET	RESULT	
	Conc.	25 %
E (Epoxy topcoat) Primer: MIL-PRF-23377, Ty I, Class C High-Solids Epoxy Primer Topcoat: MIL-PRF-22750 Epoxy Topcoat, Color #: 17925	N/A	PASS
H (Polyurethane) Primer: MIL-PRF-23377, Ty I, Class C High-Solids Epoxy Primer Topcoat: MIL-PRF-85285 Ty I, Polyurethane, High Solids, Color #: 17925	N/A	PASS
F (Enamel) Primer: MIL-PRF-23377, Ty I, Class C High-Solids Epoxy Primer Topcoat: TT-E-529 Enamel, Semi-gloss, Color #: 27925	N/A	PASS

Result _____ Conforms _____

- 3.9 Stress crazing of MIL-PRF-5425 and MIL-PRF-25690 (Type A and C) acrylic plastics: The concentrated product (Type III only) and a 10% solution (Types I, II and IV) in distilled water shall not cause stress crazing or staining of acrylic plastics when tested in accordance with 4.5.14.

Material	As received	Dilution (10%)
MIL-PRF-5425 (Type A)	N/A	PASS
MIL-PRF-25690 (Type C)	N/A	PASS

Result _____ Conforms _____

- 3.10 Stress crazing of polycarbonate plastic: The concentrated product (Type III only) and a 10% solution (Types I, II and IV) in distilled water shall not cause stress crazing or staining of polycarbonate plastic conforming to MIL-P-83310 when tested in accordance with 4.5.15.

Material	As received	Dilution (10%)
MIL-P-83310 (Polycarbonate)	N/A	PASS

Result Conforms

- 3.11 Long-term storage stability: After being stored for a period of 12 months, in accordance with 4.5.17, the cleaning compound shall not layer, separate, precipitate or corrode the shipping container. Plastic containers shall not show leakage nor any cracking, crazing, or softening. All cleaning compounds shall meet the requirements of paragraphs 3.5.1, 3.7.1, 3.7.2, 3.15, and 3.16 of this specification.

Result Not performed

- 3.12 Hot dip galvanizing corrosion: The concentrated product (Type III only) and a 10% solution of the cleaning compound (Types I, II and IV) in distilled water shall not show a weight change of an average of three (3) test panels greater than 0.14 mg/cm² when tested in accordance with 4.5.18.

As received: *Not applicable*
Dilute (10%): *0.10 mg/cm²/24hrs*

Result Conforms

- 3.13 Workmanship: The cleaning compound shall be a liquid having a uniform and homogenous appearance. The cleaning compound shall be manufactured from materials that shall produce a product harmless to metal surfaces and humans when used as directed.

Result To be Cert. by Mfr.

Client: Simple Green
Product: **Extreme Simple Green Aircraft Cleaner**
Dilution: Per Specification **Aviation Cleaner**
MIL-PRF-87937D (Type IV)

Date: 19-Jan-2004
SMI/REF: 03DEC886

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- 3.14 Effect on polysulfide sealants: The concentrated cleaning compound (Type III only) and a 25% solution (Types I, II and IV) of the cleaning compound in distilled water shall not change the durometer hardness of the polysulfide sealant by more than 5 units when tested in accordance with 4.5.19.

Sealants: **MIL-S-81733 Type 1:** **< 5 units hardness change**
 MIL-S-8802 Type 1: **< 5 units hardness change**

Result _____ Conforms _____

- 3.15 Rubber compatibility: The concentrated cleaning compound (Type III only) and a 25% solution (Types I, II and IV only) of the cleaning compound in distilled water shall not change the durometer hardness more than 5 units when tested in accordance with 4.5.20.

Rubbers: **AMS 3204:** **< 5 units hardness change**
 AMS 3209: **< 5 units hardness change**

Result _____ Conforms _____

- 3.16 Effect on polyimide insulated wire: The cleaning compound, when tested according to 4.5.26, shall not cause dissolution, cracking, or dielectric breakdown (leakage) of the polyimide insulated wire in excess of that produced by distilled water.

Polyimide wire exhibited cracking upon double reverse wrap.

Result _____ Does not conform _____