A MARK IN TIME
1975 simple green 2000
SUNSHINE MAKERS, INC

25 Years of Environmental Intelligence

Information Regarding the Compressed Gas Industry

The following pages give information about original Simple Green and Crystal Simple Green as they relate to the compressed gas industry. This industry includes oxygen equipment for medical, industrial and recreational uses and other compressed gases used in industry including freon, fluoride, neon and many others.

The critical and key benefit of using Simple Green and Crystal Simple Green to clean equipment and gas lines is the feature of rinsibility. When organic compounds come into contact with many of these compressed gases, particularly oxygen, explosions can occur. Therefore, after cleaning, it is critical to rinse thoroughly, removing all organics from crevices, porous surfaces and other hidden areas. In 1992, the US Navy conducted a study of cleaning agents and found that Simple Green produced superior cleaning and rinsing results in comparison to traditional cleaners such as Freon 113 and TSP (trisodium phosphate) cleaners. Their cleaning protocol[1], for hyperbaric (in-place piping systems for pressurized oxygen equipment) which gives dilution ratio, cleaning, deionized water rinsing and system checking with ultraviolet light is given in the attached document.

The other documents attached follow the testing procedure set forth by the Compressed Gas Association. Simple Green contracted SGS US Testing Laboratories to conduct two ASTM tests (G121 & G122) on both original Simple Green and on Crystal Simple Green to determine the Cleaning Efficacy Factor[2] for both products. Both products received the highest rating of "1.0." Although Simple Green has chosen not to bear the expense of joining the Compressed Gas Association in 1999, this data can be given to any customer that wants to see data which supports the use of Simple Green or Crystal Simple Green in a compressed gas equipment cleaning application. An additional authorization from a large international corporation[3] in the compressed gas industry is attached. They choose to remain anonymous so as not to incur any potential liability from "endorsing" any particular product.

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[1] CCHI CLEANING PROCEDURE "CLEANING OF IN-PLACE PIPING SYSTEMS WITH SIMPLE GREEN", 1/9/92 -5 pgs.
[2] "CLEANING EFFICACY FACTORS" test data from SGS US Testing Laboratories, 8/26/99 -3 pgs.
[3] FLOURINE CLEAN (CLASS AAAA) CLEANING, INSPECTION AND ACCEPTANCE REQUIREMENTS, from 8/99 -6 pgs.

Hyperbarics

Ser: 04BA/92-102
9 January 1992

From: Commander, Naval Facilities Engineering Command
To: Commanding Officer, Chesapeake Division, Naval Facilities Engineering Command

Subj: CHHI CLEANING PROCEDURE "CLEANING OF IN-PLACE PIPING SYSTEMS WITH SIMPLE GREEN"

Ref: (a) CHHI ltr J91062 of 18 Oct 91

Encl: (1) NAVFAC 04BD memo of 19 Nov 91

1. Based on the information provided in enclosure (1), the subject cleaning procedure, forwarded by reference (a), is approved.

JOHN J. CECILIO
By direction

Post-it™ brand fax transmittal memo 7671 | # of pages ▸

To "Mr." DeAngelis	From Lori
Co.	Co. NAVFACHQ
Dept.	Phone # 221-0044
Fax (904) 225-5257	Fax # (703) 325-1916

19, NOV 1991

From: NAVFAC Code 04BD
To: NAVFAC Code 04BA

Subj: The SIMPLE GREEN LIQUID (SGL) as a Substitute for Freon 113 and Trisodium Phosphate Use as a Cleaner and Degreaser in the Hyperbaric In-Place Piping Systems

Ref: (a) Ltr From C.H. Hyperbarics, J91062, 18 Oct 91, to CHESTDIV, D. DeAngelis

Encl: (1) Comments on the Simple Green Liquid (SGL) as a Cleaning Solution Substitute for Freon 113 Based on the Sunshine Makers Inc. Laboratory Analysis Test Result Report.
(2) Comments on the Procedures for cleaning the Hyperbaric In-Place Piping Systems Using Simple Green Liquid (SGL).

1. The C.H. Hyperbarics Inc. was asked to investigate the feasibility of using SGL as a cleaning solution for the hyperbaric in-place piping system, reference (a).

2. The SGL in a 1 to 500 solution did prove to be the most effective when compared to the questionable Freon 113 and to the troublesome precipitating Trisodium phosphate cleaners/degreasers

3. The manufacturer, Sunshine Makers Inc. was contacted for chemical analysis of the SGL. They sent all of their test results, which consisted of three large volumes of reports. A complication of seven years of testing by 12 different labs including USDA, EPA, DUKE University and other known reputable labs. It can be safely assessed that SGL has demonstrated its acceptability as a substitute for cleaning and degreasing the hyperbaric in-place piping systems, enclosure (1).

4. The proposed cleaning procedures were reviewed with comments in enclosure (2).

Chris T. Matthews
Chem/Environ Engr.

COMMENTS ON THE SIMPLE GREEN LIQUID (SGL) AS A CLEANING SOLUTION SUBSTITUTE FOR FREON 113 BASED ON THE "SUNSHINE MAKERS INC." LABORATORY ANALYSIS TEST RESULTS REPORTS.

1. The acute toxicity testing and the study of ingredient toxicity have failed to show any dangerous properties other than the eye and skin mild irritant properties,

2. The chemical Ethylene Glycol Monobutyl Ether (EGMBE) or butyl cellosolve, CAS #111-76-2, a raw material ingredient in the confidential formulation of SGL, can significantly affected fertility and reproduction in mice at low concentration of 2%. But the SGL formulation does not show any occupational health risk that is associated with exposures to EGMBE. The EGMBE chemical appears to be inhibited or neutralized.

3. If the SGL is introduced at a 100% concentration, the biodegradability factor can be seriously compromised because the microorganisms responsible for the decomposition are killed or obstructed. But the test results show that the test microorganism at various levels of SGL dilution (at 1:500 ratio) will effectively support the biological breakdown of SGL. In a wastewater stream, SGL will remain water soluble and will not adversely affect the sewage treatment systems.

4. SGL is nonflammable and nonexplosive, poses no fire hazard problem. SGL is normally stable even during fire event conditions.

5. SGL is not a reactant; it does not react with water, acids and other oxidizers. This will give little to no problems in storage handling.

6. The use as a dispersant for cleaning up oil spills has shown great promise as environmentally safe and nontoxic to man

METHOD 2

OIL-FREE CLEANING WITH SIMPLE GREEN AND INSPECTION FOR HYDROCARBONS

SCOPE. THIS METHOD OUTLINES THE OIL-FREE CLEANING PROCEDURE FOR METALLIC AND/OR NONMETALLIC (EXCLUDING ELASTOMERIC) COMPONENTS OR ASSEMBLIES FOR USING A SIMPLE GREEN SOLUTION. THIS METHOD APPLIES ONLY TO COMPONENTS OF THE EX 14 MOD 1 AND MK 18 SYSTEMS.

NOTE

SIMPLE GREEN IS APPROVED BY NAVSEA FOR CLEANING EXCLUSIVELY METALLIC, DELRIN, FIBERGLASS, NYLON, POLYETHYLENE, ACETAL, TEFLON, POLYCARBONATE, POLYESTER, AND MAKROBLEND PARTS IN THE EX 14 MOD 1 AND MK 18 SYSTEMS. HOWEVER, DETERMINATION OF ACTUAL CLEANING METHOD SPECIFIED ON THE COMPONENT DRAWINGS IS NOT BASED ENTIRELY ON THE GENERIC NATURE OF THE MATERIAL. THEREFORE, PERSONNEL CLEANING THE EX 14 MOD 1 AND MK 18 COMPONENTS SHALL ADHERE STRICTLY TO THE CLEANING METHOD SPECIFIED ON THE APPLICABLE COMPONENT DRAWING. USE OF SIMPLE GREEN TO CLEAN PER THESE PROCEDURES IS LIMITED TO NAVCOASTSYSCEN. NAVSEA APPROVAL REQUIRED FOR OTHER ACTIVITY USE.

MATERIAL AND EQUIPMENT.

SIMPLE GREEN.

MFG: SUNSHINE MAKERS, INC.
15922 PACIFIC COAST HIGHWAY
HUNTINGTON HARBOR, CA 92649
PART NUMBER: 13005
PH: (714) 840-1319
CAGE CODE: 1Z575

GRADE B WATER (MAX CHLORIDE ION, 1 PPM; MAX CONDUCTIVITY, 20 MICROMHOS/CM; VISUAL CLARITY, NO TURBIDITY, OIL, OR SEDIMENT).

NITROGEN PER FED SPEC BB-N-411, TYPE I, CLASS I, GRADE B; OR COMPRESSED AIR PER FED SPEC BB-A-1034, GRADE A OR C.

ULTRAVIOLET LIGHT SOURCE.ULTRAVIOLET LIGHT SOURCE WILL BE A LONG WAVELENGTH ULTRAVIOLET (3600-3900 ANGSTROMS).

CLEANING PROCEDURES. CLEAN PARTS, IN ACCORDANCE WITH THE FOLLOWING STEPS, USING THE SPECIFIED MATERIALS AND UTILIZING PROPER EQUIPMENT. ELECTRICAL AND ELECTRONIC COMPONENTS SHALL NOT BE PLACED IN THE ULTRASONIC CLEANER BUT SCRUBBED BY HAND. NO RUBBER COMPONENTS OR RUBBERLIKE (ELASTOMERIC) COMPONENTS SHALL BE CLEANED WITH SIMPLE GREEN SOLUTION.

CLEANING OF PARTS.

CAUTION

THE SIMPLE GREEN CLEANING SOLUTION COULD BE HARMFUL TO EYES AND SKIN. FOR THIS REASON SAFETY GARMENTS SHOULD BE WORN WHEN HANDLING AND/OR WORKING WITH THIS SOLUTION.

THE CLEANING SOLUTION SHALL BE MADE BY ADDING 1/4 OUNCE (7-8 ML) OF SIMPLE GREEN TO ONE GALLON OF GRADE B WATER (1 TO 500 MIXING RATIO). SIMPLE GREEN PROCUREMENT TRACEABILITY WILL BE APPROPRIATELY MAINTAINED.

.1.2 PRECLEAN COMPONENTS WITH CLEANING SOLUTION. SOAK, AGITATE, AND SCRUB WITH A NYLON BRISTLE BRUSH UNTIL ALL VISIBLE TRACES OF DIRT AND GREASE DISAPPEAR.

NOTE

DO NOT HEAT CLEANING SOLUTION. AT TEMPERATURES ABOVE 130°F, THE SIMPLE GREEN CLEANING AGENT BREAKS DOWN AND WILL NOT PERFORM ITS INTENDED CLEANING FUNCTION.

.1.3 PLACE COMPONENTS IN AN ULTRASONIC CLEANING TANK CONTAINING THE SIMPLE GREEN CLEANING SOLUTION (DO NOT HEAT CLEANING SOLUTION) AND ENERGIZE FOR 8 TO 10 MINUTES.

.2 RINSE. RINSE WITH GRADE B WATER AT 120° ±5°F UNTIL SHAKE TEST, PARAGRAPH 3.3, OF EFFLUENT SHOWS NO VISIBLE SIGNS OF DETERGENT.

.3 SHAKE TEST. COLLECT SOME OF THE WATER RINSED OVER THE ITEMS IN A FLASK THAT CAN BE FITTED WITH A RUBBER STOPPER. SHAKE THE FLASK FOR A FEW SECONDS AND IF ANY BUBBLES FORM AND REMAIN ON THE SURFACE OF THE WATER IN THE FLASK, CONTINUE TO RINSE THE ITEMS UNTIL NO BUBBLES FORM AND REMAIN ON THE SURFACE FOR THE SAMPLE IN THE FLASK.

.4 DRYING. BLOW DRY WITH OIL-FREE AIR OR OIL-FREE NITROGEN UNTIL VISUALLY DRY; OR ALLOW TO AIR DRY BY EVAPORATION.

.5 HYDROCARBON INSPECTION. VERIFY HYDROCARBONS HAVE BEEN REMOVED BY USING AN ULTRAVIOLET LIGHT. THE PRESENCE OF HYDROCARBONS WILL CAUSE THE SURFACE TO FLUORESCE. ANY SIGN OF FLUORESCENCE IS NOT ACCEPTABLE. (5-MINUTE MINIMUM WARM-UP TIME OF ULTRAVIOLET LIGHT IS CRITICAL. MAXIMUM DISTANCE OF ULTRAVIOLET LIGHT FROM THE COMPONENT WILL BE 15 INCHES.)

.6 ASSEMBLE AND/OR PACKAGE AS OUTLINED ON THE ASSEMBLY OR COMPONENT DRAWING.

.7 TEMPORARY PACKAGING IS AS FOLLOWS: HEAT SEAL COMPONENT OR ASSEMBLY IN CLEAN 6-MIL POLYETHYLENE BAG THEN PLACE IN A ZIP LOCK BAG WITH A TAG BETWEEN THE BAGS AS OUTLINED ON THE ASSEMBLY OR COMPONENT DRAWING, WITH THE DATE THE ITEM WAS TESTED, CLEANED AND BAGGED. ITEMS MAY REMAIN IN TEMPORARY PACKAGING FOR UP TO 60 DAYS. AFTER THAT THE ITEM(S) MUST BE RECLEANED AND REPACKAGED.

Crystal Simple Green

Aqueous

Sunshine Makers, Inc., 15922 Pacific Coast Hwy. Huntington Harbour, CA 92649
Phone: 562-795-6000 / 800-228-0709 Fax: 562-592-3830
Email: sales@simplegreen.com Web Site: www.simplegreen.com

PROPERTIES

Type of Cleaner:	Aqueous
Active Ingredient:	Non-ionic surfactants
CAS Number	111-76-2
Cleaning System Options: Immersion: Yes	Spray Wash: Yes Wipe: Yes
Practical Use and Procedure Summary:	Dilute minimum of 2 parts water to 1 part Crystal Simple Green, clean with agitation, rinse thoroughly.
Cleaning Ability per Contaminant – Test Method:	ASTM G121/122
Contaminant:	Mobil 600
Average Initial Contamination Level (mg/m^2)	1615±538 mg/m^2
Concentration of Cleaning Agent:	5%
Method:	Immersion
Time (minutes):	10 minutes
Cleaning Effectiveness Factor (CEF):	1.0 (0=lowest, 1.0=highest)

CEF = 1.0

Evaporation Rate Referenced to Butyl Acetate:	>1	Flammability:	
Vapor Pressure (mm Hg at 20° C):	17	Flammable:	No
Corrosivity (Al, Cu, Fe):	Mild on Al.	Combustible:	No
pH:	9.5 neat	Flash Point:	Not flammable
Residue Potential:	Negligible if rinsed thoroughly	LEL (%):	N/A
		UEL (%):	N/A

ENVIRONMENTAL FACTORS

Health Hazard (MSDS):	1 = slight (NFPA/HMIS) *Mild eye irritant
Carcinogen:	No
TLV – TWA (ppm)	Not determined
Carcinogen per CA Prop 65:	No
Sara Title III Section 313 Toxic:	No – 111-76-2 reportable @ 5%
OSHA PEL, PPM	N/A
ACGIH TLV, PPM	N/A
Acute Dermal LD_{50} mg/kg H < 4,300:	>2.0 g/kg body weight
Acute Inhalation LD_{50} mg/m^3 H < 10,000 PPM:	None
Fish Toxicity 96 HR LC_{50} mg/L H, 500 mg/L:	Non-lethal @ 200 mg/L (0.02%)
Ozone Depleting:	No
Volatile Organic Compound:	Zero g/L per ASTM Method 3960-90
EPA Clean Air Act Hazardous Air Pollutant:	Yes
RCRA Hazardous Waste:	No
On SNAP List	Yes

OTHER

Storage Period:	Indefinite
Ease of Disposal/Recyclable	No special disposal method required
Special Handling:	None
Material Incompatibility:	None
Warranty:	Complete
Availability:	Worldwide through distributors/retailers
Price/Unit:	Available from distributors
Additional Information:	Oral LD >5.0 g/kg body weight

WORLDWIDE FABRICATION AND ERECTION SPECIFICATION Fluorine Clean (Class AAAA) Cleaning, Inspection and Acceptance Requirements	4WPI-SW70004 Revision 0 September 1997 Page 1 of 6

RESPONSIBLE GROUP:

1. PURPOSE

1.1 This fabrication and erection specification defines the criteria for the cleaning, degreasing, inspection, acceptance, and the preparation for shipment of piping and equipment, prior to fluorine (F_2) exposure, classified as **Fluorine Clean (Class AAAA).**

2. SCOPE

2.1 This specification applies to cleaning of equipment, piping, components and systems designed, owned, operated or purchased by in fluorine service greater than 20% F_2 by weight. For fluorine service at levels equal to or lower than 20% F_2 by weight, specification 4WPI-SW70003 is considered to be acceptable.

2.2 This specification is used along with a contract cleaning document that identifies when the fluorine cleaning specifications apply.

3. RELATED DOCUMENTS

3.1 Products Engineering Documents

Worldwide: 4WPI-SW70003	Oxygen Clean (Class AA) Inspection and Acceptance Requirements
American: 660.500	Pictorial Representation of Allowable Rust

3.2 Compressed Gas Association (CGA)

G4.1 Cleaning Equipment for Oxygen Service

3.3 Industrial Gases Committee (IGC Europe)

33/86E Cleaning for Oxygen Service

3.4 International Organization for Standardization (ISO)

8501-1 Preparation of steel substrates before application of paints and related products-visual assessment of surface cleanliness - (also SIS SS 05 59 00, and ASTM D2200, same title)