MATERIAL SAFETY DATA SHEET: SIMPLE GREEN®

SUNSHINE MAKERS, INC.

RESEARCH AND DEVELOPMENT DIVISION
15922 Pacific Coast Highway
Huntington Harbour, CA 92649 USA
Telephone: 800-228-0709 • 310-795-6000

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SUPERSEDES ANY PREVIOUS VERSIONS

For 24-hour emergency, call Chem-Tel, Inc.: 800-255-3924

PRODUCT IDENTIFICATION

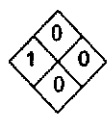
Other Names: Simple Green®
Simple Green®-Industrial Cleaner and Degreaser

UN Number: Not required

Dangerous Goods Class: Nonhazardous

Hazard Rating (NFPA/HMIS)

Health = 1* Reactivity = 0
Fire = 0 Special = 0



Rating Scale

0 = minimal 1 = slight
2 = moderate 3 = serious
4 = severe

*Mild eye irritant, non-mutagenic and non-carcinogenic. **None of the ingredients in Simple Green® are regulated or listed as potential cancer agents by Federal OSHA, NTP, or IARC.**

Use: An all purpose cleaner and degreaser used undiluted or diluted in water for direct, spray, and dip tank procedures.

SAFE HANDLING INFORMATION

Fire/Explosion Hazard

Simple Green® is nonflammable, stable, and will not burn.
Flash Point/Auto-Ignition: Not relevant.
Extinguishing Media: Nonflammable/nonexplosive. No special procedures required.

Special Fire Fighting Procedures: None required.

Reactivity Data

Nonreactive. Simple Green® is stable, even under fire conditions, and will not react with water or oxidizers. Hazardous polymerization will not occur.

Storage and Transport

No special precautions are required. **This product is non-hazardous for storage and transport according to the U.S. Department of Transportation Regulations.**

Simple Green® requires no special labeling or placarding to meet U.S. Department of Transportation requirements.

Spills and Disposal

Spill or Leakage Procedures: Recover usable material by convenient method; residual may be removed by wipe or wet mop. If necessary, unrecoverable material may be washed to drain with large quantities of water.

Waste Disposal: Simple Green® is fully water soluble and biodegradable and will not harm sewage-treatment microorganisms if disposal by sewer or drain is necessary. Dispose of in accordance with all applicable local, state, and federal laws.

PRECAUTIONS FOR USE

Exposure Limits: The Simple Green® formulation presents no health hazards to the user, other than mild eye irritancy.

Ventilation: No special ventilation is required during use.

Personal Protection

Precautionary Measures: No special requirements under normal use conditions.

Eye Protection: Caution, including reasonable eye protection, should always be used to avoid eye contact where splashing may occur.

Skin Protection: No special precautions required; rinse completely from skin after contact.

Respiratory Protection: No special precautions required.

Work and Hygienic Practices: No special requirements. Wash or rinse hands before touching eyes or contact lenses.

SYMPTOMS OF OVEREXPOSURE AND FIRST AID TREATMENT

Eye contact: Reddening may develop. Immediately rinse the eye with large quantities of cool water; continue 10-15 minutes or until the material has been removed; be sure to remove contact lenses, if present, and to lift upper and lower lids during rinsing. Get medical attention if irritation persists.

Skin contact: Minimal effects, if any; rinse skin with water, rinse shoes and launder clothing before reuse. Reversible reddening may occur in some dermal-sensitive users; thoroughly rinse area and get medical attention if reaction persists.

Swallowing: Essentially non-toxic. Give several glasses of water to dilute; do not induce vomiting. If stomach upset occurs, consult physician.

Inhalation: Non-toxic. Exposures to concentrate-mist may cause mild irritation of nasal passages or throat; remove to fresh air. Get medical attention if irritation persists.

INGREDIENT INFORMATION

The only ingredient of Simple Green® with established exposure limits is undiluted 2-butoxyethanol (<6%) (Butyl Cellosolve; CAS No. 111-76-2): the OSHA PEL and ACGIH TLV is 25 ppm (skin).
Note, however, that Butyl Cellosolve is only one of the raw material ingredients that undergo processing and dilution during the manufacture of Simple Green®. Upon completion of the manufacturing process, Simple Green® does not possess the occupational health risks associated with exposure to undiluted Butyl Cellosolve. Verification of this is contained in the independent test results detailed under "Toxicity Information" on Page 3 of this MSDS.

The Butyl Cellosolve in Simple Green® is part of a chemical category (glycol ethers) regulated by the Emergency Planning and Community Right-to-Know Act (SARA, Title III, section 313); therefore, a reporting requirement exists. Based upon chemical analysis, Simple Green® contains no known EPA priority pollutants, heavy metals, or chemicals listed under RCRA, CERCLA, or CWA. Analysis by TCLP (Toxicity Characteristic Leaching Procedure) according to RCRA revealed no toxic organic or inorganic constituents.

TOXICITY INFORMATION

Human Health Effects or Risks from Exposure

Adverse effects on human health are not expected from Simple Green®, based upon seventeen years of use without reported adverse health incidence in diverse population groups, including extensive use by inmates of U.S. Federal prisons in cleaning operations.

Simple Green® is a mild eye irritant; mucous membranes may become irritated by concentrate-mist.

Simple Green® is not likely to irritate the skin in the majority of users. Repeated daily application to the skin without rinsing, or continuous contact of Simple Green® on the skin may lead to temporary, but reversible, irritation.

Medical Conditions Aggravated by Exposure

No aggravation of existing medical conditions is expected; dermal-sensitive users may react to dermal contact by Simple Green®.

Nonhuman Toxicity

Acute Mortality Studies:

Oral LD_{50} (rat): >5.0 g/kg body weight
Dermal LD_{50} (rabbit): >2.0 g/kg body weight

Dermal Irritation: Only mild, but reversible, irritation was found in a standard 72-hr test on rabbits. A value of 0.2 (non-irritating) was found on a scale of 8.

Eye Irritation: With or without rinsing with water, the irritation scores in rabbits at 24 hours did not exceed 15 (mild irritant) on a scale of 110.

Subchronic dermal effects: No adverse effects, except reversible dermal irritation, were found in rabbits exposed to Simple Green (up to 2.0 g/kg/day for 13 weeks) applied to the skin of 25 males and 25 females. Only female body weight gain was affected. Detailed microscopic examination of all major tissues showed no adverse changes.

Fertility Assessment by Continuous Breeding: The Simple Green® formulation had no adverse effect on fertility and reproduction in CD-1 mice with continuous administration for 18 weeks, and had no adverse effect on the reproductive performance of their offspring.

BIODEGRADABILITY AND ENVIRONMENTAL TOXICITY INFORMATION

Biodegradability:

Simple Green® is readily decomposed by naturally occurring microorganisms. The biological oxygen demand (BOD), as a percentage of the chemical oxygen demand (COD), after 4, 7, and 11 days was 56%, 60%, and 70%, respectively.

In a standard biodegradation test with soils from three different countries, Butyl Cellosolve reached 50% degradation in 6 to 23 days, depending upon soil type, and exceeded the rate of degradation for glucose which was used as a control for comparison.

Environmental Toxicity Information:

Simple Green® is nontoxic to any of the following marine and estuarine test animals at concentrations below 200 mg/L (0.02%). The Simple Green® concentrations that are likely to be lethal to 50% of the exposed organisms are summarized in the following table:

	LC_{50} in mg/L (ppm)	
	48-hour	96-hour
Marine Fish:		
Mud minnow *(Fundulus heteroclitus)*	1690	1574
Whitebait *(Galaxias maculatus)*	210	210
Marine/Estuarine Invertebrates:		
Brine Shrimp *(Artemia salina)*	610	399
Grass Shrimp *(Palaemonetes pugio)*	270	220
Green-lipped Mussel *(Perna canaliculus)*	220	220
Mud Snail *(Potamopyrgus estuarinus)*	410	350

OTHER INFORMATION

Physical Description and Properties

Appearance/odor: Translucent green liquid with characteristic sassafras odor.
Flashpoint: Nonflammable
Flammability Limits: Nonflammable
Vapor Pressure: 17 mm Hg @ 20 °C
22 mm Hg @ 25 °C
VOC Composite Partial Pressure: 0.006 mm Hg @ 20 °C
Boiling Point: 110 °C (231 °F)
Freezing Point: -9 °C (16 °F)
Specific Gravity: 1.0257
pH: 9.5
Vapor Density: 1.3 (air = 1)
Volatile Organic Compounds: 7.96 g/L
Water Solubility: Completely soluble in water. The higher salt concentrations in marine ecosystems will lead to complexes with Simple Green that may become visible at ratios above one part Simple Green® to 99 parts seawater.
Detection: Simple Green® has a characteristic sassafras odor that is **not** indicative of any hazardous situation.

Additional Data

Ash Content: At 600 °F: 1.86% by weight.
Nutrient Content: Nitrogen: <1.0% by weight (fusion and qualitative test for ammonia).
Phosphorus: 0.3% by formula.
Sulfur: 0.6% by weight (barium chloride precipitation method).

General Information

Containers: Simple Green® residues can be completely removed by rinsing with water; the container may be recycled or applied to other uses.

Electrical Wiring Compatibility: Polyimide insulated wiring is not affected by exposure to Simple Green®. After immersion in Simple Green® for 14 days at 74°F, the 61 cm piece of polyimide insulated wire passed a one minute dielectric proof test at 2500 volts (ASTM D-149).

Contact Point: Sunshine Makers, Inc., Director of Research and Development: 310-795-6000.

*** NOTICE ***