



## LEED™ Green Housekeeping Innovation Credit

LEED Credit Interpretation Ruling  
April 8, 2004

### ENVIRONMENTALLY PREFERABLE CLEANING PRODUCTS AND PRACTICES:

The commitment to environmentally preferable cleaning products and practices is a noteworthy one that complements the IEQ requirements of LEED. Generic requirements for commercial and multi-unit residential buildings are addressed below.

**INTENT:** Reduce exposure of building occupants and maintenance personnel to potentially hazardous chemical contaminants that adversely impact air quality, occupant well-being, and the environment.

### REQUIREMENTS FOR COMMERCIAL BUILDINGS:

To receive an innovation point, the project team will need to demonstrate that a comprehensive green cleaning/housekeeping program is in place with clear performance goals, including:

1. A statement of purpose describing what the policy is trying to achieve from a health and environmental standpoint, focusing on cleaning chemicals and custodial training at a minimum.
2. A contractual or procedural requirement for operations staff to comply with the guidelines, including a written program for training and implementation.
3. A clear set of acceptable performance level standards by which to measure progress or achievement, such as Green Seal standard GS-37 (see [www.greenseal.org](http://www.greenseal.org)) or California Code of Regulations, Title 17 Section 94509, VOC standards for cleaning products (go to [www.calregs.com](http://www.calregs.com), click on "California Code of Regulations" and perform a keyword search for "94509").
4. Documentation of the program's housekeeping policies and environmental cleaning solution specifications, including a list of approved and prohibited chemicals and practices. Demonstrate that the products used in the project are non-hazardous, have a low environmental impact, and meet the criteria set forth in #3 above. Concentrated cleaning products should be utilized when available.

### REQUIREMENTS FOR MULTI-UNIT RESIDENTIAL BUILDINGS:

For cleaning and maintenance of common areas, a building owner/manager must comply with the requirements stated above. Additional steps are required to influence housekeeping protocols within residences. Select six major cleaning needs and identify products (compliant with #3, above) that will be supplied to meet these needs. Note that one cleaner may address several cleaning functions. Examples of cleaning needs include, but are not limited to: counter, sink, tub/shower, tile, limescale remover, toilet, hard flooring, laundry detergent, laundry bleach and windows. Provide an estimated 6 month supply of these products to residents, as well as information on how to easily purchase refills and/or replacements. Educate the residents on the green cleaning concepts and products via discussion and written materials upon move-in and periodically thereafter.

Additionally, if the building contains retail tenants, actively educate them on the cleaning products, standards and protocols that are being used in the common areas. Submit a narrative and highlighted supportive documents (e.g., relevant to policy, O&M, communications, products and contracts) as part of your LEED certification submittal.

### **Green Seal standard GS-37**

Taken from [www.greenseal.org](http://www.greenseal.org)

### **Industrial and Institutional Cleaners (GS-37)**

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#### 1. **Scope**

This standard establishes environmental requirements for industrial and institutional general-purpose, bathroom, and glass cleaners. For purposes of this standard, general-purpose, bathroom, and glass cleaners are defined as those cleaners intended for routine cleaning of offices, institutions, warehouses, and industrial facilities. The standard does not focus on the use of cleaners in households, food preparation operations, or medical facilities.

Due to the large number of possible cleaning products, processes, soil types, and cleaning requirements, the compatibility of cleaners with surface materials is not specifically addressed in this standard. Product users should follow the manufacturers' instructions on compatibility.



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Each criterion states whether it applies to the undiluted product or to the product as used.

### 2. Definitions:

**Bathroom cleaners.** This category includes products used to clean hard surfaces in a bathroom such as counters, walls, floors, fixtures, basins, tubs, and tile. It includes products that are required to be registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), such as disinfectants and sanitizers, but does not include products specifically intended to clean toilet bowls.

**Concentrate.** This is a product that must be diluted by at least eight parts by volume water (1:8 dilution ratio) prior to its intended use.

**Dispensing-system concentrates.** These are products that are designed to be used in dispensing systems that cannot be practically accessed by users.

**General-purpose cleaners.** This category includes products used for routine cleaning of hard surfaces including impervious flooring such as concrete or tile. It does not include cleaners intended primarily for the removal of rust, mineral deposits, or odors. It does not include products intended primarily to strip, polish, or wax floors, and it does not include cleaners intended primarily for cleaning toilet bowls, dishes, laundry, glass, carpets, upholstery, wood, or polished surfaces. This category does not include any products required to be registered under FIFRA, such as those making claims as sterilizers, disinfectants, or sanitizers.

**Glass cleaners.** This category includes products used to clean windows, glass, and polished surfaces. This category does not include any products required to be registered under FIFRA, such as those making claims as sterilizers, disinfectants, or sanitizers.

**Ingredient.** Any constituent of a product that is intentionally added or known to be a contaminant that comprises at least 0.01% by weight of the product.

**Ozone-depleting compounds.** An ozone-depleting compound is any compound with an ozone-depletion potential greater than 0.01 (CFC 11 = 1).

**Product as used.** This is the most concentrated form of the product that the manufacturer recommends for a product's intended use. For example, if a manufacturer recommends a product be diluted 1:64 or 2:64 for use as a general-purpose cleaner, the product shall meet the environmental and performance requirements at a dilution of 2:64.

**Primary packaging.** This packaging is the material physically containing and coming into contact with the product, not including the cap or lid of a bottle.

**Recyclable package.** This package can be diverted from the waste stream through available processes and programs, and can be collected, processed, and returned to use in the form of raw materials or products.

**Undiluted product.** This is the most concentrated form of the product produced by the manufacturer for transport outside its facility.

### 3. Product-Specific Performance Requirements

Each product *as used* when diluted with water from the cold tap at no more than 50 °F, shall clean common soils and surfaces in its category effectively, as measured by a standard test method. Green Seal recommends the following test methods:

**General-purpose cleaners.** The product shall remove at least 80% of the particulate soil in the American Society for Testing and Materials (ASTM) D4488-95, A5.

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**Bathroom cleaners.** The product shall remove at least 75% of the soil in ASTM D5343 as measured by ASTM D5343.

**Glass cleaners.** The product shall achieve at least a rating of three in each of the following Chemical Specialties Manufacturers Association (CSMA) DCC 09 categories: soil removal, smearing, and streaking.

Using standard test methods, a manufacturer can also demonstrate that its product performs as well as a nationally recognized product in its category or achieves the removal efficiency defined in this section.

#### 4. Product-Specific Health and Environmental Requirements

##### 4.1 Toxic Compounds

The *undiluted* product shall not be toxic to humans. Dispensing-system concentrates shall be tested as used. A product is considered toxic if any of the following criteria apply:

Oral lethal dose 50 (LD50)	<2,000 mg/kg
Inhalation lethal concentration (LC50)	<20 mg/L *

\* If the vapor-phase concentration of the product at room temperature is less than 20 mg/L, it should be tested at its saturation concentration. If it is not toxic at this concentration, it passes the inhalation criterion.

Toxicity shall be measured on the product as a whole. Alternatively, a mixture need not be tested if existing toxicity information demonstrates that each of the ingredients complies. Ingredients that are nonvolatile do not require inhalation toxicity testing, and ingredients that are not readily absorbed through the skin do not require dermal toxicity testing (Appendix A). It is assumed that the toxicity of the individual component compounds are weighted and summed and that there are not synergistic effects (Appendix A).

The toxicity testing procedures should meet the requirements put forth by the Organization for Economic Cooperation and Development (OECD) Guidelines for Testing of Chemicals. These protocols include Acute Oral Toxicity Test (TG 401), Acute Inhalation Toxicity Test (TG 403), and Acute Dermal Toxicity Test (TG 402).

##### 4.2 Carcinogens and Reproductive Toxins

The *undiluted* product shall not contain any ingredients that are carcinogens or that are known to cause reproductive toxicity. Carcinogens are defined as those chemicals listed as known, probable, or possible human carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), the U.S. Environmental Protection Agency, or the Occupational Health and Safety Administration. Chemicals known to cause reproductive toxicity are defined as those listed by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, *et seq.*).

Naturally occurring elements and chlorinated organics, which may be present as a result of chlorination of the water supply, are not considered ingredients if the concentrations are below the applicable maximum contaminant levels in the National Primary Drinking Water Standards found in 40 Code of Federal Regulations (CFR) Part 141.

##### 4.3 Skin and Eye Irritation

The *undiluted* product shall not be corrosive to the skin or eyes. Dispensing-system concentrates shall be tested as used. The undiluted cleaning product shall not be corrosive to the skin, as tested using the Human Skin Construct systems (Liebsch et al. 2000; Fentem et al. 1998). The undiluted cleaning product shall also not be corrosive to the eye as tested using the bovine opacity and permeability test (BCOP) (Sina et al. 1995) after a 10-minute exposure. Green Seal will also accept the results of other peer-reviewed or standard in vitro or in vivo test methods demonstrating that the product mixture is not corrosive.

#### 4.4 Skin Sensitization

The *undiluted* product shall not be a skin sensitizer, as tested by the OECD Guidelines for Testing Chemicals, Section 406. Dispensing-system concentrates shall be tested as used. Green Seal shall also accept the results of other standard test methods, such as those described in Buehler (1994) or Magnusson and Kligman (1969), as proof that the product or its ingredients are not skin sensitizers.

#### 4.5 Combustibility

The *undiluted* product shall not be combustible. The product or 99% by volume of the product ingredients shall have a flashpoint above 150 °F, as tested using either the Cleveland Open Cup Tester (ASTM D92-97) or a closed-cup method International Standards Organization (ISO) 13736 or ISO 2719. Alternatively, the product shall not sustain a flame when tested using ASTM D 4206.

#### 4.6 Photochemical Smog, Tropospheric Ozone Production, and Indoor Air Quality

The product as used shall not contain substances that contribute significantly to the production of photochemical smog, tropospheric ozone, or poor indoor-air quality. The volatile organic content of the product as used shall not exceed the following:

- 1% by weight for general-purpose and bathroom cleaners
- 3% by weight for glass cleaners

The volatile organic content shall be determined by California Air Resources Board Method 310.

#### 4.7 Toxicity to Aquatic Life

The product as used shall not be toxic to aquatic life. A compound is considered not toxic to aquatic life if it meets one or more of the following criteria:

Acute LC<sub>50</sub> for algae, daphnia, or fish < 100 mg/L

For purposes of demonstrating compliance with this requirement, aquatic toxicity testing is not required if sufficient aquatic toxicity data exist for each of the product's ingredients to demonstrate that the product mixture complies. Aquatic toxicity tests shall follow the appropriate protocols in ISO 7346.2 for fish and in 40 CFR 797, Subpart B for other aquatic organisms.

#### 4.8 Aquatic Biodegradability

Each of the organic ingredients shall exhibit ready biodegradability in accordance with the OECD definition except for a FIFRA-registered ingredient in a bathroom cleaner. However, all other ingredients in a FIFRA-registered bathroom cleaner must comply. Biodegradability shall be measured by one of the following methods: ISO 9439 carbon dioxide (CO<sub>2</sub>) evolution test, ISO 10708 (two-phase closed-bottle test), ISO 10707 (closed bottle test), or ISO 7827 (dissolved organic carbon removal). Specifically, within a 28-day test, the ingredient shall meet one of the following criteria within 10 days of the time when biodegradation first reaches 10%:

Removal of dissolved organic carbon (DOC)	>70%
Biological oxygen demand (BOD)	>60%
% of BOD of theoretical oxygen demand (ThOD)	>60%
% CO <sub>2</sub> evolution of theoretical	>60%

For organic ingredients that do not exhibit ready biodegradability in these tests, the manufacturer may demonstrate biodegradability in sewage treatment plants using the Coupled Units Test found in OECD 303A by demonstrating dissolved organic carbon (DOC) removal >90%.

Testing is not required for any ingredient for which sufficient information exists concerning its biodegradability, either in peer-reviewed literature or databases or proving that the ingredient was tested in accordance with standard test procedures.



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### 4.9 Eutrophication

The product *as used* shall not contain more than 0.5% by weight of total phosphorus.

### 4.10 Packaging

The primary package shall be recyclable. Alternatively, manufacturers may provide for returning and refilling of their packages.

### 4.11 Concentrates

The product must be a concentrate, except for FIFRA-registered bathroom cleaners.

### 4.12 Fragrances

Manufacturers shall identify any fragrances on their material safety data sheets (MSDSs). Any ingredient added to a product as a fragrance must follow the Code of Practice of the International Fragrance Association.

### 4.13 Prohibited Ingredients

The product shall not contain the following ingredients:

- Alkylphenol ethoxylates
- Dibutyl phthalate
- Heavy metals including arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, or selenium
- Ozone-depleting compounds

### 4.14 Training

The product manufacturer, its distributor, or a third party shall offer training or training materials in the proper use of the product. These shall include step-by-step instructions for the proper dilution, use, disposal, and the use of equipment. Manufacturers shall have product labeling systems to assist non-English-speaking or illiterate personnel.

### 4.15 Animal Testing

This section applies to Sections 4.1, 4.3, and 4.7. Green Seal wants to discourage animal testing and will accept the results of past peer-reviewed or standard tests demonstrating compliance with a criterion. A mixture need not be tested if existing information demonstrates that each of the ingredients complies with a criterion. Additionally, Green Seal may accept non-animal (in-vitro) test results, providing that the test methods are referenced in peer-reviewed literature and the manufacturer provides the reasons for selecting the particular test method.

## 5. Labeling Requirements

The manufacturer's label shall state clearly and prominently that dilution with water from the cold tap is recommended and shall state the recommended level of dilution. The manufacturer shall also include detailed instructions for proper use and disposal and for the use of personal protective equipment.

Whenever the Green Seal certification mark appears on a package, the package shall contain a description of the basis for certification. The description shall be in a location, style, and typeface that are easily readable. Unless otherwise approved in writing by Green Seal, the description shall read as follows:

"This product meets Green Seal's environmental standard for industrial and institutional cleaners based on its reduced human and aquatic toxicity and reduced smog production potential."

For FIFRA-registered bathroom cleaners, replace "toxicity" with the word "impacts".

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