



**GREEN SEAL™ ENVIRONMENTAL STANDARD FOR
INDUSTRIAL AND INSTITUTIONAL
CLEANERS**

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THE MARK OF ENVIRONMENTAL RESPONSIBILITY

GREEN SEAL™

Green Seal is a non-profit organization devoted to environmental standard setting, product certification, and public education. Green Seal's mission is to work towards environmental sustainability by identifying and promoting environmentally responsible products, purchasing, and production. Through its standard setting, certification and education programs, Green Seal:

- identifies products that are designed and manufactured in an environmentally responsible manner;
- offers scientific analyses to help consumers make educated purchasing decisions regarding environmental impacts;
- ensures consumers that any product bearing the Green Seal Certification Mark has earned the right to use it; and
- encourages manufacturers to develop new products that are significantly less damaging to the environment than their predecessors.

The intent of Green Seal's environmental requirements is to reduce, to the extent technologically and economically feasible, the environmental impacts associated with the manufacture, use and disposal of products. Set on a category-by-category basis, Environmental Standards focus on significant opportunities to reduce a product's environmental impact.

Green Seal offers certification to all products covered by its Standards. Manufacturers may submit their products for evaluation by Green Seal. Those which comply with Green Seal's requirements may be authorized to use the Green Seal Certification Mark on products and in product advertising. Manufacturers authorized to use the Green Seal Certification Mark on their product are subject to an ongoing program of testing, inspection, and enforcement. For additional information on Green Seal or any of its programs, contact:

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**GREEN SEAL™ ENVIRONMENTAL STANDARD FOR INDUSTRIAL AND
INSTITUTIONAL CLEANERS (GS-37)**

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FOREWORD

A. Certification. This Environmental Standard contains the basic requirements for certain products (as defined in the Scope section below) to be certified by Green Seal™ and for their manufacturers to receive authorization to use the Green Seal Certification Mark on products and their packaging, and in product advertising. The requirements are based on an assessment of the environmental impacts of product manufacture, use, and disposal and reflect information and advice obtained from industry, trade associations, users, government officials, environmental and other public interest organizations, and others with relevant expertise. These requirements are subject to revision as further experience and investigation may show is necessary or desirable.

B. Compliance with the Standard. Compliance with this Standard is one of the conditions of certification of a product by Green Seal.

C. Compliance with Government Rules. In order to be authorized to use the Green Seal Certification Mark, the manufacturer of the certified product must disclose all governmental allegations or determinations of violation of federal, state, or local environmental laws or regulations with respect to facilities in which the product is manufactured. Certification will be denied any product manufactured in violation of environmental laws or regulations if, in Green Seal's judgment, such violations indicate that the environmental impacts of the product significantly exceed those contemplated in the setting of the standard.

D. Limitations on Purpose of Standard. Green Seal's Standards provide basic criteria to promote environmental quality. Provisions for product safety have not been included in this Standard because government agencies and other national standard-setting organizations establish and enforce safety requirements.

E. Substantially Equivalent Products. Products that are substantially similar to those covered by this standard in terms of function and environmental impact may be evaluated and certified by Green Seal against the intent of the requirements of this standard.

F. Unanticipated Environmental Impacts. A product which complies with this Standard will not necessarily be certified by Green Seal if, when examined and tested, it is found to have other features which significantly increase its impact on the environment. In such a situation, Green Seal will ordinarily amend its standards to account for the unanticipated environmental impacts.

G. Certification Agreement and Green Seal Rules. In order to be authorized to apply the Green Seal Certification Mark to a product or its packaging, or to use the Green Seal Certification Mark in product advertising, the manufacturer of the product must (1) undergo an initial product evaluation to determine that the product complies with Green Seal's requirements, (2) sign a Green Seal Certification Agreement that, among other things, defines how and where the Green Seal may be used, (3) pay fees to cover the costs of testing and monitoring, (4) agree to an ongoing program of factory inspections and product testing, and (5) comply with the requirements found in the most recent version of "Rules Governing the Use of the Green Seal Certification Mark."

H. Disclaimer of Liability. Green Seal™, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. Green Seal shall not incur any obligations or liability for damages, including consequential damages, arising out of or in connection with the interpretation of, reliance upon, or any other use of this Standard.

I. Care in Testing. Many tests required by Green Seal's Standards involve safety considerations. Adequate safeguards for personnel and property should be employed in conducting such tests.

J. Referenced Standards. Standards referenced in this document may have been superseded by a later edition, and it is intended that the most recent edition of all referenced standards be used in determining compliance of a product with this standard.

K. Labeling Requirements. This standard neither modifies nor supersedes government labeling requirements. Labeling language which varies in form from the requirements of this section may be used with the written approval of Green Seal.

List of Acronyms and Terms

ACGIH. American Conference of Governmental Industrial Hygienists.
AOEC. Association of Occupational and Environmental Clinics.
ASTM. American Society for Testing and Materials.
ATSDR. Agency for Toxic Substances and Disease Registry.
BCF. Bioconcentration factor.
BOD. Biological oxygen demand.
CFC. Chlorofluorocarbon.
CO₂. Carbon dioxide.
CFR. Code of Federal Regulations.
CREL. Chronic reference exposure level.
DOC. Dissolved organic carbon.
EPA. United States Environmental Protection Agency.
FDA. The United States Food and Drug Administration.
GHS. Globally Harmonized System for Classification and Labeling of Chemicals.
GREENGUARD. GREENGUARD Environmental Institute an industry-independent, non-profit organization (www.greenguard.org).
IARC. International Agency for Research on Cancer.
IRIS. Integrated Risk Information System.
ISO. International Organization for Standardization.
LLNA. Local Lymph Node Assay.
LOAEL. Lowest-observed adverse effect level.
MRL. Minimal risk level.
MSDS. Material safety data sheet.
NOAEL. No-observed adverse effect level.
NTP. National Toxicology Agency.
OECD. Organization for Economic Co-operation and Development.
OEHHA. Office of Environmental Health Hazard Assessment.
OSHA. Occupational Safety and Health Administration.
QSAR. Quantitative structure-activity relationship.
RfC. EPA reference concentration.
ThOD. Theoretical oxygen demand.

GREEN SEAL™ ENVIRONMENTAL STANDARD FOR INDUSTRIAL AND INSTITUTIONAL CLEANERS (GS-37)

1.0 SCOPE

This standard establishes environmental requirements for industrial and institutional general-purpose, restroom, glass, and carpet cleaners. For purposes of this standard, industrial and institutional cleaners are defined as those cleaners intended for routine cleaning of offices, institutions, warehouses, and industrial facilities. Furthermore, the criteria in this standard include consideration of vulnerable populations in institutional settings such as schools, day-care facilities, nursing homes, and other facilities. The standard does not include cleaners for household use, food preparation operations, or medical facilities. The standard does not apply to air fresheners, enzymatic or microbially active products or products required to be registered under the Federal Insecticide, Fungicide, and Rodenticide Act, such as those making claims as sterilizers, disinfectants, or sanitizers.

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 manufacturer's instructions on compatibility.

Each criterion states whether it applies to the undiluted product or to the product as used. Where there is more than one criterion that applies to a product component, the more stringent criterion applies.

2.0 DEFINITIONS

2.1 Asthma. Asthma is a chronic inflammatory disorder of the airways that impairs breathing. Asthma affects children and adults, may be intermittent or persistent, and is further classified as mild, moderate, or severe. The chronic inflammation associated with variable airflow obstruction commonly causes difficulty breathing, coughing, wheezing, shortness of breath, and/or chest pain. Symptoms may resolve completely between active episodes. Symptoms may occur during exposure, immediately after exposure, or up to 24 hours later in a "late phase," frequently interrupting sleep.

2.2 Asthmagens. Substances designated as asthma causing agents by the AOEC, which after review by AOEC have met the AOEC sensitization criteria.

2.3 Carcinogens. Chemicals listed as a known, probable, reasonably anticipated, or possible human carcinogen by the IARC (Groups 1, 2A, and 2B), NTP (Groups 1 and 2), EPA IRIS (weight-of-evidence classifications A, B1, B2,

C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or by OSHA (as carcinogens under 29 CFR 1910.1003(a)(1)).

2.4 Carpet Cleaners. Products developed to perform routine cleaning or spot cleaning of carpets and rugs. This category may include, but is not limited to, products used in cleaning by means of wet extraction, shampooing, dry foam, bonnet or absorbent compound.

2.5 Closed Dilution-Control System. Systems that control the dilution of a concentrate product so that the undiluted product cannot be practically accessed by users.

2.6 Closed Dilution-Control System Concentrate. Products that are designed to be used in closed dilution-control systems that are contained in spill-resistant packaging and cannot be practically accessed by users.

2.7 Color Component. A product component, such as a dye or pigment, whose only function is to change the product's color.

2.8 Component. A deliberately added product compound, where it is added for its continued presence in the final product to provide a specific characteristic, appearance, or quality. Naturally occurring elements and chlorinated organics that may be present as a result of chlorination of the water supply, are not considered intentional components if the concentrations are below the applicable maximum contaminant levels in the National Primary Drinking Water Standards found in 40 CFR Part 141.

2.9 Concentrate. Product, as sold, that must be diluted by water prior to its intended use.

2.10 Drop Test. The primary package, with the lid on, dropped from a height of 48 inches with 4 drops: flat-on-bottom, flat-on-top, flat-on-side, and corner.

2.11 Fragrance. An additive, often (but not limited to) a multi-component additive, used in a product with the purpose of imparting a scent to the product.

2.12 General-purpose Cleaners. Products used for routine cleaning of hard surfaces, including impervious flooring such as concrete, stone surfaces, 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 dishes, laundry, toilets, restrooms, glass, carpets, upholstery, wood, or polished surfaces, nor does it include biological cleaners. Other cleaners may be included if they meet the requirements and are marketed as general purpose cleaners. Another term used for these cleaners may be multi-surface cleaners.

- 2.13 Glass Cleaners.** Products used to clean windows, glass, dry erase boards, and mirrored surfaces.
- 2.14 Haber's Rule.** For a given toxic gas, the concentration of the gas multiplied by the duration of exposure equals a constant ($C \times t = k$); for example, doubling the concentration will halve the time for a given toxic effect.
- 2.15 Ingredient.** Any component of a product that is intentionally added or known to be a contaminant that comprises at least 0.01% by weight of the product.
- 2.16 Intentional Introduction.** The act of deliberately utilizing a material in the formation of a package or packaging component where its continued presence is desired in the final package or packaging component to provide a specific characteristic, appearance, or quality.
- 2.17 Mutagen.** A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans, under the GHS.
- 2.18 Natural Color Component.** Color components that come from biological products or renewable materials, forestry or agricultural materials (including plant, animal, and marine materials), or minerals.
- 2.19 Optical Brightener.** Additives designed to enhance the appearance of colors and whiteness in materials by absorbing ultraviolet radiation and emitting blue radiation. These compounds are also known as fluorescent whitening agents.
- 2.20 Ozone-Depleting Compound.** A compound with an ozone-depletion potential greater than 0.01 (CFC 11=1) according to the EPA list of Class I and Class II Ozone-Depleting Substances.
- 2.21 Post-Consumer Material.** Material that would otherwise be destined for solid waste disposal, having completed its intended end-use and product life cycle. Post-consumer material does not include materials and by-products generated from, and commonly reused within, an original manufacturing and fabrication process.
- 2.22 Practically Accessed.** Packaging that allows for access/exposure of the product during routine handling of the package, such as while transferring from shipping cartons, after opening a cap or lid, or when connecting to the dispensing system.

2.23 Primary Package. Package that is the material physically containing and coming into contact with the product, not including the cap or lid of the package or container.

2.24 Product As Used. 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 health and environmental requirements at a dilution of 2:64.

2.25 Recyclable. The package can be collected in a substantial majority of communities, separated or recovered from the solid waste stream and used again, or reused in the manufacture or assembly of another package or product through an established recycling program.

2.26 Refillable Package. A container that is routinely returned to and refilled by the product manufacturer at least five times with the original product held by the package, and demonstrated in practice. For the purpose of this standard, the product manufacturer or the product manufacturer's agent may refill a package.

2.27 Reproductive Toxin. A chemical listed as a reproductive toxin (including developmental, female, and male toxins) 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., also known as Proposition 65).

2.28 Restroom Cleaners. Products used to clean hard surfaces in a restroom such as counters, walls, floors, fixtures, basins, tubs, toilets, urinals, and tile. Other terms used for these cleaners may include bathroom cleaners, toilet bowl cleaners, or urinal cleaners.

2.29 Serious Eye Damage. The production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application.

2.30 Skin Corrosion. The production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars.

2.31 Skin Sensitizer. A substance that will lead to an allergic response following skin contact.

2.32 Source-Reduced Package. A package that has at least 20% less material (by weight) compared to containers commonly used for that product type. For bag-in-the-box type packages, the box is included in the weight if the box is used during product use.

2.33 Spill-Resistant Packaging. Packaging that requires coupling to a specially designed device in order to dispense product.

2.34 Undiluted Product. The most concentrated form of the product produced by the manufacturer for transport outside its facility.

3.0 PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS

3.1 Product Performance. Each product shall clean common soils and surfaces in its category effectively, at the most dilute/least concentrated manufacturer-recommended dilution level for routine cleaning, as measured by the following applicable standard test methods. Products shall be diluted, as required, just prior to testing using water from the cold tap at no more than 50°F. Carpet cleaners may be diluted with warm or hot water where required by the test method or performance considerations.

3.1.1 General-Purpose Cleaners. The product shall remove at least 80% of the particulate soil in ASTM D4488-95, A5.

3.1.2 Restroom Cleaners. The product shall remove at least 75% of the soil in ASTM D5343-06 as measured by the method. If the product is used for toilet bowl or urinal cleaning, then it must also demonstrate efficacy for water hardness removal with an appropriate method following the requirements outlined in 3.2 for Alternative Performance Requirements.

3.1.3 Carpet Cleaners. The product shall have a pH between 3-10 and be tested following the requirements with an appropriate method as outlined in 3.2, Alternative Performance Requirements, for cleaning efficacy and resoiling resistance. Alternatively, products that have WoolSafe certification or a Carpet and Rug Institute Cleaning Solutions Seal of Approval, or equivalent, will be accepted.

3.1.4 Glass Cleaners. The product shall achieve at least a rating of three in each of the following Consumer Specialty Products Association (CSPA) DCC 09 categories: soil removal, smearing, and streaking.

3.2 Alternative Performance Requirements. Alternatively, using another objective, scientifically-validated method conducted under controlled and reproducible laboratory conditions, the product performs as well as or better than

a conventional, nationally-recognized product in its category and at equivalent product-specific use directions. Test methodology and results must be documented in sufficient detail for this determination to be made.

4.0 PRODUCT-SPECIFIC HEALTH AND ENVIRONMENTAL REQUIREMENTS

4.1 Acute Toxicity. The *undiluted* product shall not be toxic to humans. A product is considered toxic if either of the following criteria apply:

Oral lethal dose 50 (LD ₅₀)	≤ 5,000 mg/kg
Inhalation lethal concentration (LC ₅₀)	≤ 20 mg/L at 1 hr

Toxicity shall be measured on the product as a whole. The toxicity testing procedures should meet the requirements put forth by the 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). Testing is not required for any ingredient for which sufficient information exists.

For purposes of demonstrating compliance with this requirement, acute toxicity testing is not required if sufficient acute toxicity data exist for each of the product's ingredients to demonstrate that the product mixture complies, using a weighted average approach that assumes that the toxicity of the individual ingredients is additive. The toxicity values are adjusted by the weight of the ingredient in the product and summed using the following formula:

$$TP = \left(\sum_{i=1}^n \frac{wt_i}{TV_i} \right)^{-1}$$

Where,

TP = toxicity of the product

wt_i = the weight fraction of the ingredient

TV = the toxicity value for each ingredient (LD₅₀)

n = number of ingredients

Inhalation toxicity shall be determined from all ingredients with a vapor pressure greater than 1 mm Hg at ambient conditions (1 atm pressure and 20-25° C).

4.2 Skin and Eye Irritation. The *undiluted* product shall not be corrosive to the skin or cause serious eye damage as defined by the GHS. Furthermore, a product is considered corrosive to skin or to cause serious eye damage if it has a pH of 2 or less or a pH of 11.5 or greater, unless tested and proven otherwise.

A product shall be evaluated for skin corrosion and eye damage following the testing and evaluation strategy described in the GHS, preferably using an *in vitro* test validated by the Interagency Coordinating Committee on the Validation of Alternative Methods or the European Centre for the Validation of Alternative Methods. The results of other peer-reviewed or standard *in vitro* or *in vivo* test methods demonstrating that the product mixture is not corrosive will also be accepted. Testing is not required for any ingredient for which sufficient information exists.

4.3 Carcinogens, Mutagens, and Reproductive Toxins. The *undiluted* product shall not contain any ingredients or components that are carcinogens, mutagens or reproductive toxins. The product shall not contain any ingredients known to produce or release carcinogens, mutagens or reproductive toxins.

4.4 Ingredients that Cause Asthma. The *undiluted* product shall not contain any ingredients that have been identified as asthmagens.

4.5 Skin Sensitization. The *undiluted* product shall not be a skin sensitizer, as tested by the LLNA or following EPA test guidelines for skin sensitization (OECD Guideline 429, OPPTS 870.2600). The results of other standard test methods, such as the guinea pig maximization test (OECD Guideline 406) or the Buehler test (OECD 406), will be accepted as proof that the product in its most concentrated form is not a skin sensitizer when data from LLNA tests are not available. Any new product or ingredient testing should use the LLNA. Testing is not required for any ingredient for which sufficient information exists.

4.6 Skin Absorption. The *undiluted* product shall not contain ingredients, present at greater than or equal to 1% in the product, that are listed on the ACGIH Threshold Limit Value list (TLV) carrying a skin notation, or substances that are listed on the German Deutsche Forschungsgemeinschaft (DFG) Maximum Allowable Concentrations (MAK) list with a skin absorption H notation. Further, the product shall not contain ingredients that sum to 1% in the formula that are listed on ACGIH or DFG with the same target organ.

4.7 Prohibited Ingredients. The *undiluted* product shall not contain the following ingredients¹:

- Heavy metals including, lead, hexavalent chromium, or selenium; either in the elemental form or compounds
- 2-butoxyethanol
- Alkylphenol ethoxylates
- Phthalates

¹ The listed ingredients are prohibited because they have demonstrated one or more of the following health concerns: endocrine disruption, neurotoxicity, and systemic toxicity. Other chemicals may have such health concerns but are not listed because they may already be prohibited through other criteria in the standard.

4.8 Ozone Depleting Compounds. The *undiluted* product shall not contain any ingredients that are ozone-depleting compounds.

4.9 Volatile Organic Compound Content. The product *as used* shall not contain components that contribute significantly to the production of photochemical smog, tropospheric ozone, or poor indoor-air quality; i.e., the volatile organic compound content of the product as used shall not exceed the following:

- 0.1% by weight for dilutable carpet cleaners
- 1% by weight for general-purpose cleaners
- 1% by weight for restroom cleaners
- 1% by weight for glass cleaners
- 1% by weight for ready-to-use carpet cleaners

The volatile organic compound content shall be determined either by summing the percent by weight contribution from all components of the product that have a vapor pressure of greater than 0.1 mm mercury at standard conditions or by the California Air Resources Board Method 310, modified to not allow the exemption for fragrances specified under Method 310.

4.10 Inhalation Toxicity. The product shall meet either 4.10.1 or 4.10.2.

4.10.1 Chronic Inhalation Toxicity. The product *as used* shall not contain ingredients with a vapor pressure above 1 mm mercury at ambient conditions (1 atm pressure and 20-25° C) that cause chronic inhalation toxicity as evidenced by either of the following:

- Listed by the European Chemicals Bureau as R48/23: Danger of serious damage to health by prolonged exposure through inhalation.
- Classified as producing significant toxic effects in mammals from repeated inhalation exposure at or below 1.0 mg/L as a vapor according to OECD Harmonized Integrated Classification System for Human Health and Environmental Hazards of Chemical Substances and Mixtures. For the purposes of this standard, significant toxic effects in mammals from repeated inhalation exposure at or below 1.0 mg/L as a vapor shall be established by a NOAEL, based on a test duration of 90 days at 6 hours per day; values from other exposure regimes shall be estimated (extrapolated) per the principles of Haber's rule. In lieu of a NOAEL, the LOAEL can be used with a ten-fold safety factor (i.e., LOAEL/10).

4.10.2 Chamber Testing. A product *as used* shall meet the inhalation criteria and as tested according to the method used for the

GREENGUARD Children and Schools Certification for Cleaners and Cleaning Maintenance Products and Systems, which includes office, school, and restroom models (also called the GREENGUARD Standard Method for Measuring and Evaluating Chemical Emissions from Cleaners and Cleaning Maintenance Systems Using Dynamic Environmental Chambers).

4.11 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 LC₅₀ 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, using a weighted average approach (as in section 4.1). Aquatic toxicity tests shall follow the appropriate protocols in ISO 7346-2 for fish, OECD test guidance 203 for fish, OECD test guidance 201 for algae, or OECD test guidance 202 for daphnia.

4.12 Bioaccumulating Compounds. The product *as used* shall not contain any ingredients that bioaccumulate or that form degradation products that bioaccumulate. A chemical is considered to bioaccumulate when it has a BCF greater than 100 (or log BCF >2) as determined by ASTM E-1022-94(2007) Standard Guide for Conducting Bioconcentration test with Fishes and Saltwater Bivalve Mollusks or OECD 305 Bioconcentration: Flow-through Fish Test. If the chemical meets the requirement for biodegradability, 4.13, it may be considered to not bioaccumulate. Testing is not required for any ingredient for which sufficient information exists.

4.13 Aquatic Biodegradability. Each of the individual organic ingredients in the product *as used*, except for the polymer portion of a carpet cleaner, shall exhibit ready biodegradability in accordance with the OECD definition. Biodegradability shall be measured according to any of the following methods: ISO 7827, 9439, 10707, 10708, 9408, 14593; OECD Methods 301A – F; or OECD 310. 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 DOC > 70%
- BOD > 60%
- % of BOD of ThOD > 60%
- % CO₂ evolution of theoretical > 60%

Per OECD guidance the 10-day window requirement does not apply to structurally-related surfactant homologues. 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 DOC removal > 90%.

An exception shall be made for an organic ingredient that does not exhibit ready biodegradability if it has low aquatic toxicity, is not bioaccumulating (4.12), and exhibits biodegradation rates above 70% (measured as BOC, DOC, or COD), per ISO test methods 9887 or 9888; or OECD 302A, B, or C. For purposes of this section, low aquatic toxicity is defined as having an acute *and* chronic aquatic toxicity >100 mg/L where chronic aquatic (fish) toxicity is measured per OECD Method 204.

Testing is not required for any ingredient for which sufficient information exists concerning its biodegradability, either in peer-reviewed literature or databases. In the absence of experimental data, QSAR data from EPA's BioWin (EpiSuite) models may be considered.

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

4.15 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 D92-05a), the Abel Closed-Cup method (ISO 13736) or the Pensky-Martens Closed-Cup method (ISO 2719). Alternatively, the product shall not sustain a flame when tested using ASTM D 4206.

4.16 Fragrances. Fragrances added to the product must follow the Code of Practice of the International Fragrance Association. All fragrance components must be disclosed to the certifying body. The product label and material safety data sheets shall reflect the use of fragrances (present or not) in accordance with section 6.3.

4.17 Color Components. Each color component shall meet one of the following:

- be FDA certified and permitted for ingestion.
- be a natural color.
- not have any of the following heavy metals intentionally added during its production: Arsenic, Cadmium, Cobalt, Hexavalent Chromium, Lead, Manganese, Mercury, Nickel, and Selenium.

4.18 Optical Brighteners. The *undiluted* product shall not contain any ingredients that are optical brighteners.

4.19 Concentrates. The product, except for toilet bowl/urinal cleaners, dry/absorbent compound carpet cleaners, or products solely labeled as carpet spot removers, must be concentrated to at least the following levels:

- General purpose cleaners: 1:32
- Glass, restroom, and carpet cleaners: 1:16

4.20 Closed Dilution-Control Systems and Concentrates. Products that meet the definition for closed dilution-control systems (2.5) and concentrates (2.6) and the closed dilution-control system and concentrate packaging requirements (5.4) may be evaluated *as-used* for skin and eye irritation (4.2) and acute toxicity (4.1), but must meet the closed dilution-control concentrate labeling requirements in 6.5 and 6.7.

4.21 Animal Testing. To discourage animal testing the results of past peer-reviewed or standard tests demonstrating compliance with a criterion will be accepted. A mixture need not be tested if existing information demonstrates that each of the ingredients complies with a criterion. Additionally, non-animal (in-vitro) test results may be accepted, providing that the test methods are referenced in peer-reviewed literature and the manufacturer provides the reasons for selecting the particular test method.

5.0 PACKAGING REQUIREMENTS

5.1 Plastic Package. A plastic primary package shall be recyclable, a refillable package, a source-reduced package, or contain at least 25% post-consumer material. The package must be clearly marked with the appropriate Society of the Plastics Industry symbol to identify the type of plastic for recycling.

5.2 Post-Consumer Material. The primary package, for materials other than plastic, shall contain at least 25% post-consumer material or demonstrate that efforts were made to use the maximum available post-consumer material in the package.

5.3 Concentrated Product Packaging. Concentrated products are prohibited from being packaged in spray-dispenser bottles or other ready-to-use package types.

5.4 Closed Dispensing-Control System and Concentrate Packaging. Products that are evaluated as outlined in 4.20, shall meet the following requirements for packaging and system design:

- The primary package shall be durable as demonstrated by passing a drop test with the results that the packages must not leak, contents must be retained, and no damage to the outer package likely to adversely affect safety must be sustained.
- Backflow prevention that meets the American Society of Sanitary Engineering's (ASSE) 1055B standard shall be included in the closed dispensing-control system.

5.5 Aerosol Cans. Aerosol cans are prohibited.

5.6 Heavy Metal Restrictions. Heavy metals, including lead, mercury, cadmium, and hexavalent chromium, shall not be intentionally introduced. Further, the sum of the concentration levels of these metals present shall not exceed 100 parts per million by weight (0.01%); an exception is allowed for refillable packages or packages that would not exceed this maximum level but for the addition of post-consumer materials. Further, intentional introduction does not include the use of one of the metals as a processing aid or intermediate to impart certain chemical or physical changes during manufacturing, where the incidental retention of a residual of that metal in the final packaging or packaging component is not desired or deliberate, if the final packaging or packaging component complies with the incidental concentration restrictions of 100 ppm.

5.7 Other Restrictions. Phthalates and chlorinated packaging material are prohibited from being intentionally introduced; an exception is allowed for packages that would not have added phthalates or chlorinated packaging material but for the addition of post-consumer material.

6.0 TRAINING AND LABELING REQUIREMENTS

6.1 Training. The product manufacturer, its distributor, or a third party shall offer training or training materials on the proper use of the product. This shall include step-by-step instructions for the proper dilution, use, consequences of improper use or improper dilution, disposal of the product, and the use and maintenance of equipment, as well as recommended personal protection equipment for each stage of the product or equipment's use. Product manufacturers shall make the appropriate product and/or equipment training information, including MSDSs and technical data sheets, available electronically as well as in hard copy.

6.2 Label Language. The manufacturer's label shall include English and another language or English and a graphical representation or icons, in order to assist illiterate or non-English-speaking personnel.

6.2.1 Label Dilution Directions. 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. Carpet cleaner labels shall specify the use of cold water for products that do not suffer significant performance degradation in cold water.

6.2.2 Label Use and Disposal Directions. The manufacturer's label shall have explicit disposal, recycling, reuse, or refill instructions, proper and clear directions for use, and appropriate precautions and recommendations for the use of personal protective equipment.

6.3 Label and Material Safety Data Sheet Fragrance Declaration. The product shall declare on the product label and on the MSDS if a fragrance has been added or if no fragrance has been added.

6.4 Material Safety Data Sheet pH Declaration. The MSDS shall declare the pH of the product, both undiluted and as used.

6.5 Closed Dilution-Control Concentrate Labeling. Products that are evaluated as outlined in 4.20 shall meet the following labeling and communication requirements:

- The MSDS shall include the applicable text "meets Green Seal's requirements for skin and eye irritation and acute toxicity at the as-used dilution"
- The Web site of the certifying body listing certified products shall identify which products were evaluated as-used, and which health criteria were evaluated as-used.

6.6 Certification Mark. The Green Seal Certification Mark may appear on the packaging and may appear on the product itself. The Green Seal Certification mark shall not be used in conjunction with any modifying terms, phrases, or graphic images that might mislead consumers as to the extent or nature of the certification.

6.7 Statement of Basis for Certification. 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 the Green Seal™ environmental standard for industrial and institutional cleaners based on its reduced human and environmental toxicity and reduced volatile organic compound content."

If the product was evaluated in accordance with 4.20, the description shall read as follow:

“This product meets the Green Seal™ environmental standard for industrial and institutional cleaners based on its reduced human and environmental toxicity and reduced volatile organic compound content, with skin and eye irritation and acute toxicity met at the as-used dilution”.
[whichever health criteria apply to the product]