



**GREEN SEALTM DRAFT FINAL REVISED
ENVIRONMENTAL STANDARD FOR
INDUSTRIAL AND INSTITUTIONAL
CLEANERS (GS-37)**

April 18, 2008

THE MARK OF ENVIRONMENTAL RESPONSIBILITY

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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™ DRAFT FINAL REVISED ENVIRONMENTAL STANDARD
FOR INDUSTRIAL AND INSTITUTIONAL CLEANERS (GS-37)**

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DRAFT FINAL REVISED INDUSTRIAL AND INSTITUTIONAL CLEANERS STANDARD GS-37**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

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(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

ASTM. American Society for Testing and Materials.

CFR. Code of Federal Regulations.

EPA. United States Environmental Protection Agency.

FDA. The United States Food and Drug Administration.

GHS. Globally Harmonized System for Classification and Labeling of Chemicals.

IARC. International Agency for Research on Cancer.

IRIS. Integrated Risk Information System.

ISO. International Organization for Standardization

MSDS. Material safety data sheet.

NOAEL. No-observed adverse effect level.

NTP. National Toxicology Agency.

OECD. Organization for Economic Co-operation and Development.

OSHA. Occupational Safety and Health Administration.

QSAR. Quantitative structure-activity relationship.

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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, general-purpose, restroom, glass, and carpet cleaners are defined as those cleaners intended for routine cleaning of offices, institutions, warehouses, and industrial facilities. Further, the criteria in this standard include consideration of vulnerable population requirements in institutional settings such as schools, day-care facilities, nursing homes, and other facilities. The standard does not include the use of cleaners in households, food preparation operations, or medical facilities. This 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.

2.0 DEFINITIONS

2.1 Asthma. Asthma is a chronic inflammatory disorder of the airways that impairs breathing. The chronic inflammation is associated with variable airflow obstruction, commonly presenting with symptoms of cough, wheezing, shortness of breath, or chest tightness, which may be mild, moderate, severe and even life-threatening. 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. Chemicals that cause asthma include those listed as asthmagens after a full review of that chemical's evidence by the Association of Occupational and Environmental Clinics that have evidence of being sensitizers which are those that lead to hypersensitivity of the airways through sensitizing biologic mechanisms or meet the criteria outlined in Appendix A.

2.2 Carcinogens. Chemicals listed as a known, probable, reasonably anticipated, or a 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,

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C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or OSHA.

2.3 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 extraction, shampooing, dry foam, bonnet or absorbent compound. These products have a pH between 3-9.

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

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

2.6 Color Component. A deliberately added product component, where it is added for its ability to change the product's color, typically dyes or pigments.

2.7 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, which 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.

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

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

2.10 Endocrine Disruptors. A chemical that is suspected to or determined to adversely affect the endocrine system of humans or animals by disrupting or mimicking the physiologic function of endogenous hormones. Consideration will also be given to the metabolites of the parent compound. This may be determined through one or more internationally validated endocrine activity screens, such as the uterotrophic assay, Hershberger assay, or OECD fish screening assay, or other screening assays as they become validated.

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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 in the product.

2.12 General-purpose Cleaners. This category includes 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 or biological cleaners. Other cleaners may be included if they meet the requirements and marketed for general purpose cleaners. Other terms used for these cleaners may include, multi-surface cleaner.

2.13 Glass Cleaners. This category includes products used to clean windows, glass, dry erase boards, and mirrored surfaces.

2.14 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.

2.15 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.

2.16 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 which cause mutations in germ cells (United Nations Economic Commission for Europe, GHS. First Edition).

2.17 Natural Ingredient. Ingredients that come from biological products or renewable materials, forestry or agricultural materials (including plant, animal, and marine materials), or minerals.

2.18 Neurotoxin. A chemical that is suspected to or determined to adversely affect the nerve cells and nervous system of humans or animals.

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.

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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 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.

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

2.24 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.

2.25 Refillable Package. A container which 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 program, the product manufacturer or the product manufacturer's agent may refill a package.

2.26 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).

2.27 Respiratory Irritant. A chemical that may cause serious irritation the nose, throat, airways and lungs of humans or result in positive results from appropriate animal tests.

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2.28 Restroom Cleaners. Products in this category include those 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 Rigid Plastic Package. A primary package made entirely of plastic and has a capacity no more than 5 gallons, or the equivalent volumes, and maintains its shape while holding the product. It does not include flexible packages that do not maintain their shape while holding a product, boxes that have at least one side that is not made of plastic, or plastic buckets with an attached metal handle.

2.30 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.

2.31 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.

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

2.33 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 when the box is used during product use.

2.34 Systemic Toxin. A chemical that when it enters the body, through any route of exposure, causes organ or tissue damage, such as to the red blood cells or the liver.

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

3.0 PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS

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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 method. 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 the 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 also must demonstrate efficacy for water hardness removal following the requirements outlined in 3.2 for Alternative Performance Requirements.

3.1.3 Carpet Cleaners. The product shall be tested following the requirements 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 concentration. Test methodology and results must be documented in sufficient detail for to make this determination.

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 any of the following criteria apply:

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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. Alternatively, a mixture need not be tested if existing toxicity information demonstrates that each of the ingredients complies. 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.

To demonstrate compliance with this requirement. It is assumed 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

For inhalation toxicity, it is determined from all ingredients with a vapor pressure greater than 0.1 mm Hg at standard conditions.

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 Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Further, 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 *in vitro* test validated by the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM) or the European Centre for the Validation of Alternative Methods (ECVAM). 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,

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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 cause asthma.

4.5 Skin Sensitization. The *undiluted* product shall not be a skin sensitizer, as tested by the local lymph node assay (LLNA) or following EPA test guidelines for skin sensitization (OECD Guideline 429, OPPTS 870.2600). Green Seal will accept the results of other standard test methods, such as the guinea pig maximization test (OECD Guideline 406) or the Buehler test (OECD 406), 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 American Conference of Governmental Industrial Hygienists (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 Neurotoxins. The *undiluted* product shall not contain the following ingredients that are neurotoxins:

- Heavy metals including, lead, hexavalent chromium, or selenium both in the elemental form or compounds

4.8 Systemic Toxins. The *undiluted* product shall not contain the following ingredients that are systemic toxins:

- 2-butoxyethanol

4.9 Endocrine Disruptors. The *undiluted* product shall not contain the following ingredients that are endocrine disruptors:

- Alkylphenol ethoxylates
- Phthalates

4.10 Respiratory Irritants. The product *as used* shall not contain the following ingredients that are respiratory irritants above the specified levels:

- D-limonene shall be limited to a concentration of 20 millimoles (mmol) or less per liter.

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- Terpene hydrocarbons, other than d-limonene, (e.g. pinene, myrcene) shall be limited to 10 mmol or less per liter.

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

4.12 Volatile Organic Compound Content. 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 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 and 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 exemptions for fragrances and low vapor pressure organic compounds specified under Method 310.

4.13 Chronic Inhalation Toxicity. The product *as used* shall not contain any ingredients with a repeated dose inhalation NOAEL for mammals at or below 1.0 mg/L (1,000 mg/m³). The NOAEL shall be from a test duration of at least 90 days. An ingredient with a vapor pressure less than 0.1 mm mercury is exempt from the chronic inhalation toxicity criterion. Alternatively, GREENGUARD Children and Schools certified cleaning products and systems, or equivalent, meets this criterion.

4.14 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. 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.

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4.15 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 bioconcentration factor (BCF) greater than 100 (or $\log \text{BCF} > 2$) 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, 4.16, it is considered to not bioaccumulate. Testing is not required for any ingredient for which sufficient information exists.

4.16 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 dissolved organic carbon (DOC) > 70%
- Biological oxygen demand (BOD) > 60%
- % of BOD of theoretical oxygen demand (ThOD) > 60%
- % CO₂ evolution of theoretical > 60%

Per OECD guidance (2003) 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 dissolved organic carbon (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 (4.16), 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.

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

4.18 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.

4.19 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 and must meet all relevant criteria of this standard. The product label and material safety data sheets shall reflect the use of fragrances (present or not) in accordance with section 6.3.

4.20 Color Components. Any color component must meet all relevant criteria of this standard and shall be FDA certified and permitted for food, drug, and cosmetic (FD&C) use or be a natural ingredient.

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

4.22 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 as follows:

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

4.23 Closed Dilution-Control Systems and Concentrates. Products that meet the definition for closed dilution-control systems (2.4) and concentrates (2.5) 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.

4.24 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 4.23, shall meet the following requirements for packaging and system design:

- The primary package shall be a rigid plastic package.
- 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.
- The closed dispensing-control system shall draw the product out of package, rather than using gravity.
- 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

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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 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.

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6.5 Closed Dilution-Control Concentrate Labeling. Products that are evaluated as outlined in 4.23, 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 oral 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 as outlined in 4.23, 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 oral toxicity met at the as-used dilution”.
[whichever health criteria apply to the product]

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A substance will meet criteria for causing asthma if it first meets the test of specificity (it can be identified as a discrete workplace substance) and clinical relevance (it is present in the air of workplaces) and in addition meets sufficient criteria as listed below. To be included as a sensitizing cause of asthma, it must meet one or more of the major criteria, or two or more of the minor criteria.

- A. Specificity. A substance must be defined in such a way that, if it is a cause of asthma, it can be avoided specifically by the patient without requiring unnecessary avoidance of non-asthmagens.
- B. Clinical relevance. Substances must be currently used or have been used in workplaces where there is potential for inhalation exposure. A peer-reviewed case report, outbreak report, or case series report is also required to establish clinical relevance where circumstances described in the report indicate the possibility of this substance as an asthmagen.

Major Criteria (at least one)

1. Specific inhalation challenge indicates occupational asthma (i.e. immediate or delayed fall in FEV₁ after exposure) in at least one patient with asthma who appears to have developed the asthma as a result of exposure to the implicated substance. Peer reviewed study should indicate a response to sub-irritant levels of sensitizing substances. Ideally, a positive challenge will be controlled by negative challenges in asthmatic patients who are not believed to be sensitized to the particular substance, but this design is not characteristic of many specific exposure challenges.

2. Workplace challenge with physiologic response (serial spirometry or serial peak expiratory flow) showing reversible expiratory airflow obstruction or changing airway reactivity in relation to exposure, with a comparable control period without significant variable airflow obstruction or airway reactivity. Subjects tested should be reasonably considered to be without asthma prior to testing in the workplace, to exclude work-aggravated asthma. Peer reviewed publication.

OR

Minor Criteria (at least two):

1. Non-Specific airway hyperresponsiveness is demonstrated in patients with suspected occupational asthma while they are still employed at the workplace in question, based on methacholine, histamine, or cold-air challenge, published in a peer-reviewed journal.

2. Work-exposure related reversible wheezing heard with repeated exposures in at least one patient with a compatible clinical picture, published in a peer-reviewed journal.

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3. Positive IgE antibody (skin test or serologic test) for the suspected antigen in at least two patients, indicating potential IgE sensitization, published in a peer-reviewed journal.
4. Clinical response of remission of symptoms with cessation of exposure and recurrence of symptoms with re-exposure in one or more patients in each of two or more subjects published in a peer-reviewed journal.