Standard for Cleaning Products for Industrial and Institutional Use (GS-37)

June 23, 2022

Edition 7.8

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Foreword

General. The final issued standard was developed in an open and transparent process with stakeholder input that included producers, users, and general interests. Edition 7.8 was issued on June 23, 2022. It replaces Edition 7.7 from November 11, 2021. Corrections and/or clarifications were last made on August 23, 2024. Information on changes made to this standard can be found on Green Seal's website.[1]

The requirements in the standard are based on an assessment of the environmental, health, or social impacts associated with the products, services, or organizations covered in the scope of the standard. These requirements are subject to revision and generally cover aspects above and beyond regulatory compliance. This standard neither modifies nor supersedes laws and regulations. Any conformity assessment to this standard requires compliance with all applicable laws and regulations for the manufacturing and marketing of the products.

Provisions for safety have not been included in this standard since they are supervised by regulatory agencies. Adequate safeguards for personnel and property should be employed for all stages of production and for all tests that involve safety considerations.

Products, services, or organizations that are substantially similar to those covered by this standard in terms of function and life cycle considerations may be evaluated against the intent of the requirements of this standard, accounting for relevant differences between the intended scope of the standard and the actual product, service, or organization to be evaluated.

This standard may not anticipate a feature of the product that may significantly, and undesirably, increase its impact on the environment, health, or society. In such a situation, Green Seal will ordinarily amend a standard to account for the unanticipated environmental, health, or societal impacts.

Normative references (e.g., other standards) in this standard intend to refer to the most recent edition of the normative reference. Test methods may be required for product evaluation. Unless explicitly stated that a specified method is the only acceptable one, the intent of the standard is that an equivalent test method may be accepted, at Green Seal's sole discretion.

Certification to this standard shall be awarded only by Green Seal or, with Green Seal's explicit written permission, by a third-party certification program conducting on-site audits.

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[1] Standards Document Library, www.greenseal.org/green-seal-standards/library#section12

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List of Acronyms and Abbreviations

ACGIH. American Conference of Governmental Industrial Hygienists
AOEC. Association of Occupational and Environmental Clinics
ASTM. ASTM International, a standard setting organization formerly known as the American Society for Testing and Materials
BCF. Bioconcentration Factor
BOD. Biological Oxygen Demand
CARB. Air Resources Board for the State of California
CFC. Chlorofluorocarbon
CFR. Code of Federal Regulations
CFU. Colony Forming Unit
CO_2. Carbon Dioxide
DOC. Dissolved Organic Carbon
EN. European Standard
EPA. United States Environmental Protection Agency
GHS. Globally Harmonized System for Classification and Labelling of Chemicals
GMM. Genetically Modified Microorganism
GREENGUARD Gold. Certification from UL EcoLogo focusing on chemical emission rates. (https://www.ul.com/services/ul-greenguard-certification)
HCPA. Household & Commercial Products Association
ISO. International Organization for Standardization
JECFA. Joint Food and Agricultural Organization of the United Nations/ WHO Expert Committee on Food Additives
LLNA. Local Lymph Node Assay
LOAEL. Lowest-Observed Adverse Effect Level
NOAEL. No-Observed Adverse Effect Level
OECD. Organization for Economic Co-operation and Development
SDS. Safety Data Sheet
VOC. Volatile Organic Compound
WHO. World Health Organization

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Green Seal Standard for Cleaning Products for Industrial and Institutional Use, GS-37

1.0 Scope

This standard establishes 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. This standard includes *general-purpose*, *bathroom*, *glass,* and *carpet* cleaning products that contain *enzymes* or *microorganisms.* 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, air fresheners, or products required to be registered under the Federal Insecticide, Fungicide, and Rodenticide Act, such as those making claims as sterilizers, disinfectants, or sanitizers. This standard does not include products that contain *enzymes* and are sold in, or designed for use in, *spray packaging*. See Appendix 1 for an example list of products included in this standard.

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.

Words and phrases described in the standard that appear in *italics* have a corresponding definition located in the definition section of the standard, Annex A.

2.0 Safer Chemicals

2.1 Safer Ingredients

2.1.1 Aquatic Biodegradability. Each of the individual organic *ingredients* in the product as used, except for polymers, 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%
- Biochemical Oxygen Demand (BOD) > 60%
- BOD, as % of Theoretical Oxygen Demand (ThOD) > 60%
- CO2 evolution, as % of theoretical CO2 > 60%

Per OECD guidance the 10-day window requirement does not apply to structurally-related surfactant homologues.

Alternative Evaluation Options: Substances that Do Not Exhibit Ready Biodegradability.

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For organic *ingredients* in the *product as used* that do not exhibit ready biodegradability, one of the following options may be acceptable:

1. The manufacturer may demonstrate biodegradability in sewage treatment plants using the Coupled Units Test found in OECD 303A by demonstrating DOC removal > 90%.
2. The manufacturer may demonstrate that the compound has low aquatic toxicity (acute LC50 ≥ 100 mg/L for algae, daphnia, or fish) and exhibits inherent ultimate biodegradability with biodegradation rates above 70% (measured as BOD, DOC, or COD), per ISO test methods 9887 or 9888 or OECD 302A-C.

Note: 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, Quantitative Structure-Activity Relationship data from EPA's BioWin (EpiSuite) models may be considered.

2.1.2 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 BCF >2) as determined by ASTM E1022 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, 3.13, it may be considered to not bioaccumulate. Testing is not required for any *ingredient* for which sufficient information exists.

2.1.3 Carcinogens, Mutagens, and Reproductive Toxins. The *undiluted product* shall not contain any *ingredients* or *components* that are *carcinogens*, *mutagens,* or *reproductive toxins*. The *undiluted product* shall not contain any *ingredients* that, according to published uses,[2] are typically added for the purpose of releasing substances into a raw material or the final product, if those substances are *carcinogens*.

Note: Refer to Annex D for the exemption of titanium dioxide in products that contain *enzymes*.

2.1.4 Colorants. Each *colorant* shall meet one of the following:

- U.S. Food and Drug Administration-certified and permitted for ingestion.
- A *natural colorant*.
- Not have any of the following heavy metals intentionally added: arsenic, cadmium, cobalt, hexavalent chromium, lead, manganese, mercury, nickel, and selenium.

2.1.5 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 D92-05a), 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.

[2] Published uses include sources such as peer-reviewed research, industry practice, or manufacturer documentation.

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2.1.6 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 5.5.

2.1.7 Ingredients that Cause Asthma. The *undiluted product* shall not contain any *ingredients* that have been identified as *asthmagens*. Refer to Annex C, Requirement D for potential exemptions for *enzymes.*

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

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

2.1.10 Per- and Polyfluoroalkyl Substances (PFAS). The *undiluted product* shall not contain any *ingredients* or *components* that are *Per- and Polyfluoroalkyl Substances (PFAS).*

2.1.11 Products Containing Enzymes. Products that contain *enzymes* shall meet all Annex D criteria.

2.1.12 Products Containing Microorganisms. Products that contain *microorganisms* shall meet all Annex E criteria.

2.1.13 Prohibited Ingredients. The *undiluted product* shall not contain the following *ingredients*[3]:

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

2.1.14 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.

2.1.15 Skin and Eye Damage. The *undiluted product* shall not cause *skin corrosion* or cause *serious eye damage*. For purposes of demonstrating compliance with this requirement, data may be evaluated for each of the product's *ingredients*. If the *ingredients* at their concentrations in the *undiluted product* are not shown to cause *skin corrosion* or *serious eye damage*, then the product will not be considered to cause *skin corrosion* or *serious eye damage*. Results from peer-reviewed studies or standard in vitro

[3] 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.

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or in vivo test methods may also be accepted. Testing is not required for any *ingredient* for which sufficient information exists.

Further, a product is considered to cause *skin corrosion* or to cause *serious eye damage* if it has a pH of 2.0 or less or a pH of 11.5 or greater, unless data prove otherwise.

Note: Refer to Annex B for potential alternative thresholds for products packaged in *closed dilution-control systems*.

Note: Refer to Annex C for potential alternate thresholds for products as *powders/solids/non-aqueous liquids.*

2.1.16 Skin Sensitization. The *undiluted product* shall not be a *skin sensitizer*, as tested by the Local Lymph Node Assay (LLNA) or following U.S. Environmental Protection Agency (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.

2.2 Safer Products

2.2.1 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 (LD50)	< 5,000 mg/kg
Inhalation lethal concentration (LC50)	< 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 Organization for Economic Co-operation and Development (OECD) Guidelines for Testing of Chemicals. These protocols include Acute Oral Toxicity Test (TG 401), Acute Inhalation Toxicity Test (TG 403). 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_i = the toxicity value for each *ingredient* (LD_{50})
n = number of *ingredients*

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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).

Note: Refer to Annex B for potential alternative thresholds for products packaged in *closed dilution-control systems*.

Note: Refer to Annex C for potential alternate thresholds for products as *powders/solids/non-aqueous liquids.*

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

2.2.3 Inhalation Toxicity. The product shall meet either 2.2.3.1 or 2.2.3.2.

2.2.3.1 Chronic Inhalation Toxicity. The *product as used* shall not contain *ingredients* with a vapor pressure above 1 mm mercury (1 atm pressure and 20-25° C) that are 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 No-Observed Adverse Effect Level (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 Lowest-Observed Adverse Effect Level (LOAEL) can be used with a ten-fold safety factor (i.e., LOAEL/10).

2.2.3.2 Chamber Testing. A *product as used* shall meet the inhalation criteria and as tested according to the method used for the GREENGUARD Gold Certification Program Method for Measuring and Evaluating Chemical Emissions from Cleaners And Cleaning Maintenance Systems Using Dynamic Environmental Chambers which includes office, school, and restroom models.

2.2.4 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 3.1.1). Aquatic toxicity tests shall follow the appropriate protocols in International Organization for Standardization (ISO) 7346-2 for fish, OECD test guidance 203 for fish, OECD test guidance 201 for algae, or OECD test guidance 202 for daphnia.

2.2.5 Volatile Organic Compounds (VOC). VOCs include all organic compounds that have a vapor pressure of greater than 0.1 mm mercury at 1 atm pressure and 20º C. "VOC content" means the total weight of VOCs in a product expressed as a percentage of the product weight.

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The VOC content of the *product as used* shall not exceed the current regulatory limits of the Air Resources Board for the State of California (CARB) for its product category.

For *glass cleaners* the VOC content for the *product as used* shall not exceed the lower of the following options:

- 1% by weight.
- The current CARB regulatory limit.

The VOC content shall be determined in one of the following ways:

- By summing the percent by weight contribution from all volatile organic *ingredients*.
- According to the California Air Resources Board Method 310 (or equivalent), modified to include all *fragrances* and all volatile organic *ingredients*.[4]

Current CARB regulatory limits for VOCs.[5]

Product Category	**Effective Date**	**Limit (%)**
Carpet cleaners (dilutable)	1/1/2001	0.1
Carpet cleaners (ready-to-use)	12/31/2010	1
General purpose cleaners	12/31/2012	0.5
Bathroom/Restroom *cleaners* (all forms)	12/31/2008	1
Spot removers	12/31/2012	3

2.2.6 Animal Testing. To avoid new animal testing, previous test results will be accepted as evidence of meeting a criterion. When existing data are not available, the preferred methods for new testing include methods that replace, reduce, or refine animal use, particularly those recommended by the Interagency Coordinating Committee on the Validation of Alternative Methods or the European Centre for the Validation of Alternative Methods, unless indicated otherwise. In addition, other non-animal (in-vitro) test results, modeling data, data from structural analogs, and other lines of evidence may be accepted, provided that the methods are peer-reviewed and applicable. Specific in vitro or modeling methods may be noted in the standard, but additional options may be accepted by the certification program.

Further, a mixture need not be tested if existing information demonstrates that each of the applicable *components* complies with the criterion.

[4] Evaluation of the VOC content in this standard includes all *fragrances* and volatile organic compounds present in the product at 0.01% or more. Evaluation of the VOC content under Method 310 exempts *fragrances* and all volatile organic compounds present below 0.1%.
[5] These limits are a reference to the current CARB regulatory limits and will be updated to reflect any amendments made by CARB in the future.

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3.0 Sustainable Packaging

3.1 Packaging Materials

3.1.1 Plastic Package. A plastic primary package shall be one of the following:

- A *source-reduced package*
- *Recyclable*
- Contain at least 25% *post-consumer material*
- A *refillable package* with an effective *take-back program*
- An alternative approach that has been independently proven to have a similar life-cycle benefit as one of the options listed above.

3.1.2 Non-Plastic Package. For materials other than plastic, the *primary package* shall contain at least 25% *post-consumer material* or be *recyclable*.

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

3.1.4 Aerosol Cans. Aerosol cans are prohibited.

3.2 Packaging Label

3.2.1 Resin Identification Code. The *package* must be marked with the appropriate Resin Identification Code.

3.3 Restricted Substances

3.3.1 Heavy Metal Restrictions. Lead, mercury, cadmium, and hexavalent chromium shall not be *intentionally introduced* to *primary packaging*. 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 material*.

3.3.2 Other Restrictions. Phthalates, bisphenol A, and chlorinated packaging material are prohibited from being *intentionally introduced* to a plastic *primary package*; an exception is allowed for *primary packages* that would not have added phthalates, bisphenol A, or chlorinated packaging material but for the addition of *post-consumer material*.

4.0 Verified Performance and Claims

4.1 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 50ºF. *Carpet cleaners* may be diluted with warm or hot water where required by the test method or performance considerations.

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4.1.1 General-Purpose Cleaners. *General-purpose cleaners* shall remove at least 80% of the particulate soil in ASTM International (ASTM) D4488, A5.[6]

4.1.2 Restroom Cleaners. *Restroom cleaners* shall remove at least 75% of the soil in ASTM D5343 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 stain removal with an appropriate method following the requirements outlined in 4.2 for Alternative Performance Requirements.

4.1.3 Carpet Cleaners. *Carpet cleaners* shall have a pH between 3–10 and be tested following the requirements with an appropriate method as outlined in 4.2, Alternative Performance Requirements, for cleaning efficacy and re-soiling resistance. Alternatively, products that have WoolSafe certification or a Carpet and Rug Institute Cleaning Solutions Seal of Approval, or equivalent, will be accepted.

4.1.4 Glass Cleaners. *Glass cleaners* shall achieve at least a rating of three in each of the following HCPA method DCC 09 categories: soil removal, smearing, and streaking.

4.2 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 nationally recognized or market-leading product of its type and at equivalent product-specific use directions. Test methodology and results must be documented in sufficient detail for this determination to be made.

4.3 Product Label

4.3.1 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 Safety Data Sheets (SDSs) and technical data sheets, available electronically as well as in hard copy.

4.3.2 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.

4.3.3 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.

4.3.4 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] ASTM D4488 has been withdrawn, however, it is still the best available method for this performance testing, it is available for purchase, and it is regularly used by laboratories to test performance.

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

4.3.6 Safety Data Sheet pH Declaration. The SDS shall declare the pH of the *undiluted product* and the *product as used*. Refer to Annex C for potential exemptions for products as *powders/solids/non-aqueous liquids*.

Note: Additional Product Label Requirements

For products formulated with *fragrances*, refer to Criterion 2.1.6.
For products packaged in *closed dilution control systems*, refer to Annex B.
For products sold as *powders/solids/non-aqueous liquids*, refer to Annex C.
For products containing *enzymes*, refer to Annex D.
For products containing *microorganisms*, refer to Annex E

4.4 Product Design

4.4.1 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

5.0 Trademark Use Requirements

5.1 Trademark Use. Any use of the Green Seal® Certification Mark or the Green Seal name, e.g., on the product, product label, packaging, secondary documents, or promotional materials, must be in accordance with Green Seal's Trademark Use Guidelines.[7]

5.2 Misleading Claims. Green Seal trademarks 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.

[7] www.greenseal.org/trademark-use-guidelines

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Annex A – Definitions (Normative)

Note that the defined terms are italicized throughout the standard.

Aerosol Packaging. A *package* that requires a pressurized propellant to dispense product through a nozzle.

Antimicrobial Agent. A substance intended to disinfect, sanitize, reduce, or mitigate growth or development of *microorganisms* and protect inanimate objects, industrial processes or systems, surfaces, water, or other chemical substances from contamination, fouling, or deterioration caused by bacteria, viruses, fungi, protozoa, algae, or slime.

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.

Asthmagen. A substance designated as an *asthma* causing agent by the Association of Occupational and Environmental Clinics (AOEC), which after review by AOEC have met the AOEC sensitization criteria.

Carcinogen. A chemical listed as a known, probable, reasonably anticipated, or possible human carcinogen by the International Agency for Research on Cancer (Groups 1, 2A, and 2B), National Toxicology Agency (Groups 1 and 2), EPA Integrated Risk Information System (weight-of-evidence classifications A, B1, B2, C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or by Occupational Safety and Health Administration (as carcinogens under 29 Code of Federal Regulations (CFR) 1910.1003(a)(1)).

Carpet Cleaner. A product 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.

Child-Resistant Packaging. Child-resistant packaging, as defined by the Poison Prevention Packaging Act, is packaging that is designed or constructed to be significantly difficult for children under five years of age to open or obtain a toxic or harmful amount of the substance contained therein within a reasonable time, and not difficult for normal adults to use properly, but does not mean packaging which all such children cannot open or obtain a toxic or harmful amount within a reasonable time. Code of Federal Regulations, Title 16, Part 1700 and Title 40, Part 157.

Closed Dilution-Control System. A system that controls the dilution of a *concentrate* product so that the *undiluted product* cannot be *practically accessed* by users.

Closed Dilution-Control System Concentrate. A product designed to be used in *closed dilution-control system*s that are contained in *spill-resistant packaging* and cannot be *practically accessed* by users.

Colony Forming Unit (CFU). A measure of bacteria concentration assuming that each bacterium is capable of forming a colony.

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

Component. A constituent that is deliberately added at any level for its continued presence in the final product to provide a specific characteristic, appearance, or quality.[8]

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

Enzyme. A protein that acts as a catalyst in biochemical reactions. Each enzyme is specific to a particular reaction or group of similar reactions.

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.

General-Purpose Cleaner. A product 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. 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.

Genetically Modified Microorganism (GMM). A *microorganism* in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. The methods or techniques by which *GMM* are produced are listed by the European Commission Directive 2009/41/EC on the Contained Use of Genetically Modified Microorganisms.

Glass Cleaner. A product used to clean windows, glass, dry erase boards, and mirrored surfaces.

Haber's Rule. For a given toxic gas, the concentration of the gas multiplied by the duration of exposure equals a constant (C x t = k); for example, doubling the concentration will halve the time for a given toxic effect.

Ingredient. Any constituent that comprises at least 0.01% by weight of a product, whether it is intentionally added or present as a contaminant.

Intentional Introduction. The use of substances for their desired or deliberate presence in the *primary package* for the purpose of providing a specific characteristic or quality. It does not refer to the use of substances as processing aids or the use of an intermediate that imparts certain chemical or physical changes during manufacturing, as long as the substance or intermediate is present in the *primary package* at concentrations below 100 ppm.

Microorganism. An organism that cannot be seen by the naked eye (microscopic organisms) including, but not limited to, bacteria, fungi, archaea, and protists. Also included in this category are viruses or virus-like particles, although they are generally regarded as non-living.

[8] 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.

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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.

Natural Colorant. A *colorant* that comes from biological products, forestry, or agricultural materials (including plant, animal, and marine materials), or minerals.

Optical Brightener. An additive 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.

Ozone-Depleting Compound. A compound with an ozone-depletion potential greater than 0.01 (Chlorofluorocarbon (CFC) 11=1) according to the EPA list of Class I and Class II Ozone-Depleting Substances.

Package. This includes the *primary package* used for the product.

Pathogenic Microorganism. For the purposes of this standard this includes microorganisms that cause disease and can be classified as World Health Organization (WHO) Risk Group 2, 3, or 4, including, but not limited to: coliforms, Escherichia coli, Salmonella, Staphylococcus aureus, Pseudomonas aeruginosa, and some yeasts and molds.

Per- and Polyfluoroalkyl Substances (PFAS). A class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom.

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.

Powders/Solids/Non-Aqueous Liquids. Products that cannot be formulated with additional water due to the form of the product, including, but not limited to: powdered detergents, solid bar soaps, detergents in tablet form, detergents as extruded or cast solids, non-aqueous liquid products in a dissolvable shell.

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.

Primary Cleaning Function. For the purposes of this standard, a cleaning product's primary function is to remove soil.

Primary Package. Package material that physically contains and contacts the product, not including the cap or lid. For products that meet the annex requirements for Products as Powders/Solids/Non-Aqueous Liquids, the primary package is the material that holds the individually packaged product units or the entire product.

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.

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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.

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.

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).

Respiratory Sensitizer. A substance designated as leading to hypersensitivity of the airways following inhalation of the substance and meeting the classification criteria of Category 1 respiratory sensitization (H334) in accordance with the GHS.

Restroom Cleaner. A product 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 cleaning products may include bathroom cleaning products, toilet bowl cleaners, or urinal cleaners.

Secondary Function. For the purposes of this standard, the secondary function of a cleaning product may be to enhance the primary cleaning function through bubble or foam formation or to provide some other added functional enhancement (e.g., longer-term cleaning effect).

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. Substances identified under Category 1 for Serious Eye Damage/Eye Irritation (H318) under the GHS are also considered to cause serious eye damage.

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. Substances designated as Category 1A, 1B or 1C for Skin Corrosion/Irritation (H314) under the GHS are also considered to cause skin corrosion.

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

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.

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

Spray Packaging. A package that dispenses the product through a nozzle and the product is in small droplets (i.e., a spray). It does not require a pressurized propellant to dispense the product. Trigger bottles or squeeze bottles that dispense a foam, or a liquid stream are not considered spray packaging.

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Take-Back Program. A program sponsored by the original product manufacturer that has been demonstrated to receive at least 50% of sold *packages* for recycling or reuse.

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

World Health Organization (WHO) Risk Group 1. Microorganisms that are unlikely to cause human or animal disease under the basis for classification defined by the World Health Organization in the Laboratory Biosafety Manual. In the case that a particular strain has conflicting risk group designations on various international lists, the most hazardous (highest level) designation will be utilized. The biosafety designation lists that will be consulted include:

- Australia/New Zealand
- Belgium
- Switzerland
- United Kingdom
- Germany
- United States Department of Health and Human Services, National Institutes of Health (NIH)
- European Commission
- Singapore
- Japan

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Annex B – Closed Dilution-Control System (Normative)

Closed Dilution-Control System. *Closed dilution-control system* products that meet all of the following requirements may be evaluated for acute toxicity (3.1) and skin and eye damage (3.2) with the *product as used* (rather than with the *undiluted product*).

A. Practically Inaccessible. The *primary package* shall not allow 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.

B. Spill Resistant. The *primary package* shall require coupling to a specially designed device in order to dispense product.

C. Drop Test. The *primary package*, with the lid on, shall be durable as demonstrated by passing the following drop test: drop the product from a height of 48 inches with 4 drops: flat-on-bottom, flat-on-top, flat-on-side, and corner; with passing results including 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.

D. Backflow Prevention. The product shall have backflow prevention included in the *closed dilution-control system* that meets the American Society of Sanitary Engineering's (ASSE) 1055B standard.

E. SDS. The product label and SDS shall include the applicable text “meets Green Seal’s requirements for acute toxicity and/or skin and eye damage at the as-used dilution.”

F. Certifier’s Web Site. The Web site of the certification program listing certified products shall identify which products were evaluated as-used, and which health criteria were evaluated as-used.

Note: Refer to Annex C for potential alternate thresholds for products as *powders/solids/non-aqueous liquids*.

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Annex C – Powders/Solids/Non-Aqueous Liquids (Normative)

Products as Powders/Solids/Non-Aqueous Liquids. *Powder/solid/non-aqueous liquid* products that meet all of the following requirements may be exempt from the skin and eye damage criterion (3.2) and may have an alternate threshold of 300 mg/kg for oral acute toxicity (2.2.1) herein. They shall also be exempt from pH declaration (4.3.6) for the *undiluted product*.

A. Packaging Requirements. The product shall meet the requirements under **either** A(1) Child-Resistant Packaging Requirements **or** A(2) Packaging Durability Requirements.

(1) Child-Resistant Packaging. The product shall be packaged in *child-resistant packaging* following the ASTM D3475 classification. *Child-resistant packaging* must be tested per ISO 8317 or European Standard (EN) 862.

(2) Packaging Durability. The product shall meet the following requirements to be considered durable.

i. Drop Test. The *primary package*, including any lid, shall be durable as demonstrated by passing the following drop test: drop the product from a height of 48 inches with 4 drops scenarios: flat-on-bottom, flat-on-top, flat-on-side, and corner; with passing results including 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.

ii. Spill Resistant. The *primary package* shall not spill when tipped over, turned upside down or shaken and shall not leak when exposed to water.

iii. Practically Inaccessible. The *primary package* shall not allow for easy access/exposure of the product during routine handling of the package, such as while transferring from shipping cartons, during storage, or after opening (e.g., the user still cannot get at the contents, or the contents are protected or wrapped).

B. Dispensing Exposure Requirements. Documentation shall be provided to demonstrate that expected dispensing situations will not result in incidental contact exposure to oral consumption/toxicity, skin corrosion, or eye damage.

C. Labeling Requirements. The product label shall include the following in a conspicuous location:

- The signal word “WARNING” or ‘CAUTION” on products which cause *skin corrosion*, cause *serious eye damage*, or have an acute toxicity greater than or equal to 300 mg/kg and less than or equal to 5,000 mg/kg, with the applicable precautionary measures:
  - May cause skin corrosion, do not get on skin
  - May cause serious eye damage, do not get in eyes
  - Harmful if swallowed, do not ingest
- Instruction, when necessary or appropriate, for first-aid treatment
- The statement “KEEP OUT OF REACH OF CHILDREN” or its practical equivalent in capitalized text

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Annex D – Enzymes (Normative)

Products Containing Enzymes. Products that contain *enzymes* shall meet all of the following:

A. Enzyme Form. *Enzymes* in the product shall be in liquid form or an encapsulated solid (or other dust-free solid) with a minimum diameter of 0.15 mm. Smaller diameters may be permitted for solid products if they are demonstrated to result in airborne *enzyme* concentrations equivalent to or less than encapsulated solids with a 0.15mm diameter.

B. Enzyme Source. The source from which *enzyme*s were derived shall be identified to a species level and disclosed to the certification program.

C. Enzyme Source Microorganisms. For *enzymes* derived from *microorganisms*, documentation shall be provided that the source *microorganism* is absent from the finished product. Test methodology and results shall be documented in sufficient detail and provided to the certification program. If the product does not conform to this provision, then all *microorganism*s shall meet the requirements in Annex D herein.

D. Exemptions. *Enzymes* are exempt from being categorized as *asthmagens* (3.4 herein) or *respiratory sensitizers.* Titanium dioxide[10] is exempt from the prohibition on *carcinogens* (3.5 herein) when it is present only due to the use of *enzymes.* For products sold in solid form, e.g., powders, bars, tablets, titanium dioxide must be bound within the product or enzyme matrix or bonded to other *ingredients*.

E. Labeling Requirements. Products containing *enzymes* shall include the following on the product label:

- A declaration that the “product contains enzymes,” in addition to the listing in the ingredient line.
- A statement that immune-compromised individuals or those with asthma should avoid exposure to products containing *enzymes* from both direct use and incidental contact during or shortly after application to these products and instruction, when necessary or appropriate, for follow-up treatment.

F. Industrial Hygiene. Documentation shall be provided to the certification organization that demonstrates that the manufacturer has implemented an industrial hygiene plan intended to minimize concentrations of and exposure to airborne *enzymes* (e.g., engineering controls, work practices, and personal protective equipment) and monitor the air concentrations of the *enzyme/s* and worker illness/sensitization due to the *enzyme/s*. An example of best practices that may be applicable for this plan is available at AISE.

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Annex E – Microorganisms (Normative)

Products Containing Microorganisms. Products that contain *microorganisms* shall meet all of the following with any specified testing conducted with an objective, scientifically-validated method under controlled and reproducible laboratory conditions (and appropriate testing details provided to the certification program):

A. Genetically Modified Microorganisms in Microbial Products. The presence of *GMM* as a deliberate addition or as a contaminant above 0.01% in the finished product is prohibited.

B. Microorganism Biosafety. All *microorganisms* shall be classified as *WHO Risk Group 1* or equivalent biosafety designation. For strains that do not appear on any international biosafety designation lists, alternative means may be acceptable; consultation with the certifying organization may be required.

C. Microorganism Strain Identification. *Microorganism* strains shall be identified through a taxonomic review (e.g., genetic or phenotypic analysis) that is provided by a full-service culture collection listed with the World Federation of Culture Collections, whether or not the strain is part of the collection.

D. Absence of Contaminants. *Pathogenic microorganisms* shall not be present in the microbial strain, finished product, or at the end of the product's intended shelf life. Testing for the presence of *pathogenic microorganisms* shall be conducted according to the Joint Food and Agriculture Organization of the United Nations/WHO Expert Committee on Food Additives (JECFA) Combined Compendium of Food Additive Specifications standard microbiological analytical methods or comparable method and a Certificate of Analysis shall be provided to the certification program.

E. Effective Prevention Measures and Treatment. All *microorganisms* shall be demonstrated to be susceptible to the following prevention and treatment measures:

- An *antimicrobial agent*, as demonstrated by testing the microbial strain in the product against an acceptable substance (i.e., an EPA general disinfectant, Center for Disease Control low-level disinfectant, or a registered *antimicrobial agent* by Health Canada). The test method should be modeled on the EPA/Office of Pesticide Programs Standard Operating Procedure (SOP) or the AOAC International Use Dilution Method for Testing Disinfectants, SOP Number: MB-05-04, but replace the pathogenic strains specified in these SOPs with the microbial strain(s) in the product.
- One of the five major antibiotic classes (aminoglycoside, macrolide, beta-lactam, tetracycline, and fluoroquinolones), as demonstrated by testing the microbial strain in accordance with the Kirby Bauer disk method.

F. Microbial Count. A *microorganism* used to serve the *primary cleaning function* in the *undiluted product* shall have a plate count that is greater than or equal to $1x10^7$ *CFU* per milliliter for liquid products and $1x10^9$ *CFU* per gram for solid products. A total plate count shall be conducted in accordance with the methods for microbiological analyses listed in the JECFA Combined Compendium of Food Additive Specifications or comparable method. An exception shall be made for *microorganisms* used to serve a *secondary function* in the *undiluted product*.

G. Product Label and User Information. The product label shall disclose that the product contains *microorganisms*. An alternative phrase for *microorganisms* may be approved by the certification program, e.g., "bacterial cultures." The product label shall include a statement that the product will not function effectively

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when used in conjunction with disinfectants, such as chlorine bleach. For products that are sold for use in *spray packaging*,[9] the product label shall include a statement that the product should not be spray into the air.

H. Additional Requirements for Products in Spray Packaging. Products that are sold in *spray packaging*[10] shall not be formulated with any fungal or mold species. Yeast species are acceptable. Additionally, at least one of the following requirements shall be met:

- Microbial species in the product shall only be those that are listed on the European Food Safety Authority's (EFSA) Qualified Presumption of Safety (QPS) List.
- The product shall undergo inhalation exposure testing. The total airborne concentration of microorganisms shall not be above 10,000 CFU/m^3. Testing parameters shall be in alignment with the A.I.S.E. Spray Protocol (2020).[11]

[9] Or designed for use in *spray packaging*
[10] Or designed for use in *spray packaging*
[11] Spray Protocol," https://www.aise.eu/our-activities/standards-and-industry-guidelines/safe-handling-of-enzymes.aspx

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Appendix 1 – Scope (Informative)

Examples of products included in or excluded from the scope of GS-37:

Industrial and Institutional Products Included in GS-37

- *Carpet cleaner* products
- Carpet spot cleaning products
- Dry erase board cleaning products
- Floor cleaning products
- *General-purpose cleaner* and multi-purpose cleaning products
- General-purpose surface degreasers
- *Glass cleaner* and mirror cleaning products
- Products that contain *microorganisms*
- Products that contain *enzymes* and are sold and/or designed for use in non-*spray packaging*
- *Restroom cleaner* products
- Toilet or urinal cleaning products

Products Excluded from GS-37

- Air fresheners
- Boat cleaning products (included in GS-52 and GS-53)
- Cleaners/degreasers marketed as suitable for cleaning soils in production and maintenance applications (included in GS-34)
- Deck and outdoor furniture products (included in GS-52 and GS-53)
- Dish cleaning products (included in GS-52 and GS-53)
- Disinfectants or sanitizers (included in GS-52 and GS-53)
- Drain additive/cleaning products
- Floor finish and finish strippers (included in GS-40)
- Furniture polish products (included in GS-52 and GS-53)
- Graffiti remover (included in GS-52 and GS-53)
- Hand cleaners (covered in GS- 41 and GS-44)
- Household versions of those included on the left column (included in GS-8)
- Laundry care products
- Metal cleaning products (included in GS-52 and GS-53)
- Motor vehicle cleaning products (included in GS-52 and GS-53)
- Oven cleaning products (included in GS-52 and GS-53)
- Paint removers/thinners
- Products that contain *enzymes* and are sold in, or designed for use in, *spray packaging*.
- Specialty cleaning products (included in GS-52 and GS-53)
- Upholstery cleaning products (included in GS-52 and GS-53)

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