



GS-8

**GREEN SEAL™ STANDARD FOR
CLEANING PRODUCTS
FOR HOUSEHOLD USE**

**EDITION 5.2
September 8, 2017**

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THE MARK OF ENVIRONMENTAL RESPONSIBILITY

GREEN SEAL

Green Seal is a nonprofit organization whose mission is to use science-based programs to empower consumers, purchasers, and companies to create a more sustainable world. Green Seal sets leadership standards that aim to reduce, to the extent technologically and economically feasible, the environmental, health, and social impacts throughout the life-cycle of products, services, and companies. The standards may be used for conformity assessment, purchaser specifications, and public education.

Green Seal offers certification of products, services, and companies in conformance with its standards. For additional information on Green Seal or any of its programs, contact:

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FOREWORD

Edition. This version, Edition 5.2, was issued on September 8, 2017 and replaces Edition 5.1 from July 12, 2013. This revision includes substantive changes.

General. The final issued standard was developed in an open and transparent process with stakeholder input that included producers, users, and general interests.

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.

Disclaimer of Liability. Green Seal, as the developer of this standard, shall not incur any obligations or liability for any loss or damages, including, without limitation, indirect, consequential, special, or incidental damages, arising out of or in connection with the interpretation or adoption of, reliance upon, or any other use of this Standard by any party. Green Seal makes no express or implied warranty of merchantability or fitness for a particular purpose, nor any other express or implied warranty with respect to this Standard.

ACRONYMS AND ABBREVIATIONS

AATCC. American Association of Textile Chemists and Colorists
AISE. Association for Soaps, Detergents and Maintenance Products
ASTM. ASTM International, a standard setting organization formerly known as the American Society for Testing and Materials
CARB. Air Resources Board for the State of California
CFR. Code of Federal Regulations
CFU. Colony Forming Unit
CO₂. Carbon Dioxide
CSPA. Consumer Specialty Products Association
EN. European Standard
GHS. Globally Harmonized System of Classification and Labelling of Chemicals
GMM. Genetically Modified Microorganism
ISO. International Organization for Standardization
JECFA. Joint Food and Agricultural Organization of the United Nations/ WHO Expert Committee on Food Additives
SDS. Safety Data Sheet
OECD. Organization for Economic Co-operation and Development
VOC. Volatile Organic Compound
WHO. World Health Organization

GREEN SEAL STANDARD FOR CLEANING PRODUCTS FOR HOUSEHOLD USE, GS-8

1.0 SCOPE

This standard establishes requirements for *general-purpose, bathroom, glass, and carpet cleaners* marketed specifically for use in households or similar residential settings. This standard includes *general-purpose, bathroom, glass and carpet* cleaning products that contain *enzymes or microorganisms*. This standard does not apply to products that contain *enzymes or microorganisms* that are sold in *spray packaging*. This standard does not include antimicrobial pesticide products such as those requiring registration with the U.S. Environmental Protection Agency (EPA) under the Federal Insecticide Fungicide and Rodenticide Act, such as those making claims as sterilizers, disinfectants, or sanitizers¹. See Appendix 1 for an example of products included in this standard.

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 PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS

2.1 Standard Performance Requirements. Each *product as used*, when diluted with water from the cold tap at no more than 50°F, shall clean common soils and surfaces in its category effectively, as measured by a standard test method. *Carpet cleaners* may be diluted with warm or hot water where required by the test method or performance considerations. The following test methods are recommended:

- General-purpose cleaners. The *general-purpose cleaner* product shall remove at least 80% of the particulate soil in the American Society for Testing and Materials (ASTM) D4488-95, A5.
- Bathroom cleaners. The *bathroom cleaner* product shall remove at least 75% of the soil in ASTM D5343 as measured by ASTM D5343.
- Carpet cleaners. Using a standard test method, the manufacturer must demonstrate that its *carpet cleaner* product performs as well as a conventional, nationally-recognized product in its category in both cleaning efficiency and resoiling resistance. Acceptable test methods/procedures to demonstrate performance include, but are not limited to, the following sources: the American Association of Textile Chemists and Colorists (AATCC), ASTM, the Institute of Inspection, Cleaning and Restoration Certification, the International Organization for Standardization (ISO), WoolSafe, the Carpet and Rug Institute or laboratory testing conducted as part of a bid evaluation by a government purchasing entity.

¹ Antimicrobial pesticide products such as EPA-registered products are included in the Green Seal Standard for Specialty Cleaning Products for Household Use, GS-52.

- Glass cleaners. The *glass cleaner* 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.

2.2 Alternative Performance Requirements. Alternatively, using standard test methods conducted under objective, reproducible laboratory conditions, a manufacturer can demonstrate that its product performs as well as or better than a nationally-recognized or market-leading product of its type or achieves the removal efficiency defined in this section with alternate test methods and has a documented rationale for the method modification for Green Seal's review.

3.0 PRODUCT-SPECIFIC HEALTH AND ENVIRONMENTAL REQUIREMENTS

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

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

For purposes of demonstrating compliance with this requirement, existing acute toxicity data for each of the product's *ingredients* in the undiluted product may be used. These data are used to calculate a weighted average that assumes that the toxicity of the individual *ingredients* is additive. The toxicity values are adjusted by the weight of the *ingredients* 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* (LD₅₀)

n = number of *ingredients*

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

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

3.2 Prohibition of Carcinogens, Mutagens, and Reproductive Toxins. The undiluted product shall not contain any *ingredients* that are *carcinogens*, *mutagens* or *reproductive toxins*. For the purposes of this standard, naturally occurring elements and chlorinated organics, which may be present as a result of chlorination of the water supply, are not considered *ingredients* if the concentrations are below the applicable maximum contaminant levels in the National Primary Drinking Water Standards found in 40 CFR Part 141.

3.3 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 *ingredients* in the undiluted product. 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 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 less than or equal to 2.0 or greater than or equal to 11.5, unless data prove otherwise.

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

3.4 Skin Sensitization. The undiluted product shall not be a *skin sensitizer*. For purposes of demonstrating compliance with this requirement, data may be evaluated for each of the product's *ingredients*. If the *ingredients* at the concentrations in the undiluted product are not shown to be *skin sensitizers*, then the product will not be considered to be a *skin sensitizer*.

3.5 Aquatic Toxicity. 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. Aquatic toxicity tests shall follow the appropriate protocols in ISO 7346.2 for fish or OECD test guidance 203 for fish, OECD test guidance 201 for algae, and 202 OECD test guidance for daphnia.

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.

3.6 Aquatic Biodegradability. Each of the organic *ingredients* in the *product as used* shall exhibit ready biodegradability in accordance with the OECD definition, except for polymers.

Biodegradability shall be measured according to any of the following methods:

- OECD Methods 301A–F
- OECD 310
- ISO 7827, 9439, 10707, 10708, or 14593.

Specifically, within a 28-day test, the organic *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.

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 $LC_{50} \geq 100$ 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.

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

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

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.

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*².

Current CARB regulatory limits for VOCs³.

| Product Category | Effective Date | Limit (%) |
|---------------------------------------|----------------|-----------|
| <i>Carpet cleaners</i> (dilutable) | 1/1/2001 | 0.1 |
| <i>Carpet cleaners</i> (ready-to-use) | 12/31/2010 | 1 |
| <i>General purpose cleaners</i> | 12/31/2012 | 0.5 |

² 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%.

³ 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.

| Product Category | Effective Date | Limit (%) |
|-----------------------------------|----------------|-----------|
| <i>Glass cleaners</i> | 12/31/2012 | 3 |
| <i>Bathroom/Restroom cleaners</i> | 12/31/2008 | 1 |

3.9 Other Prohibited Ingredients. The undiluted product shall not contain the following *ingredients*:

- 2-Butoxyethanol
- Alkylphenol ethoxylates
- Phthalates
- The heavy metals lead, hexavalent chromium, or selenium, either in the elemental form or compounds.
- *Ozone-depleting compounds*
- *Optical brighteners*

3.10 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) or a closed-cup method ISO 13736 or ISO 2719. Alternatively, the product shall not sustain a flame when tested using ASTM D4206.

3.11 Fragrances. Manufacturers shall disclose the use of any added fragrances on their safety data sheets (SDSs) and product labels. Any *ingredient* added to a product as a fragrance must follow the Code of Practice of the International Fragrance Association.

3.12 Products Containing Enzymes. Products that contain *enzymes* shall meet all Annex C criteria.

3.13 Products Containing Microorganisms. Products that contain *microorganisms* shall meet all Annex D criteria.

3.14 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.

3.15 Disposable Wipes. Products may contain disposable wipes/towelettes/sheets or other disposable single-use materials if they are made from agricultural products, wood pulp, and other

cellulosic materials. An exception shall be made for reusable wipes/towelettes/sheets that are intended to be used multiple times (e.g., three or more uses).

4.0 PACKAGING REQUIREMENTS

4.1 Primary Package. The *primary package* shall be at least one of the following:

- *A source-reduced package*
- *Recyclable*
- *Contain 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*

4.2 Secondary Package. A *secondary package* shall only be used for *concentrates*. An exception may be made for packaging of multiple units when at least one of the units is a ready-to-use form, and the total packaging (*primary package* plus *secondary package*) is a reduction in overall packaging material use.

4.3 Concentrated Product Packaging. *Concentrates* are prohibited from being packaged in spray-dispenser bottles, disposable wipes, or other ready-to-use *primary package* forms.

4.4 Aerosol Cans. Aerosol cans shall be *recyclable* packages. Further, manufacturers of products packaged in aerosol cans must show that recycling programs are widely available where the product is sold. In addition, manufacturers of products packaged in aerosol cans must demonstrate why aerosol cans are the most suitable packaging for a given product considering environmental, health, and performance considerations.

4.5 Heavy Metal Restrictions. There shall be no *intentional introduction* of lead, mercury, cadmium, and hexavalent chromium 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 *recovered material*.

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

4.7 Plastic Labeling. If plastic, the packaging must be marked with the appropriate Resin Identification Code.

5.0 CERTIFICATION AND LABELING REQUIREMENTS

5.1 Use Instructions. The label must include detailed instructions for proper use to maximize product performance and minimize waste.

5.2 Dilution Instructions. Where the product is intended to be diluted with water by the consumer prior to use, the label shall state clearly and prominently that dilution with water from the cold tap is recommended and shall state the recommended level of dilution in commonly understood measurements. Carpet cleaner labels shall specify the use of cold water for products that do not suffer significant performance degradation in cold water.

5.3 Disposal Instructions. The label must include proper disposal instructions. If the product is a towelette or other disposable wipe product, the label must clearly indicate proper disposal of the wipes. For the package disposal, the label must include clear recycling instructions.

5.4 Protective Equipment. The label shall also include instructions for proper use of personal protective equipment.

5.5 Certification Mark. The Green Seal® Certification Mark may appear on the product, packaging, secondary documents, and promotional materials, only in conjunction with the certified product. Use of the Mark must be in accordance with *Rules Governing the Use of the Green Seal Certification Mark*⁴.

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.

Green Seal must review all uses of the Certification Mark prior to printing or publishing.

5.6 Use With Other Claims. The Green Seal Certification Mark shall not appear in conjunction with any human health or environmental claims, unless verified and approved in writing by Green Seal.

5.7 Statement of Basis for Certification. Wherever the Green Seal Certification Mark appears, it shall be accompanied by 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, unless an alternate version is approved in writing by Green Seal:

This product meets Green Seal™ Standard GS-8 based on effective performance, recycled/recyclable packaging, and protective limits on VOCs and human & environmental toxicity. GreenSeal.org.

If the *powder/solid/non-aqueous liquid* product was evaluated in accordance with Annex B, the description shall read as follows, unless an alternate version is approved in writing by Green Seal:

⁴ www.greenseal.org/TrademarkGuidelines

This product meets Green Seal™ Standard GS-8 based on effective performance, recycled/recyclable packaging, and protective limits on VOCs and human & environmental toxicity. [Powders OR Solids OR Non-aqueous liquids]⁵ have alternate thresholds for [acute toxicity and/or skin/eye damage]⁶ and added requirements for packaging and labeling. GreenSeal.org

⁵ The specific type of product shall be listed.

⁶ Only the criteria that were evaluated according to the relevant Annex shall be listed.

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.

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

Bathroom Cleaner. A product used to clean hard surfaces in a household bathroom such as counters, walls, floors, fixtures, basins, tubs, and tile. This category does not include products specifically intended to clean toilet bowls.

Carpet Cleaner. A product used for routine cleaning of household 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. It does not include products intended primarily for spot removal.

Carcinogen. A chemical listed as a known, probable, or possible human *carcinogen* by the International Agency for Research on Cancer (Groups 1, 2A, and 2B), the National Toxicology Program (Groups 1 and 2), the EPA Integrated Risk Information System (weight-of-evidence classifications A, B1, B2, and C), or the Occupational Safety and Health Administration.

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 to 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.

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

Concentrate. A product that must be diluted by water prior to its intended use, or a product that is diluted during 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.

General-Purpose Cleaner. A product specifically marketed as suitable for cleaning common household surfaces. They do not include task-specific cleaners, such as scouring cleaners, toilet bowl cleaners, upholstery cleaners, laundry and dishwashing detergents, spot/stain removers, oven cleaners, furniture polish, or drain 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, and mirrored surfaces.

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.

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 Harmonized System for the Classification Of Chemicals Which Cause Mutations in Germ Cells (UN, 2003).

Optical Brightener. An additive designed to enhance the appearance of colors and whiteness in materials by absorbing ultraviolet radiation and emitting blue radiation; including but not limited to fluorescent whitening agents.

Ozone-Depleting Compound. Any compound with an ozone-depletion potential greater than 0.01 (CFC 11=1).

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.

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.

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

Primary Package. The material physically containing and coming into contact with the product, not including the cap, lid, or nozzle of a package. 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. This is the most commonly used form of the product that the manufacturer recommends for a product's intended use. For example, if a manufacturer recommends a floor cleaner *concentrate* be diluted 1:8 with water, the product shall meet the environmental and performance requirements that specify 'as used' at a dilution of 1:8.

Post-Consumer Material. Finished products, packages or materials generated by a business or consumer that have served their intended end uses, and that have been recovered from or otherwise diverted from the waste stream for the purpose of recycling.

Recovered Material. Material that has been recovered from or otherwise diverted from the waste generated after a material manufacturing process. Recovered material may include *post-consumer* material, cuttings, trimmings, obsolete inventories, and rejected unused stock, but does not include material capable of being re-used within the process that generated it.

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 rigid plastic packaging container that can be refilled by the product manufacturer at least five times with the original product held by that package and is proven to be routinely returned to the product manufacturer by the consumer for such a purpose.

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.).

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.

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).

Secondary Package. Any packaging or material other than the primary package, including wrappers, boxes, and blister packs, but excluding shipping containers.

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 classified as 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 causes an immunologically mediated cutaneous reaction, also known as allergic contact dermatitis.

Source-Reduced Package. A *primary 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 *primary packages*, the box is included in the weight if the box is used during product use or in product merchandising.

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.

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

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

ANNEX B – 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 (3.3) and may have an alternate threshold of 300 mg/kg for oral acute toxicity (3.1) herein.

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 corrosion.

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

ANNEX C – 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 *enzymes* 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 *microorganisms* shall meet the requirements in Annex D herein.

D. Sensitization and Asthma. *Enzymes* are exempt from being categorized as *asthmagens* or *respiratory sensitizers*.

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 of 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.

ANNEX D – 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 I* 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:

- *Antimicrobial agents*, as demonstrated by testing the microbial strain 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) in accordance with 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
- Each of the five major antibiotic classes (aminoglycoside, macrolide, beta-lactam, tetracycline and fluoroquinolones), as demonstrated by testing the microbial strain in accordance with Beckman Dickinson BBL antimicrobial susceptibility disc 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 1×10^7 CFU per milliliter for liquid products and 1×10^9 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. Labeling Requirements. Products containing *microorganisms* shall include the following on the label:

- A declaration that the product contains *microorganisms*
- A statement that immune-compromised individuals should avoid exposure to products containing *microorganisms* from both direct use and incidental contact during or shortly after application to these products, especially when the treated areas are still wet
- Contact with open cuts or sores should be avoided
- Users should wash their hands after using the product
- Instructions that *microorganisms* may not be effective in the presence of *antimicrobial agents* such as chlorine bleach
- Instructions that the product shall not be used on food-contact surfaces
- Instructions that products containing *microorganisms* should not be sprayed directly into the air.

APPENDIX 1 – SCOPE (Informative)

Examples of products included in or excluded from the scope of GS-8:

Household Products Included in GS-8

- *Bathroom cleaners*
- Floor cleaning products
- *Glass cleaners* and mirror cleaning products
- *General-purpose cleaners*
- *Carpet cleaners*
- Products containing *microorganisms* (e.g. general-purpose, glass, restroom, carpet)
- Products containing *enzymes* (e.g. general-purpose, glass, restroom, carpet)
- Products that contain *enzymes* or *microorganisms* and are packaged in trigger bottles or squeeze bottles

Products Excluded from GS-8

- Air fresheners
- Cleaners/degreasers marketed as suitable for cleaning soils in production and maintenance applications (included in GS-34)
- Deck and outdoor furniture products for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Antimicrobial pesticide products (disinfectants or sanitizers) for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Floor finish and finish strippers (included in GS-40)
- Furniture polish products (included in GS-52 and GS-53)
- General-purpose, restroom, glass and carpet cleaners for industrial and institutional use (included in GS-37)
- Hand cleaning products for industrial and institutional use (covered in GS-41) or *household use* (covered in GS-44)
- Motor vehicle cleaning products for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Oven cleaning products for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Paint remover/thinner products
- Specialty cleaning products for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Upholstery cleaning products for household use (covered in GS-52) and industrial and institutional use (covered in GS-53)
- Products that contain *enzymes* or *microorganisms* that are sold in *spray packaging*