



Technical Specifications for the Procurement of Janitorial Cleaners

Department of the Environment
City and County of San Francisco
March 25, 2005

Development of the Specifications

The City and County of San Francisco has adopted a total of 18 mandatory specifications for the procurement of janitorial products. These specifications are based on criteria developed by the Environmentally Preferable Purchasing Pilot Program (SFE, 2003), which was mandated by the Environmentally Preferable Purchasing Ordinance (Chapter 2 of the Environment Code).

The criteria were developed in 1999-2000, using a stakeholder process that involved end users representing 10 City departments. A technical advisory group, which included five technical experts from EPA Region IX, the Commonwealth of Massachusetts, and the State of Minnesota, provided specific comments on the specifications. The pilot program specifications used a point-based scoring system to determine whether a product passed or failed. This approach was modified slightly in 2004 to a pass-fail system, in order to better harmonize with the existing Green Seal GS-37 Standard for Industrial and Institutional Cleaners. The pass-fail approach was also considered simpler to implement by City staff. Fifteen of the San Francisco specifications correspond to the current (March 2005) Green Seal GS-37 specifications.

Summary of Technical Specifications

Specifications from Green Seal GS-37 (March 2005)

- 1 Toxic Compounds - Acute Toxicity
- 2 Carcinogens & Reprotoxins
- 3 Eye and Skin Irritation
- 4 Skin Sensitization
- 5 Combustibility
- 6 VOC Content
- 7 Aquatic Toxicity
- 8 Aquatic Biodegradability
- 9 Eutrophication
- 10 Packaging
- 11 Concentrate
- 12 Fragrances
- 13 Prohibited Ingredients

- 14 Training
- 15 Animal Testing
- 16 Labeling

Additional specifications based on the requirements of the City and County of San Francisco

- 17 Additional Prohibited Ingredients
- 18 Skin Absorption Potential
- 19 Aerosol Containers Prohibited

Description of Technical Specifications

The following 16 specifications are based on Green Seal GS-37 standards (March 2005)

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

Oral lethal dose 50 (LD50) $\leq 2,000\text{mg/kg}$
Inhalation lethal concentration (LC50) $\leq 20\text{mg/l}$ *

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

Toxicity shall be measured on the product as a whole. Alternatively, a mixture need not be tested if existing toxicity information demonstrates that each of the ingredients complies. Ingredients that are nonvolatile do not require inhalation toxicity testing, and ingredients that not readily absorbed through the skin do not require dermal toxicity testing (Green Seal Standard – Appendix A). It is assumed that the toxicity of the individual component are weighted and summed and that there are no synergistic effects (Appendix A).

The toxicity testing procedures should meet the requirements put forth by the Organization for Economic Cooperation and Development (OECD) Guidelines for Testing Chemicals. These protocols include Acute Oral Toxicity Test (TG 401), Acute Inhalation Toxicity Test (TG 403), and Acute Dermal Toxicity Test (TG 402). The City desires to minimize the number of new tests conducted upon live animal subjects. Therefore, bidder may submit existing results from equivalent tests, such as EPA OPPTS Harmonized Test Guidelines 870-1100 for Acute Oral Toxicity.

2. **Carcinogens and Reproductive Toxins** – The undiluted product shall not contain more than one-hundredth of one percent (0.01%) by weight of any ingredients that are a carcinogen or that are known to cause reproductive toxicity.

Carcinogens are defined as those chemicals listed as known, probable, or possible human carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), the U.S. Environmental Protection Agency or the Occupational Health and Safety Administration (OSHA).

Chemicals known to cause reproductive toxicity are defined by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, *et seq.*).

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

3. **Eye and Skin Irritation** – The undiluted product shall not be corrosive to skin or eyes. Dispensing-system concentrates shall be tested as used. The undiluted cleaning product shall not be corrosive to skin, as tested using the Human Skin Construct Systems (Liebsch et al. 2000; Fentem et al. 1998). The undiluted cleaning product shall also not be corrosive to the eyes, as tested using the bovine opacity and permeability test (BCOP) (Sina et al. 1995) after a 10-minute exposure. The City will also accept the results of other peer-reviewed or standard in vitro or in vivo test methods demonstrating that the product mixture is not corrosive.
4. **Skin Sensitization** – The undiluted product shall not be a skin sensitizer as tested by the OECD Guidelines for testing chemicals, Section 406. Dispensing-system concentrates shall be tested as used. The City shall also accept the results of other standard test methods, such as those described in Buehler (1994) or Magnusson and Kligman (1969), as proof that the product or its ingredients are not skin sensitizers.
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 degree F, as tested using either the Cleveland Open Cup Tester (ASTM D92-97) or a closed cup method International Standards Organization (ISO) 13736 or ISO 2719. Alternatively, the product shall not sustain a flame when tested using ASTM D 4206.
6. **Volatile Organic Compound (VOC) Content** – The product as used shall not contain substances that contribute significantly to the production of photochemical smog, tropospheric ozone and poor indoor air quality. The volatile organic compound (VOC) of

the product as used shall be determined by the CA Air Resources Board Method 310 and shall not exceed the following:

1% by weight for general purpose cleaners and bathroom cleaners

3% by weight for glass cleaners

7. **Aquatic Toxicity** – The product as use shall not be toxic to aquatic life. A compound is considered not toxic to aquatic life if it meets on 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 product’s ingredients demonstrating that the product mixture complies. Aquatic toxicity tests shall follow the appropriate protocols in ISO 7346.2 for fish and in 40 CFR 797, Subpart B for other aquatic organisms.

8. **Aquatic Biodegradability** – Each of the organic ingredients shall exhibit ready biodegradability in accordance with the Organization for Economic Cooperation and Development (OECD) definition except for a FIFRA-registered ingredient in a bathroom cleaner. However, all other ingredients in a FIFRA-registered bathroom cleaner shall comply. Biodegradability will be measured by one of the following methods: ISO 9439 (carbon dioxide evolution test), ISO 10708 (two-phase close bottle test), ISO 10707 (close bottle test), or ISO 7827 (dissolved organic carbon removal). Specifically, within a 28-day test, the ingredient shall meet one of the following criteria within 10 days of the time when the biodegradability first reaches 10%:

Removal of dissolved organic carbon (DOC)	>70%
Biological oxygen demand (BOD)	> 60%
% of BOD of theoretical oxygen demand (ThOD)	>60%
% of carbon dioxide evolution of theoretical	>60%

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

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

9. **Eutrophication** – The product as used shall not contain more that 0.5% by weight of total phosphorus.

10. **Packaging** - The primary package shall be recyclable. Alternatively, manufacturers may provide for returning and refilling of their packages.
11. **Concentrate** – The product shall be a concentrate, except for FIFRA-registered bathroom cleaners.
12. **Fragrances** – Manufacturers shall identify any added fragrances in their MSDS. Any ingredients added to a product, as a fragrance shall follow the Code of Practice of the International Fragrance Association.
13. **Prohibited Ingredients** – The product shall not contain the following ingredients:
 - i). Alkylphenol ethoxylates
 - ii). Dibutyl phthalate
 - iii). Heavy metals including arsenic, lead, cadmium, cobalt, chromium, mercury, nickel, zinc or selenium
 - iv). Ozone depleting compounds
14. **Training** – Product manufacturers, their distributors, or a third party shall offer training or training materials in the proper use of the products. These shall be step-by-step instructions for the proper dilution, use and disposal, and the proper use of dispensing equipment, if applicable. Manufacturers shall have a product labeling system to assist non-English speaking personnel.
15. **Animal Testing** - This section applies to Sections 1, 3, and 7. Green Seal wants to discourage animal testing and will accept the results of past peer-reviewed or standard tests demonstrating compliance with a criterion. A mixture need not be tested if existing information demonstrates that each of the ingredients complies with a criterion. Additionally, Green Seal may accept non-animal (in-vitro) test results, providing that the test methods are referenced in peer-reviewed literature and the manufacturer provides the reasons for selecting the particular test method.
16. **Labeling** – 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. The manufacturer shall also include detailed instructions for proper use and disposal and for the use of personal protective equipment. Whenever the Green Seal certification mark appears on a package, the package shall contain a description of the basis for certification. The description shall be in a location, style, and typeface that are easily readable. Unless otherwise approved in writing by Green Seal, the description shall read as follows: “This product meets Green Seal’s environmental standard for industrial and institutional cleaners based on its reduced human and aquatic toxicity and reduced smog production potential.” For FIFRA-registered bathroom cleaners, replace “toxicity” with the word “impacts”.

The following three additional specifications are based on the requirements of the City and County of San Francisco.

17. Additional Prohibited Ingredients

Prohibited Substances (0.01%) The product in its concentrated form shall contain less than 0.01% by weight of any of the following ingredients [CAS number in brackets]:

- Global warming compounds, as listed by US EPA
- 1,1,1-TCE [71-55-6]
- acetone [67-64-1]
- benzyl alcohol [100-51-6]
- butoxy propanol [5131-66-8]
- Coconut diethanolamide [8051-30-7]
- coconut oil diethanolamine [68603-42-9]
- cyclohexanol [108-93-0]
- diethanolamine [111-42-2]
- diethylene glycol [111-46-6]
- diethylene glycol monobutyl ether [112-34-5]
- diethylene glycol monoethyl ether [111-90-0]
- diethylene glycol monomethyl ether [111-77-3]
- ethylene glycol [107-21-1]
- hexylene glycol [107-41-5]
- methyl ethyl ketone [78-93-3]
- naphtha [8030-30-6]
- naphthalene [91-20-3]
- n-hexane [110-54-3]
- n-methyl pyrrolidinone [872-50-4]
- perchloroethylene [127-18-4]
- propylene glycol [57-55-6]
- propylene glycol monomethyl ether [107-98-2]
- stoddard solvent [8052-41-3]
- toluene [108-88-3]
- triethanolamine [102-71-6]
- trichloroethylene [79-01-6]
- xylene [1330-20-7]

Prohibited Substances (10.0%) The product in its concentrated form shall contain less than 10% by weight of any of the following ingredients:

- ammonia [7664-41-7]
- ethyl alcohol [64-17-5]
- isopropyl alcohol [67-63-0]

18. Skin Absorption

When tested to the following standard, product as a whole in its diluted-for-use form shall have a low potential to absorb through skin. In addition, each individual ingredient that comprises 1.0% or more of the diluted product by weight shall have a low potential to absorb through skin. A “low potential” for skin absorption shall mean that less than 1.0% of the diluted whole product or individual ingredient test dose absorbs through the skin of the test subject.

Skin absorption shall be determined by test methods specified by OPPTS 870.7600 for Dermal Penetration studies, as published in EPA 712–C–98–350, August 1999.

The following chemicals have a high potential for skin absorption, and therefore shall not be present as an ingredient at or above 1.0% by weight of the diluted for use product:

- 2-butoxyethanol [111-76-2]
- monoethanolamine [141-43-5]

19. Aerosol Containers Prohibited

Products shall be furnished in unpressurized non-aerosol containers.

References

San Francisco Department of the Environment (SFE), 2003: Environmentally Preferable Purchasing Pilot Program Final Report. February, 2003. Prepared by Tetra Tech EM Inc. URL: <http://temp.sfgov.org/sfenvironment/aboutus/innovative/epp/purchasing.htm>

Skin Absorption Test Standard cited in Paragraph 17: EPA 712–C–98–350, August 1998. URL: http://www.epa.gov/opptsfrs/OPPTS_Harmonized/

Standard GS-37: Green Seal Environmental Standard for General-Purpose, Bathroom, and Glass Cleaners Used for Industrial and Institutional Purposes (GS-37). URL: http://www.green Seal.org/gs-37_proposed_amnd.pdf

Test standards cited in GS-37: Kelly, K., and G.A. Davis Green Seal Standard and Environmental Evaluation for General-purpose, Bathroom, and Glass Cleaners Used for Industrial and Institutional Purposes. Prepared for Green Seal, Inc., Washington, DC (University of Tennessee; October 2000). URL: <http://eerc.ra.utk.edu/ccpct/pdfs/GS-GPBGCIIP.pdf>