

**Key Sustainable Products Standards
Public Buildings Service
U.S. General Services Administration**

OFFICE OF ACQUISITION MANAGEMENT
OFFICE OF DESIGN AND CONSTRUCTION
OFFICE OF FACILITIES MANAGEMENT AND SERVICES PROGRAMS
OFFICE OF LEASING

September 2014

Introduction

As part of an effort to simplify sustainable purchasing at the Public Buildings Service (PBS) and improve PBS's sustainable purchasing performance, the Offices of Acquisition Management, Design and Construction, Facilities Management and Services Programs, and Leasing have identified the products that PBS uses most frequently, developed clear sustainability standards for them, and planned an educational and promotional campaign to boost their purchase at PBS. These products have been called "Key Sustainable Products" or "KSPs." The KSP standards have been posted on a special PBS-specific page in the Green Procurement Compilation (www.sftool.gov/greenprocurement).

The KSP standards were selected to meet all applicable Federally-required environmental performance attributes for each product. The Federally-required environmental performance attributes as of the date of this report are: recovered content, biobased, less-ozone-depleting, less-toxic, energy-efficient, and water-efficient. Wherever possible, widely-used third-party standards (i.e. standards developed by outside organizations) that meet or exceed Federal green purchasing requirements and do not add to the cost of products were included to make identification of compliant products easier. Finally, the use of each of the third-party standards was determined not to pose any barriers to international trade.

The specific rationale for inclusion of each of the third-party standards used is as follows:

- The Green Seal GS-01 standard was used for paper towels and bathroom tissue because it meets or exceeds the Federal recycled content requirement.
- The UL 126 standard was used for wastebasket liners because it meets or exceeds the Federal recycled content requirement.
- The Green Seal GS-41 standard and the UL 2784 standard were used for hand soap because both meet or exceed the Federal requirements for less-toxic and less-ozone-depleting chemicals.
- The Green Seal GS-37 standard and the UL 2759 standard were used for hand soap because both meet or exceed the Federal requirements for less-toxic and less-ozone-depleting chemicals.
- The NSF-140 Gold standard was used for nylon carpet because it meets or exceeds the Federal requirements for less-toxic and less-ozone-depleting chemicals.
- The Greenguard Gold standard was used for gypsum board and the California Section 01350 standard was used for acoustical ceiling tile because these are the standards used for reduced VOC emissions in the gypsum board and acoustical ceiling tile industries, respectively.

For two product categories, tradeoffs had to be made where some products had some Federal attributes and other products had different Federal attributes. For example, interior latex paints suitable for commercial use that meet the Federal recycled content and USDA BioPreferred paint standards generally have higher VOC levels than paints that do not meet these standards. Therefore, we excluded these requirements in favor of standards requiring low VOC levels until products with all three attributes become available on the market. Likewise, the availability on the market of hand soaps suitable for commercial use that are USDA BioPreferred as well as less-hazardous and low-VOC (in the form of Green Seal and UL-certified products) is very low. Therefore, we excluded the Federal biobased requirement until products with all three attributes become available.

Table 1 below lists the Key Sustainable Products and standards. The purpose of this report is to provide the rationale for each KSP standard. The report will also show that the specification of these products with the environmental standards listed in this report will have little or no effect on cost or availability.

TABLE 1 - PBS KEY SUSTAINABLE PRODUCTS AND STANDARDS

Product	Sustainability Standard
<i>Nylon carpet</i>	NSF 140 Gold certification <i>and</i> ≥ 10% post-consumer recovered content
<i>Interior latex paint</i>	≤ 50 grams per liter (g/L) VOCs post-tint (i.e. SCAQMD Rule 1113 standard)
<i>Gypsum board</i>	Greenguard Gold certification
<i>Acoustical ceiling tiles</i>	Meets the California Section 01350 standard for low-VOC materials <i>and</i> Total recycled content ≥ 20% <i>and</i> Recyclable in a closed loop process <i>and</i> USDA BioPreferred <i>and</i> Environmental Product Declaration (EPD) available
<i>Concrete (ready-mix and site-mix)¹</i>	≥ 15% fly ash <i>or</i> ≥ 25% ground granulated blast-furnace (GGBF) slag
<i>Wastebasket liners (24" x 33" or smaller)²</i>	≥ 20% post-consumer recycled content <i>or</i> UL 126 (formerly CCD 126)
<i>Paper towels</i>	[≥ 50% post-consumer recycled content <i>and</i> 100% total recycled content OR Green Seal (GS-1)
<i>Bathroom tissue</i>	[≥ 25% post-consumer recycled content <i>and</i> 100% total recycled content OR Green Seal (GS-1)
<i>Hand Soap</i>	USDA BioPreferred AND [Green Seal (GS-41) <i>or</i> EcoLogo (UL 2784) <i>or</i> EPA Design for the Environment (DfE)
<i>Multipurpose Cleaner</i>	Green Seal (GS-41) <i>or</i> EcoLogo (UL 2784) <i>or</i> EPA Design for the Environment (DfE)

¹For leasing, this standard only applies to new lease construction projects.

² This standard does not yet apply to leases.

Key Sustainable Product Standards

Nylon Carpet

PBS Standard:

- \geq 10% post-consumer recovered content; and
- NSF 140 Gold level

Rationale:

This standard meets three of the six¹ required Federal attributes - recovered content, less-ozone-depleting, and less-toxic. Currently, neither recycled nor biobased content recommendations for nylon carpet have been made by EPA and USDA – only for polyester carpet, which has limited durability and is generally not used in offices. Recycled content nylon carpet is, however, available on the market. We found no biobased nylon carpet. The NSF-140 standard at the Gold level requires minimization of volatile organic compounds (VOCs) (making the carpet less-ozone-depleting) and persistent, bioaccumulative, and toxic (“PBT”) chemicals (making the carpet less-toxic). Tables 2 and 3 show that the NSF-140 Gold standard has been almost universally adopted in the carpet industry and 10% post-consumer recovered content is commonly available. Using the NSF 140 standard has the added benefit of ensuring that specific performance standards in the following areas are met: texture appearance retention rating (TARR), tuft bind, delamination strength, flammability, electrostatic propensity, and colorfastness to light.

The market data in Tables 2 and 3 show, on average, little or no price difference between both broadloom and modular carpet that meets the PBS standard and carpet that does not. For broadloom carpet, the average price per square yard for carpet meeting the PBS standard was \$24.32, virtually the same as the average price per square yard, which was \$23.41. For modular carpet, the price per square yard for carpet meeting the PBS standard was *lower* than the average - \$24.66 compared with \$28.95.

¹The six required Federal attributes are recovered content, biobased, non-ozone-depleting, less-toxic, energy-efficient, and water-efficient.

of sale. As indicated in Table 4, all paints sampled for this report had VOCs \leq 50 g/L and they are available at reasonable prices. Contractors should check with the manufacturer to determine whether the VOC levels advertised are pre-tint or post-tint. If a paint meets the most current South Coast Air Quality Management District (SCAQMD) requirements for flat and non-flat interior paints, it will be considered compliant with the PBS standard.

The best comparative price information was found on Consumer Reports (last updated May 2013). Prices per gallon for the 14 best-performing interior eggshell, satin, and semi-gloss finish paints were obtained from the Consumer Reports paint buying guide; these are the paints are shown in Table 4. Based on these data, there is only a very small relative price difference between paints that meet the PBS standard and those that do not. On average, paints that meet the PBS standard are \$40 per gallon; those that do not are \$35 per gallon. Given that the range of prices per gallon for the paints on the list is \$25 to \$68, this is a small difference.

TABLE 4
PRICES, EGGSHELL/SATIN/SEMI-GLOSS INTERIOR PAINTS

Product	VOC level (g/L)*	Same VOC Level After Tinting?	Meets PBS Standard?	Price per Gallon
Product #1 - Eggshell/Satin/Semi-Gloss	<5	No	Yes	\$25
Product #2 - Eggshell/Satin/Semi-Gloss	<5	No	Yes	\$25
Product #3 - Eggshell/Satin/Semi-Gloss Enamel	<5	No	Yes	\$27
Product #4 - Eggshell/Satin/Semi-Gloss Enamel	≤50	No	No	\$27
Product #5 - Eggshell/Semi-Gloss	≤50	No	No	\$28
Product #6 - Eggshell/Satin/Semi-Gloss	<5	No	Yes	\$29
Product #7 - Eggshell/Satin/Semi-Gloss	≤50	No	No	\$30
Product #8 - Eggshell/Satin/Semi-Gloss Enamel	≤50	No	No	\$32
Product #9 - Eggshell/Satin/Semi-Gloss Enamel	≤50	No	No	\$34
Product #10 - Eggshell/Satin/Semi-Gloss	≤50	No	No	\$34
Product #11 - Eggshell/Pearl/Semi-Gloss	<5	Yes	Yes	\$50
Product #12 - Eggshell/Semi-Gloss	<5	Yes	Yes	\$57
Product #13 - Matte/Satin/Semi-Gloss	≤50	No	No	\$63
Product #14 - Eggshell/Satin/Semi-Gloss	≤50	Yes	Yes	\$68

Average, paints that meet PBS standard \$40
Average, paints that do not meet PBS standard \$35

*<5 g/L is considered "zero VOC."

Sources: Prices from Consumer Reports; VOC content from manufacturer Technical Data Sheets, MSDS's, and websites, April 2014.

Gypsum Board

PBS Standard:

- Greenguard Gold certification

Rationale:

The PBS standard encompasses two of the six required Federal attributes - less-ozone-depleting and less-toxic. The Greenguard Gold standard ensures that certified products emit low or no VOCs and VOCs are both ozone-depleting and toxic.

As Table 5 indicates, Greenguard Gold gypsum board is widely available. This table lists all 5/8" gypsum board available in 4' x 8' sheets on the Home Depot and Lowes websites. Three of these five products possess the Greenguard Gold designation.

TABLE 5
PRICES, GYPSUM BOARD

PRODUCT	Greenguard Gold ?	Meets PBS Standard?	Price per 4' x 8' sheet
Product #1	Yes	Yes	\$11.48
Product #2	Yes	Yes	\$11.48
Product #3	Yes	Yes	\$11.48
Product #4	No	Yes	\$11.48
Product #5	No	Yes	\$11.78

Acoustical Ceiling Tiles

PBS Standard:

- California Section 01350 standard for low-VOC materials;²
- Total recycled content \geq 20%;
- Recyclable in a closed loop process;³
- USDA BioPreferred; *and*
- Environmental Product Declaration (EPD) available.

² This standard is also sometimes referred to as the California Department of Public Health (CDPH) standard or the Collaborative for High-Performance Schools (CHPS) standard. Greenguard Gold (formerly Greenguard Children & Schools) certified products exceed this standard.

³ i.e., the manufacturer has a take-back program through which it picks up used ceiling tiles and uses it to make new panels.

Rationale:

The PBS standard encompasses four of the six required Federal attributes - less-ozone-depleting and less-toxic (via reduced VOC's), recycled content, and biobased. Ceiling tiles (composite panels) are a designated item under the USDA BioPreferred program. Though they are not a designated item under the EPA CPG (recovered content) program, ceiling tile is widely available with recycled content and closed-loop recycling is a common practice in the industry. As Table 6 shows, total recycled content of 20% or more appears to be universally available. Reduced VOC's – through compliance with California Section 01350 or an equivalent standard – also appears to be widely available.

No third-party standard that encompasses several environmental attributes has been widely adopted by the industry yet; this is why the PBS standard lists five different attributes separately. However, Environmental Product Declarations (EPDs) – detailed summaries of the environmental attributes of a product in a format certified by a reputable third-party organization – are widely available in the ceiling tile industry and almost all of the attributes in the PBS standard are presented in that document.

Table 6 shows pricing information for 12 acoustical ceiling tile lines. The vast majority if not all acoustical ceiling tiles suitable for office buildings are made only three manufacturers. Of these three, two make tiles that are USDA BioPreferred. Pricing information for more than a handful of lines was only available from one website; all lines listed on that site for one manufacturer and the three BioPreferred lines from another were included. The average price per square foot for those meeting the PBS standard (\$2.23) was *less* than that for those that did not meet the PBS standard (\$2.93).

TABLE 6
PRICES, ACOUSTICAL CEILING TILES

Product	Recycled Content ≥20%?	USDA BioPreferred ?	Closed Loop?	CA 01350?	EPD?	Meets PBS Standard?	Price per S F
Product #1	25-50%	Yes	Yes	Yes	Yes	Yes	\$1.09
Product #2	56%	Yes	Yes	Yes	Yes	Yes	\$1.55
Product #3	52%	Yes	No	No	No	No	\$2.31
Product #4	69%	Yes	Yes	Yes	Yes	Yes	\$2.31
Product #5	69%	Yes	Yes	Yes	Yes	Yes	\$2.31
Product #6	51%	Yes	Yes	Yes	Yes	Yes	\$2.31
Product #7	40%	Yes	No	No	No	No	\$2.31
Product #8	24-49%	No	Yes	Yes	No	No	\$2.31
Product #9	86%	Yes	Yes	Yes	Yes	Yes	\$2.92
Product #10	86%	Yes	Yes	Yes	Yes	Yes	\$3.08
Product #11	75-81%	No	Yes	Yes	Yes	No	\$3.08
Product #12	63-82%	No	Yes	Yes	Yes	No	\$4.63

Average, tiles that meet PBS standard \$2.23
Average, tiles that do not meet PBS standard \$2.93

Source: www.ceilingtilesbyus.com and manufacturer websites, September 2014.

Concrete (Ready-Mix and Site-Mix)

PBS Standard:

- Recycled content in the form of
 - ≥ 15% fly ash or
 - ≥ 25% ground granulated blast-furnace (GGBF) slag

Rationale:

Typically, concrete can be purchased with only one Federally-required attribute – recovered content. The PBS standard is EPA’s recommended minimum recovered content standard for concrete. Fly ash and GGBF slag are considered recovered-content materials; they are by-products from the production of coal and iron/steel-making, respectively. The construction industry already commonly uses fly ash and slag at the levels in the PBS standard. The use of these materials in concrete also significantly reduces the amount of energy and CO₂ used in the production of concrete, making concrete meeting the PBS standard less-ozone-depleting as well.

The price of concrete varies regionally based on a variety of factors, especially the cost of fuel. Fly ash and GGBF slag are already commonly-used ingredients in concrete, so there is expected to be no price impact as a result of using the PBS standard.

Wastebasket Liners (24" x 33" or smaller)

PBS Standard:

- $\geq 20\%$ post-consumer recycled content *or*
- UL 126 (formerly CCD 126)

Rationale:

Currently, recovered content is the only Federal attribute that applies to plastic trash bags – USDA has not yet designated these products as part of their BioPreferred program.⁴ EPA recommends a minimum of 10% post-consumer recycled content. Table 7 below shows that most wastebasket liners that are available with post-consumer recycled content have at least 30% post-consumer content and are comparable in price to those with less than 30%. However, since the recycled content of a product is often difficult to ascertain, we adopted the 20% post-consumer requirement of UL 126 so that people can identify the recycled content simply by looking for the UL designation. Although the UL designation has the added advantage of taking into account other environmental attributes as well, either the post-consumer content percentage or the UL designation meets the KSP standard.

⁴ As of the date of this report, USDA has not yet designated these products as part of their BioPreferred program. There are a number of biobased, biodegradable trash bags available, but none were found in sizes appropriate for wastebaskets and these bags, for all sizes, were significantly more expensive than their non-biobased/non-biodegradable counterparts.

TABLE 7
PRICES, WASTEBASKET LINERS

Product	Size	Post Consumer Recycled Content	UL 126?	Price per bag
Product #1	7 gal	30%	Yes	\$0.03
Product #2	7-10 gal	None	No	\$0.03
Product #3	7-10 gal	None	No	\$0.05
Product #4	10 gal	30%	No	\$0.08
Product #5	8 gal	10%	No	\$0.09
Product #6	7-10 gal	10%	No	\$0.11
Product #7	7-10 gal	30%	No	\$0.16

Average price, liner meeting PBS standard \$0.03

Average price, liners not meeting PBS standard \$0.09

Source: Various retail websites that list the recovered content of trash bags offered, April 2014.

Paper Towels

PBS Standard:

- $\geq 50\%$ post-consumer recycled content *and* 100% total recycled content

OR

- Green Seal (GS-1)

Rationale:

The PBS standard encompasses the only Federal attribute applicable to paper towels – recycled content. The EPA recommends a minimum of 40% post-consumer recovered content and 100% total recovered content for paper towels. However, all paper towel lines found which contain recovered content reported post-consumer recovered content of at least 40%, so the PBS standard was set at 50%. Two of the six product lines contained both 50% post-consumer content and 100% total recovered content. 50% post-consumer content and 100% total content is also the Green Seal standard GS-1 standard. In addition, Green Seal standard GS-1 requires that the paper towels they

certify meet certain functional performance requirements and include other environmental standards, such as those related to chemicals used in the manufacturing process and packaging.

Table 8 lists six commercial paper towel lines containing various levels of recovered content. The average price per 100 feet for those lines that meet the PBS standard (\$1.06) is *lower* than that for lines that did not meet the standard (\$1.38).

TABLE 8
PRICES, COMMERCIAL ROLL PAPER TOWELS WITH RECOVERED CONTENT

Product	Total Recycled Content	Post Consumer Recycled Content	Green Seal?	Price per 100 feet
Product #1	100%	88%	No	\$0.81
Product #2	100%	40%	No	\$1.20
Product #3	60%	40%	No	\$1.25
Product #4	100%	50%	Yes	\$1.27
Product #5	100%	50%	Yes	\$1.32
Product #6	50%	40%	No	\$1.81

Average - meets PBS standard \$1.06

Average - does not meet PBS standard \$1.38

Source: Roll towels on Grainger and Uline websites for which total and post-consumer percentages available, April 2014.

Bathroom Tissue

PBS Standard:

- \geq 25% post-consumer recycled content *and* 100% total recycled content

OR

- Green Seal (GS-1)

Rationale:

The PBS standard encompasses the only Federal attribute applicable to bathroom tissue – recycled content. The EPA recommends a minimum of 20% post-consumer recovered content and 100% total recovered content for bathroom tissue. However, all but one bathroom tissue line found which contain recovered content reported post-consumer recovered content of at least 20%, so the PBS standard was set at 25%. Table 9 shows that six of the seven products with post-consumer recycled content

contain at least 25% post-consumer content. 25% post-consumer content and 100% total content is also the Green Seal GS-1 standard. In addition, Green Seal standard GS-1 requires that the paper towels they certify meet certain functional performance requirements and include other environmental standards, such as those related to chemicals used in the manufacturing process and packaging.

Table 9 lists eight widely-available commercial bathroom tissue lines containing various levels of recovered fiber. Prices per 1,000 feet range from \$2.67 to \$8.78. The average price for lines meeting the PBS standard (\$5.71) is lower than that for lines that do not meet the PBS standard (\$5.82).

TABLE 9
PRICES, COMMERCIAL BATHROOM TISSUE WITH RECOVERED CONTENT

Product	Total Recycled Content	Post Consumer Recycled Content	Green Seal?	Price per 1,000 feet
Product #1	65%	65%	No	\$2.67
Product #2	100%	88%	No	\$3.25
Product #3	45%	30%	No	\$3.79
Product #4	100%	30%	No	\$5.75
Product #5	100%	40%	Yes	\$5.75
Product #6	0%	0%	No	\$8.06
Product #7	100%	25%	Yes	\$8.11
Product #8	25%	20%	No	\$8.78

Average - meets PBS standard \$5.71

Average - does not meet PBS standard \$5.82

Source: Tissue paper on various janitorial supply websites for which total and post-consumer percentages available, April 2014 (price for Product #5 from July 2015).

Hand Soap

PBS Standard:

- USDA BioPreferred

AND

- Green Seal standard GS-41, EcoLogo standard UL 2784, or EPA Design for the Environment (DfE) designated

Rationale:

The Green Seal, EcoLogo, and DfE standards all require less-ozone-depleting (via low VOC's) and use of less-toxic substances – two of the required Federal environmental attributes. In addition, the PBS standard meets the biobased requirement: hand cleaners are a designated product category under the USDA BioPreferred program. A review of all commercial foaming⁵ hand cleaners listed on the USDA BioPreferred website found that eleven of them were also Green Seal, EcoLogo, or EPA Design for the Environment (DfE) designated. This was considered a sufficient number to justify including all attributes in the PBS standard.

Table 10 lists several commercial foaming hand soaps and their respective prices for a standard size refill. The average price for hand soaps meeting the PBS standard - \$20.35- is *lower* than that for hand soaps that do not meet the standard - \$26.41.

TABLE 10
PRICES, FOAMING HAND SOAP FOR COMMERCIAL USE

Product	EPA Design for the Environment	Green Seal (GS 41) or EcoLogo (UL 2784)	USDA Bio Preferred	Price per 1250 mL
Product #1	Yes	No	Yes	\$14.73
Product #2	No	No	No	\$15.32
Product #3	No	Yes	Yes	\$16.82
Product #4	No	Yes	Yes	\$17.95
Product #5	No	Yes	No	\$18.00
Product #6	No	No	No	\$19.32
Product #7	No	Yes	No	\$19.68
Product #8	No	No	No	\$21.15
Product #9	No	Yes	Yes	\$24.05
Product #10	No	No	No	\$26.02
Product #11	No	Yes	Yes	\$28.19
Product #12	No	Yes	No	\$33.48
Product #13	No	Yes	No	\$33.60
Product #14	No	Yes	No	\$34.43
Product #15	No	Yes	No	\$34.55
Product #16	No	Yes	No	\$35.02
Average, products that meet PBS standard				\$20.35
Average, products that do not meet PBS standard				\$26.41

Source: Various janitorial supply websites, April 2014.

⁵ Only foaming soaps should be used because they require significantly less product and water than liquid soaps.

Multipurpose Cleaner

PBS Standard:

- Green Seal standard GS-41, EcoLogo standard UL 2784, or EPA Design for the Environment (DfE) designated

Rationale:

The Green Seal, EcoLogo, and DfE standards all require less-ozone-depleting (via low VOCs) and use of less-toxic substances – two of the required Federal environmental attributes. Based on a review of all commercial floor cleaners listed on the USDA BioPreferred website, there are only two floor cleaners that have both the USDA BioPreferred designation and Green Seal, EcoLogo, or DfE designation. However, based on the data in Table 11, these cleaners are significantly more expensive than cleaners with only the Green Seal, EcoLogo, or DfE designation – averaging \$35.79 per gallon compared with \$15.91 per gallon for the latter group. Because VOCs and hazardous substances negatively affect the occupants of a building directly and commercial floor cleaner with all applicable standards is significantly more expensive, PBS is not currently requiring that floor cleaner used by contractors in its buildings be USDA BioPreferred.

Product	Recommended Dilution Ratio	EPA Design for the Environment	Green Seal (GS-37) or EcoLogo (UL 2759)	BioPreferred?	Price per Gallon
Product #1	1:32 to 1:128	No	No	No	\$10.26
Product #2	1:32 to 1:128	Yes	No	No	\$12.79
Product #3	1:32 to 1:512	No	No	No	\$13.00
Product #4	1:32 to 1:128	No	Yes	No	\$13.21
Product #5	1:32 to 1:128	No	Yes	No	\$17.61
Product #6	1:32 to 1:128	No	Yes	No	\$20.03
Product #7	1:32 to 1:128	Yes	Yes	Yes	\$24.00
Product #8	1:128	No	Yes	Yes	\$36.00
Product #9	1:64 to 1:16	No	Yes	Yes	\$47.36
		Average, no 3rd-party certification and not BioPreferred			\$11.63
		Average, with 3rd-party certification only			\$15.91
		Average with 3rd-party certification and BioPreferred			\$35.79
<i>Source: Various websites, April 2014 and July 2015</i>					