



**GREEN SEAL™ PROPOSED REVISED
ENVIRONMENTAL STANDARD FOR SANITARY
PAPER PRODUCTS (GS-1)**

BACKGROUND DOCUMENT

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THE MARK OF ENVIRONMENTAL RESPONSIBILITY

Green Seal, Inc. • 1001 Connecticut Ave., NW, Suite 827 • Washington, DC 20036-5525 •
(202) 872-6400 • Fax (202) 872-4324 www.greenseal.org

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INTRODUCTION

The purpose of revising GS-1 and GS-9 is to combine these two Green Seal™ standards into one comprehensive standard that evaluates the critical issues in the life cycle of sanitary paper products. Since the standards were last issued, in 1992 and 1993 respectively, technological and scientific advancements have been made to identify and improve the environmental life cycle of the products¹. Research for this revision has identified several life cycle components as being most important in the production of environmentally preferable sanitary paper products. These include: fiber source; use of chlorine and other hazardous materials in various stages of production; water and energy usage during production; air and water quality emissions from production; transportation and related air emissions; waste; packaging; and social responsibility. The scope of the standard has also been expanded to include other sanitary paper products (*e.g.*, placemats and other table coverings). The revision and combination of GS-1 and GS-9 will provide a comprehensive, easy to use standard addressing the life cycle issues for sanitary paper products.

SCOPE

This revised standard establishes environmental requirements for sanitary paper products, including paper towels, paper napkins, bathroom tissue, facial tissue, and toilet seat covers, and placemats and other table coverings. The standard covers products for institutional as well as retail markets. The products are required to be made from 100% recovered material, since this provides the greatest reduction in life-cycle impacts (*i.e.*, maintains biodiversity in forests, maintains trees for storing and sequestering carbon, less energy input to manufacture, fewer overall emissions)².

The formerly separate standards, GS-1 and GS-9, have been combined into one comprehensive standard, GS-1 Sanitary Paper Products, since these products have similar characteristics, and are often manufactured at the same facility. This revised standard covers the facial and bathroom tissues, toilet seat covers, paper towels, and napkins which were covered in the original GS-1 and GS-9, with the addition of paper placemats and table coverings. The standard does not include nonwoven sanitary products, general purpose wipes, flushable wipes, disposable diapers, or sanitary napkins and tampons.

¹ <http://www.greenseal.org/certification/environmental.cfm>

² Paper Task Force 1995 and 2002. Lifecycle environmental comparison: virgin paper and recycled paper-based systems. http://www.edf.org/documents/1618_WP3.pdf.

PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS

The revised standard will require specific product testing for the following product characteristics: basis weight, wet and dry tensile strength, stretch, water absorbency, and brightness. These tests are standard in the industry, and are used to ensure production of a consistent and well-made product. Specific American Society for Testing and Materials (ASTM) tests in the major product characteristics will be required, when available. The results will need to fall within an acceptable performance range. Equivalent Technical Association of Pulp and Paper Industry (TAPPI) and/or International Organization for Standardization (ISO) standard testing protocol will also be accepted.

Alternative performance requirements may be allowed for sanitary paper products not specified in the standard that may be developed in the future and may follow different testing criteria than those listed in the standard.

Manufacturers will be required to contain minimum material specifications with regard to the number of sheets per roll/box/package or an equivalent square footage. The intent of this specification is to ensure that efficient packaging is being considered, and that the maximum reasonable amount of material is packaged on a roll or in a box. In addition, the manufacturer will need to demonstrate that the product is packaged and shipped using the most efficient approach. Alternate sizes for the material specifications may be accepted, if their use will improve the overall packaging and transportation efficiency. The manufacturer will need to provide their specifications for packaging and shipping to show that these criteria have been considered (*e.g.*, product/package ratio, cube utilization).

PRODUCT-SPECIFIC HEALTH AND ENVIRONMENTAL REQUIREMENTS

Recovered Material Content

A study conducted by the Environmental Defense Fund indicated that manufacturing processes based on recovered fiber require fewer inputs and generate lower outputs than virgin fiber manufacturing processes, including water and energy use as well as air emissions and wastewater³. Further, according to the Environmental Paper Network, it takes between 2.2 and 4.4 tons of raw wood fiber to produce one ton of virgin pulp and it takes 1.4 tons of recovered material to produce one ton of recycled pulp, which is a wood fiber (tree) savings of up to 310%⁴. This enables preservation of clean water and air, as well as biological diversity and climate regulation⁵. Further, solid waste generated from pulp and paper manufacturing is dwarfed by the life cycle contribution of paper to solid

³ Blum, Lauren et al. Environmental Defense Fund. *A Life Cycle Approach to Purchasing and Using Environmentally Preferable Paper*, *Journal of Industrial Ecology*, Vol. 1 Num. 3, Pp 15-46, 1998.

⁴ <http://www.environmentalpaper.org/issues.html>, the Environmental Paper Network.

⁵ www.metafore.org, Paper Working Group, Environmentally Preferable Paper Defined.

waste, when paper is disposed of in landfills and incinerators instead of being recycled⁶. Increased utilization of recovered material can reduce inputs to municipal waste streams, thus reducing overall space and costs associated with its management. The maximum feasible utilization rate of recovered paper in sanitary paper products is 100%⁷. Other paper grades (*e.g.*, printing and writing, container board) can only utilize lesser amounts. The amount that can be utilized depends on factors in the processing and converting of the product, as well as the requirement of the product to meet certain technical specifications. Therefore, sanitary paper products are the foundation in the hierarchy of accepting recovered material. As a result, the recovered material content requirement in the standard is 100%.

Recovered material content includes waste that cannot be used from the converting process (conventional or certified products), waste generated from manufacturing the certified product (*i.e.*, recovered mill broke), as well as post-consumer material. Virgin or part virgin fibrous waste generated from the manufacturing process, such as fibers recovered from trimmings of the paper machine (*i.e.*, virgin mill broke) is not considered recovered material.

It has been acknowledged that integrated mills or integrated facilities may not be able to maintain precisely 100% recovered material content due to the process of reclaiming mixed fiber within these mills through whitewater and wastewater recovery. Minor amounts of reclaimed mixed fibers would not prohibit the mill from meeting the intent of the standard. Thus, the manufacturer can meet the requirement by demonstrating, through mass balance calculations, that the amount of virgin fiber within the reclaimed mixed fiber is less than 0.5% of the total incoming recovered material furnish (stock).

Post-Consumer Material

The required post-consumer contents have increased to be consistent with the maximum amount required in the US Environmental Protection Agency (EPA) 2007 Comprehensive Procurement Guidelines⁸. This requirement is consistent with other national programs such as The New Zealand Ecolabelling Trust and The Australian Ecolabel Program, both which require levels of post-consumer material that are consistent or higher than the EPA maximums. An alternative to meeting these levels may be permitted when a reduction in total fiber use and disposal (*i.e.*, through source reduction) is demonstrated. Source reduction means altering the design, manufacture, or use of sanitary paper products to reduce the amount that gets disposed of in a landfill. As an example, if a manufacturer can show that they have altered the design of their product such that 15% less material is used and ultimately disposed of in a landfill, then the amount of post-consumer content required in the product could be reduced by an equivalent percentage (*e.g.*, the paper towel post-consumer content requirement could decrease from 60% to 45%).

⁶ The State of the Paper Industry, Monitoring the Indicators of Environmental Performance. Environmental Paper Network. 2007. www.environmentalpaper.org/stateofthepaperindustry.

⁷ The Fiber Cycle Technical Document, Metafore Summary Report, March 2006.

⁸ <http://www.epa.gov/epawaste/conservation/tools/cpg/pdf/paper.pdf>

In the manufacture of products made the agricultural residue from non-timber species (*e.g.*, bagasse, banana stalks), industry practice is to incorporate some timber-based fiber into the product. This standard will require that the timber-based fiber (typically 15%) be post-consumer material.

Recovered Material Processing

The standard requires that all products be Processed Chlorine Free. The intent of this is to reduce the negative impacts associated with chlorine use in the sanitary paper making process. Use of chlorine and/or chlorine-containing compounds in paper making can result in the formation of dioxins, furans, and other chlorinated organics that typically pass through a wastewater treatment plant, and end up accumulating in the environment in the fat tissue of animals and humans. These compounds have been linked to adverse health effects, including cancer and toxicity to reproductive, immunologic, and endocrine systems⁹.

The previous standard prohibited the use of chlorine and its derivatives for the bleaching and deinking stages of the paper making process, without clearly addressing other stages of the process (*e.g.*, during wet strength broke processing). Therefore the standard is more specific in terms of the prohibition of chlorine and its derivatives throughout all of the possible stages of the manufacturing process, including, but not limited to: pulping, screening, deinking, washing, and bleaching.

It is acknowledged that the use of chlorine and/or chlorine derivatives and biocides may be necessary in the manufacturing process as a disinfectant for the purposes of treating incoming and recycled water sources and abatement of biological growth, all which may have an adverse effect on the final product. Residuals from these disinfectants and their disinfection by-products are acceptable if the concentrations in wastewater are below the applicable maximum contaminant levels (MCLs) and maximum residual disinfectant levels (MRDLs) in the National Primary Drinking Water Regulations found in 40 CFR, Part 141.

Green Seal has historically moved to prohibit carcinogens, mutagens, and reproductive toxins in the manufacturing of environmentally preferable products. This standard will also prohibit these compounds. In addition, consistent with GS-1 (1992) this standard does not allow the product or packaging to contain any added colorant components (*i.e.*, pigments, inks, dyes), or fragrances.

This revision has also included the restriction of other potentially harmful compounds. Heavy metals, both in elemental form or as compounds (*e.g.*, hexavalent chromium), including lead, chromium, and selenium are restricted as they have been demonstrated to produce neurotoxic effects in humans. Other heavy metals not listed are covered by the carcinogen prohibition. Optical brighteners and surfactants are restricted due to issues

⁹ USEPA Fact Sheet: The Pulp and Paper Industry, the Pulping Process and Pollutant Releases to the Environment (1997) www.epa.gov/waterscience/pulppaper/jd/fs2/pdf.

with biodegradation and ecotoxicity. Chemicals that contribute to urban smog and global warming have also been restricted, including ozone-depleting compounds and hazardous air pollutants. These restrictions are also consistent with other Green Seal standards (GS-37, GS-40, GS-8, GS-11).

For all of these prohibitions, existing information is used for the evaluation. Product testing and ingredient testing is not required to be conducted.

Social Responsibility

In order to ensure that certified products are made in accordance with reasonable social practices, companies may demonstrate compliance with certification under the International Labour Organisation (ILO). In lieu of this certification, manufacturers can demonstrate that they meet the following requirements: freedom of association & collective bargaining, which means that workers are free to elect to join unions and that their bargaining power is respected; freedom of labor, which prohibits bonded and child labor; freedom from discrimination, which does not allow discrimination based on age, race, sex, political affiliation or social caste that will inhibit opportunities. In addition, freedom from discrimination addresses use or tolerance of corporal punishment or use of physical or verbal abuse or intimidation. Other requirements include occupational health and safety, which establishes minimum safe working conditions and training to minimize injury and accidents as well as conditions of employment that guarantee regular employment, living wages and working hours that are not excessive. This demonstration will need to include: documentation that these requirements are in company policy; providing a written certification statement signed by a legally responsible officer of the company attesting to said requirements; and a review of site conditions by the certifying auditor.

Manufacturing

The most important life cycle components in the production of sanitary paper products with respect to manufacturing include water and energy use (*i.e.*, fossil-fuel based) during production, air and water quality emissions from production, and transportation and energy-related emissions.

The pulp and paper industry remains the single largest industrial consumer of water in many countries and is the third greatest industrial greenhouse gas emitter, after the chemical and steel industries¹⁰. Fossil-fuel based energy production, one of the major sources of energy in product manufacturing around the world, can also generate the most pollutants during production. This source of energy can contribute to global warming and environmental and health issues ranging from asthma to acid rain.¹¹

The ability to improve water and energy use at a manufacturing facility can be affected by the scale of the facility, the age and efficiency of equipment, the current process

¹⁰ <http://www.environmentalpaper.org/issues.html>, the Environmental Paper Network.

¹¹ The Associated Press, *World's growing dependence on coal leaving a trail of environmental devastation*, International Herald Tribune, November 4, 2007. <http://www.ihrt.com/articles/ap/2007/11/05/asia/AS-FEA-GEN-China-Coal-The-Dark-Side.php>

configuration of a facility, regional environmental issues and regulations. Given the factors that can affect manufacturing efficiency, setting a specific threshold is challenging. However, since these are the most significant manufacturing life cycle criteria for sanitary paper products, manufacturers will be required to meet specific levels for these criteria. The levels set in the proposed revised standard have been developed through research, industry survey, and evaluation of other ecolabeling programs.

Paper production can create concentrations of substances that can have a negative impact on the water, air, climate and global ecosystem. Air emissions can include mercury and green house gases such as CO₂, while water effluent can include adsorbable organic halides (AOX), total suspended solids (TSS), chemical oxygen demand (COD), and solid waste^{12,13}. The paper industry has made significant strides in recent years, in part due to state and federal regulations, to reduce the adverse environmental impacts of the industry. In the revised GS-1 standard, manufacturers will be required to document their regulated wastewater and air emissions data, since these criteria are already regulated at a state, federal, or international level.

Transportation of raw materials and finished products can also be a large source of pollution. Emissions produced from international merchant fleets involved in global trade are thought to represent a significant contribution to the global anthropogenic emissions such as NO_x, SO₂, CO, CO₂, and volatile organic compounds (VOC).¹⁴ The environmental costs associated with shipping materials for manufacturing should be taken into consideration, and local sources should be used when possible. If product is being shipped long distances to be manufactured in one locality and then shipped back around the world to be sold, the adverse environmental impacts associated with the transportation could offset the environmental benefits associated with an environmentally preferable product.

One approach to address transportation and related emissions could be to perform a life-cycle assessment (LCA) of a company's carbon footprint. However, preparing an LCA is a complicated process and the results can be quite variable. Therefore, although transportation and related emissions are important in the manufacture of environmentally preferable products, specific criteria have not been included in the standard at this time.

PACKAGING

Packaging in this revised document has expanded the requirements of product packaging and associated materials beyond cores to include primary and secondary packaging items such as containers, bands, corrugated boxes, and plastic films. Plastics in packaging have also been included to prohibit harmful constituents and to require recovered material content.

¹² www.metafore.org, Paper Working Group, Environmentally Preferable Paper Defined.

¹³ The WWF Paper Scorecard Manual, World Wildlife Fund, www.panda.org.

¹⁴ Endresen, Øyvind et al. *Abstract-Emission from international sea transportation and environmental impact*, JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 108, NO. D17, 4560, doi:10.1029/2002JD002898, 2003. <http://www.agu.org/pubs/crossref/2003/2002JD002898.shtml>.

