

GS-1, Green Seal Standard for Sanitary Paper Products



Proposed revisions:

- **Include rapidly renewable fiber in the standard.**
- **Make other substantive and editorial revisions:**
 - **Section 2.1 Product Performance:** Allowing an exception to the upper bounds of tensile strength and stretch, requiring wet tensile strength in only one direction, lowering basis weight requirements for some products, adding in general purpose wipers.
 - **Section 2.3 Product Specifications:** Modifying the minimum product per roll/package in several sub-categories and adding in small dispenser napkins.
 - **3.1 Fiber Requirements:** Adjusting requirements for agricultural residue.
 - **Section 3.5.6 Biodegradability:** Requiring biodegradability only for substances above 100 ppm in the product.
 - **Section 4.2 Manufacturing and Converting Reporting Requirements:** Adding pulping to the processes that have reporting requirements, and clarifying that recycled pulp (MDIP) meet the requirements for energy and water use separately.
 - **Some additional changes, including edits for clarity.**

Green Seal's mission is to advance a green economy by identifying products that provide leadership levels of performance and protection of human health and the environment. Our science-based standards must be applicable and appropriate for the products currently available on the market, and our vision can be realized only when a substantial minority of products can meet the requirements in the standards.

Green Seal issued the first editions of GS-1 and GS-9 in 1992 and 1993, respectively. The two standards were combined into a comprehensive GS-1 standard in 2010. In 2011 and 2012 Green Seal made surgical revisions to GS-1 to incorporate new industry information based on stakeholder feedback and certification review details.

Green Seal is now proposing a revision to GS-1 to incorporate rapidly renewable fiber (RRF) and to make other substantive and editorial revisions to the standard to ensure that the criteria reflect the current practice and environmental leadership in the industry.

The rationale for incorporating RRF into the standard and the resulting revisions are summarized in this document.

Rationale:

Fiber and Recycled Content Requirements

When Green Seal first issued its standards for tissue paper in the early 1990s¹, the United States was engaged in a multifaceted initiative to implement recycling of waste products, including paper. Recycling, then at a low rate nationally, was especially targeted for office paper, and various

¹ GS-1 and GS-9, formerly, before they were combined into GS-1

policies and programs were established to increase the demand for recycled-content papers to stimulate recycling by “closing the loop.” These included a Federal executive order² issued two years after GS-1 was issued requiring Federal purchasers to buy copy paper with a minimum amount of post-consumer fiber, and other state and institutional purchasing initiatives with similar requirements.

These requirements and guidelines focused on post-consumer recycled fiber because this type directly connected with the end-user in the marketplace to truly close the loop and give value to consumer recycling programs. Pre-consumer recycling, such as for unsold copies of magazines and newspapers, had already been incorporated in the paper supply process to a large extent, although it, too, needed to be encouraged. The initiative in paper recycling also aligned with growing efforts to protect natural forests from destruction; the Forest Stewardship Council was formed around this time for this purpose.

Green Seal’s tissue paper standards thus had multiple objectives in requiring that the product be made entirely from recovered material content with a significant fraction from post-consumer content. In addition to protecting natural forests and stimulating recycling of usable fiber to reduce waste, it was also believed that a disposable product like tissue paper should not be made with virgin fiber that is used just once and discarded, thereby reserving the virgin fiber for non-disposable products. Far better, it was reasoned, to make disposable products out of fiber that is “re-purposed” through recycling so that virgin fiber at least gets several uses before winding up in the waste stream.³

Green Seal continues to see the value of using recovered material for tissue paper and including stringent requirements for post-consumer material as well. The maximum theoretical collection rate for recovered paper is estimated to be ~81%, because of non-recoverable laminated or contaminated sources⁴. The United States (U.S.) industry goal for 2012 was 60% paper recovery. That goal was exceeded and hit a record recently; in 2016 67.2% of paper consumed in the U.S. was recovered for recycling. The industry has set the goal for paper recycling at exceeding 70% by 2020 as part of its sustainability initiative.⁵ Thus, the North American market has not yet reached its limit for recycling paper products, and it is still feasible to meet reasonable post-consumer content requirements despite competition for this fiber from abroad. In 2012 North America exported 44% of its recovered paper, up from 37% in 2007. This is used mainly to feed the demand from China⁶. As the recovered material collection in other countries improves, and nonwood fibers get used more in Asia, there should be a shift to additional available recovered paper for the North American market. In both cases, pressure is taken off natural forests to supply fiber for tissue products.

Increasingly, the tissue market is incorporating virgin material from a few wood fiber sources and other nonwood plant fibers that grow rapidly in agricultural settings and can be made into tissue

² Executive Order 12873, 1993, <http://www.thecre.com/fedlaw/legal14/eo12873.htm>

³ Green Seal Proposed Revised Environmental Standard for Sanitary Paper Products (GS-1) Background Document, January 2009,

http://greenseal.org/Portals/0/Documents/Standards/GS1%20Stn%20Dev/gs1_background_doc_%201_5_09.pdf

⁴ 2005. Final Pulp & Paper Statistics. Bureau of International Recycling Paper Division.

⁵ Press Release, May 2017. U.S. Paper Recovery Rate Reaches Record 67.2 Percent in 2016.

<http://www.paperrecycles.org>

⁶ 2012. Recovered Paper Market in 2012. Bureau of International Recycling Paper Division.

products. These RRFs are typically harvested within six to ten-year cycles and often require minimal inputs of water, fertilizer, pesticides, or energy. They are, thus, analogous to agricultural crops, which by their nature are consumed in their “virgin” condition.

Green Seal and others consider RRF to be an environmentally preferable fiber source if it meets similar pulp and paper production requirements as recovered material, plus additional sustainability requirements specific to agricultural production⁷. The thinking is that while these are “virgin” sources that will be used just once, they are quickly regenerated with low impact and can contribute to relieving pressure on natural forests. The key difference between RRF and virgin fiber from forests is that the latter are on a much longer time cycle that represents a significant ecological “investment”. Even if the latter are managed and harvested sustainably, the fibers are better used for recyclable products that can “pay off” the investment over a longer time.

There are several RRF sources that are emerging in the market as preferred fiber; the main ones are several wood fiber sources (i.e., eucalyptus and acacia) as well as many nonwood fiber sources (i.e., hemp, flax (linen), reed (*arundo donax*), bamboo, kenaf, and elephant grass (*miscanthus*). Nonwood pulp production continues to be mainly in Asia and Latin America⁸. These nonwood fibers can be used in combination with softwood and hardwood fiber or on their own.⁹

In addition, agricultural waste from crops, such as sugar-cane residue (bagasse) and wheat straw¹⁰, is becoming an increasing source of alternative fiber for tissue paper.¹¹ GS-1 currently allows agricultural residue up to 85% of the product, with the rest post-consumer, but this may be an unnecessary restriction on the use of agricultural residue. Certainly, there are products currently on the market that are made entirely of residue, and the low environmental impact of harvesting waste from sustainably-produced crops seems to be a double benefit.

To explore the various environmental and health impacts of RRF and agricultural residue in sanitary paper products, Green Seal commissioned a life-cycle review of the major RRFs used to produce paper, as conducted by the Georgia Institute of Technology (Georgia Tech) and funded by a grant to Green Seal by the Solaris Paper Company. The report from Georgia Tech is included among the background documents for this proposal.¹²

The Georgia Tech study shows, in summary, that specific production processes (both agricultural/silvicultural and papermaking) factor more heavily in determining the environmental footprint of various fibers used in sanitary paper products than the type of fiber itself. This led to Green Seal’s conclusion that alternative fiber, including both RRF and agricultural residue, should also qualify as source material for environmentally preferable sanitary paper products if they met similar or identical requirements to those already in GS-1.

⁷ Conservatree, September 2004. The Environmental Paper Listening Study, Chapter Four: Tree Free Paper.

⁸ 2012. Recovered Paper Market in 2012. Bureau of International Recycling Paper Division.

<http://www.bir.org/assets/Documents/publications/brochures/BIR-PaperStats-2014-V3.pdf>

⁹ https://www.paperonweb.com/Articles/plant_fiber_uses.pdf

¹⁰ <http://www.chicagotribune.com/business/chi-wheat-paper-towels-toilet-paper-20150411-story.html>

¹¹ <http://www.cleanlink.com/sm/article/Go-Green-With-Alternative-Fibers-Recycled-Paper-Towels--19089>

¹² Favero et.al., April 2017. “Life cycle and market review of the major alternative fibers for paper production”. Georgia Institute of Technology.

Forest Degradation. An argument that has been advanced against using alternative fiber sources as a substitute for trees typically used for wood fiber (i.e., hardwoods and softwoods with longer growth cycles) is that a significant amount of these trees derives from private forests¹³, and allowing alternative fiber could diminish their value and hasten conversion of forests to other uses. Even though GS-1 currently requires 100% recovered material, the recovered waste stream sources from virgin material in the upstream (i.e., pre-recycled) products, hence ultimately from forests. Also, there are some draw backs to using alternative fiber sources (i.e., seasonal growth cycle, short harvesting period requiring long term storage, poor pulp drainage)¹⁴. Given this and other reasons, it is doubtful in the foreseeable future that the amount of alternative fibers likely to be used in the emerging market of tissue papers will seriously diminish demand for tree fibers¹⁵.

Since RRF sources are by their nature akin to agricultural crops, ensuring that they are as sustainable as recovered material requires that their production be guided by various principles and limits. For instance, a tissue product derived from a flax crop grown on land that just had a primary tropical forest cleared for the purpose could not be considered sustainable, no matter how low the paper production impacts might be. Similarly, inputs of fertilizer, pesticides, and energy must be bounded and guidelines for proper planting practices followed. Fortunately, there is precedent in GS-1 for such agricultural considerations and an existing agricultural sustainability standard for the purpose.

Sustainable Agriculture for RRF. GS-1 currently requires that residue from agricultural crops must be certified to the “Rainforest Alliance Sustainable Agriculture Standard, or other approved third-party certification program.” This is to prevent use of residue from unsustainably located or managed crops, such as the instance cited above. This agricultural standard, now referred to as Sustainable Agricultural Network’s “2017 SAN Standard,” covers many aspects of agricultural production, particularly in tropical areas. But the current list of crops certified to it does not include those that are typically used for tissue paper. Hence, the proposed requirement for RRF is that documentation be provided to demonstrate that they comply with key provisions of this standard. The required provisions include protection of high conservation value areas, natural ecosystems and forests, protected areas, and endangered animals; integrated pest management; use of pesticides; planting practices; nutrient management practices; and application of fertilizers.

For the growth phase of wood fiber that are sources of RRF, we propose to require the same criteria from the 2017 SAN Standard as nonwood fiber plants that are sources of RRF, rather than using forestry certification criteria. As explanation, these rapidly renewable wood fibers are, by definition, on very short-cycle rotations (less than ten years), and their cultivation resembles agriculture as much as silviculture. In addition, the forestry programs are currently focused on forest management/certification and not on crop certification¹⁶. The portions of the 2017 SAN Standard referenced focus on planting, nutrient management, and use of pesticides which are all pertinent to crops. Also, the 2017 SAN Standard precludes any crops (or, by extension, trees) grown on high value conservation land converted since 2005¹⁷ or any forests or natural ecosystems

¹³ Confidential source, personal communication, 2016.

¹⁴ Chandra, 1998. Use of Nonwood Plant Fibers for Pulp and Paper Industry in Asia: Potential in China.

¹⁵ Bottiglieri, Jan. 2016. Nonwood Fiber: Growth and Opportunity. Paper 360°, November/December 2016.

¹⁶ Review of websites <http://www.sfiprogram.org/>; <https://www.pefc.org/>; <https://us.fsc.org/en-us>

¹⁷ Section 2.1, 2017 SAN Standard, <http://sanstandard2017.ag/>

converted after 2014¹⁸. Therefore, Green Seal considers the selected 2017 SAN Standard criteria suitable for rapidly renewable wood fiber sources.

Sustainable Agriculture for Agriculture Residue. We are also proposing that crops from agricultural residue shall meet these criteria from the 2017 SAN Standard. This represents a change from the existing GS-1 which requires that agricultural residue originate from crops that are *certified* to the entire 2017 SAN Standard or other approved third-party certification. This change is proposed not only to be consistent with requirements for RRFs, but also to reduce the high hurdle of obtaining a double certification for tissue products made from agricultural residue. The selected criteria maintained in the proposed revision represent key requirements for protecting existing forest and high conservation areas and endangered species; and requiring sustainable management of the crop through good planting, soil management, and appropriate use of soil amendments and pesticides.

Applicants using agricultural residue and RRFs can still provide proof of 2017 SAN Standard certification, since direct certification would cover the 2017 SAN Standard requirements in the GS-1 standard. However, applicants can also demonstrate that they meet the specified 2017 SAN Standard criteria, instead. This demonstration will require substantive documentation specific to each criterion, the content of which will be delineated by Green Seal upon completion of the revised standard. Green Seal will use as a guide the documentation requirements of the 2017 SAN Standard itself. Because of the significance of agricultural/silvicultural production in the life-cycle of these products, attestations alone will not generally suffice for demonstrating compliance.

Transportation. Concerns have been raised about the use for tissue paper of RRFs grown in distant areas of the world and transported long distances to production facilities. Transportation can be a factor in some unique instances, but studies have generally not found it to be a major contributor to the environmental impact of tissue products. In today's pulp and paper market, fibers of all types are sourced from many geographical areas, and are often transported long distances. Ocean transport is typically used, and it is among the most efficient and low-impact types of transportation. It is difficult to pin down and calculate the transportation effects in every case. Even recycled fiber often gets transported long distances at times.¹⁹

Forest Residue. GS-1 has not included in its scope products made of forest residue. Forest residue is mentioned in the current standard only as an exclusion from recovered material. As discussed earlier, the thrust of GS-1 since its beginning has been to promote recycled or recovered wood fiber, particularly post-consumer fiber, to stimulate recycling of paper products so that there would be less pressure to cut forests for tissue paper. Forest management was not directly relevant because of the requirement that the product contain 100% recovered material (with the dispensation for agricultural residue the only exception).

These proposed revisions continue to exclude forest residue from eligibility under the standard. Regarding full-cycle forests, the emphasis continues to be reuse of recycled wood fiber through use of recovered material. Including forest residue begs the question of how the forest was managed and harvested, which introduces the issue of forest certification. Given the limited use of forest

¹⁸ Section 2.2, 2017 SAN Standard, <http://sanstandard2017.ag/>

¹⁹ Favero et.al., April 2017. "Life cycle and market review of the major alternative fibers for paper production". Georgia Institute of Technology, "5.3.3 Cold Spots," Page 25.

residue in sanitary paper products, Green Seal does not consider it necessary to address this issue at this time.

Combined Fiber Sources. We propose to modify the mix of fiber sources allowed under GS-1 to add rapidly renewable fibers to the existing recovered material and agricultural residue sources. 100% recovered material with minimum post-consumer material depending on the type of product will remain as the first option to continue to stimulate and maintain the recycling market and use recovered (longer-cycle) wood fibers. The option of agricultural residue with post-consumer material will be expanded to allow for 100% agricultural residue, since the market typically does not offer products mixed with both agricultural residue and post-consumer material. Similarly, we propose to allow products made from 100% RRF, since the current and emerging market typically involves such products. Finally, an option is provided for a mix of agricultural residue and RRF (in any combination), and for a mix of these two fiber sources plus recovered material with some restrictions on the latter (to prevent a product from essentially having just pre-consumer material).

Pulp and Paper Production. In addition to specific agricultural production requirements as indicated, RRF and agricultural residue should meet similar pulp and paper production requirements as recovered material is required to meet. These include restrictions on the use of toxic substances, such as chlorine-based bleaching agents or carcinogenic additives or contaminants, in material processing and manufacturing. RRF and agricultural residue should also be subject to the same energy and water limitations in manufacturing as recovered material to ensure that they provide an overall environmental advantage over traditional virgin wood fiber from longer growth cycle trees.

Below are summaries of these proposed revisions and redlined (edited) versions of the criteria. The **red text** are proposed additions and the ~~black crossed-out text~~ are proposed deletions. To see these changes as they would appear in a future standard, view the Proposed Standard with Accepted Changes (PDF) on the Landing Page for this standard revision:

The following changes are proposed to incorporate RRFs and residues:

Section 3.1 Fiber Requirements: The standard has been revised to allow for rapidly renewable fiber (RRF); adjustments have been made in the three tracks provided by the current standard for fiber content and new tracks have been added. The current standard provides for the following three fiber tracks: all recovered with variable minimum post-consumer content per Section 3.2; agricultural residue with minimum post-consumer content; and a combination of recovered and agricultural residue with variable minimum post-consumer content per Section 3.2. The proposed revised standard provides for five tracks for fiber content, as follows: all recovered with variable minimum post-consumer content per Section 3.2 (unchanged); all agricultural residue; all rapidly renewable fiber; any combination of agricultural residue and rapidly renewable fiber; and any combination of agricultural residue and rapidly renewable fiber along with recovered material, provided that the latter is entirely post-consumer or the product meets the minimum requirements for same in Section 3.2.

<p>3.1 Fiber Requirements. The fiber source shall meet one of the following:</p> <p>a) The product shall be made from 100% <i>recovered material</i>, subject to the applicable requirement in section 3.2;</p> <p>b) The product shall be made from up to 85% 100% agricultural residue; with the balance made from post-consumer material⁴;</p> <p>c) The product shall be made from 100% rapidly renewable fiber;</p> <p>d) The product shall be made from any combination of agricultural residue and rapidly renewable fiber;</p> <p>e) The product shall be made from any combination of recovered material, and any combination of agricultural residue and rapidly renewable fiber, provided that the recovered material is 100% post-consumer material, or the product meets the applicable and the balance of the product shall meet the post-consumer material requirement in section 3.2 herein.</p> <p>For <i>recovered material produced by integrated mills</i> where <i>whitewater</i> and/or <i>wastewater</i> recovery may cause contamination of the incoming <i>recovered material furnish</i> (stock), reclaimed mixed fibers containing virgin material may be acceptable as long as it can be shown, through mass balance calculations, that the amount of <i>virgin fiber</i> in the reclaimed mixed fibers is less than 0.5% of the incoming <i>recovered material furnish</i> (stock).</p> <p>⁴For <i>agricultural residue</i> products, this requirement may be satisfied by using post-consumer material that originated from wood pulp, because post-consumer materials originally made from <i>agricultural residue</i> may not be available.</p>

In addition, the requirement that agricultural residue be certified to the Sustainable Agricultural Standard (or equivalent) has been modified to include rapidly renewable fibers and to replace certification with compliance with specific 2017 SAN Standard criteria most relevant to concerns regarding these fibers. A 2017 SAN Standard certification would also still be acceptable.

When using *agricultural residue*, the manufacturer shall document the original source of the material. For any *agricultural residue* or *rapidly renewable fiber* the manufacturer shall document the original source of the material and the *agricultural residue* shall originate from a crop sources that meet the following sections of certified to the Rainforest Alliance Sustainable Agriculture Standard Network's 2017 SAN Standard⁴: 2.1 (re High Conservation Value areas), 2.2 (re natural ecosystems and forests), 2.3 (re protected areas), 2.4 (re endangered animals and control of pests), 3.3 (re integrated pest management), 3.4 (re use of pesticides), 3.10 (re planting practices), 3.11 (re nutrient management practices), and 3.12 (re application of fertilizers) or other approved *third party certification program*.

⁴ <http://sanstandard2017.ag/>

Section 3.3 Post-Consumer Material Calculations: The formula has been revised to incorporate rapidly renewable fiber.

3.3 Post-Consumer Material Calculations. The percentage of *post-consumer material* shall be calculated and certified based on the fiber weight of the paper. The calculation of recycled content based on fiber weight shall be performed using the following formula for *post-consumer material*:

$$\frac{\text{Post-consumer Material} \times \text{Yield}_{\text{PC}}}{\text{Recovered Material}[\text{or}][\text{Agricultural Residue}][\text{or}][\text{Rapidly Renewable Fiber}] \times \text{Yield}_{\text{R}}}$$

Yield will depend on the product manufactured, the raw material, the level of contaminants and the cleaning and deinking technology employed. The percentage yield shall be calculated by dividing the total material output by the total material input². The percentage of *recovered material*, ~~or~~ *agricultural residue*, or *rapidly renewable fiber* and *post-consumer material* shall be calculated based on a weighted average of the materials used for a period of time not to exceed the previous three months.

⁵If a particular manufacturer's operating procedures do not provide for accurate yield measurements, the following shall be used as default values:

Default *Recovered Material*, ~~or~~ *Agricultural Residue*, or *Rapidly Renewable Fiber* yield (Yield_R): 75%

Default *Post-Consumer Material* yield (Yield_{PC}): 75%

Section 3.5.1 Processed Chlorine Free (PCF): For virgin fiber, such as agricultural residue or rapidly renewable fiber, avoidance of chlorine in processing is denoted as Totally Chlorine Free. Process Chlorine Free applies to avoidance of chlorine in processing recovered fibers that may previously have been bleached with chlorine. These distinctions are made clear in the proposed revised language. Also, a footnote is added to clarify that Elemental Chlorine Free (ECF) does not meet the processing requirements of this section.

3.5.1 Processed Chlorine Free (PCF) Chlorine Free. The *papermaking process* used to produce the products shall be *Processed Chlorine Free (PCF) for any recovered material use and Totally Chlorine Free (TCF) for any rapidly renewable fiber or agricultural residue use*³.

³*Elemental Chlorine Free (ECF) does not meet the processing requirements of this section.*

Section 6.4: Statement of Basis for Certification: The main basis statement is modified to focus on recovered material without the former agricultural residue option with its minimum requirement of 85%. Also, another sample basis statement is provided to incorporate the other fiber options, including rapidly renewable and agricultural residue fibers. In addition, a new sentence has been added as an option stating whether the product meets the recovered fiber requirements of the Federal Comprehensive Procurement Guideline Program. This has been requested by many manufacturers and purchasers in the past.

6.4 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.

The description shall read as follows, unless an alternate version is approved in writing by Green Seal:

This product meets Green Seal™ Standard GS-1 based on chlorine-free processing, energy and water efficiency, and content of 100% recovered material of YY with a minimum of XX% post-consumer material. GreenSeal.org. [~~Where YY is the material used (i.e. 100% recovered material, 85% agricultural residue), and where XX is the verified minimum level of post-consumer material].~~]

OR

This product meets Green Seal™ Standard GS-1 based on chlorine-free processing, energy and water efficiency, and use of sustainably produced [rapidly renewable fiber (YY%)] [and] [agricultural residue (ZZ%)] [and] [recovered material (AA%)] [with a minimum of XX% post-consumer material]. GreenSeal.org.

[Where:

- XX is the verified minimum level of post-consumer material;
- YY is the verified level of rapidly renewable fiber;
- ZZ is the verified level of agricultural residue; and
- AA is the verified level of recovered material.]

For products that meet Section 3.2 herein, the label may also include the following text: “This product also meets the material requirements of the Federal Comprehensive Procurement Guideline Program.” or equivalent text as approved by the certifying organization as approved in writing by Green Seal.

Annex A – Definitions: The definitions for “agricultural residue,” “energy use,” “fresh water use,” “furnish,” and “papermaking process” have been modified to incorporate language relevant to rapidly renewable fiber and agricultural residue. In addition, the former definitions for “non-timber species” and “wood pulp” have been replaced with more specific definitions for “nonwood fiber” and “wood fiber.”

Agricultural Residue. Process waste material remaining from ~~harvesting nonwood plants~~~~a non-timber species agricultural plant~~ after it was used to produce food or fiber, which would otherwise be incinerated or disposed of *in situ* or in a landfill. Material that would normally be used as compost/fertilizer *in situ* is excluded.

Energy Use. The total energy used to manufacture *sanitary paper products*, including the net energy consumption during re-pulping of *recovered material*; ~~pulping of~~ ~~or agricultural residue~~ ~~pulping or rapidly renewable fiber~~; throughout the paper making process; during waste treatment; and during converting and/or packaging. Net energy consumption is considered energy purchased and generated less sales. It does not include transportation.

Fresh Water Use. The total amount of steam, process, and cooling water used in the manufacture of *sanitary paper products*, including water used during ~~re-pulping of recovered material~~ ~~re-pulping or~~ ~~pulping of agricultural residue~~ ~~pulping or rapidly renewable fiber~~; throughout the paper making process; and during converting (if applicable). ~~Fresh water does not include whitewater or other recycled water streams.~~

Furnish. The mixture of *recovered material* fiber, ~~or agricultural residue~~ fiber, ~~or rapidly renewable fiber~~ and other chemicals that is blended in a water suspension, or slurry, from which paper products are made. Also referred to as stock.

Nonwood Fiber. Fiber from plants that can be used in the manufacture of *sanitary paper products*, including: bamboo, hemp, flax, wheat straw, cotton, kenaf, sugar cane, or other plants that are botanically not considered trees.

Papermaking Process. The process of using fiber, water and additives to make paper, including, but not limited to, ~~pulping~~/re-pulping, cleaning, screening, deinking, washing, bleaching, and papermaking.

Wood Fiber. Fiber from softwood or hardwood trees that can be used in the manufacture of *sanitary paper products*, including, but not limited to: aspen, birch, eucalyptus, acacia, fir, or pine.

~~**Non-Timber Species.** Plant species used in the manufacture of *sanitary paper products* such as but not limited to bamboo, hemp, cotton, kenaf, or sugar cane, that are not typical fiber sources for pulp or paper products and are botanically not considered trees.~~

~~**Wood Pulp.** Pulp originally generated from softwood or hardwood trees, such as but not limited to aspen, birch, eucalyptus, fir or pine.~~

A definition has been added for “rapidly renewable fiber,” which includes both wood and nonwood fiber sources if they are customarily harvested within ten-year cycles. This duration is critical for distinguishing these alternative fibers from conventional tree fibers, and it is consistent with the definition of the term rapidly renewable in other standards such as the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) rating system.

Rapidly Renewable Fiber. Virgin material produced using *wood or nonwood fiber* sources that are harvested in cycles of less than ten years.

A definition has been added for “totally chlorine free (TCF)” to address the prohibition on chlorine use in processing virgin fibers as opposed to recycled fibers, and a definition for “elemental chlorine free (ECF)” has been added for clarification.

Totally Chlorine Free (TCF). Virgin-content papers in which chlorine or chlorine-derivatives (i.e., elemental chlorine, chlorine dioxide, sodium hypochlorite, sodium chlorite) are not used in any of the unit processes used to manufacture the product, including, but not limited to, the pulping, screening, washing, and bleaching stages.

Elemental Chlorine Free (ECF). Virgin-content papers in which elemental chlorine (i.e., chlorine gas) is not used in any unit processes used to manufacture the product; however, other chlorine compounds (i.e., chlorine dioxide, sodium hypochlorite, sodium chlorite) are still used to manufacture the product during pulping, screening, washing, bleaching and other stages of the process.

The following changes are proposed revisions identified during the certification process to improve the standard and increase clarity, but not related to the rapidly renewable fiber proposal:

Section 2.1 Product Performance: In general, Green Seal’s research and experience from certifying products supports the continued use of the ranges required in the GS-1 standard for performance. However, there are some instances where a product may exceed the upper bounds of the tensile and stretch ranges, while still performing satisfactorily. Green Seal does not want to restrict the industry unnecessarily. A sanitary paper product (e.g. paper towel, napkin) cannot in practical terms be too strong, provided the product is able to be converted and usable. Bath tissue does not have wet strength, and companies need to prove claims of septic safe or degradable/dissolvable, so the dry strength of those products shouldn’t affect usability. Therefore, we are allowing an exception to the upper bound for tensile strength and stretch, based on information from the manufacturer demonstrating the products usability.

In addition, we propose in Section 2.1.2 that wet tensile strength need only be measured according to the test method in one direction (machine or cross), as typically companies only measure one of these directions in determining the wet strength of their product. Green Seal generally accepts industry methods and criteria for evaluating functional performance of their products.

In this section we also propose to explicitly include the sub-category of general purpose wipers, which had previously been omitted although within the scope of the standard. We have applied the same specifications to this sub-category as for folded towels, to which they are closely related.

Finally, we propose to lower the basis weight requirement for bathroom tissue, facial tissue, and toilet seat covers. The industry trend is to make a lighter weight product with the same level of performance, so this will allow for that innovation.

2.1 Product Performance. Product performance requirements shall be consistently measured on either the unconverted (*parent roll*) or *converted product* depending on facility procedures. Testing shall be conducted under controlled and reproducible laboratory conditions. In addition to the measured performance requirements, the product shall be made in accordance with reasonable industry practice.

As an exception, products may exceed the upper ranges for tensile strength or stretch, provided the manufacturer demonstrates that the product meets market expectations for usability.

2.1.1 Basis Weight (grammage).

<i>General purpose wipers</i>	15 - 35	24.4 – 56.9
<i>Bathroom tissue</i>	8-7.5 – 22	13.0 12.2 – 35.8
<i>Facial tissue</i>	8 7.5 – 19	13.0 12.2 – 30.9
<i>Toilet seat covers</i>	8-7.5 – 10.5	13.0 12.2 – 17.1

2.1.2.1 Tensile strength using TAPPI T 494/456. Product characteristics shall meet the following requirements when tested according to TAPPI T 494 or ISO 1924/3 (dry tensile strength) and TAPPI T 456 (wet tensile strength), as measured in gram force/inch (gf/in, English units):

Product	Dry Tensile Strength ^(a)		Wet Tensile Strength ^(b)	
	MD	CD	MD	CD

<i>General purpose wipers</i>	800 - 2700	200 - 1300	230 - 600	90 - 400
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(a) See TAPPI T 1210, Table 1, Section 2.1 for conversion factors

(b) Wet tensile strength data needs to be provided only in one direction (MD or CD)

2.1.2.2 Tensile strength using TAPPI T 576. Product characteristics shall meet the following requirements when tested according to TAPPI T 576 (dry and wet tensile strength) as measured in gf/3in (English units):

Product	Dry Tensile Strength ^(a)		Wet Tensile Strength ^(b)	
	MD	CD	MD	CD

<i>General purpose wipers</i>	2400 - 8100	600 - 3900	690 - 1800	270 - 1200
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(a) See TAPPI T 1210, Table 1, Section 2.1 for conversion factors

(b) Wet tensile strength data needs to be provided only in one direction (MD or CD)

2.1.3 Stretch and Water Absorbency. Product characteristics shall meet the following requirements when tested according to TAPPI T 494 or ISO 1924/3, or TAPPI T 576 for stretch, and TAPPI T 432 for water absorbency, as measured in % stretch or seconds of water absorbency:

<i>General purpose wipers</i>	2 - 22	0 - 160
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Section 2.3 Product Specifications:

We propose modifying the minimum product per roll/package in several sub-categories, as follows, for the indicated reasons just below each proposed change:

INSTITUTIONAL PRODUCTS				
<i>Bathroom Tissue</i>	83 62 ft ² /roll	800 600-3.75" x 4" sheets	41 31 ft ² /roll	400 300-3.75" x 4" sheets

Since 2010 the industry trend has been to reduce the sheet size in this sub-category by 25% while holding prices the same in a challenging market. The basis weight of products has also increased in some cases for performance so that fewer sheets can fit on the same roll size.

INSTITUTIONAL PRODUCTS				
Facial Tissue –Flat Box	--	--	44 1 ft ² /box	100- 7.5 8" x 8" sheets
Facial Tissue – Cube/ Dispenser Boxes	--	--	37 35 ft ² /box	85 80-8" x 8" sheets

The boxes for institutional and retail are often used interchangeably, so the sizes should be the same.

INSTITUTIONAL PRODUCTS				
Paper Towels –Hard wound or Center Pull	133 125 ft ² /roll	200 feet– 7.5 8 inch wide roll	67 62 ft ² /roll	100 feet– 7.5 8 inch wide roll

Towels have also seen some reduction in sheet size based on the same rationale as noted above for bathroom tissue, namely, reduction in sheet size or number of sheets to hold price the same and/or thicker sheets for better performance.

INSTITUTIONAL PRODUCTS				
Paper Towels – Kitchen Rolls (full sheet or select-a- size)	110 67 ft ² /roll	160–11" x 5.5 9" sheets	58 35 ft ² /roll	85–11" x 5.5 9" sheets

RETAIL PRODUCTS				
Paper Towels – Kitchen Rolls (full sheet or select-a- size)	80 67 ft ² /roll	160–11" x 5.5 9" sheets	40 35 ft ² /roll	85–11" x 5.5 9" sheets

Institutional and retail kitchen rolls are basically the same type of product, just used in different settings, so their specifications should be the same. In addition, since 2010 there has been growth in the use of select-a-size rolls, which offer the benefit of using less product, but these sometimes come with fewer sheets because the product is thicker and more absorbent. Hence, both the institutional and retail specifications have been updated.

Paper Napkins – Small Dispensing	62 ft ² /package	200–5" x 9" sheets	31 ft ² /package	100–5" x 9" sheets
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This sub-category is new, reflecting what is used in many institutional settings such as fast-casual restaurants.

Section 3.2 Post Consumer Material Requirements:

The following phrase was added to the header in Section 3.2 for greater clarity:

Product Type	Post-Consumer Material Requirement (% in product)
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Section 3.5.4 Optical Brighteners:

An editorial change was made to refer only to the units of parts per million.

3.5.4 Optical Brighteners. *Optical brighteners* may be used as a *functional papermaking additive* at a dosage not to exceed 200 ~~parts per million~~ **ppm (0.02%)** by weight in the finished product. This level does not include any *optical brighteners* that may be present in the *furnish* through the use of *recovered materials*.

Section 3.5.5 Colorants:

To be clearer about the intended subject of this requirement, the list of product sub-categories has been replaced with the defined phrase, converted products. Other editorial changes were made for clarity.

3.5.5 Colorants. The product shall not contain any *colorants* as *functional papermaking additives*; an exception shall be made for products that would not contain *colorants* but from the addition of *recovered materials*.

Further, ~~paper towels and general purpose wipes, paper napkins, and placemats and other table coverings~~ **converted products** may be printed with *colorants* provided that these *colorants* contain a sum concentration of less than 100 ~~parts per million~~ **ppm**; by weight (~~0.01%~~), of **the** heavy metals ~~including~~ lead, mercury, cadmium, and hexavalent chromium.

Section 3.5.6 Biodegradability:

This provision ensures that additives and contaminants in the papermaking process are biodegradable so that they do not accumulate at the end of the product life-cycle. As originally written, however, it required that biodegradability data be identified for any additive, no matter how low its concentration in the process. To ensure that efforts are directed at significant concerns with respect to additive compounds, a qualification is added to the additives that the biodegradability requirement applies when they are present in the finished product above 100 ppm.

3.5.6 Biodegradability. *Any functional papermaking additives* **present above 100 ppm by weight in the finished product** or *contaminants* used in the *papermaking process*, except for inorganic compounds, polymers, *optical brighteners*, and *biocides*, shall exhibit ready biodegradability in accordance with the Organization for Economic Co-operation and Development (OECD) definition, as follows.

3.5.7 Additional Prohibited Substances: An editorial revision was made for clarity.

3.5.7 Additional Prohibited Substances. The product shall not contain the following substances as *functional papermaking additives* or *contaminants*:

- *Fragrances*
- ~~Heavy metals, including but not limited to~~ **The heavy metals** lead, chromium, or selenium both in the elemental form or compounds

Section 3.6 Added Lotions:

This editorial change reflects the addition of a definition to the standard for “added lotions.” This definition is needed to clarify the difference between an added lotion and a softener/debonder, since use of added lotions triggers additional requirements to be met under a different standard applicable to personal-care products (GS-50).

3.6 Added Lotion. *Added lotion* ~~Lotions~~ may be added to ~~used on~~ sanitary paper products for product softening or other reasons. Such lotions shall not contain any fragrances or colorants and shall meet the requirements of Section 3.0 Product-Specific Sustainability Requirements in the Green Seal Standard for Personal Care and Cosmetic Products, GS-50.

Section 4.1.2 Freedom of Labor:

This is an editorial change simply to denote that a definition for “child labor” has been added to the standard. The definition is identical to that already used in other Green Seal standards.

Section 4.2 Manufacturing and Converting Reporting Requirements:

The pulping process itself has been added to the processes with reporting requirements, now that virgin fibers from rapidly renewable sources are being proposed for inclusion in the standard.

4.2 Manufacturing and Converting Reporting Requirements. The following information shall be reported for processes including **pulping**, re-pulping, deinking, papermaking, product converting, and waste treatment (on-site or off-site facilities), on an annual basis or when any changes are made to the processes.

Section 4.3 Manufacturing and Converting Requirements – Water and Energy Use:

This section also includes pulping among the processes for which water and energy use are limited, for the same reason as in the previous section. A water and energy use survey for RRF products was performed and preliminary conclusions are that these mills can meet the same requirements, so no change in the limits is proposed.

In addition, a sentence is proposed clarifying that for recycled pulp (formally known as market deinked pulp or MDIP), the manufacture of the MDIP must separately meet the energy and water requirements, as well as the subsequent papermaking process using that MDIP. This ensures that both the MDIP supplier and the paper manufacturer use energy and water efficiently, while not penalizing the paper manufacturer for the processes duplicated when MDIP is used (such as re-pulping, drying, waste treatment).

4.3 Manufacturing and Converting Requirements – Water and Energy Use.

Manufacturers shall meet the following fresh water and *energy use* criteria, for combined processes including **pulping**, re-pulping, deinking, papermaking, product converting, and waste treatment (on-site or off-site facilities).

If a manufacturer only does converting, then the energy and water use for the other processes (**pulping**, re-pulping, deinking, papermaking, and waste treatment) shall be supplied by the manufacturer of the *parent roll*.

If a manufacturer purchases market de-inked pulp (MDIP), then the supplier of the MDIP will be required to provide the energy and water use data associated with production of the MDIP. **This supplier data regarding energy and water use in production of MDIP shall meet the criteria in this section separately and in addition to the data from the paper manufacturer itself.**

Section 4.4 Distribution:

This section, which has been reserved and without criteria, will be deleted. As explained in the rationale for including rapidly renewable fibers, source material for tissue products in today's market derives from many locations, and it would be difficult and generally not of great significance to calculate the transportation effects for each product.

~~**4.4 Distribution.** Reserved.~~

Section 5.1 Primary and Secondary Packaging:

The editorial change in the third bullet simply refers to the proper definition and eliminates redundancy in mentioning the reduction amount, which is included in the definition. The plastic labeling criterion was moved from 6.1 to 5.1, since the package is what is marked with the RIC.

5.1 Primary and Secondary Packaging. *Primary and Secondary packaging* shall meet the following requirements based on the packaging material type:

- Packaging made from paper or paperboard shall be *recyclable*, and made from 100% *recovered material*.
- Packaging made from containerboard (corrugated cardboard) shall be *recyclable* and made from at least 30% *recovered material*.
- Packaging made from plastic shall be *recyclable*, or **a source-reduced package** ~~by 20%~~, or shall contain 25% *recovered material* content (*pre- or post-consumer material*). Where a product's packaging is below these levels, the manufacturer ~~must~~**shall** demonstrate that efforts have been made to use the maximum available *pre- or post-consumer material* in packaging. **An exception** shall be made for packaging with an effective *take-back program*.

5.1.1 Plastic Labeling. If plastic, the packaging shall be marked with the appropriate Resin Identification Code.

Section 5.2 – 5.4 Colorants, Heavy Metal Restrictions, Other Restrictions [for packaging]:

These sections were updated editorially to be consistent with other Green Seal standards, to clarify that other restrictions only apply to plastic packaging, and to confirm that the sections apply to primary and secondary packaging.

5.2 Colorants. *Primary and secondary* packaging may be printed using *colorants* provided that these *colorants* contain a sum concentration of less than 100 ~~parts per million,~~ **ppm** by weight (0.01%), of lead, mercury, cadmium, and hexavalent chromium.

5.3 Heavy Metal Restrictions. ~~Heavy metals, including~~ **The heavy metals** lead, mercury, cadmium, and hexavalent chromium, shall not *be intentionally introduced* in *primary and secondary* packaging. Further, the sum of the concentration levels of these metals present shall not exceed 100 **ppm** ~~parts per million~~ by weight (0.01%); an exception ~~shall be made~~ **is allowed** for packaginges that would not exceed this maximum level but for the addition of *recovered materials*. ~~Further, intentional introduction does not include the use of one of the metals as a processing aid or intermediate to impart certain chemical or physical changes during manufacturing, where the incidental retention of a residual of that metal in the final packaging or packaging component is not desired or deliberate, if the final packaging or packaging component complies with the incidental concentration restrictions of 100 ppm.~~

5.4 Other Restrictions. Phthalates, bisphenol A, and chlorinated packaging material are prohibited from being *intentionally introduced* ~~in~~ **to plastic primary or secondary** packaging; an exception ~~shall be made~~ **is allowed** for packaginges ~~with that would not have~~ added phthalates, bisphenol A, or chlorinated packaging material ~~solely from~~ **but for** the addition of post-consumer material.

Section 6.1 Disposal [for labeling]:

The proposed revisions update the language to be consistent with current practice and other Green Seal standards. The Resin Identification Code is now an international code, and it does not necessarily denote that the plastic may be recycled where it is sold. The plastic labeling was also moved to 5.1.1.

6.1 Disposal. The manufacturer's label shall include a statement encouraging recycling of appropriate *primary and secondary* packaging.

~~If plastic, the packaging must be marked with the appropriate Society of the Plastics Industry symbol to identify the type of plastic for recycling. If the symbol is in a conspicuous location, the appropriate qualification of recyclability is required, as referenced in 6.1, such as "This product may not be *recyclable* in your area, see if accepted by your local program" or "only a few communities accept this package for recycling, check with your local program."~~

Annex A – Definitions

These changes are to definitions unrelated to the rapidly renewable fiber addition, but that were also identified as needing to be updated for editorial or other reasons as mentioned below.

A definition has been added for “added lotion” to clarify the difference between an added lotion and a softener/debonder. This is significant because section 3.6 imposes additional requirements on an added lotion, but not on a softener/debonder.

A definition for “child labor” has been added to clarify the requirements in section 4.1.2. The definition is the same as in other Green Seal standards.

The definition for “colorant” has been modified to include reference to colorant being added to the finished product.

The definition for “contaminant” has been slightly modified to clarify the intent of the term, which is meant to apply to contaminants in functional papermaking additives that are left on or in products and to update the units to ppm only.

The definition for “fresh water use” has a qualifying sentence added at the end excluding recycled water, consistent with the standard term in Smook's *Handbook of Pulp & Paper Terminology*. (see page 10 of this document for revised definition).

The definition for “general-purpose wipes” has been modified to change the name to “wipers,” consistent with industry terminology, and to include retail as well as institutional uses.

The definition for “intentionally introduction” has been updated for consistency of Section 5.3 Heavy Metal Restrictions with other Green Seal standards.

The definition for “paper napkins” has been modified to incorporate the sub-category “small institutional dispenser napkins” and for an editorial correction.

The definition for “secondary packaging” has been modified to clarify the second qualifying sentence about shipping packaging.

Added Lotion: Material applied to the finished surface of the paper or tissue to provide softness to the touch. Techniques to add lotion include dipping or spraying. A softener or debonder added to the furnish as a *functional papermaking additive* is not considered an *added lotion*.

Child Labor. Work that deprives children of their childhood, their potential and their dignity, and that is harmful to physical and mental development. To avoid child labor the International Labour Organization provides the following instruments: Minimum Age Convention (e.g., a minimum age not less than 15 for standard work and 18 for hazardous work) and the Worst Forms of Child Labour Convention.

Colorant. Inks, dyes, or pigments which are capable of imparting color when added in the paper-making process **or to the finished product**.

Contaminant. A substance **in a functional papermaking additive** that was not intentionally added, but is known to be present above ~~0.01%~~ **100 ppm (100 parts per million)** by weight, in the **finished** product.

General-Purpose Wipers. A class of absorbent disposable paper products suitable for use as industrial **or retail** wipers and containing no cleaning agents (e.g., surfactants) or *fragrances*.

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. ~~The act of deliberately utilizing a material in the formation of a package or packaging component where its continued presence is desired in the final package or packaging component to provide a specific characteristic, appearance, or quality.~~

Paper Napkins. A class of absorbent, disposable paper products that is typically folded and is suitable for wiping hands and mouth, including, but not limited to: *retail* beverage, luncheon, dinner, and guest towel napkins; *institutional* folded ~~towels~~ **napkins** used with or without a dispenser; **small *institutional* dispenser napkins**; and *institutional* beverage, luncheon, dinner, and guest towel napkins.

Secondary Packaging. Packaging used to contain primary package/s and typically used for merchandizing **or labeling**. **This does not include the *primary package* or additional shipping packaging.** ~~beyond the secondary packaging. This does not include case or shipping packaging or the primary package.~~