



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

January 5, 2009

THE MARK OF ENVIRONMENTAL RESPONSIBILITY

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Green Seal, Inc., developed these Environmental Standards to provide purchasers and manufacturers or service providers with specifications and to enable Green Seal, Inc., to certify products and services for compliance. Use of these standards by others to certify or evaluate compliance is expressly prohibited.

## **GREEN SEAL™**

Green Seal is a non-profit organization devoted to environmental standard setting, product certification, and public education. Green Seal's mission is to work towards environmental sustainability by identifying and promoting environmentally responsible products, purchasing, and production. Through its standard setting, certification and education programs, Green Seal:

- identifies products that are designed and manufactured in an environmentally responsible manner;
- offers scientific analyses to help consumers make educated purchasing decisions regarding environmental impacts;
- ensures consumers that any product bearing the Green Seal Certification Mark has earned the right to use it; and
- encourages manufacturers to develop new products that are significantly less damaging to the environment than their predecessors.

The intent of Green Seal's environmental requirements is to reduce, to the extent technologically and economically feasible, the environmental impacts associated with the manufacture, use and disposal of products. Set on a category-by-category basis, Environmental Standards focus on significant opportunities to reduce a product's environmental impact.

Green Seal offers certification to all products covered by its Standards. Manufacturers may submit their products for evaluation by Green Seal. Those which comply with Green Seal's requirements may be authorized to use the Green Seal Certification Mark on products and in product advertising. Manufacturers authorized to use the Green Seal Certification Mark on their product are subject to an ongoing program of testing, inspection, and enforcement. For additional information on Green Seal or any of its programs, contact:

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## FOREWORD

**A. Certification.** This Environmental Standard contains the basic requirements for certain products (as defined in the Scope section below) to be certified by Green Seal™ and for their manufacturers to receive authorization to use the Green Seal Certification Mark on products and their packaging, and in product advertising. The requirements are based on an assessment of the environmental impacts of product manufacture, use, and disposal and reflect information and advice obtained from industry, trade associations, users, government officials, environmental and other public interest organizations, and others with relevant expertise. These requirements are subject to revision as further experience and investigation may show is necessary or desirable.

**B. Compliance with the Standard.** Compliance with this Standard is one of the conditions of certification of a product by Green Seal.

**C. Compliance with Government Rules.** In order to be authorized to use the Green Seal Certification Mark, the manufacturer of the certified product must disclose all governmental allegations or determinations of violation of federal, state, or local environmental laws or regulations with respect to facilities in which the product is manufactured. Certification will be denied any product manufactured in violation of environmental laws or regulations if, in Green Seal's judgment, such violations indicate that the environmental impacts of the product significantly exceed those contemplated in the setting of the standard.

**D. Limitations on Purpose of Standard.** Green Seal's Standards provide basic criteria to promote environmental quality. Provisions for product safety have not been included in this Standard because government agencies and other national standard-setting organizations establish and enforce safety requirements.

**E. Substantially Equivalent Products.** Products that are substantially similar to those covered by this standard in terms of function and environmental impact may be evaluated and certified by Green Seal against the intent of the requirements of this standard.

**F. Unanticipated Environmental Impacts.** A product which complies with this Standard will not necessarily be certified by Green Seal if, when examined and tested, it is found to have other features which significantly increase its impact on the environment. In such a situation, Green Seal will ordinarily amend its standards to account for the unanticipated environmental impacts.

**G. Certification Agreement and Green Seal Rules.** In order to be authorized to apply the Green Seal Certification Mark to a product or its packaging, or to use the Green Seal Certification Mark in product advertising, the manufacturer of the product must (1) undergo an initial product evaluation to determine that the product complies with Green Seal's requirements, (2) sign a Green Seal Certification Agreement that, among other things, defines how and where the Green Seal may be used, (3) pay fees to cover the costs of testing and monitoring, (4) agree to an ongoing program of factory inspections and product testing, and (5) comply with the requirements found in the most recent version of "Rules Governing the Use of the Green Seal Certification Mark."

**H. Disclaimer of Liability.** Green Seal™, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. Green Seal shall not incur any obligations or liability for damages, including consequential damages, arising out of or in connection with the interpretation of, reliance upon, or any other use of this Standard.

**I. Care in Testing.** Many tests required by Green Seal's Standards involve safety considerations. Adequate safeguards for personnel and property should be employed in conducting such tests.

**J. Referenced Standards.** Standards referenced in this document may have been superseded by a later edition, and it is intended that the most recent edition of all referenced standards be used in determining compliance of a product with this standard.

**K. Labeling Requirements.** This standard neither modifies nor supersedes government labeling requirements. Labeling language which varies in form from the requirements of this section may be used with the written approval of Green Seal.

## List of Acronyms and Terms

**AOX.** Adsorbable Organic Halide  
**ADMT.** Air Dried Metric Ton.  
**ASTM.** American Society for Testing and Materials.  
**BTU.** British Thermal Unit.  
**CD.** Cross direction.  
**CFR.** Code of Federal Regulations.  
**CFC.** Chlorofluorocarbon.  
**CO<sub>2</sub>.** Carbon dioxide.  
**COD.** Chemical Oxygen Demand.  
**EPA.** United States Environmental Protection Agency.  
**gf.** Gram force.  
**GHS.** Globally Harmonized System for Classification and Labeling of Chemicals.  
**GJ.** Gigajoules.  
**HAP.** Hazardous air pollutant.  
**Hr.** Hour.  
**in.** inch.  
**IARC.** International Agency for Research on Cancer.  
**ILO.** International Labour Organisation.  
**ISO.** International Organization for Standardization.  
**IRIS.** Integrated Risk Information System.  
**Kg.** Kilogram.  
**Kw.** Kilowatt.  
**lb.** pound.  
**m<sup>2</sup> or m<sup>3</sup>.** Square meters or cubic meters.  
**MCL.** Maximum contaminant level.  
**MD.** Machine direction.  
**MRDL.** Maximum residual disinfectant level.  
**N.** Newton.  
**NO<sub>x</sub>.** Nitrogen Oxides.  
**NTP.** National Toxicology Program.  
**OECD.** Organization for Economic Co-operation and Development.  
**OSHA.** Occupational Safety and Health Administration.  
**PCF.** Processed Chlorine Free.  
**PVC.** Polyvinyl chloride.  
**SIC.** Standard Industrial Classification.  
**SO<sub>2</sub>.** Sulfur Dioxide.  
**TAPPI.** Technical Association of the Pulp and Paper Industry.  
**TPM.** Total Particulate Mater.  
**TSS.** Total Suspended Solids.  
**USDA.** United States Department of Agriculture.

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

### **1.0 SCOPE**

This standard establishes environmental requirements for sanitary paper products including paper towels, paper napkins, bathroom tissue, facial tissue, toilet seat covers, placemats and other sanitary paper products made from 100% recovered material. The standard covers products for institutional as well as retail markets. This standard does not include nonwoven sanitary products, general purpose wipes, flushable wipes, disposable diapers, or sanitary napkins and tampons.

### **2.0 DEFINITIONS**

**2.1 Adsorbable Organic Halide (AOX).** A measure of the total sum of the halide (typically measured as chloride) concentration bound in organic compounds. AOX is a surrogate measure for the amount of chlorinated organic compounds in wastewater.

**2.2 Agricultural Residue.** Material remaining from a plant after it was used to produce food or fiber.

**2.3 Bathroom Tissue.** A soft paper product used to maintain personal hygiene, designed to disperse in septic tanks. Sheets can range in size from a minimum of 3 7/8" by 3 7/8" up to 4 1/2" by 4 1/2".

**2.4 Biocide.** A chemical used to kill biological organisms.

**2.5 By-product.** A secondary or incidental product deriving from a manufacturing process.

**2.6 Carcinogen.** Chemicals listed as a known, probable, reasonably anticipated, or possible human carcinogen by the IARC (Groups 1, 2A, and 2B), NTP (Groups 1 and 2), EPA IRIS (weight-of-evidence classifications A, B1, B2, C, carcinogenic, likely to be carcinogenic, and suggestive evidence of carcinogenicity or carcinogen potential), or by OSHA (as carcinogens under 29 CFR 1910.1003(a)(1)).

**2.7 Chemical Oxygen Demand (COD).** An indirect measure of the amount of organic compounds (and some inorganic compounds, such as ammonia) in wastewater that exert a demand on oxygen during decomposition.

**2.8 Colorant.** Inks, dyes, or pigments used in the paper-making process.

**2.9 Component.** A substance deliberately added to a product, where it is added for its continued presence in the final product to provide a specific characteristic, appearance, or quality.

- 2.10 Cube Box.** A tissue box size that is typically an upright package with a square base and an elongated height.
- 2.11 Disinfection By-Product.** Compounds formed when disinfectants used for water treatment react with bromide and/or natural organic matter present in the source water. Regulated disinfection by-products include trihalomethanes, haloacetic acids, bromate, and chlorite.
- 2.12 Energy Use.** The total energy used to manufacture sanitary paper products, including energy used during pulping of recovered material, throughout the paper making process, during waste treatment, and during converting and/or packaging. Total energy use is considered all energy consumed, regardless of source, excluding any generated energy sold to a power grid. It does not include transportation.
- 2.13 Facial Tissue.** A class of soft, absorbent, disposable paper suitable for use on the face. Sheets can range in size from an 8-inch square, to a slightly larger size.
- 2.14 Fragrance.** A constituent, often (but not limited to) a multi-component constituent, used in a product with the purpose of imparting a scent to the product.
- 2.15 Fresh Water Use.** The total amount of process and cooling water used in the manufacture of sanitary paper products, including water used during recovered material pulping, throughout the paper making process, and during converting (if applicable).
- 2.16 Furnish or Stock.** The mixture of recovered material fiber and other materials that is blended in a water suspension, or slurry, from which paper products are made.
- 2.17 Hazardous Air Pollutant (HAP).** Any compound listed by the EPA in the Clean Air Act Section 112(b) (1) as a hazardous air pollutant.
- 2.18 Ingredient.** Any component of a product that is intentionally added or known to be a contaminant that comprises at least 0.01% by weight of the finished product.
- 2.19 Institutional.** A category of products manufactured for use at institutional facilities, such as schools, hospitals, or offices.
- 2.20 Integrated Mill or Integrated Facility.** A facility with either a pulp mill or the capability to repulp virgin fiber and a paper mill on the same site.
- 2.21 Intentional Introduction.** 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.

**2.22 Mutagen.** A chemical that meets the criteria for category 1, chemicals known to induce heritable mutations or to be regarded as if they induce heritable mutations in the germ cells of humans, under the GHS.

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

**2.24 NO<sub>x</sub>.** Nitrogen Oxides, which are emitted from motor vehicles, power plants and other sources of combustion.

**2.25 Optical Brightener.** Components designed to enhance the appearance of colors and whiteness in materials by absorbing ultraviolet radiation and emitting blue radiation. These compounds are also known as fluorescent whitening agents.

**2.26 Ozone-Depleting Compound.** Any compound with an ozone-depletion potential greater than 0.01 (CFC 11=1) according to the EPA list of Class I and Class II Ozone-Depleting Substances.

**2.27 Paperboard.** Material used to contain or package sanitary paper products, including roll cores, brown papers, wrappers, bands, and folding cartons.

**2.28 Paper Napkins.** A class of absorbent, disposable paper that is typically folded and is suitable for wiping hands and mouth. Retail sheet size is typically 11 inches by 12 inches. Institutional sheet size varies, but a typical size is 14 inches by 17 inches.

**2.29 Paper Towels.** A class of absorbent, disposable paper suitable for use in drying hands, wiping windows, or cleaning up spills. Retail sheet size is typically 11 inches by 9 inches. Institutional rolls are typically 7 1/2 to 10 inches wide, and a typical folded towel is a minimum 9-inch square.

**2.30 Placemats and other Table Coverings.** A protective table pad or table cover made from paper. Sizes vary.

**2.31 Post-Consumer Material.** Material that would otherwise be disposed of as solid waste, having completed its intended end-use. Post-consumer material does not include materials, agricultural residues, or by-products generated from, and commonly reused within, an original manufacturing and fabrication process.

**2.32 Primary Packaging.** The material physically containing and coming into contact with the product, such as tissue boxes or plastic film wrappers.

**2.33 Processed Chlorine Free (PCF).** Recycled or recovered-content papers in which chlorine or chlorine-containing compounds are not used in any of the

unit processes used to manufacture the product, including, but not limited to, the pulping, screening, deinking, washing, and bleaching stages.

**2.34 Recovered Material.** Material recovered from or otherwise diverted from the solid waste stream that is generated after the completion of the paper manufacturing process.

Recovered material may include:

- Recovered fibers from wastewater or trimmings of paper machine rolls (recovered mill broke) used to make the certified product.
- Manufacturing waste such as dry paper and paperboard waste generated after completion of the papermaking process (i.e., during converting).
- Post-consumer materials such as paper, paperboard, and fibrous materials from retail stores, office buildings, homes, etc., after they have completed their intended end-use.

Recovered material does not include:

- Virgin or part virgin fibrous waste paper generated during the manufacturing process, such as fibers recovered from wastewater or trimmings of paper machine rolls (virgin mill broke), regardless of whether such materials are used by the same or another company.
- Fibrous by-products of harvesting, extractive or woodcutting processes or forest residues such as cotton linters, bark or sawdust.

For non-timber species, recovered material is considered agricultural residue that would otherwise be disposed as waste.

**2.35 Recyclable.** The package or product can be collected in a substantial majority of communities, separated or recovered from the solid waste stream and used again, or reused in the manufacture or assembly of another product package through an established recycling program.

**2.36 Reproductive Toxin.** A chemical listed as a reproductive toxin (including developmental, female, and male toxins) by the State of California under the Safe Drinking Water and Toxic Enforcement Act of 1986 (California Code of Regulations, Title 22, Division 2, Subdivision 1, Chapter 3, Sections 1200, et. Seq., also known as Proposition 65).

**2.37 Retail.** A category of products manufactured for use in consumer homes and typically sold in retail stores.

**2.38 Sanitary Paper Products.** SIC 2676. Products including facial and bathroom tissues, toilet seat covers, paper towels, paper napkins, paper placemats

and table coverings. Products that are technically in this category by SIC code, but not covered by this standard include nonwoven sanitary products, general purpose wipes, flushable wipes, disposable diapers, or sanitary napkins and tampons.

**2.39 Secondary Packaging.** Any packaging or material other than primary packaging, including paper bands, wrappers, boxes, and other packaging.

**2.40 Size or Sizing.** Components applied to the paper either internally through the beater or as a coating that improves printing qualities and resistance to liquids.

**2.41 Source Reduction.** Altering the design, manufacture, or use of sanitary paper products to reduce the amount that gets disposed of in a landfill.

**2.42 Surfactant.** A group of chemicals that have a hydrophilic and hydrophobic group. Defoamers, dispersants, foaming agents, and collectors used in flotation deinking are all considered surfactants. This group of chemicals is also known as surface active agents.

**2.43 Toilet Seat Covers.** A soft, thin paper product used to cover toilet seats for personal hygiene protection, designed to disperse in septic tanks.

**2.42 Total Particulate Matter (TPM).** Airborne particulate matter (carbonaceous, organic, and sulfate particulates) with an upper size limit of approximately 100 microns in diameter.

**2.44 Total Suspended Solids (TSS).** A measure of the amount of suspended solids in wastewater obtained by separating particles from a water sample using a filter with a nominal pore size of 2 micrometers (or smaller). Suspended solids are the portion retained on the filter.

**2.45 Unsized Products.** Products that have not gone through a sizing process, such as bathroom tissue, facial tissue, napkins, and towels.

**2.46 Virgin Fiber.** Fiber that is not of recovered or post-consumer origin.

**2.47 Waste.** Waste material from the manufacturing of the product not included in the finished product, which are not salable and are disposed, including wastewater.

**3.0 PRODUCT-SPECIFIC PERFORMANCE REQUIREMENTS**

**3.1 Test Methods.** Product characteristics shall be measured for all products according to the following ASTM test methods (or equivalent TAPPI or ISO methods):

Product Characteristic	S.I. Units	English Units	Test Method
Basis Weight (grammage)	g/m <sup>2</sup>	lbs/ream	ASTM D 646 (T-410; ISO 536)
Dry Tensile Strength (MD & CD)	N/m	gf/in or gf/3in	ASTM D 828 (T-494; ISO 1924/3) or T-576
Wet Tensile Strength (MD & CD)	N/m	gf/in or gf/3in	ASTM D 829 (T-456) or T-576
Stretch	%	%	ASTM D 828 (T-494; ISO 1924/3) or T-576
Brightness	reflectance scale	reflectance scale	ASTM D 985 (T-452; ISO 2469,2470/2) or T-525

**3.2 Additional Test Methods for Unsized Products.** In addition to 3.1, unsized products shall be measured for the following product characteristic according to the following ASTM test method (or equivalent TAPPI method):

Product Characteristic	Units	Test Method
Water Absorbency	seconds	ASTM D 824 (T-432)

**3.3 Testing Results.** The above product characteristic test results shall be documented, and shall meet the following performance ranges that are considered reasonable industry practice.

**3.3.1 Basis weight (grammage)**

Product	Basis Weight (lbs/ream)	Grammage <sup>(a)</sup> (g/m <sup>2</sup> )
Paper towels	11 - 32	17.9 – 52.1
Paper napkins	10 – 28.3	16.3 – 46.1
Bathroom tissue	8.5 - 22	13.8 – 35.8
Facial tissue	8 - 19	13.0 – 30.9
Toilet seat covers	8.7 – 9.7	14.1 – 15.7
Placemats and other table coverings	35 - 40	57 - 65

(a) See ASTM D 646 for basis weight to grammage conversion.

### 3.3.2 Tensile strength using ASTM D 828/829 (T-494/456)

Product	Dry Tensile Strength <sup>(a)</sup>		Wet Tensile Strength	
	MD	CD	MD	CD
	(gf/in)	(gf/in)	(gf/in)	(gf/in)
Paper towels	1750 - 2800	650 - 1200	300 - 700	150 - 300
Paper napkins	470 - 550	275 - 350	n/a	n/a
Bathroom tissue	166 - 600	50 - 190	n/a	n/a
Facial tissue	302 - 456	92 - 124	20 - 40	10 - 15
Toilet seat covers	3.1 - 7	1 - 2	n/a	n/a
Placemats and other table coverings	n/a	n/a	n/a	n/a

(a) 1 gf/in = 0.3886 N/m

n/a = not applicable

### 3.3.3 Tensile strength using T-576

Product	Dry Tensile Strength <sup>(a)</sup> (T-576)		Wet Tensile Strength (T-576)	
	MD	CD	MD	CD
	(gf/3 in)	(gf/3 in)	(gf/3 in)	(gf/3 in)
Paper towels	2100 - 9250	1600 - 5750	900 - 2500	300 - 1400
Paper napkins	1500 - 2900	750 - 1650	n/a	n/a
Bathroom tissue	1050 - 2000	475 - 825	n/a	n/a
Facial tissue	1130 - 2150	400 - 750	230 - 250	90 - 115
Toilet seat covers	4750	2500	160	100
Placemats and other table coverings	n/a	n/a	n/a	n/a

(a) 1 gf/3in = N/m

n/a = not applicable

### 3.3.4 Stretch, Brightness and Water Absorbency

Product	Stretch	Brightness	Water Absorbency
	(%)	(reflectance)	(seconds)
Paper towels	2 - 22	55 - 85	2 - 75
Paper napkins	6 - 20	76 - 87	2 - 25
Bathroom tissue	7 - 18	70 - 84	8 - 45
Facial tissue	3 - 23	70 - 87	n/a

Toilet seat covers	1.7	82	n/a
Placemats and other table coverings	n/a	65 - 80	n/a

n/a = not applicable

**3.4 Alternative Performance Requirements.** Alternative test methods may be allowed for sanitary paper products not specified in this standard that may follow different criteria than those listed in this standard. A manufacturer must provide documented rationale for use of the method. The method must be an objective, scientifically-validated method, conducted under controlled and reproducible laboratory conditions. The results of the testing must meet performance ranges that are considered reasonable industry practice.

**3.5 Product Specifications.** Products must contain the following minimum material specifications (unless an alternate size generates better packaging or shipping efficiencies per Section 3.6):

Product	Single Ply Specification <sup>(a)</sup>	Double Ply Specification <sup>(a)</sup>
Bathroom Tissue	800 sheets per roll (equivalent to 84 ft <sup>2</sup> /roll for a 3 7/8" x 3 7/8" sheet)	400 sheets per roll (equivalent to 42 ft <sup>2</sup> /roll for a 3 7/8" x 3 7/8" sheet)
Facial Tissue – Institutional Flat Box	n/a	100 sheets per box (equivalent to 44 ft <sup>2</sup> /box for an 8" x 8" sheet)
Facial Tissue – Retail Flat Box	n/a	200 sheets per box (equivalent to 88 ft <sup>2</sup> /box for an 8" x 8" sheet)
Facial Tissue – Cube/Dispenser Boxes	n/a	85 sheets per box (equivalent to 37 ft <sup>2</sup> /box for an 8" x 8" sheet)
Paper Towels – Institutional Rolls	200 feet per roll (equivalent to 133 ft <sup>2</sup> /roll for an 8 inch wide roll)	100 feet per roll (equivalent to 67 ft <sup>2</sup> /roll for an 8 inch wide roll)
Paper Towels – Institutional Folded	200 sheets per package (equivalent to 112 ft <sup>2</sup> /package for a 9" x 9" sheet)	100 sheets per package (equivalent to 56 ft <sup>2</sup> /package for a 9" x 9" sheet)
Paper Towels – Retail Rolls	180 sheets per roll (equivalent to 124 ft <sup>2</sup> /roll for an 11" x 9" sheet)	90 sheets per roll (equivalent to 62 ft <sup>2</sup> /roll for an 11" x 9" sheet)
Paper Napkins – Institutional	200 sheets per package (equivalent to 330 ft <sup>2</sup> /package for a 14" x 17" sheet)	100 sheets per package (equivalent to 165 ft <sup>2</sup> /package for a 14" x 17" sheet)
Paper Napkins - Retail	250 sheets per package (equivalent to 229 ft <sup>2</sup> /package)	100 sheets per package (equivalent to 91 ft <sup>2</sup> /package)

	for an 11" x 12" sheet)	for an 11" x 12" sheet)
Toilet Seat Covers	250 sheets per package	n/a
Placemats and Other Table Coverings	n/a	n/a

(a) The equivalent square footage for the specified sheet or roll size is provided so that a manufacturer using a different size sheet can determine the minimum sheets per roll/box/package for that sheet size (e.g., tissue: minimum sheets per roll = square feet per roll divided by sheet size (in<sup>2</sup>) multiplied by 144 (in<sup>2</sup>/ft<sup>2</sup>)).

**3.6 Packaging Efficiency.** The manufacturer shall provide specifications to demonstrate that they have taken into consideration packaging and shipping the product using an efficient approach (e.g., product/package ratio and cube utilization).

#### 4.0 PRODUCT-SPECIFIC HEALTH AND ENVIRONMENTAL REQUIREMENTS

**4.1 Recovered Material Requirements.** The fiber shall contain 100% recovered materials. For integrated mills where whitewater and/or wastewater recovery may cause contamination of the incoming recovered material furnish (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 virgin fiber in the reclaimed mixed fibers is less than 0.5% of the incoming recovered material furnish (stock).

When using agricultural residues for recovered materials, the manufacturer shall document the source of the crop; the original agricultural crop shall be USDA Organic, or certified to the Rainforest Alliance Sustainable Agriculture standard.

**4.2 Post-Consumer Material Requirements.** 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:

$$\frac{\text{Post-consumer Material} \times \text{Yield}}{\text{Recovered Material} \times \text{Yield}}$$

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 input<sup>1</sup>. The percentage of recovered material 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.

<sup>1</sup> If a particular manufacturer's operating procedures do not provide for accurate yield measurements, the following shall be used as default values:  
Recovered/Post-Consumer Material: 75%

**4.2.1 Paper Towels and Napkins.** The fiber in paper towels and napkins shall contain at least 60% post-consumer material.

**4.2.2 Bathroom Tissue.** The fiber in bathroom tissue shall contain at least 60% post-consumer material.

**4.2.3 Facial Tissue.** The fiber in facial tissue shall contain at least 15% post-consumer material.

**4.2.4 Toilet Seat Covers.** The fiber in toilet seat covers shall contain at least 30% post-consumer material.

**4.2.5 Placemats and other Table Coverings.** The fiber in placemats and other table coverings shall contain at least 75% post-consumer material.

**4.2.6 Agricultural Residue Products.** Products made from agricultural residue of non-timber species shall contain at least 15% post-consumer content. This requirement may be satisfied by using timber-species post-consumer material since post-consumer materials may not be readily available from agricultural residue sources.

**4.2.7 Alternative Requirements.** Alternatively, if a reduction of total fiber use and disposal (*i.e.*, through source reduction) can be demonstrated, the post-consumer material requirements outlined in 4.2.1 – 4.2.6 may be lowered by an equivalent amount.

### **4.3 Recovered Material Processing:**

**4.3.1 Processed Chlorine Free.** The recovered material used to manufacture the products shall be PCF.

**4.3.2 Carcinogens, Mutagens, and Reproductive Toxins.** The product shall not contain any ingredients or components that are carcinogens, mutagens or reproductive toxins. Additionally, the product shall not contain any ingredients or components known to produce or release carcinogens, mutagens or reproductive toxins.

**4.3.3 Other Prohibited Components.** The product shall not contain the following components:

- Heavy metals, including but not limited to lead, chromium, or selenium both in the elemental form or compounds
- Ozone-depleting compounds
- Optical brighteners
- Surfactants
- Fragrances

- HAPs
- Colorants

**4.3.4 Colorant Exception.** Paper towels, paper napkins, and placemats and other table coverings (not including packaging) may be printed with colorants provided that these colorants contain a sum concentration of less than 100 parts per million, by weight, of heavy metals including lead, mercury, cadmium, and hexavalent chromium.

**4.3.5 Disinfection.** Chlorine, chlorine derivatives, biocides, and disinfection by-products may be allowed in the manufactured product, if the presence of these chemicals are a result of disinfection of the water supply. Product testing is not required, as long as the wastewater concentrations of the materials used for disinfection are below the applicable MCLs or MRDLs in the National Primary Drinking Water Regulations found in 40 CFR, Part 141.

**4.4 Social Responsibility.** The manufacturer shall be certified under the International Labour Organisation. In lieu of this certification, the production of the product shall meet the following social responsibility requirements (as documented in company policy, provided in an attestation, and evaluated by the certifying auditor):

**4.4.1 Freedom of Association and Collective Bargaining.** Workers shall have the right to join or form trade unions of their own choosing and their right to bargain collectively shall be recognized and respected.

**4.4.2 Freedom of Labor.** There shall not be forced or bonded labor or use of child labor.

**4.4.3 Freedom from Discrimination.** There shall not be discrimination in terms of race, color, sex, religion, age, disability, gender, marital status, sexual orientation, union membership, political opinion, national extraction or social origin such that it affects the opportunity or treatment in employment and there shall be no support or tolerance of corporal punishment, physical or verbal coercion, sexual or other harassment, intimidation or exploitation.

**4.4.4 Occupational Health and Safety.** A safe and hygienic workplace environment shall be provided with access to potable water. Adequate steps shall be taken to minimize the hazards of the workplace and workers shall receive health and safety training to prevent accidents and injury.

**4.4.5 Conditions of Employment.** Workers shall work under fair conditions of employment. Wages, working hours and overtime shall meet

at a minimum the national legal or industry benchmark standard and regular employment shall be provided.

**4.5 Manufacturing and Converting Requirements – Air.** Fossil CO<sub>2</sub> (from grid and external sources) SO<sub>2</sub>, NO<sub>x</sub>, Mercury, and TPM shall be documented as kg/air dried ton of product.

**4.6 Manufacturing and Converting Requirements - Wastewater.** Wastewater levels for AOX, TSS, and COD shall be documented as kg/air dried ton of product.

**4.7 Manufacturing and Converting Requirements - Waste Disposal.** The ratio of the ton of material entering an external waste disposal stream to the ton of product produced shall be documented.

**4.8 Manufacturing and Converting Requirements – Water and Energy Use.** Manufacturers shall meet the following fresh water and energy use criteria, on a facility-wide basis. The data should represent the total annual average resource used divided by the total annual production of all grades.

Fresh Water Use (gallons/air dried ton of final product) <sup>a</sup>	Total Energy Use (millions of BTUs/air dried ton of final product) <sup>b</sup>
17,500	15.5

<sup>a</sup> gallons/air dried ton of final product = 0.00417 m<sup>3</sup>/ADMT

<sup>b</sup> millions of BTUs/air dried ton of final product = 1.16 GJ/ADMT = 323.2 kwh/ADMT

## 5.0 PACKAGING REQUIREMENTS

**5.1 Paperboard Primary Packaging.** The paperboard primary packaging shall be recyclable, and shall contain the applicable EPA Comprehensive Procurement Guideline minimum levels for recovered and post-consumer material content.

**5.2 Plastic Primary Packaging.** Plastic primary packaging shall be recyclable or shall contain a state-of-the-art amount of post-consumer material content. Where the primary packaging is below these levels, the manufacturer must demonstrate that efforts have been made to use the maximum available post-consumer material in packaging. The package must be clearly marked with the appropriate Society of the Plastics Industry symbol to identify the type of plastic for recycling.

**5.3 Secondary Packaging.** Secondary packaging shall be recyclable and shall contain the applicable EPA Comprehensive Procurement Guideline minimum levels for recovered and post-consumer content. Where the secondary packaging is below these levels, the manufacturer must demonstrate that efforts

have been made to use the maximum available post-consumer material in packaging.

**5.4 Colorant Components.** Packaging may contain colorant components provided that they contain a sum concentration of less than 100 parts per million, by weight, of items prohibited in 4.3.2 and 4.3.3.

**5.5 Heavy Metal Restrictions.** Heavy metals, including lead, mercury, cadmium, and hexavalent chromium, shall not be intentionally introduced in packaging. Further, the sum of the concentration levels of these metals present shall not exceed 100 parts per million by weight (0.01%); an exception is allowed for packages that would not exceed this maximum level but for the addition of post-consumer 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.

**5.6 Other Restrictions.** Phthalates and chlorinated packaging material are prohibited from being intentionally introduced; an exception is allowed for packages with added phthalates or chlorinated packaging material solely from the addition of post-consumer material.

## 6.0 LABELING REQUIREMENTS

**6.1 Disposal.** The manufacturer's label shall include a statement encouraging proper disposal of the product and encouraging consulting with local authorities regarding reuse and recycling opportunities for packaging and unused product.

**6.2 Certification Mark.** The Green Seal Certification Mark may appear on the product's packaging. It may be embossed, or printed on the product where applicable in 4.3.4. The Green Seal Certification Mark shall not be used in conjunction with any modifying terms, phrases, or graphic images that might mislead consumers as to the extent or nature of the certification.

### 6.3 Statement of Basis of Certification

**6.4.1 Certification Statement.** Whenever the Green Seal Certification Mark appears on a package or applicable product, the package or applicable product must contain a description of the basis for the certification. The description shall be in a location, style, and typeface that are easily readable by the consumer. Unless otherwise approved in writing by Green Seal, the description shall read as follows:

“This product meets the Green Seal™ environmental standard for Sanitary Paper Products for being processed chlorine free and for

efficient energy and water use during manufacturing. The product contains 100% recovered material, including XX% post-consumer content, and contains no added colorants or fragrances.” [Where XX is the verified level of post-consumer material].

**6.4.2 Manufactured Without Bleach.** If the product has been made without bleach of any kind, the package or the product may bear the additional endorsement: "**Unbleached**" or an equivalent description, approved in writing by Green Seal.

**6.4.3 Manufactured Without Chlorine or its Derivatives.** Since the product has been bleached without chlorine or any of its derivatives, the package, or the product, may bear the additional endorsement: "**No Chlorine Bleach,**" or "**Oxygen Bleached,**" as appropriate, or an equivalent description, approved in writing by Green Seal.